**Green Angel Syndicate**

**Market Needs Review with respect to**

**Energy Efficiency in Public Buildings**

*On behalf of*

**MAICh, Chania**

*In support of*

**Interreg Europe project ZEROCO2**

**31st October 2017**

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**Market Needs Review with respect to Energy Efficiency in Public Buildings**

**Introduction**

The following review has been produced as an outcome of a desk research exercise followed by a seminar in Chania designed to explore the current status and quality of energy efficiency projects in public buildings in the Chania prefecture on the island of Crete, and in particular, the funding measures available to support them from the public and private sectors. The grounds for this review are therefore based on the visible data available on the internet dealing with funding options for energy efficiency projects in public buildings, whose target is zero CO2 emissions; and the seminar in Chania itself. Within the limitations of these review formats, this report is offered as a bridge towards understanding market needs in Crete with respect to energy efficiency in public buildings, and how best these can be addressed with improvements to public policy and funding measures. The review has been concluded with the seminar, and so we introduce the report with an account of the seminar itself.

**Seminar**

**Place:** Chania, Crete, Greece **Date:** 10th October 2017

**In attendance:**

Ioannis Vourdoubas, Scientific Expert of the project ZEROCO2, MAICh

George Angelakis, Local Manager of the project ZEROCO2, MAICh

Eleni Stamataki, Researcher of MAICh

Manolis Lavoutas, Head of Heating & Air-Conditioning Centre of Crete

Nikos Kalogerakis, President of Panhellenic Investors Association of Photovoltaics Antonius Kalogerakis, Head of the Institute of Theology & Ecology at Orthodox Academy of Crete

Antonios Patelakis, Director of Dynamis energy enterprise

Ioannis Hidemenakis, Member of Dynamis energy enterprise

Manolis Kotzakis, Representative of Federation of Professionals, Craftsmen and Merchants of the Prefecture of Chania

Nick Boretos, Technical Expert of MAICh

George Plokamakis, Section Manager of Hellenic Electricity Distribution Network Operator S.A

Markos Malandrakis, Special Consultant of Municipality of Platanias

Spyros Sofianos, President of Technical Chamber of Greece, Department of Western Crete

Ioannis Kokkinakis, Director of Public Power Corporation S.A., Department of Chania

Nick Lyth, Green Angel Syndicate

Steve Taylor, Green Angel Syndicate

**Purpose of the Seminar**

The purpose of the seminar was to discuss the impact of financial instruments available in Chania for energy efficiency measures within public buildings. It contributes to the ZEROCO2 project, in which MAICh is a partner, designed to improve the policy measures in such a way as to promote zero carbon emissions from energy use in public buildings.

This requires practical improvements in the infrastructure and systems for public buildings’ energy consumption, using technologies both existing and new. But these depend on a policy framework supported by, and stimulating, investment.

A further purpose of the seminar was to discuss how policy is supported by investments, the sources of that investment, whether public or private, and the effectiveness in achieving a result as a consequence. The attendees at the seminar represented a wide range of local public and private sector players who may be able to influence policy and uptake of renewable energy and energy efficiency measures in public buildings. This includes the President of Panhellenic Investors Association of Photovoltaics (which lobbies Government), the President of Technical Chamber of Greece-Department of Western Crete, local businesses which supply and install renewable energy systems and energy efficiency equipment, local authority representatives, the electricity distribution network & Public Power Corporation, a non-profitable Organization with buildings that have installed renewable energy systems and a representative of the Federation of Professionals, Craftsmen and Merchants of the Prefecture of Chania. This enabled a balanced view of the issues.

**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 although these were not highlighted during the seminar and it is possible that dissemination of information regarding these grants might be limited. 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”.

**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.

**Current Local Investment projects**

There are a number of local projects worthy of note, which have gone ahead despite the national economic crisis and limitations on support.

The Orthodox Academy of Crete, a not for profit organisation which runs a conference centre as well, has installed a 50kW solar PV system to power the centre. They offer seminars, with an emphasis on environmental issues, and have installed the PV which is expected to meet 80% of their energy needs. In addition to reducing energy costs, the solar PV acts as a dissemination project. Environmental benefits are seen as more important than economic benefits to the Academy.

The solar project is expected to reduce CO2 emissions by 40T/year and is funded largely through the Net Metering Tool. The total cost of €60,000 suggests a 9 year payback period.

The MAICh building has a small PV installation, 13.8KWp, which was installed with financial assistance from the previous ERDF programme.

The Technical University of Crete has a small PV and heat pump system.

The Organisation for the Development of Crete (OAK S.A) has a solar PV and water pumping system for irrigation. Both were funded through the previous ERDF programme.

Thodorou Island, just off the coast of Crete, is a small island noted for wildlife conservation. There is a small off-grid system, built in 2002, through the island management’s own funds with donations from the forestry department and others.

There is a similar project in Samaria Gorge, where an off grid settlement, with a ranger’s station, has a solar PV installation with a small wind turbine. This was funded partly through ERDF.

The Chania municipal building has improved energy efficiency through a series of measures including a new AC system using heat pumps, more efficient windows/glazing and installation of low energy / LED lights. EU structural funds were used to help meet the capital costs along with the Municipality’s own funds.

Under the umbrella of a Green Rooftops programme, the municipality of Hersonissos and a school in Heraklion have used ERDF to help develop environmental projects.

The largest scale renewable energy system on Crete is in the Lassithi area where PV powered pumps are used to store water for irrigation. This is a public project but not a public building as such.

There are two other examples of renewable energy on public infrastructure, albeit not on buildings. One is a streetlights project and the other is a linkage with the water authority which has installed solar PV to power water pumps across the water and sewerage systems. This can be effective as pumps are high energy users and tend to be most active during sunlight hours.

**Policy / Funding Compatibility**

Prior to 2007 there were some significant investments in solar PV across Greece. However, due to financial difficulties, one programme stopped in 2013 when there were unfinished investments for incomplete projects. There has been no clear political drive or additional funding to support the completion of these investments. It is noted that Greece imports gas from Russia, so completing these investments could potentially reduce costs of gas imports and increase energy security.

Research carried out in 2012 by Norton Rose Fulbright suggested that despite the current macro-economic conditions in Greece, the deployment and construction of large scale renewable energy projects and associated infrastructure (e.g. grids and sub-sea interconnection cables between mainland Greece and the islands) is seen by the state as a critical path for economic development which will add considerable value to the country. While this research is now dated, there has been no clear change to the policy to enable the research conclusions.

The research identified a number of regulatory initiatives that had been put in place at the time of the research, but these had been ineffective in accelerating or changing the pace of development of renewable energy resources in any way. This can largely be blamed on bureaucratic barriers, licensing hurdles and the limited grid capacity available for renewable energy projects.

Significant grid expansion works are planned by the Transmission System Operator (TSO) in the medium term which will alleviate some of the grid issues faced today in windy and remote areas of Greece, including South Evia and Thrace. Some more ambitious grid expansion works are envisaged in the long term for the interconnection of the Aegean Sea islands, including Crete, to mainland Greece with a view to completing this by 2020

The expansion of solar is probably hindered by the law which requires a separate meter for solar and traditionally generated power. Feed in Tariffs are available only towards energy generated for the property’s own consumption; the Net Metering System could be improved if it enabled payments for energy generated and exported to grid (as found for example in the UK system). The law does enable builders to create a 10% larger property if solar is installed. But there are clear conflicts in the law, requiring separate meters, which introduces difficulties.

The European programme is still to be agreed and is therefore unable to provide funds at present to meet policy aspirations.

The situation regarding Energy Service Companies or ESCOs is not too encouraging. There is a legal instrument in Greece that allows the operation of ESCO’s but there is little belief that the Government will pay for work in public buildings. The seminar particpants indicated that the banking system is not working to best effect, meaning the ESCO’s are unable to get the required funding. The EU Green Bank investment should be available, or a part of any bank should be green – but this would require a policy change.

There are no ESCO’s in Crete, although a national ESCO is interested in opening in Crete and has visited the island. They are currently looking for trading terms which will encourage them to enter the market in Crete.

It is noted that one private sector installer of renewable energy systems advised that there is no demand from the public sector to install on their buildings. There are contractors keen to do the work, but the small number of actual installations will remain small due to the inability to stimulate demand or encouragement to the public sector to invest in renewables and energy efficiency. There were also references to the difficulty in obtaining installation licences, due in part to a lack of Government support or communication.

There is also a suggestion that municipalities do not help each other sufficiently through sharing information, experience or advice. Better connections could encourage greater investments.

**The Banking Position**

Following the seminar two interviews were held with two local banks to try and gain a better understanding of the banker’s view.

Both the largest Cretan Co-operative Bank (PanCreta Cooperative Bank) and the Bank of Piraeus noted a lack of demand from the Public Sector. There were no requests for loans for energy investment. This is likely to change in future, especially in relation to schools which are expected to require an obligatory energy certificate for school buildings. This may lead to increased investment and demand for loans from the banks.

The banks were unclear how important the new ERDF programme would be in stimulating demand for loans. If the grant intervention rate is 50-70% it would be likely to stimulate interest in grant funded investments.

There is an added difficulty in that around 50% of the Greek population are currently defaulting on bank loans awarded during more positive economic times. Anyone owing the bank is unlikely to get a new loan, so effectively half of the population would be ineligible to get a new loan. This of course significantly reduces demand for loans.

The Cooperative Bank has a good relationship with the Prefecture and would be willing to work with the public authorities on future Zero CO2 building projects. In general loans should have a payback period of less than 5 years, with longer term loans requiring a guarantor. Interest rates are currently around 3%.

In addition the bank is keen to support SMEs which are engaged in the renewables sector.

The Cooperative Bank building itself does not have LED lighting or specific energy efficiency measures, which is largely because the building is rented not owned by the bank.

The Bank of Piraeus operates a specific policy for green investments. This has led to many loans being granted for PV investments across the primary, secondary and tertiary sectors. But there has been little demand from the public sector for public buildings.

The bank is ensuring that funds will be available to provide match funding to potential ERDF applications when the programme opens. There is expected to be a demand from hotels for renewable installations.

The bank also has a specific section working with the public sector but to date there has been little demand from the municipalities for their energy programmes. The bank states that it is ready to invest when the municipalities’ demand grows.

**Market Needs – Considerations**

1. Should new funds be created? The current economic situation makes this difficult but there is a feeling that funds are needed to incentivise and increase interest in energy efficiency in public buildings
2. Should tax incentives be created to stimulate investment in building efficiency measures for public buildings?
3. The Net Metering System only covers energy generated for use within the building, and not excess energy which is delivered to the grid. It is also slow and could be managed more efficiently.
4. Many public buildings are poorly insulated with inefficient AC and heating systems. This would suggest that the scope for financial and CO2 savings should be good and there could be greater encouragement to improve the public buildings. This could be combined with greater public education as the knowledge of the benefits of renewable energy is probably not adequately addressed in schools or in the workplace.
5. There is concern over the banks/investor relationship. The public sector suggests that the banks will not lend money, while the banks state that they would lend money but the public sector does not ask for it.
6. There are arguments for reducing VAT on renewable energy investments which is currently 24%, the same as other VAT rated goods. In other countries, such as the UK, VAT on renewables is 5%, significantly lower than the normal 20%. Such a reduction in Greece would help increase investments in renewables.
7. There is a lack of monitoring and case studies. This means that opportunities to promote and encourage investment in renewable energy and energy efficiency are being missed. There is no individual employee motivation – individual use of energy is not measured and there is no competitive or motivational scheme from employees to reduce their own personal energy use.
8. The Greek Government has set criteria and targets for installing renewable energy and for reducing CO2 emissions. There is a view that it is difficult to meet these targets without additional funding, however, a concerted initiative that encourages investment due to the relatively short payback periods could be encouraged. This would link with education, use case studies for motivation, work with banks and identify annual cost savings and CO2 reductions.

**Market Needs – Conclusions**

The conclusions regarding market needs in Crete and the Chania Prefecture regarding energy efficiency in public buildings are that very little is happening, and that public policy does not adequately encourage investment in energy efficiency in public buildings. The public funding sources are limited with the main European source still not available three years after the programme should have opened. There are few clear policies and measures that incentivise or help gain access to private sector funding.

The Net Metering System could be improved. There are good conditions for solar and wind installations on Crete but far fewer installations than many other areas of Europe. The incentives appear inadequate at a time where renewable energy and energy efficiency measures would reduce running costs during times of economic difficulty.

There appears to be very little in the way of measures to incentivise technology investment and infrastructure investment within the private or public sectors. There is no clear evidence of innovation or technology development to satisfy the market need for commercially viable, revenue generating, self-sustaining enterprise which will yield a return for the investors by means of energy efficient public building projects.

The relationship between banks and the public sector is vague and could benefit from clarification. The public sector suggests that the banks do not lend money to support investment in renewable energy or energy efficiency while the banks indicate that the public sector does not seek loans or ask for support towards investments.

The Greek Government has targets for renewable energy and CO2 reduction and a concerted comprehensive programme aimed at public buildings could go a long way to encouraging investments which would help meet those targets.

**Market Needs – The Challenge for ZEROCO2 Ambitions**

There is an issue of trust in national Government which acts as a constraint on cooperation. Government is expected to be bureaucratic, slow and obstructive, hence a barrier to action rather than an enabler.

This has bred a set of interlinked problems relating to market need for improvement in ZEROCO2 projects in public buildings which are probably beyond the capacity of policy or regulation to change:

1. Motivation to work together with Government and the public sector is missing.
2. There is no trust in the Government that collaboration will be effective.
3. Consequently the expectation is that any attempts will end in failure.
4. Hence there is an absence of plans or actions to make them happen.
5. The banks are secure and confident in their own position.
6. Their power base has been consolidated rather than weakened by the crisis.
7. The politicians also feel empowered.
8. But there is a disconnect between the banks and politicians on the one side and the private sector and public sector employees on the other.
9. There is a reluctance to incur further debt with the banks, as debt was largely responsible for the crisis in the first place, and debt levels remain a big problem.
10. EU offers a way of reaching over the heads of the unreliable Government and untrustworthy banking sector.
11. EU cash is a saviour.
12. But access is compromised by virtue of pitifully small allocations negotiated; the delays on agreeing, finalising and thereby accessing the final allocations; and the inability to access match funding
13. In spite of this, there are a surprisingly large number of projects undertaken in the ZEROCO2 field and they are successfully completed.
14. Levels of knowledge, information and skills provision in relation to energy improvements, efficiency and emissions reduction in public buildings are high.
15. There is a clear track record in applying this to public buildings serving the community – schools and hospitals.
16. These suggest an enlightened community action capability in the face of crippling corruption and lack of Government support.
17. There is possibly a Greek, or maybe Cretan, characteristic and tradition of independent action which respects neither authority nor law, but observes the pressures of need and community benefit.
18. This has been and is effective in delivering some of the objectives of ZEROCO2.
19. The market needs to support this by facilitating it
20. The most effective means of doing this is access to greater financial support.
21. This could be enabled by encouraging closer and speedier bank lending.
22. Regulation could be framed to support this.
23. But neither of these overcome the earlier noted problems of trust and motivation.

It is possible that, in the context of this Interreg Europe project, there is a progressive recommendation in relation to the situation in Crete, that the policy improvement of greatest benefit will be that which enables greater independence of action, and encourages the development of funding mechanisms for commercially viable initiatives in public buildings through the private sector. These could be tax concessions, or related benefits, specific to these activities. This will be explored in the next stage of the project.