Social attitudes about environmental design and RES – Field study in Cyprus

P. Kosmopoulos
Dr. Architect Engineer, Assoc. Professor, DUTH

Th. Ioannou
Environmental Engineer, PhD Candidate

ABSTRACT

The application of Environmental Design principles can substantially contribute in energy conserving in residential areas. People constitute an imponderable factor for the accomplishment of this target and it is very important to inquire the readiness of people to accept and adopt innovations in their lives in order to achieve energy saving. To investigate the social attitudes, a social research took place in Cyprus. This was attained by answering questionnaires which were applied in four social groups. They were applied to citizens, to different kind of businesses companies, to construction companies and engineers and to public services.

1. INTRODUCTION

The requested energy for buildings' space heating and cooling in Europe, represents more than 40% of the total energy consumption, whilst the electricity demand for housing represents more than 30% of the total electricity production. Besides this, 45% of the total CO_2 emissions come from buildings. The main operations which consume energy in buildings are: space heating (because of thermal loss through transparent and non-transparent surfaces, air penetration and the external climate conditions), space cooling (because of thermal gains from the solar radiation and the external climate conditions), lighting, function of electric appliances, as well as hot water provision. The energy which is consumed for house space heating and cooling represents more than 50% of the total energy consumption of a house.

2. ENVIRONMENTAL DESIGN

The target of built environment reconciliation in the environment can be achieved through Environmental Design, which does not only meet the human needs, but it also includes provisions for the protection of environment.

Environmental Design in residential areas is in-wrought with the Environmental Architecture. The latter aims at creating such technical shells that will be able to meet the targets of (Kosmopoulos, 2004):

- Healthy environment achievement, from the aspect of psychological, social and physiological approach.
- The smallest impact on environment.

The principles for an ecological oriented and environmental friendly design are:

- Smaller buildings;
- Use of recyclable and renewable materials;
- Use of low energy materials;
- Use of timber;
- Water collection systems;
- Low maintenance;
- Buildings' recycling;
- Reduction of ozone's chemical destruction;
- Natural environment sustenance;
- Energy efficiency;
- Buildings' orientation;
- Public transport access.

3. ENVIRONMENTAL EVALUATION AND KNOWLEDGE PROCEDURE

The investigation of the relations and interactions that are being developped between people and physical – built environment, constitutes a

key factor for relations' decryption between perception-knowledge and prospect- attitudes, according to environmental problems and solutions that are given from the experts in every section, so that some environmental problems that appear in modern societies will be worked out.

According to Kosmopoulos (2000), environmental evaluation and knowledge appears as the point which shows the special conduciveness of a psychological prospect in the research of an issue. The individual variances to "environmental attitudes" and the environment's characteristics, are studied as variable manners that allow the prefiguration of the behavior models which will be adopted from people in relation with different kinds of environments. From the aspect of special computational and cognitional behaviors' dimensions, the attention has been focused on the research of components that have to do with emotions and perception-knowledge.

When we study the "environmental attitudes", the attention is focused on the efficient - axiological and cognitive – informational content of the status that people express in relation with the natural environment's semblance or specific characteristics. As Stokols (1978) designates, the main target at this case is to reflect optimum or not optimum response trends to the examined environmental characteristics.

4. SOCIAL ATTITUDES ABOUT ENVIRONMENTAL PROBLEMS

The research has been oriented to the investigation of the ways that people comprehend and valuate the environmental problems. Special attention was given to the forms of information that people have for particular problems, since information constitutes their reference mean for the formation of attitudes (Kosmopoulos, 2000).

Our attempt at this research was focused on the investigation about the information level of four categories of people with reference to the energy problem and the alternative solutions that are given from the scientists. We also investigated the attitudes and perceptions about the exploitation systems of renewable energy sources in residential areas. The method we used for information collection is the A.S.S.A (Applied Socio-Semiotic Analysis), which has been used from Kosmopoulos (1974, 1986, 1991, 1993). This method concerns a social investigation for the research of social attitudes and perceptions, by answering questionnaires.

5. RESEARCH RESULTS

To investigate the social attitudes about the environmental design and the exploitation of the Renewable Energy Sources in residential areas, in the island of Cyprus, a social research took place. This was attained by answering questionnaires which were applied in four categories. The first category was applied to citizens, the second was applied to different kind of businesses companies, the third to construction companies and the fourth to public services. The questionnaires were then codified and processed by using a software program.

The correlation of some questions was thought to be purposeful and the reason is that the most important appear clearer. The results that arise from the elaboration of questionnaires are shown through the following figures.

A question that was included in all of the categories of questionnaires was "Are you aware of the economic and environmental impacts of conventional energy sources?" The given answers are shown at Figures 1, 2, 3 and 4.

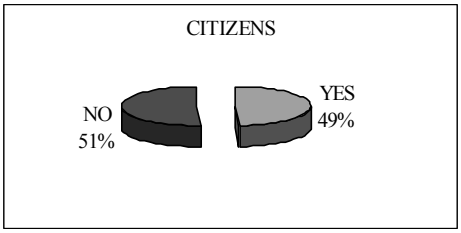

Figure 1: "Are you aware of the economic and environmental impacts of conventional energy sources?" The 51% of questioned people answered 'NO' and 49% answered 'YES'.

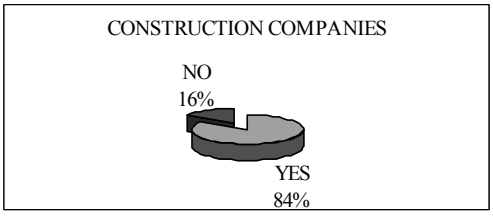

Figure 2: "Are you aware of the economic and environmental impacts of conventional energy sources?" The 16% of people questioned answered 'NO' and 84% answered 'YES'.

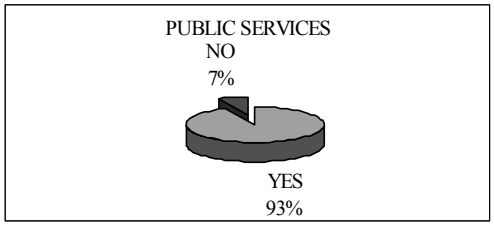

Figure 3: "Are you aware of the economic and environmental impacts of conventional energy sources?" The 7% of people questioned answered 'NO' and 93% answered 'YES'.

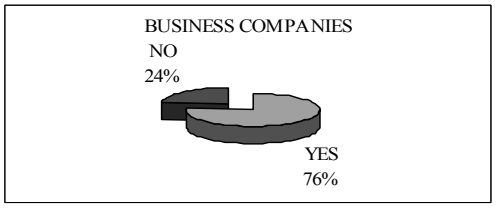

Figure 4: "Are you aware of the economic and environmental impacts of conventional energy sources?" The 24% of people questioned answered 'NO' and 76% answered 'YES'.

Another question that was included in all of questionnaires' categories "Do you know that there is an alternative solution for energy saving by using renewable energy sources and renewable energy exploitation systems?" Given answers are shown at Figures 5, 6, 7 and 8.

A question that was included in the categories of questionnaires that were applied to business companies and public services was "Do you know what and which renewable energy sources are?" Given answers are shown at Figures 9 and 10.

A question that was included in the categories of questionnaires that were applied to citizens and construction companies and engineers was "Do you know that by using renewable energy in houses and buildings, there will be, in long term, financial avails for you and the government, and environmental profits?". Given answers are shown at Figures 11 and 12.

A correlation that we did was between the given answers to the question "Would you be interested in applying environmental design at your projects?", which was applied to construction companies and engineers, and the given answers to the questions "Would you like to buy a house with energy saving systems, which means that you will save money through your bills, even if it costs a bit more than a usual house?" and "Or you would prefer to install such systems (solar collector, photovoltaics, e.t.c) in the future on your own?", that were applied to citi-

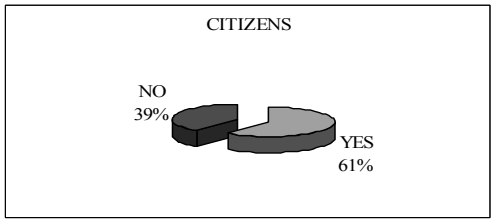

Figure 5: "Do you know that there is an alternative solution for energy saving by using renewable energy sources and renewable energy exploitation systems?" The 39% of people questioned answered 'NO' and 61% answered 'YES'.

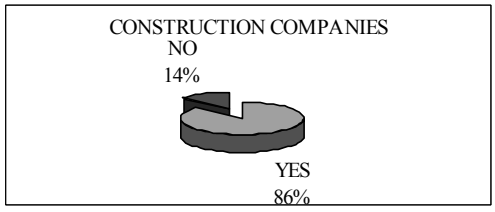

Figure 6: "Do you know that there is an alternative solution for energy saving by using renewable energy sources and renewable energy exploitation systems?" The 14% of people questioned answered 'NO' and 86% answered 'YES'.

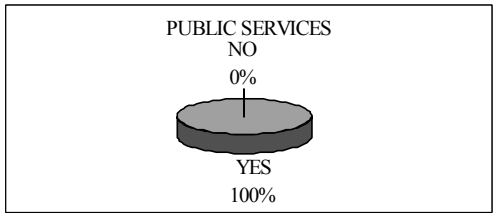

Figure 7: "Do you know that there is an alternative solution for energy saving by using renewable energy sources and renewable energy exploitation systems?" The 0% of people questioned answered 'NO' and 100% answered 'YES'.

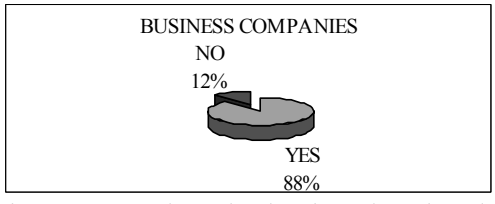

Figure 8: "Do you know that there is an alternative solution for energy saving by using renewable energy sources and renewable energy exploitation systems?" The 12% of people questioned answered 'NO' and 88% answered 'YES'.

zens. The answer results are shown at Figures 13 and 14 and 15.

Another correlation we did was between the given answers to the questions "Would you like renewable energy exploitation systems to be used at the business company you are working for?" and "Would like to get involved into research that will aim at finding the appropriate systems for renewable energy exploitation for the business company you are working for?". These two questions were applied to business companies. Given answers are shown at Figures 16 and 17.

Finally, a last correlation we did was between the answers to the questions "Would you like the public service you are working for, to finance researches and applications of renewable energy exploitation systems?" and "What are those that restrain you to finance researches and applications of renewable energy exploita-

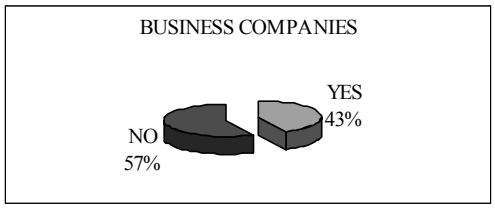

Figure 9: "Do you know what and which renewable energy sources are?" The 57% of people questioned answered 'NO' and 43% answered 'YES'.

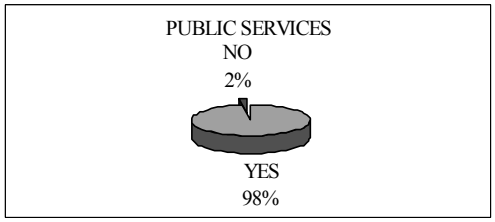

Figure 10: "Do you know what and which renewable energy sources are?" The 98% of people questioned answered 'YES' and only 2% answered 'NO'.

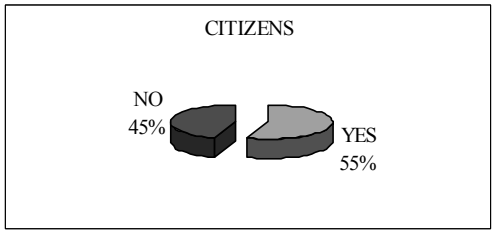

Figure 11: "Do you know that by using renewable energy in houses and buildings, there will be, in long term, financial avails for you and the government, and environmental profits?". The 45% of people questioned answered 'NO' and 55% answered 'YES'.

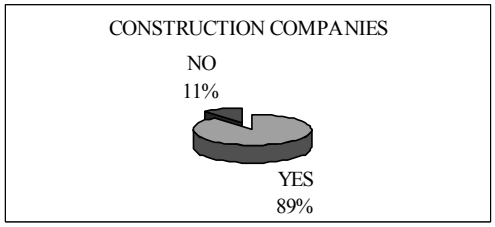

Figure 12: "Do you know that by using renewable energy in houses and buildings, there will be, in long term, financial avails for you and the government, and environmental profits?". The 11% of people questioned answered 'NO' and 89% answered 'YES'.

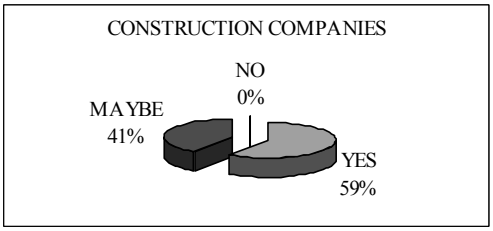

Figure 13: "Would you be interested in applying environmental design at your projects?". The 41% of people questioned answered 'MAYBE', 0% answered 'NO' and 59% answered 'YES'.

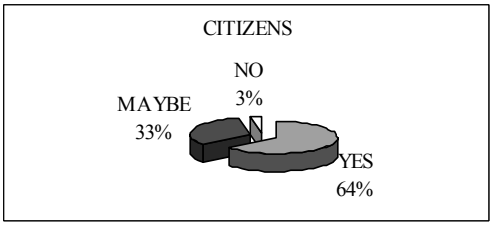

Figure 14: "Would you like to buy a house with energy saving systems, which means that you will save money through your bills, even if it costs a bit more than a usual house?". The 33% of people questioned answered 'MAYBE', 3% answered 'NO' and 64% answered 'YES'.

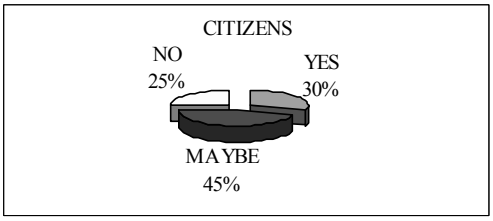

Figure 15: "Or you would prefer to install such systems (solar collector, photovoltaics, e.t.c) in the future on your own?". The 45% of people questioned answered 'MAYBE', 25% answered 'NO' and 30% answered 'YES'.

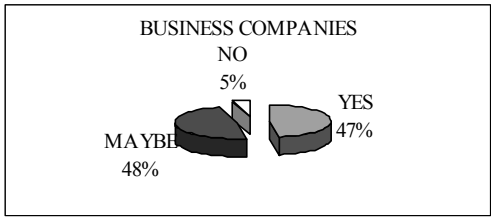

Figure 16: "Would you like renewable energy exploitation systems to be used at the business company you are working for?". The 48% of people questioned answered 'MAYBE', 5% answered 'NO' and 47% answered 'YES'.

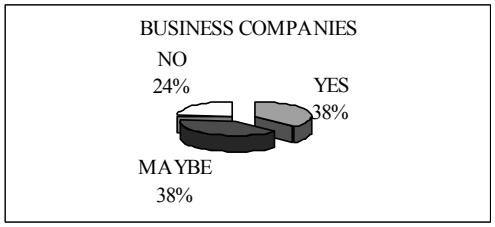

Figure 17: "Would like to get involved into research that will aim at finding the appropriate systems for renewable energy exploitation for the business company you are working for?". The 38% of people questioned answered 'MAYBE', 24% answered 'NO' and 38% answered 'YES'.

tion systems?". These two questions were applied to civil services. Given answers are shown at Figures 18 and 19.

6. CONCLUSIONS

As it results from the social survey, citizens are enough informed about renewable energy exploitation. They have also realized that they can contribute to energy saving and that through the RES exploitation a lot of financial and environmental benefits can arise. An interesting sign is that they seem quite ready to adopt innovations in their lives that they will lead to energy saving and RES exploitation.

With reference to construction companies and engineers, they seem to be well informed about RES exploitation in housing and they also seem to know very well the benefits that result from this. A disappointing sign is that they don't seem to be really ready to apply the environmental design principles in their projects. However, they don't reject this method of housing development.

People that work at private business companies, seem to have heard about RES exploitation, but they do not seem to be really ready for innovations at their work ground. They express hesitance which leads us to the conclusion that they need motivation.

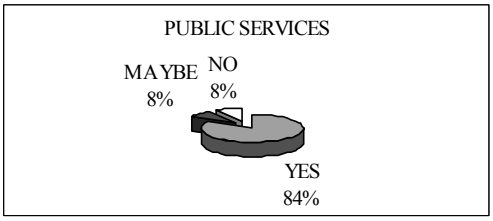

Figure 18: "Would you like the public service you are working for to finance researches and applications of renewable energy exploitation systems?". The 8% of people questioned answered 'MAYBE', 8% answered 'NO' and 84% answered 'YES'.

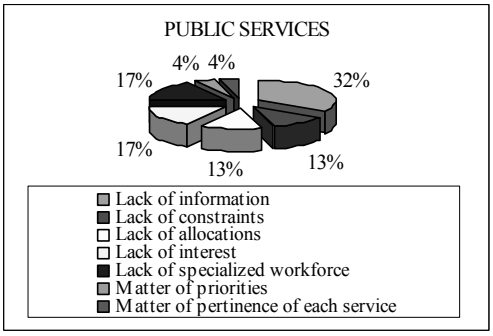

Figure 19: "What are those that restrain you to finance researches and applications of renewable energy exploitation systems?". The 32% of people questioned answered "Lack of information", 13% answered "Lack of constraints", 13% answered "Lack of allocations", 17% "Lack of interest", 17 % "Lack of specializes workforce", 4% "It is a matter of priorities", and 4% answered "It is a matter of pertinence of each public service".

Public servants seem to know very well what RES are and that there is the potentiality to replace conventional energy sources. They also seem to be quite interested about RES expansion and they express their interest on getting further informed. However, they refer that the Public Services they work for, haven't done any steps towards financing researches and applications of RES exploitation systems. They quote that the main reasons that restrain this are the lack of information, constraints, allocation, interest and specialized workforce.

7. SUGGESTIONS

The most important provision for a better level of information and interest about RES exploitation and energy saving is a big informing campaign about these issues.

The funding of allocations, motivations provision for business companies and individuals and their financing for buying RES exploitation systems seem to be a driving force for such systems expansion.

Seminars organized for engineers and public servants would help a lot since interest already exists about RES from these people.

Finally, allocations provision for research seems to constitute a very important factor for the achievement of the energy targets that have been set all over Europe regarding renewable energy.

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