ZEROCO2

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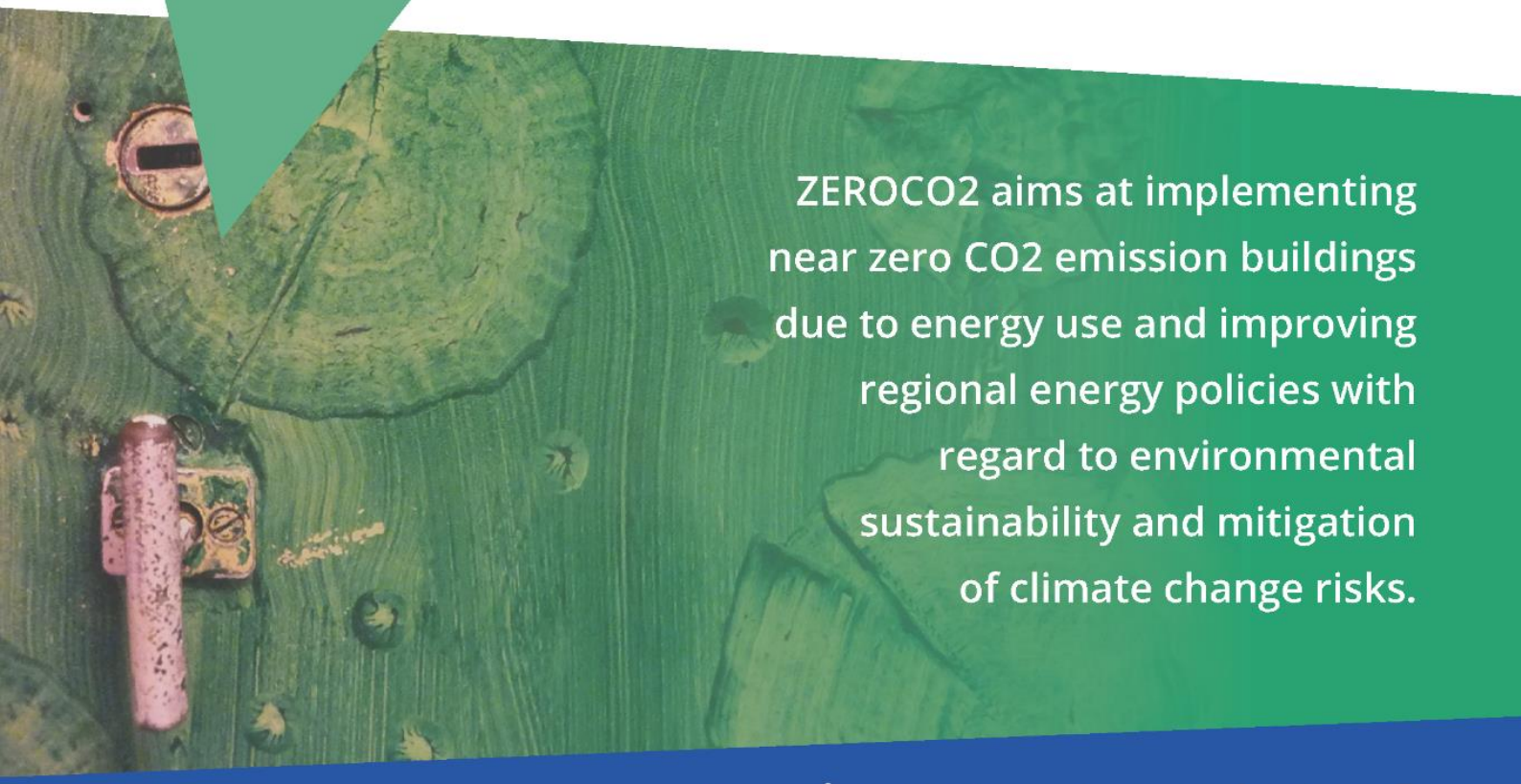

ZEROCO2 aims at implementing near zero CO2 emission buildings due to energy use and improving regional energy policies with regard to environmental sustainability and mitigation of climate change risks.

www.interregeurope.eu/zeroco2

An interregional cooperation project for improving low-carbon economy policies

Project Partners

European Institute for Innovation (DE)
Mediterranean Agronomic Institute of Chania (EL)
Thermopolis Ltd. (FI)
A.VI.TE.M – Agency For Sustainable Mediterranean Cities and Territories (FR)
Molise Region (IT)
Municipality of Kaunas District (LT)
Local Councils' Association (MT)
University of Malta (MT)
Local Energy Agency Spodnje Podravje (SI)

Low-carbon economy

€ 1.23 M ERDF

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European Union
European Regional Development Fund

Promotion of near zero CO2 emission buildings due to energy use

ACTION PLAN

MEDITERRANEAN AGRONOMIC INSTITUTE OF CHANIA –

Regional operational programme of Crete, 2014-2020

TABLE OF CONTENT

1. INTRODUCTION 4

2. REGIONAL ANALYSIS 6

2.1 Population Characteristics 6

2.2 A brief description of Crete/Greece 9

2.3 Use of energy 11

2.4 Use of renewable sources in building 11

2.5 CO2 emissions 12

2.6 Potential of using RES in Crete 12

2.7 Policies/initiatives already promoting use of RES and EE: 13

3. MARKET NEEDS REVIEW WITH RESPECT TO ENERGY EFFICIENCY IN PUBLIC BUILDINGS 15

3.1 Current Funding Opportunities 15

3.2 Policy Background 16

4. POLICY CONTEXT - ACTIONS 17

4.1 ACTION 1 17

4.2 ACTION 2 21

4.3 ACTION 3 23

4.4 ACTION 4 25

4.5 ACTION 5 27

1. INTRODUCTION

The aim of the project is to improve regional energy policies with regard to environmental sustainability and mitigation of climate change risk, with a special focus on greening the building sector through enhancement of various eco-friendly energy sources and technologies, stressing its importance as an incubator for new markets in the field of energy, technologies, services and business models.

The project represents and implements NEAR ZERO CO2 EMISSION BUILDINGS DUE TO ENERGY USE in policies addressed at the same level as had been done for NEAR ZERO ENERGY BUILDINGS, which means that the buildings do not produce CO2 emissions due their use. EU, national and regional policies do not define near zero CO2 buildings due to energy use.

MEDITERRANEAN AGRONOMIC INSTITUTE OF CHANIA

MAICH is the Greek partner of the ZEROCO2 project. By implementing the project, MAICH will improve the policy of the Region of Crete.

Crete is the largest and most populous of the Greek islands and the fifth largest area of the Mediterranean. Located at the southern end of the Aegean Sea, Crete is one of the 13 regions of Greece. It is divided in 70 municipalities and four prefectures: Heraklion, Chania, Rethymnon and Lassithi with Heraklion being the capital and the largest city on the island.

Various fuels are used in Crete for electricity generation, heat production and transport. The electric grid of Crete is not interconnected with the Greek continental grid and this limits the penetration of renewable energies in power generation in the island. The use of fossil fuels includes a) fuel oil and diesel oil for electricity generation as well as for heat production, b) LPG for heat production, c) Gasoline and diesel oil use in transport. Total consumption of fuels (including fuels for heating and transport but not for power generation) in Crete during 2013 was 333.999 tons [0.54 tons per capita]. Nuclear energy, coal and natural gas are not used currently in Crete. The installed power of conventional power stations in Crete is 850 MW and the electricity consumption 2.700

GWh/year. Apart from fossil fuels various renewable energies are currently used in Crete including solar energy, wind energy, biomass, hydro energy and geothermal energy.

2. REGIONAL ANALYSIS

2.1 Population Characteristics

Crete is the largest and most populous of the Greek islands and the fifth largest area of the Mediterranean. Located at the southern end of the Aegean Sea, Crete is one of the 13 regions of Greece.

It is divided in 70 municipalities and four prefectures: Heraklion, Chania, Rethymnon and Lassithi with Heraklion being the capital and the largest city on the island.

Crete covers an area of 8.336 km2. Ο μόνιμος πληθυσμός της είναι 623.065 κάτοικοι, ενώ ο πραγματικός, de facto , 682.928 σύμφωνα με την στην ανατολική Κρήτη.The permanent population is 623.065 inhabitants, according to the 2011 census, corresponding to a density of 74.7 inhabitants per km2.

Name of the region	CRETE
Country	GREECE
Area	8,336 km2
Population	
- Number	623,065
- Density	74.7 Inhabitants /km2

Crete belongs in the Mediterranean climate zone which gives the main character of the climate, which is characterized as mild. θάλασσα The atmosphere can be quite humid, depending on the proximity to the sea. χειμώνας The winter is fairly mild and humid, with enough rains, mostly in western parts of the island. Snowfall is rare in the plains, but quite frequent in mountain. βαθμούς Κελσίουεκκρεμεί παραπομπή During the summer, the average temperature ranges at 25-30 degrees Celsius, certainly lower than mainland Greece.

Regarding the economy, the per capita Gross Domestic Product of Crete is little lower than that of the country. In the year 2013 it amounted to 14.007 euros while the figure of the country as an average was 16.451 euro. Regarding the employment, the total number of employees in Crete reaches the 238.637, which represents 6% of the total number of employees in Greece. The largest percentage of them (74%), with a big difference from the second, are involved in the tertiary sector and mainly in tourism.

All three sectors of the Cretan economy (agriculture, processing-packaging, services), are directly connected and interdepended. The **Primary sector** has a domineering position in terms of products, but it is characterized by small and dispersed lot, dependence on traditional models and cultivations, structural backwardness with imperfect infrastructures, largely outdated production systems and low postproduction added value. Moreover, the percentage of watered areas in Crete is much lower than that of the average of Greece, while the structure of the cultivations shows an emphasis on traditional cultivations. The cultivations of vegetables cover 3% of the total cultivation areas, but Crete has 50% of the greenhouses in Greece, with "Industry and Energy" advantages in the productions of vegetables and flowers.

In the Secondary sector there are structural problems concerning the usually small size and the family form of the businesses. The small size and the family form of most of the businesses often prevent their progress and largely explain their organizational and economic weaknesses and the subsequent low innovation. Crete only has 1,8% of the heavy industry and few units create a high turnover. The processing of the primary sector products shows problems of organization, quality, planning and standardization as well as difficulty in modernizing the production procedure. There are also difficulties in organizing commercial networks for the promotion of local products. The relations between processing and services, networking and interconnection with research centres are at low level. The degree and speed of moving into modern accommodations is not satisfactory and creates environmental problems and pressures along with the expansion of settlement and the development of other sectors in the local economy.

The sector of **Energy** and in particular the Renewable Energy Sources can be an important source of economic activity and employment growth in the island and can also reduce dependence on fossil fuels. The potential of the sector remains strong and there are great possibilities in the field of hybrid systems. The widest possible use of renewable energy sources technologies contributes to the safety of energy supplying and the development of new economic sectors, creating new jobs. The sector of "Green" energy can also be a pivot of development, promoting economic growth through large "clean" investments, social cohesion through the creation of new

decentralised work positions and complementary incomes, the protection of the environment and the development of local expertise and technology.

Tourism is the most dynamically developing sector and the demand gave incentives for important investments in hotel units, resulting in the qualitative and quantitative upgrading of hotel infrastructures. The excellent climate of the island, the beautiful landscape along with the remarkable tourist resorts, attract more than 4.000.000 foreign visitors every year. At the same time it is facing structural problems, consisting mainly in its seasonal nature and the limited expansion of the tourist movement to the inland settlements, as tourist infrastructures are mainly gathered in the northern coast and small centers in the south, while its course is largely influenced by outward, uncontrollable conditions, contributing to fluctuations in its performance.

2.2 A brief description of Crete/Greece

Various fuels are used in Crete for electricity generation, heat production and transport. The electric grid of Crete is not interconnected with the Greek continental grid and this limits the penetration of renewable energies in power generation in the island. The use of fossil fuels include a) fuel oil and diesel oil for electricity generation as well as for heat production , b) LPG for heat production , c) Gasoline and diesel oil use in transport. Total consumption of fuels (including fuels for heating and transport but not for power generation) in Crete during 2013 was 333,999 tons [0.54 tons per capita]. Nuclear energy, coal and natural gas are not used currently in Crete. The installed power of conventional power stations in Crete is 850 MW and the electricity consumption 2,700 GWh/year. Apart from fossil fuels various renewable energies are currently used in Crete including solar energy, wind energy, biomass, hydro energy and geothermal energy as follows.

- **Solar energy**: It is used for power generation, for heat and cooling production. Electricity is generated with photovoltaic systems with a total installed capacity of 94.2 MWp and it is expected that a CSP plant will be installed in Crete in the near future. Solar energy is also extensively used for hot water production with simple thermoshiphonic systems which are installed mainly in buildings (residential buildings and hotels). It is expected that approx. 500,000 m^2 of flat

plate solar collectors are installed in Crete. Solar energy is also used for space cooling with absorbtion systems. However currently there are only few such installations in Crete.

- **Biomass:** Solid and gaseous biomass is also used for power generation and heat production. Locally produced solid biomass like olive kernel wood and wood prunings are used for heat generation by burning. They are used in residential buildings, in hotels and in industry. Small quantities of gaseous biomass (biogas) is used for power and heat generation. Biogas is produced in the sewage treatments plants in the two largest cities in Crete, Chania and Heraklion. It is expected that biogas generated from the Heraklion landfill will be used soon for power generation. Biofuels are not currently produced in Crete.
- **Wind power:** Wind power is currently used for power generation and more than 20 wind parks operate in Crete generating more than 10 % of the consumed electricity. Further installation of wind parks in Crete is restricted by the fact that the power grid of Crete is not interconnected with the power grid of the continental Greece. The total installed power of wind parks in Crete is approx. 184 MW.
- **Hydro energy :** Hydropower is generated by two small hydropower plants located in the western part of the island with an installed power of 0.6 MW.
- **Low enthalpy geothermal energy:** Low enthalpy geothermal energy with heat pumps is used in various residential buildings and hotels for heat and cooling production. However, currently there are only few installations of this type in Crete.

2.3 Use of energy

Energy source	Energy consumption, GWh/year	Building sector Energy consumption, GWh/year	Building sector consumption / total energy consumption (%)
RES	982	580.9	59.15
Heating oil and fuel oil	3,058	2,141	70.01
Natural gas	0	0	-
Coal	0	0	-
LPG	464	328	70.69
Transport fuels	3,515	0	0
Total	8,019	3,049.9	38.03
Total per capita	12.9 (MWh per capita per year)	4.90 (MWh per capita per year)	

2.4 Use of renewable sources in building

RES	Energy production from RES, (% of total energy consumption)	Building sector RES Energy consumption , (% of the total energy consumption in buildings)	Energy consumption in buildings/total RES energy consumption (%)
Wind Power	243 GWh/year (3.03 %)	0	0
Wood biomass	682 GWh/year (8.5 %)	348 GWh/year (11.4 %)	51.03
Hydro power	1.2 GWh/year (0.01 %)	0	0
Solar-thermal energy	241 GWh/year (3 %)	230 GWh/year (7.54 %)	95.44
Solar-PV energy	135 GWh/year (1.68 %)	2.1 GWh/year (0.07 %)	1.56
Geothermal energy (geothermal heat pumps)	0.8 GWh/year (0.01 %)	0.8 GWh/year (0.03 %)	100
Gaseous biomass	2.2 GWh/year (2.5 %)	0	0
Total	1,305.2 GWh/year (16.28 %)	580.9 GWh/year(19.05 %)	44.51
Total per capita	2.1 MWh/year	0.93 MWh/year	

2.5 CO2 emissions

	CO2 Emission in ton/year		
Source	Crete/Greece	Building sector	% of CO2 emissions due to building sector
Heating oil and fuel oil	99,770	79,816	80.00
Natural gas	0	0	0
Coal	0	0	0
LPG	31,420	22,211	70.70
Electricity	2,005,000	1,740,000	86.78
Transport fuels (gasoline+diesel oil)	986,743	0	0
Total	3,122,863	1,842,027	58.98
Total per capita	5.01	2.96	59.08

2.6 Potential of using RES in Crete

There is a huge potential of unexploited of various renewable energy sources in Crete-Greece especially in solar energy, in wind energy and in solid biomass. There is also some potential for increased applications of low enthalpy geothermal heat pumps. An important factor for further development of solar and wind energy for power generation in Crete is the interconnection of the Cretan grid with the Greek continental grid with an undersea cable.

The high solar irradiance in Crete allows its use for power generation with photovoltaic panels. Since their prices have been decreased its use is more attractive. The unexploited future potential of solar electricity in Crete is higher than 1,000 MW.

Apart from power generation there is high potential of solar energy use for heat and cooling applications. It is estimated that more than 200,000 m^2 of flat plate collectors can be further installed in Crete. The potential for further development of wind energy is high being also dependent on the grids interconnection as it has been mentioned before. The unexploited potential of wind electricity in Crete is higher than 2,000 MW although factors like landscape protection might restrict its further growth.

The high solid biomass resources in Crete can be further used for heat and power generation. However the unexploited energy potential of biomass is lower than the potential of solar and wind energy. It is expected that in the future energy generation from biomass in Crete could be increased by 50 %.

2.7 Policies/initiatives already promoting use of RES and EE:

1. SAVE ENERGY in residential buildings

This initiative offers the opportunity to residential buildings owners to improve the energy behaviour of their buildings with various investments in energy saving technologies as well as in renewable energy technologies. The governmental support concerns the capital investment of the technologies used. Applications of solar energy, solid biomass and low enthalpy geothermal energy in residential buildings are assisted. The subsidy offered depends on the income of the building owner as well as on the value of the building. Owners with high income and buildings with high value are less subsidized.

2. SAVE ENERGY in municipal buildings

This initiative offers the opportunity to municipal buildings to improve the energy behaviour of their buildings with various investments in energy saving technologies as well as in renewable energy technologies. The governmental support concerns the capital investment of the technologies used with direct subsidies. Applications of solar energy, solid biomass and low enthalpy geothermal energy in residential buildings are assisted. The support in this initiative like the previous one is achieved with the use of the European structural funds.

3. PV installation on building roofs

The installation of PVs on the roofs of various buildings is supported with attractive feed-in tariffs guarantted for 25 years and are related with the electricity generated by the PVs and fed into the grid.The max allowed power of the installed PVs in each roof does not exceed 10 KWp and a solar thermal system for hot water production must be installed in the same roof with the PV panels.

4. Net-metering with PVs

The possibility of net-metering with the use of PVs installed in buildings of households and enterpises is allowed since the end of 2014.The max allowed power is 20 KWp but in some cases it could be higher.This initiative compensates only the annual electricity used per consumer which can be generated with PV panels.

5. Support of energy efficiency and use of renewables in various enterprises from the EU structural funds

Financial support of various renewable energy investments in various enterprises are offered with the support of EU structural funds. The support is related with investments in energy saving technologies and the use of renewable energies in them. The government offers direct financial subsidies and reduced taxes to the capital investments depending on the type of the technology used, the location of the company and the type and size of the company. Subsidies are offered to companies in the primary, secondary and tertiary sector and many companies try to benefit from this initiative regarding their energy investments.

3. MARKET NEEDS REVIEW WITH RESPECT TO ENERGY EFFICIENCY IN PUBLIC BUILDINGS

3.1 Current Funding Opportunities

The main source of funding appears to be the European Structural Funds 2014-20 programme, but as at October 2017 this programme had still not been agreed in Greece and funds were not yet available. While the programme ends in 2020, expenditure would be possible until 2022 under the n+2 rule, but it is still clear that at least 3 years of the programme have already been lost.

Once agreed, it is likely that the total sum available for the Island of Crete will be €12.5million for all energy related projects. This is not a large sum for a six year programme. It is hoped that the programme will start receiving applications for funding in 2018. As ERDF requires match funding there is still no guarantee that even when the programme is open, the grants will be available, as the applicants must have match funding in place in order to apply successfully, and such funds are difficult, if not impossible, to find.

The municipality of Chania currently has no funds available for energy efficiency or renewable energy although there is a prospect that some funds may be made available in 2018 for studies into public buildings.

The economic issues in Greece are well documented and it is no surprise that public funding is limited. There are few obvious alternative funding sources available through the Greek national or regional governments, although there is a Feed in Tariff system (known as the Net Metering Tool) to provide income on energy generated by renewable systems. This is funded by the power companies. The payback period for a solar PV investment through this initiative is expected to be between 8 and 10 years.

One opportunity may arise through a March 2017 decision by the European Bank for Reconstruction and Development to make €300million available to support renewable energy projects. This will involve investments and loans although to date it is not known if any of this will be invested in Crete.

There are also grants available through the EEA and Norway funds. The 2014-21 programme makes €116.7m available for a range of projects across Greece. These include “Improving the environmental standard of marine and inland waters and promoting renewable energy and research”.

3.2 Policy Background

Policy is currently a source of frustration for those involved in renewable energy and energy efficiency in public buildings in Crete, with some suggestions that there are conflicts and contradictions within the current laws and policies.

There was a belief that the Greek Government should promote ZEROCO2 buildings rather than Near ZEROCO2. Every public building should appoint a CO2 monitor as there is a lack of energy monitoring, recording and promoting. There is currently no emphasis on ZEROCO2.

There is a special programme currently reported as being planned through Green Fund designed to help people install renewable energy using a framework list of participating companies; this is being passed into law, but it lacks implementation guidelines and there is no real money available. Too many people are waiting for this programme, and the plan does not currently exist. It is likely to be mostly for domestic use, although small hotels are also included.

4. POLICY CONTEXT - ACTIONS

The Action Plan aims to impact:	+	**Investment for Growth and Jobs programme**
	☐	European Territorial Cooperation programme
	☐	Other regional development policy instrument

Name of the policy instrument addressed: **Regional operational programme of Crete, 2014-2020**

4.1 ACTION 1

Background

During the first two (2) years of the project implementation it has been noticed that:

a) The majority of old European public buildings have high energy consumption, they use mainly fossil fuels and they also have high carbon emissions due to energy use,

b) There are currently various mature, reliable and cost effective sustainable energy technologies which could be used for achieving a nearly zero (or zero) CO2 emission building,

c) Depending on the geographical area and the availability of various renewable energy resources in each region there are various renewable energies which could be used in them for decreasing their carbon emissions. These are different in northern and southern EU countries,

d) The methodology for transforming an existing building to nearly zero CO2 emission building is simple and clear,

e) There is a clear difference between nearly zero energy buildings (which are currently promoted by EU regulations) and nearly zero CO2 emission buildings,

f) There are not currently many (grid connected) buildings among EU countries which could be characterized as nearly zero CO2 emission buildings,

g) Depending on the EU country there is higher or lower availability of financial resources for energy investments and energy renovation in buildings, and

h) There are more private than public financial resources in EU countries which could be invested in energy renovation of buildings and the decrease of their CO2 emissions.

Action

- Investments for reducing the energy consumption, fossil fuels use and CO2 emissions in public buildings. These investments should be cost-effective and they should result in the improvement of the energy behaviour in public buildings increasing their energy efficiency and rating.
- This will be achieved a) with the use of energy saving techniques and technologies in the buildings, and b) with the replacing of fossil fuels currently used in them with locally available renewable energies like solar thermal energy, solar-PV energy, solid biomass and low enthalpy geothermal energy with high efficiency heat pumps. Their technologies for heat, cooling and electricity generation in buildings are well proven, mature, reliable and cost effective.
- Successful sustainable energy investments in public buildings have been realized in other participating regions like in Molise region in Italy [Use of solar-PVs and geothermal heat pumps] and in Lapua in Finland [solar thermal, solar-PVs , solid biomass use, geothermal heat pumps] and we had the opportunity to see them during our study visits in our six months meetings. A zero energy (and zero carbon emissions) building has been shown to us during our initial visit in Berlin. The building was well insulated and it was covering all its energy needs with solar energy and high efficiency heat pumps. During our study visits in other regions the use of various sustainable energy technologies was demonstrated to us while we had the opportunity to discuss and clarify various points, learn about their long term operation and performance, their operating and maintenance cost, their advantages and drawbacks.
- Public buildings in the region of Crete, following a public contest, will propose their energy renovation plans which would result in improving their energy behaviour and sustainability. This will also result in lowering as well their carbon emissions. The best of them will be selected and financed. The criteria for the selection of the best energy refurbishment plans in public buildings will be based on the decrease of fossil fuels use and on lowering carbon emissions, after their renovation, combined with the investment cost, in sustainable energy technologies, of achieving them.

- This action includes the implementation of new sustainable energy projects in public buildings in Crete adopting good practices from other regions. These projects will reduce, or zero, carbon emissions due to energy use in public buildings
- During our stakeholders meetings in Crete we had presented various sustainable energy technologies, appropriate for Crete, to our stakeholders asking their opinion regarding their future use in public buildings in Crete. Special reference has been made in the existing public hospitals in Crete which consume large amounts of energy (per unit of covered surface). The majority of the participants in these meetings had commented that priority should be given to the public hospitals in Crete for improving the energy behaviour of their buildings. They had also agreed that these technologies should be promoted since they would reduce energy consumption, fossil fuel use and carbon emissions in public buildings.
- Indicative sustainable energy investments in public buildings in Crete with cost-effective technologies

Energy saving technologies	***Renewable energy technologies***
Replace old windows with double glazing windows	Solar thermal energy
Roof insulation	Solar-PV energy
Replacement of old bulbs with new energy efficient bulbs	Solid biomass burning for heat generation
Use of Building Energy Management Systems	Use of high efficiency heat pumps including ground source heat pumps

Players involved

The majority of our stakeholders during the meetings had agreed that priority should be given to energy improvement/renovation of public buildings with the use of sustainable energy technologies. The participants had argued that a) public buildings should act as a good example to the citizens indicating the way that they should improve the energy behaviour of their own buildings, and b) The European and national legislation makes obligatory in the coming years the creation of nearly zero energy buildings (nearly zero carbon emission buildings) giving priority to the public sector.

- Region of Crete had agreed in supporting energy renovation of public buildings in the island. It will propose the energy renovation of some of its buildings,
- Municipalities of Chania and Platanias and the Union of municipalities in Crete were interesting in energy renovation of their premises including primary and secondary schools and various municipal buildings. They will propose the energy renovation of some of their buildings,
- Power utilities including the public power corporation and the electricity grid operator were supporting the energy improvement of public buildings. They will cooperate with public authorities in the installation of solar-PVs in public buildings (Through the net-metering regulations), and
- Technical Chamber of Greece/branch in western Crete was also supporting the sustainable energy investments in buildings mentioning that its members will be actively involved in the renovations,
- Final beneficiaries of this action will be only public authorities in Crete

Timeframe

Years 2018 – 2020

Costs

12.5 mil. Euros

Funding sources:

European structural funds, regional operational programme of Crete 2014-2020, Priority Axis 2, 4c, Improvement of energy efficiency in public buildings, promotion of smart energy systems and the use of renewable energy technologies.

Endorsement of our Policy Maker

Our policy maker, the managing authority of the regional operational programme 2014-2020 of Crete, has already accepted this action and it has initiated a public competition for financing and realization of sustainable energy projects in public buildings in Crete.

4.2 ACTION 2

Background

During the first two years of the project implementation in our international meetings and our study visits it has been noticed that:

a) There is lack of regular monitoring and recording of energy consumption in public buildings in Crete and the most of them do not have a staff member (appointed as energy manager) who would be responsible in energy issues,

b) Old public buildings have, in general, poor energy performance,

c) Benchmarking of energy consumption in public buildings is not usual, and

d) Partial reduction (10-20%) of energy consumption and carbon emissions in public buildings can be obtained without the implementation of high-cost energy investments but with simple measures including behavioural changes, and

e) In some other regions monitoring and recording of energy consumption in public buildings was common practice resulting in reduced energy consumption and carbon emissions.

Action

- Public authorities will monitor the energy performance of their buildings on monthly or bi-monthly basis. A staff member in each authority will be responsible for the energy monitoring. The energy consumption of various public buildings will be recorded and it will be uploaded on a web site in order to be accessible to various stakeholders and to citizens. Public buildings with high energy consumption will (or be obliged to) take corrective measures in order to improve their energy behaviour. The monitoring system will be established throughout public buildings in the region and adopted/supported as part of the current Regional Operational Support Framework.
- The cost of this monitoring and recording system is low compared with the resulting benefits. The proposed action will indicate the public buildings with low energy performance, using the benchmarking methodology, and it will assist in the improvement of their energy behaviour. In the end of the day it will reduce energy consumption and CO2 emissions due to energy use in public buildings in Crete.

- This action includes the implementation of new projects adopting good practices from other regions. We have noticed the successful implementation of this action in Slovenia, the resulting benefits, and we believe that it should be replicated in our region.

Players involved

- During the stakeholders meetings in Crete it was pointed out that the energy consumption and the CO2 emissions due to energy use in public buildings in Crete was unknown. Therefore their energy performance could not be assessed/benchmarked. It was also mentioned that without systematic monitoring, recording and benchmarking of their energy consumption it would be difficult to improve their energy performance and increase their sustainability. Additionally it was realized that the cost of regular monitoring and recording of their energy consumption was rather low. It could help in finding the public buildings with unjustified high energy consumption and in taking corrective measures improving their energy sustainability. Participants from municipalities and from the region of Crete proposed this action which, they claimed, would have low cost but significant benefits. During the implementation of the project and during the study visits it was realized that this action has been successfully implemented in Slovenia with encouraging and positive results.
- Final beneficiaries of this action will be only public authorities in Crete

Timeframe

Years 2018-2022

Costs

0.3 mil. Euros

Funding sources:

European structural funds, regional operational programme of Crete 2014-2020, Priority Axis 2, 4c, Promotion of research and development of low carbon emission technologies and their adoption in various sectors

Endorsement of our Policy Maker

Our policy maker, the managing authority of the regional operational programme 2014-2020 of Crete, has not so far accepted this action. However due to its low cost and the immediate positive benefits it might be accepted.

4.3 ACTION 3

Background

During the project implementation the following knowledge and experience was acquired:

- Public buildings consume large amounts of energy mainly fossil fuels. The use of renewable energies in public and municipal buildings in Crete is rather limited.
- There are currently various mature, reliable and cost effective sustainable energy technologies which could be used for achieving a nearly zero CO2 emission building.
- There are available private financial resources in EU countries which could be invested in energy renovation of buildings and the decrease of their CO2 emissions.
- There is lack of regular monitoring of energy consumption in public/municipal buildings.
- There is a lack of studies concerning the use of renewable energies in municipal buildings combined with the use of renewable energies for decreasing their energy use and carbon emissions.
- There is appropriate legal framework in Greece supporting the use of renewable energy in buildings including the net metering regulations and the involvement of ESCOs in sustainable energy investments.

Action

- Implementation of feasibility studies regarding energy consumption in municipalities in Crete for the installation of solar photovoltaic systems in their premises, with the net metering regulations, in order to decrease their fossil fuels use and their carbon emissions. These studies will calculate the grid electricity and fuels consumption in all the municipalities in Crete indicating the replacement of

conventional energy use with sustainable energies for reducing their environmental impact.

- This action includes improved management of the regional operational programme of Crete since the regional authorities have developed this action together (after consultation) with the local stakeholders, the municipalities in Crete.

Players involved

- During the stakeholder's meetings of ZEROCO2 project representatives from the municipalities have proposed this action. They indicated that municipalities in Crete could benefit from the installation of solar-PVs in their premises (according to net metering regulations) reducing the net annual grid electricity consumption and replacing it with green solar energy. Stakeholders from the Higher Educational Institutes in Crete had declared their interest/desire to support technically and scientifically this project/study.
- Municipalities in Crete who will be the beneficiaries of this study,
- Higher Educational Institutes of Crete who will implement this study on behalf of the Cretan municipalities, and
- The managing authority of the regional operational programme 2014-2020 of Crete. The managing authority will be responsible for financing these activities

Timeframe

Years 2018-2022

Costs

Unknown

Funding sources:

European structural funds, regional operational programme of Crete 2014-2020

Endorsement of our Policy Maker

Our policy maker, the managing authority of the regional operational programme 2014-2020 of Crete, has already accepted this action and it has signed the contract with the

Technological Education Institute of Crete for the implementation of the feasibility studies in the municipalities.

4.4 ACTION 4

Background

During the project implementation the following knowledge and experience was acquired:

- The staff of public authorities working in public buildings in Crete is not aware with the use of modern techniques and technologies which could result in low energy consumption in buildings. Additionally they are not familiar with the ways that their behaviour affects the energy consumption in these buildings
- Compared with other participating countries who train their staff working in public buildings there is plenty of room for improving the knowledge/understanding in energy efficiency, in national and EU legislation concerning the energy performance of buildings and the behaviour of the staff working in public buildings in the region of Crete.
- There are energy experts in local universities in Crete who can prepare the required educational material in this field.
- Training of public servants in the region of Crete could be realized through massive open online courses (MOOCs) in order to lower their training costs.

Action

- Adopt best practice for information and education relating to users behaviour from a high performing partner region, namely Lapua, South Ostrobothnia in Finland, where performance in relation to insulation investment, local grid management, heating systems and public education are exemplary, and the consequent energy performance standards of public buildings are very high indeed.
- A programme will be designed and developed for a partnership project that will fit EU targets and objectives, and will be eligible for EU funding through the EU structural funds under the Regional Operational Support Framework.
- During the stakeholders meetings participants from municipalities, higher educational Institutes and utility companies proposed this activity arguing that it will

increase the energy sustainability of public buildings as well as their energy performance.

- The educational programme will be designed properly targeting both the behavioural change of the buildings occupants and users as well as the replacement of the old energy systems with new which will be more efficient.
- For decreasing the cost of training the programme will be prepared and offered through the web in the form of a MOOC (massive open online course). Experts from the local Higher educational institutes in Crete will assist in the preparation of the educational material and they will support its implementation.
- This action includes the implementation of new projects adopting good practices from other regions.

Players involved

- Higher educational and research Institutes in Crete, will be responsible for the development of the educational material,
- Various public authorities, including municipalities, in Crete. The personnel in those authorities will be trained in energy issues regarding the improvement of the energy performance of public buildings, and
- Managing authority of the regional operational programme 2014-2020 of Crete. The managing authority will be responsible for financing the preparation and implementation of this programme.

Timeframe

The programme will be designed and developed in the course of 2018/19, during the final years of ZEROCO2.

Costs

0.10 mil. €

Funding sources:

- European structural funds, regional operational programme of Crete 2014-2020

Endorsement of our Policy Maker

Our policy maker, the managing authority of the regional operational programme 2014-2020 of Crete, has not so far accepted this action. However due to its low cost and the immediate positive benefits it might be accepted.

4.5 ACTION 5

Background

- During our stakeholder meetings and our study visits in other regions it was realized the importance of innovation in sustainable energies and their applications in buildings. Our stakeholders in various R+D institutions in Crete have pointed out the necessity of financing and support of new projects promoting innovations and new innovative applications of sustainable energies in buildings.
- Our stakeholders in the region of Crete have mentioned the importance of sustainable energies in the regional innovation strategy in Crete and the support offered through the EU structural funds during 2014-2020.
- During our study visits in other regions we have noticed the close cooperation of local educational and research Institutes with public and private authorities in the development of new innovative projects promoting sustainable energies.

Action

- Promotion of innovative research and development projects focused on the regional innovation strategy RIS3Crete (including the improvement of energy performance in public buildings). The supported projects will result in new sustainable energy products or/and services which, apart from promoting sustainable energy use in buildings, could also assist other sectors included in the RIS3Crete like tourism and agriculture.

- This action includes improved management of the regional operational programme of Crete

Players involved

- Managing authority of the regional operational programme 2014-2020 of Crete. The managing authority will be responsible for financing these activities,
- Higher Educational and Research Institutes have the technological expertise and capacity to create new innovations in sustainable energies and therefore they will be included among the principal innovators and developers in applied research preferably cooperating with private or public entities in the region of Crete, and
- Various SMEs or/and entrepreneurs will participate in the research and innovation projects and they will benefit either as new product/services/processes developers or as end users, from the innovations created. Other end users who could benefit from the innovations created could also be public entities.

Timeframe

Years 2018-2022

Costs

0.80 mil. €

Funding sources

European structural funds, regional operational programme of Crete 2014-2020

Endorsement of our Policy Maker

Our policy maker, the managing authority of the regional operational programme 2014-2020 of Crete, has already accepted this action. The managing authority is going to support financially R+D activities in few sectors which are prioritized in RIS3Crete. One of those sectors, promoted by RIS3Crete, is related with sustainable energies.

European structural funds, regional operational programme of Crete 2014-2020

SUMMARY OF THE PROPOSED ACTIONS IN THE REGION OF CRETE

Action	Cost (mil €)	Duration	Type of action	Endorsement from the policy makers (at this stage)
Sustainable energy investments in public buildings reducing their energy consumption and carbon emissions	12.50	2018-2022	Implementation of new projects adopting good practices from other regions.	Yes
Monitoring/recording of energy performance of various public buildings on regular basis	0.30	2018-2022	Implementation of new projects adopting good practices from other regions.	No
Support (implementation of feasibility studies) in municipalities in the realization of sustainable energy investments in their buildings	0.20	2018-2022	Improved management of the regional operational programme of Crete.	Yes
Education and training in energy issues for the personnel/staff of public authorities	0.10	2018-2020	Implementation of new projects adopting good practices from other regions.	No
Promotion of innovative research and development projects in priorities according to RIS3Crete including improvement of the energy performance in buildings	0.80	2018-2022	Improved management of the regional operational programme of Crete.	Yes
Total	13.90	2018-2022		

Project: **ZEROCO2**

Partner organisation: **CIHEAM- MEDITERRANEAN AGRONOMIC INSTITUTE OF CHANIA**

Other partner organisations involved (if relevant): -

Country: **GREECE**

NUTS2 region: **EL43, CRETE**

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Signature: _____

Stamp of the organisation: _____