Sustainable Construction in Public and Private Works through IPP approach

Minutes of the Fourth Advisory Board Meeting held in Nicosia on 3 April 2008

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1. Organisation

The meeting, organised by the University of Cyprus, was held in lecture room ΧΩΔ 01-104 at the new University campus.

2. Participants

SUSCON PARTNERS

Organisation	Participants
University of Cyprus (organiser)	Dr. Ioannis Ioannou Ms. Margarita Vatyliotou Ms. Maria Monou
Cybarco (partner)	Mr. Panicos Palochis
Cyprus Scientific and Technical Chamber - ETEK (partner)	Mr. Linos Chrysostomou
National Technical University of Athens - NTUA (partner)	Mr. Marios Mavrogiannos

ADVISORY BOARD MEMBERS

No	Organisation	Participants
1	Cyprus Association of Mechanical Engineers	Dr. Kyriakos Tsiftes
2	Cyprus Organisation for Standardization	Mr. Michalis Orphanides
3	Cyprus Association of Architects	Mr. Christos Theodorou
4	Cyprus Association of Certified Quantity Surveyors & Construction Economists	Ms. Anna Iakovou-Stylianou
5	University of Cyprus, Department of Civil and Environmental Engineering	Dr. Ioannis Ioannou
6	Cyprus Energy Regulatory Authority (CERA)	Mr. Panayiotis Keliris
7	Public Works Department (Tenders and Contracts Section)	Mr. Demetris Hadjiadamou
8	Public Works Department (Health and Safety Sector)	Ms. Filio Limboura

9	Cyprus Scientific and Technical Chamber	Mr. Linos Chrysostomou
10	Cyprus Scientific and Technical Chamber	Ms. Elena Sophocleous*
11	Ministry of Agriculture, Natural Resources and Environment (Environment Service)	Ms. Joanna Constantinidou
12	Ministry of Agriculture, Natural Resources and Environment (Environment Service)	Ms. Natalia Georgiou
13	Union of Cyprus Municipalities	Mr. Aris Konstantinou
14	Geological Survey Department	Mr. Christodoulos Hadjigeorgiou
15	Department of Town Planning and Housing	Mr. Kypros Pafitis
16	Public Works Department (Building Sector)	Ms. Stella Fylaktidi
17	Cyprus Association of Geologists and Mineralogists	Mr. Christodoulos Hadjigeorgiou
18	Cyprus Association of Environmental Scientists and Engineers	Mr. Marios Theodorou

3. Meeting Agenda

15:00 – 15:15 Arrival and Registration

15:15 – 15:20 Welcome by Dr. Ioannis Ioannou, Lecturer, Department of Civil and Environmental Engineering, University of Cyprus

15:20 – 15:35 Progress of the SUSCON project to date, Ms. Margarita Vatyliotou, Department of Civil and Environmental Engineering, University of Cyprus

15:35 – 15:50 Ecodesign criteria and description of the software created for evaluating the environmental performance of buildings, Mr. Marios Mavrogiannos, National Technical University of Athens (NTUA)

15:50 – 16:05 Results from the application of the software, Mr. Panicos Palochis, Cybarco PLC

* Ms. Sophocleous (ETEK) was unable to attend due to her absence from the country. She expressed her views on possible institutional arrangements via electronic mail

16:05 – 16:20	Coffee Break
16:20 – 16:35	First Sustainable Construction Competition in Cyprus, Ms. Maria Monou, Department of Civil and Environmental Engineering, University of Cyprus
16:35 – 17:30	Open discussion and recommendations for national institutional arrangements on sustainable construction, coordinated by Mr. Linos Chrysostomou, ETEK

4. Arrival - Registration

All participants were registered and supporting material, including the agenda and the fourth issue of the project newsletter (December 2007), was distributed to them.

5. Presentations

1. Dr. Ioannou (UCY) welcomed all participants. He mentioned the closing of the competition and its success aligned with the progression of the SUSCON project process. He also stressed the importance of the Advisory Board participating and providing recommendations for national institutional arrangements on Sustainable Construction.

2. Ms. Vatyliotou (UCY) briefly summarised the project aims and progress to-date. The term sustainable construction was explained and reference was made to the completed tasks: Task 1: Project management and formation of Advisory Board, Task 2: Analysis and Documentation of the Construction in Greece and Cyprus, Task 3: Life Cycle Analysis in two construction activities, Task 4: Development of ecodesign criteria. Reference was also made to the ongoing tasks: Task 5: Application of eco-design criteria in construction, Task 6: Online Database for the Construction Industry, Task 7: Dissemination. Within the framework of Task 7 the organisation of the 1st Sustainable Construction Project competition was mentioned. Reference was made to the SUSCON program website (where all the project deliverables are also available) and the Eupalinus database website

where the Advisory Board were asked to provide recommendations on how the database could be improved.

3. Mr. Mavrogiannos (NTUA) spoke about the development of the ecodesign criteria (Task 4) and described the software created for evaluating the environmental performance of buildings within the framework of Task 5 of the SUSCON project. Since the current tools do not take into account all the necessary parameters, this tool aims to incorporate an accurate assessment of the environmental performance of buildings. The tool is basically an EXCEL file and is designed in such a way that it can easily be adapted to the specific environmental and socioeconomic status of the area in which the assessed building or construction occurs. The evaluator can define the significance of the assessment parameter in relevance to local or national conditions. The assessment is based on two main axes: 1. the Environmental (Natural Resources: Land, Energy, Material and Water Resources and Health and Safety) and 2. the Economic (Local Economy, the Efficiency, the Adaptability, the Operational Costs and the Capital Costs). The results of the assessment are presented in a spider chart consisting of six axes (five axes for the environmental performance and one for the economic performance).

4. Mr. Palochis (Cybarco PLC) described the application of the software tool to 2 buildings on the new University of Cyprus campus: Faculty of Pure and Applied Sciences and the Faculty of Economics and Management. That latter is currently under development. Mr Palochis went through the scores given to each of the assessment parameters for each building facility. The scores followed the evaluation of some questionnaires he had distributed to the Technical Services of the University of Cyprus.

5. Ms. Maria Monou (UCY) discussed the First Sustainable Construction Project competition, mentioning the aims of the competition, the time-plan, the Assessment Committee and meetings held, the criteria on which the 2 chosen categories ('Buildings' and 'Other Public Works') were assessed and the eligible participants. Emphasis was placed on the numerous dissemination activities via UCY personnel communication, publications in newspapers and other information material, a radio broadcast, posters, leaflets, internet websites and emails. The

competition was seen to be a success in respect to the eight applications received, that were from a broad range of building and other public works categories. Special recognition was given to the Assessment Committee who participated in a number of meetings not initially planned and who also visited, upon its own initiative, all the submitted competition proposals. Furthermore, gratitude was expressed for the sponsors providing the monetary prizes for the competition and ETEK who helped by disseminating the competition announcements to all the engineers in Cyprus via electronic mail.

6. Discussion

Following the presentation given by Mr. Palochis (Cybarco PLC), describing the application of the software tool to the Building Facilities for the Faculty of Pure and Applied Sciences and for the Faculty of Economics and Management of the University of Cyprus, there was a general uncertainty amongst the Advisory Board members as to how the maximum credits were defined, how the specific assessment of each of the sub-categories was reached and therefore, the validity of the results. Some points were raised and the discussion continued during the time-slot allocated in the programme. For example, Mr. Pafitis (Department of Town Planning and Housing) questioned how bioclimatic architecture was assessed and Mr. Chrysostomou (ETEK) questioned whether the Energy and Atmosphere Pollution mark awarded for both buildings under examination (24/32) was realistic. Mr. Palochis mentioned that both buildings lost credits due to the fact that floor heating was not used in either of them, however, Dr. Tsiftes (Cyprus Association of Mechanical Engineers) mentioned that floor heating could be considered either positive or negative depending on whether water or petrol was used. He also referred to the example of the heating boilers and mentioned that the efficiency of a home boiler could be lower (e.g. 45%), while the efficiency of central boilers in bigger buildings could be much higher. The UCY employs a central boiler system for its campus. Dr. Ioannou (UCY) wondered what made the final 'health and safety' score high since it seemed with the analysis made that the buildings in question lacked a lot of essential parameters. There was a general agreement with the rest of the Advisory Board that the overall score seemed too high in general, to which Mr. Palochis replied that the study done was only an initial indication. Mr. Theodorou

(Cyprus Association of Environmental Scientists and Engineers) also noticed the fact that the maximum credits given were too high.

In view of these queries, Mr. Palochis addressed each individual point, specifically explaining how each analysis was made for the assessments.

Dr. Tsiftes (Cyprus Association of Mechanical Engineers) mentioned that the software tool seemed to be too subjective. For example, regarding air ventilation, the fact that the windows were left open in the building, despite the presence of internal air circulation system, should be considered as a negative factor in the scoring. He also mentioned that each building should ideally have an air system with use of air filters. Ms. Fylaktidi (Public Works Department - Building Sector) stated that opening the windows for fresh air could be preferred in the case of university buildings. She gave the example of the current room used, that occupied prior to the meeting and therefore, physical aeration by opening the windows has proved successful. Upon leaving, opening windows provided very efficient aeration in a short amount of time which showed a very good design of air recycling.

Dr. Tsiftes (Cyprus Association of Mechanical Engineers) also mentioned that the installation of some systems e.g. photovoltaics or geothermal power could not automatically contribute to a positive score without assessing first the efficiency of the systems installed. A similar argument and agreement was expressed by Mr. Orphanides (Cyprus Organisation for Standardization). Mr. Palochis (Cybarco PLC) agreed that this would be the next action needed in such a study.

From a speculation of the results obtained, Mr. Orphanides (Cyprus Organisation for Standardization) found the 'materials' score too low. Dr. Ioannou (UCY) agreed but also mentioned that this was to a certain level expected. Mr. Palochis (Cybarco PLC) stated that the whole life cycle of the materials was taken into consideration which is what reduced the final score.

Ms. Iakovou-Stylianou (Cyprus Association of Certified Quantity Surveyors & Construction Economists) stated that the “local” and “global” assessment weighting was too wide and vague and therefore a clear assessment could not be made. Mr. Chrysostomou (ETEK) suggested a weighting of “a,b,c” instead of a global / local

choice impact and referred to the example of energy performance. However, it was then agreed by Mr. Chrysostomou and Dr. Ioannou (UCY) that the strength of the weighting would vary and depend on the government policy, therefore, keeping the "local" and "global" assessment weighting would provide a good indication on the severity of the parameters. Mr. Chrysostomou also added that the scores given for the various criteria categories could then identify whether the impact of a specific criterion is local or global. Dr. Tsiftes (Cyprus Association of Mechanical Engineers) suggested that standard weighting factors could be defined for each building category.

Ms. Constantinidou (Environment Service) asked whether soil, water and waste pollution was included in the tool. Mr. Palochis (Cybarco PLC) and Dr. Ioannou (UCY) replied that these were included in the categories already defined.

Dr. Tsiftes (Cyprus Association of Mechanical Engineers) suggested including numerical data to help the assessment. These could include e.g. energy in KW per square meter, energy efficiency, heat permeability coefficients and also the maintenance and construction costs. Mr. Palochis (Cybarco PLC) replied that these were considered in the tool.

In reference to the ideal case (i.e. maximum performance that a building can have), Mr. Theodorou (Cyprus Association of Architects) stated that specific numerical parameters needed to be defined and questioned which government authority could be in charge of this. Mr. Chysostomou (ETEK) stated that such baseline measures had been already taken in Europe and referred to the example of the energy certificate in buildings. Mr. Theodorou mentioned that perhaps the next step would be the provision of a certificate concerning the Building Sustainability.

It was generally expressed through the Advisory Board members that they would like to further study the tool developed including the main categories and subcategories defined. Ms. Vatyliotou (UCY) agreed on that and stated that the software tool would be sent to all members via email in order to receive their comments. These comments will also be needed in view of the next project action which is the improvement of the tool.

From the comments given, Mr. Chrysostomou (ETEK) summarised that the tool needed to be more representative of the goal it was trying to achieve and less subjective. Dr. Ioannou (UCY) invited the Advisory Board members to comment whether there were any parameters missing. He also stated that ideally, the tool should be used during the initial construction study and upon completion of the building.

Dr. Ioannou (UCY) emphasized the innovative aspect of this tool, in that it incorporated all sustainability aspects and emphasized that the funding provided by the European Union for the project showed their interest in developing such a tool that could be applied to buildings. For this reason, he stated that UCY could provide the tool to any of the representatives that would be willing to test it. He also stated that the software has already been given to university students in order to apply it for the case of the new General Hospital of Nicosia.

Mr. Chrysostomou (ETEK) discussed the importance this tool could have, if initially was used by the public sector or by the University of Cyprus, stressing that the private construction sector tends to follow the trends set by the public sector. He also added that Cybarco PLC could voluntarily use the tool in order to assess the performance of their existing and future works and that this fact could be publicised in technical press (e.g. the ETEK or other associations' newsletters) in order to further promote the use of such tools for the environmental assessment of buildings. He also suggested that the tool could be used to environmentally assess buildings for which an Environmental Impact Assessment Study is not required according to the respective legislation.

In reply to these ideas, Ms. Constantinidou (Environment Service) enquired how much existing national legislation could enforce the tool and Mr. Theodorou (Cyprus Association of Environmental Scientists and Engineers) stated that it would be a good idea to disseminate the tool to companies and evaluators. Ms. Vatyliotou (UCY) stated that this is already included in the proposal of the project and, upon its improvement, this will be disseminated in a number of public and private stakeholders in both Cyprus and Greece.

Mr. Chrysostomou (ETEK) stressed that the tool had to give an incentive for the users – to provide a real benefit so as to force environmental thinking through the use of the tool. So as to be effective, he mentioned it would need to be implemented firmly as a policy or to create sub-consciousness that it should be used. Mr. Pafitis (Department of Town Planning and Housing) stated that the use of this tool should be voluntarily to which Mr. Chrysostomou agreed. Mr. Keliris (CERA) added that the demand for using the tool will depend on how this will be accepted by the general public and on its evident benefits.

Ms. Fylaktidi (Public Works Department - Building Sector) expressed that the tool was a good start but needed improving before it could be disseminated. She also stressed that the definition of sustainable construction and its aim would have to be clarified and that the public and users would need to be educated in this respect first. Regarding this Dr. Ioannou (UCY) suggested that this training could be provided by personnel well aware of the tool and specifically assigned for this purpose.

Mr. Chysostomou (ETEK) then summarised the three stages needed: firstly, to see how the tool is accepted by national market, secondly, to gain feedback and thirdly, to disseminate it to all users.

Mr. Pafitis (Department of Town Planning and Housing) suggested that the Department of Town Planning and Housing could collaborate with the SUSCON partners in order to design and construct a new building with high environmental standards. Mr. Chrysostomou (ETEK) replied that this could be a good case since it would improve the image of the public sector and suggested that the University of Cyprus (Department of Civil and Environmental Engineering) would set the terms of reference concerning the design and construction of this building. Mr. Palochis (Cybarco PLC) generalised this for the private sector and mentioned that if specific requirements are defined from the beginning (in the tender form) it will be easier to incorporate a number of ecological parameters during construction.

Dr. Tsiftes (Cyprus Association of Mechanical Engineers) suggested that the competition assessment committee could use the tool to also support their decisions made for the competition entries. Dr. Ioannou (UCY) replied that the development of the tool and assessment occurred in parallel and therefore could not be used there.

Regarding the Sustainable Construction Competition Mr. Chrysostomou (ETEK) suggested that the University of Cyprus would continue collaborating with ETEK in order to organise a similar competition in the future. Dr. Ioannou (UCY) suggested that the announcement of the next competition could perhaps be announced during the one-day informational event that will take place within the first week of June. However, Ms. Fylaktidi (Public Works Department - Building Sector) stated that this competition could take place every two years instead of one. Ms. Monou (UCY) mentioned that invitations for participation to the one-day informational event, to which the competition prizes will be given, would be sent out to all the Advisory Board members within May.

Although Ms. Sophocleous (ETEK) was unable to attend, she expressed the following recommendations on possible national institutional arrangements via electronic mail: For buildings in Cyprus it is about time that water saving devices and technologies which are already subsidised for their incorporation in buildings (e.g. grey water recycling, low pressure taps, water circulator) become compulsory while granting a Building Permission. Concerning energy conservation, there is already an existing regulation (for minimum heat insulation demands) that deems it necessary to incorporate heat insulation in buildings. However, this is different to the subject of energy performance as the existing regulation does not necessarily imply or guarantee high energy performance. In addition Ms. Sophocleous believes that Cyprus should proceed as a nation to pass the obligation for provision for future installments of photovoltaics in buildings and that this provision should be examined while granting the Building Permission.

7. Closing Remarks

As there were a lot of questions on the use of the tool, it was agreed that the tool would be sent via electronic mail for further comments and recommendations for improvement. Overall, the considerable interest shown and feedback given by the Advisory Board representatives was positive and shows that there is a good potential for future use of the tool and the encouragement of sustainability practices to be enforced in construction works.

The main issues raised during the discussion stage and the conclusions of the meeting are summarised in the following table:

No	Issue	Raised by
1	The Advisory Board members should further study and comment on the tool	Ms. Iacovou-Stylianou (Cyprus Association of Certified Quantity Surveyors & Construction Economists) Dr. Ioannou (UCY) Mr. Chrysostomou (ETEK)
2	The tool needs to be more representative of the goal it is trying to achieve and less subjective.	Dr. Tsiftes (Cyprus Association of Mechanical Engineers) Mr. Chrysostomou (ETEK) Ms. Fylaktidi (Public Works Department - Building Sector)
3	The tool was a good start but needs improving before it can be disseminated.	Ms. Fylaktidi (Public Works Department - Building Sector)
4	To improve and disseminate the tool: 1. the perception of the tool by the national market should be examined and feedback should be provided prior to its dissemination. 2. the public and private sector should use the tool on a voluntarily basis in order to set a trend for other stakeholders to follow and this effort and its benefits should be publicised. 3. UCY, ETEK and the Dept of Town Planning and Housing could collaborate in order to develop an environmentally friendly building that would be used as a	Mr. Chrysostomou (ETEK), Mr Pafitis (Dept of Town Planning and Housin) and Dr. Ioannou (UCY)

	case study for the application of the tool	
5	The tool is available to any of the Advisory Board representatives that wish to test it. This would be welcomed.	Dr. Ioannou (UCY)
6	Invitations for participation to the one-day informational event, to which the competition prizes will be given, would be sent out to all the Advisory Board members within May.	Ms. Monou (UCY)