The Project Technique: An ancient idea for modern implementation (On a non-formal adult vocational training environment)

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Abstract

This research paper highlights the benefits of applying the project technique while implementing experiential learning, in non-formal AVT (Adult Vocational Training) Institutes. The project method itself is based on the principles of Gestalt and cognitive psychology and continues to evolve within the pragmatic theory of education. In this case the organization of knowledge resembles a spiral beginning at the individual level and expanding to the business and social environment. During the implementation of the experiential learning it appears that the trainees activate learning skills and E.I (Emotional Intelligence) competencies such as motivation, self – regulation, self awareness, empathy as well as a variety of social skills. The assessment process is based on quantitative and qualitative analysis using combined levels of triangulation to determine whether this technique is applicable to adult training groups with similar characteristics. Although the central idea of the project method originates in Greek antiquity, this particular application proposes fertile speculation about alternative, practical instruction, in future vocational training environments, as well as their effective connection with economy and society.

Keywords - Project method, Project technique, Adult vocational training, Institutes of Vocational Training, Learning skills, Emotional intelligence.

1. Introduction

The aim of this publication is to highlight the advantages derived from the application of "The Project Method" in learning environments of vocational training. Recently described (by Frey, 2002), as open–experiential communicative teaching process, typically involves trainees of equal status with the instructor and comprises four distinct steps. Trainees are called upon to reflect on the subject they have chosen to deal with and to organize activities which they subsequently apply, review and evaluate (Stoller, 2002). The main benefit of the Project Method is that Project trainees learn by experiencing and participation in purposeful procedures and applying these very experiences (Kilpatrick, 1935; Brinia, 2011).

2. Theoretical framework

The ancient Greek philosopher Aristotle (387–322 BC) wrote in his “Nicomachean Ethics” (Book II: 1103 a, 30): "we learn by doing the things we must do by learning" (Taylor, 2006). The idea that “knowledge is generated by experience through action” was introduced during the latter quarter of
the 19th century AD via pragmatism, an American philosophical movement associated with the philosophical school of Chicago. The term “project”, nevertheless, was first used in the architectural schools of Italy after the establishment of the “Academia di San Luca” in the late-16th century. The Project Method regards the learning process as a “building process” referring to Piaget and Gestalt psychology and mainly makes use of the principles of cognitive psychology. According to it, learning is connected with the function of thought as the product of interaction between the individual organism and the environment, in which balanced relations between the two parts are insured (Knoll, 1991; Brinia, 2007).

3. Project Method: structure, criteria, main characteristics and limitations

Comprises 9 phases according to Knoll (1996), 7 (Frey, 2002) or 4 clearly defined stages (Brinia, 2008). The specific characteristics (Tippelt and Amoro’s, 2003) of this method derived from the definition "Project" involve experiencing the learning environment, directing it by the individual interests of the group members, self-organization and liability, the systematic organization, creativity and employment of as many senses, social training and importance, jointers, and completion of the Project on a finished product (Helm and Katz, 2002). A process can therefore be considered as “project” (Chrissafidis, 2003) if it meets some basic criteria (active participation of trainees, emphasis on collaboration, growing creative thinking, involvement of general knowledge in solving the problem, connecting the educational unit with the society and the “curricula” with life- situations and achievement of creative learning). Time shortage, strict construction of the curriculum and rigid conditions of learning and teaching are counterproductive to the application of the Project Technique. In this case the educational activity requires immediate certification of the trainees’ performance (Brinia, 2007).

4. Phases (stages) of the Project

The processes of individual and team activities (with breaks for information provision and discussing feedback) are as follows:

Phase1. The phase of speculation consists of making suggestions and reviewing them, open expression of ideas and opinions and clarifying all the above before the trainees examine, evaluate and clarify their needs, review the opinions expressed and their topic choice and that of the coordinator and finally set their goals.

Phase2. The didactical activities are prepared in this stage:
A. The thematic units are specified.
B. The groups are formed.
C. The subjects are assigned and the ideas are recorded.
D. The goals are reset (the action frame is consolidated and, after conference, the coordinators are elected, obligations are defined, the necessary material is collected and classified, relevant activities are planned before the final decisions are made and work is finally assigned to groups).

Phase3. The planned activities are executed in this stage, individually and in common work.

Phase4. The phase of Evaluation signals the completion of the project with the presentation of its products. It consists of discussing the results and reviewing them, planning of taking measures, organizing the final product, conclusion and announcement of project results).
5. Applying the Project Technique: basic requirements

According to Kilpatrick, participants in Project should ideally take all the steps of the procedure on their own while the trainer is not to have any other role than that of a facilitator assisting when necessary (Frey, 2002; Brinia, 2011). In order for the purpose of the research to be served, the following research questions were employed:

1. “To what degree were the trainees satisfied with their involvement in the implementation of the Project Method?”
2. “What knowledge and ideas did the trainees gain, concerning the educational gravity of the Project Approach?”
3. “To what degree was the attitude and social environment of the trainees influenced (personally and professionally) once the project was completed and the trainees had achieved both knowledge and experience?”
4. “How was the Emotional Intelligence of the trainees influenced on completion of training in the Project Method?”

According to “the four stages approach” (Carr and Kermis, 1986; cited in Brinia, 2005) the project was held in Spring Semester as described below:

1st Stage.
The trainees chose to work on the subject “Data Communications MKT” in combination with the Curriculum and, they expressed their interest in the subject with the assistance of the trainer; emphasized on the issue to be investigated; and retrieved and recorded any prior knowledge relevant to the subject.

2nd Stage.
The active involvement of trainees in both designing and organizing the activities in this stage was of utmost importance:

Step 1. In order for the grade of interest of the trainees on the chosen subject to be assessed as well as that of their relevant knowledge, open-ended questions on MKT Communications were posed:

1st question: “What do you know about Communicative MKT from your training, working or other experience?”
2nd question: “In what aspects do you feel you should upgrade your knowledge and experience on the Subject of MKT Communications?”

The ideas and the responses expressed were recorded during an extensive dialogue.

Step 2. The group diversity of composition was carefully ensured, both in terms of skills and in terms of interests, and remained stable until the completion of the Project, so that cooperative links between members could be established. Since there were 22 adult trainees, the assembly decided to form groups of four and five people (Meyer, 1987; Courau, 2000). Someone from each group was subsequently appointed “coordinator of activities”.

Step 3. In detail, the plenary decided that the 1st team be assigned drawing a representative pharmaceutical product in terms of Personal Selling, the 2nd team the development of a system of Marketing Services means of telephone communication; the 3rd team dealing with Brand as a special element of the promotion, the 4th team Advertising; and the 5th team Public Relations.

Step 4. Having reviewed the initial goals, the trainees concluded in the following decisions: the 1st group would deal with the medicine “Depon” marketed by the
“Bristol – Myers Squibb” (of course, rather than a visit to the premises of the company which was unpractical, a contact with the National Federation of Medical Visitors was suggested for an interview and exchange of views), the 2nd group would deal with the Department of Medical Assistance of “Express Service” S.A. (Thessaloniki), as case study, emphasizing on “Medical Services”, addressing the method of sales via telephone, the third group, while processing data relating to the brand, would deal with the brand name of “Zanae” S.A. (Thessaloniki Industrial Area) as a case study, and the 4th and 5th groups would work with the Promotion & Publicity Centre “Live Press Advertising” (Thessaloniki), as a case study, within the fields assigned i.e. Advertising and PR respectively.

3rd Stage.
The trainees were asked to present groups and plenary sessions with the material already accumulated, register the material in question and estimate the value of knowledge and experience obtained from the educational process they had participated in as yet.

4th Stage.
The trainees were encouraged to assess the value of the outcome of their work, examine how the targets initially set were achieved (or not), and specify any positive or negative element of applying the Project Method on the subject of MKT Communications. Their work was then assessed by the trainer, comparing the criteria in the design, teaching and themselves. Finally, general conclusions regarding the extent of effectiveness of the Project Method as well as comments or suggestions on how to improve the method technique, errors detected during the process and possible benefits for the trainees and the instructor were recorded.

6. Methodology

Integrated levels of triangulation of various information sources and techniques were employed in order for the objectivity and validity to be secured (Cohen and Manion; 1994 Bell, 1997; Bird et al., 1999). A rigid code of ethics was also followed. The quantitative analysis was ensured via a questionnaire of 48 questions using a seven-point Likert scale with possible answers as well as 5 semi-structured interviews of 10 questions received from 5 representatives of each group of trainees. The statistical sample, consisting of 22 adult trainees (13, i.e. 59%, female and 9, i.e. 41%, male), and the Vocational Training Institute (VTI) as well, were chosen by the simple random sampling method. Authorization for this Project was granted by the administration of the Institute of Adult Continuing Education i.e. the State Service in charge and the Administration of the chosen VTI.

7. The assessment method

Evaluating the responses was conducted based on Kirkpatrick’s model and was reinforced by three additional criteria (indicators) of emotional intelligence. Thus, the variables ascertained by the questionnaire relate to cognitive, skill-based and affected outcomes. Content analysis was also used in order to make best use of the interview material. The format of the interview questionnaire was relevant to the respective levels of Kirkpatrick (1994) indicators and some indicators to the level of Emotional Intelligence (Verma and Mallick, 2004).
8. Questionnaire results

The average of 30 out of 46 cases (65, 22%) depicted rates of 6 or greater while in 34 cases (rate 71.74%), the minimum rate was higher than 4, a size that enhances the former one. What is more, in two sentences of the third axis (unit “Suspension”), values close to 1 also identify a positive evaluation by the respondents as they clearly indicate that the former overcame their hesitations. In addition, in 38 cases (rate 79.17 %) Standard Deviation occurs less than 1, confirming thus that the means are a representative statistical measure since the questions of the scale significantly reduce the standard error (Tavakol and Dennick, 2011), reliability and internal consistency of the questionnaire data are presented as increase even of the eight total measurements and the Cronbach’s alpha rates values were above 0.94 and 0.85 (with the minimum acceptable level being at 0.7).

9. Interviews results

Using the Content Analysis Tool (Weber, 1990) and the information derived from the trainee representatives’ interviews by it, show clearly that the Project Method was highly positively evaluated by them. It resulted in a more professional or social environment at levels such as emotional intelligence and reaction, knowledge, behavior as some of the comments of participants of adult learners indicate:

“I think that now I can recognize and understand better what I should do and how . . . I will organize my job better . . .” and take more initiatives (Coordinator, Group A, male).

“[. . .] in many cases (. . .) would be preferable to encourage (. . .) than to disagree (. . .). Motivation, (. . .) acted spontaneously [. . .] (Trainee, Group E, female)”. 

“[. . .] I am now a better listener (. . .). I learned how to handle objections (. . .). I have a lot more patience [. . .] (Trainee, Group C, male)”. 

“[. . .] the structure of the Project itself leads the relationships of those involved in the right direction (. . .). I am already trying to take initiatives (. . .) to encourage and motivate my colleagues (. . .). I organize my work better. (. . .). I apply self-evaluation . . . I'm trying to better myself as a professional (Coordinator, Group D, female)”. 

“[. . .] I gained more confidence in myself (. . .). I realized better what I already knew (. . .). I saw (. . .) how to manage people with kindness . . . how to control the volume and tone of my voice (Trainee, Group B, female)”. 

Anxiety, skepticism and a reluctance to participate were indeed at times observed while negative criticism sometimes did cause anxiety. Time constraints led to skepticism about the success of implementation (initially) and there was some hesitation to develop initiative (at the beginning).

10. Conclusion

The results of this research showed that this method, however certainly not a panacea, could be applied to similar environments and objects on the condition that the basic criteria and requirements are guaranteed. In this case, adult trainees “put the theory in practice”, learnt to take initiatives and triggered significant learning abilities and skills of emotional intelligence (Goleman, 1998). They were encouraged morally and ready emotionally to use tactics that they had
never previously tried. Although faced with the challenge of doubting their previous beliefs, they utilized additional knowledge and experience through a new “frame of reference”: the Project Method. It is therefore that this process has presented features of transformative learning (Knoll, 1991; Rogers, 1999; Mezirow, 2000).

This research effort has cast light on a productive discussion about the teaching ways in future training environments, as it made clear the value of the diversity of a team in contrast to the uniformity imposed on each member via the previous school experiences. Adult trainees, although in need for some time to realize whether their expectations were met, were finally to overcome the boundaries of “traditional” instruction through collaboration, building the appropriate communication bridges in the real business life as regards the subject area of their interest (Knowles, 1980; Chrissafidis, 2003).

Therefore, the issue of close interaction between education and broader economic and social environment arose. The official reactions of both the Institute that conducted the survey and the cooperating companies were as encouraging. Knowledge creation has thus been shown to function as a “spiral” process, initiated at the individually and directed to the team and the wider society, through successive changes among the four states of knowledge transformation: those of socialization, internalization, combination and externalization. The new cycle of conversions produced a new dynamic by modeling the three-dimensional “helix of knowledge” further (Nonaka and Takeuchi, 1995).

The socialization produced through all individuals and organizations involved interacting facilitated the sharing of experience. It seemed, indeed, that through the success of the Project method all participants benefited greatly (Knoll, 1997). Consequently, while the externalization was caused by the group contribution of reason and emotions through dialogue, the newly created knowledge was associated with that already existing. The practice, therefore, of new knowledge was related to “learning by doing” in J. Dewey eventually creating the internalization. In all investigations conducted “experience through action” was evident, in the final analysis (Boud et al., 1985; Rogers, 1999), which, in turn, became the starting point for developing stochastic processes attracted by the spiral motion of learning, in space and time. In the infinite quest in search of the meaning of human existence, that is.

References
Top destinations for Nightlife tourism among European islands. Why do Ibiza and Mykonos stand out?

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Abstract

Nightlife tourism is, nowadays, established as a modern cultural form of tourism, especially among young people. Acknowledging the influential effects of internet on tourism, we performed a comprehensive network research in randomly chosen sites and blogs, whose basic topic was the top nightlife European island destinations. We collected the outcomes of these selected sites, and weighted the results according to the visitor’s frequency. Our initial findings reveal that Ibiza, Mykonos, Majorca, Hvar and Cyprus stand out among the rest of the European islands. Following an extensive multivariate quantitative and qualitative analysis of statements and comments from reporters, bloggers and guests, we managed to provide measurable results of the Fodness motivational function. Our basic aim is to define the reasons that make these destinations stand out. Our findings could provide important implications to the competitors’ authorities in order to develop strategies improving their nightlife profile.

Keywords: Tourism, Nightlife, Top destinations, Social Status

1. Introduction

Tourism is considered as the world’s largest, most dynamic economic sector and fast growing industry [1]. Thus, it is essential for governments, tourism organizations and tour operators to understand the processes that determine tourists’ destination choices [2].

Tourism motivations have concerned a plethora of researchers, pertaining a large variety of issues. McIntosh and Goeldner have classified motivations into four kinds according to the following typology:

i. physical (e.g. relaxation);
ii. cultural (e.g. discovering new geographical areas);
iii. interpersonal (e.g. socializing and meeting new people) and
iv. prestige (e.g. self-esteem and self-actualization).

Fodness in 1994 pointed out, that such typologies need to be grounded in a psychological theory of motivation. Following an extensive multivariate analysis of people’s statements about tourism motivations, Fodness proposed a model based on five motivation types, which he refers to knowledge, punishment minimization,
self-esteem, ego enhancement and reward maximization. Fodness utilizing the functional theory, attempted to build up a tourist motivation scale. His investigation was based on three studies: exploratory study by qualitative interviews, scale designing using factor analysis, and market segmentation. He later concluded that his study focused more on tourist motivation conceptually and behaviorally and therefore the results provided are reliable.

Nevertheless, little research attention has been given to nightlife as a tourism motive, the nightlife touristic market, the destinations most commonly visited by young people for their holiday experiences. This paper aims at highlighting a few comparative issues relevant to the nightlife tourism, in order to partly fill the gap in the bibliography.

2. Nightlife tourism in Bibliography

Nightlife tourism has only recently been established as a form of modern cultural tourism. Travel agencies the last decades have caught the pulse of the market and created travel packages for young people and other quests who are interested in partying and clubbing. Thus, scientific bibliography rating nightlife motives is extremely rare. This paper aims at highlighting a few comparative issues relevant to the nightlife tourism, in order to partly fill the gap in the bibliography.

Sibastien Tutenges presented the risks from substance use, casual sex, commercial sex, and health problems among young Danish tourists at an international nightlife resort in Bulgaria (Sunny Beach). According to Tutenges, young tourists intentionally engage in certain forms of risk in order to move far beyond the mundane and into states of drunken adventure and memorable excess. Vacations at international nightlife resorts represent an important, but also risky element in the lives of youth in many countries. Finally, strip-club patronage and paying for sex were both associated with higher levels of drinking and use of Viagra. Paying for sex was associated with non-use of condoms with one or more sexual partners. [4].

Our aim in this paper is to go further from risks and infamous party destinations and decipher what makes a nightlife destination standout and become top, offering high quality services and financial prosperity to the local economies.

3. Methodology and Data Collection

Efficient browsing and recommendation procedures on e-tourism platforms must be supported by high quality data. In the tourism domain, an abundance of information can easily overwhelm users [5]. We had to restrict our search on the criterion of the European islands nightlife resorts, by requiring on line manual information. Our aim is to present our findings on the tourist destinations through a comprehensive network research in randomly selected informative sites, blogs and reportages, whose basic topic was the top nightlife European island destinations, excluding official promotional sites, uploaded from local authorities and tour operators, simulating the procedure with what a common internet user would do.

Internet search has currently become the main source of information on tourist destinations for travelers. The simplicity of the internet search on a destination and the millions of results of websites that contain comments, offers information and
therefore the opportunity for travelers to read visitors’ opinions instead of going to a travel agency [6]. Internet is considered as the largest travel agency [7], as too many Web sites are dedicated to tourism. It is important for travelers to know what recommendations or opinions other users have made through specialized tourism sites and blogs.

According to V. Waralak [8] internet users make queries related to tourism in order to answer questions, such as:

“Where to go?”,

“What hotels are recommended to stay?”

“What are the places to visit on the next trip?”.

The answer of these common questions is usually given by travel blogs, containing a source of information based on the experiences of tourists [9]. Using such holiday review websites and blogs, as data sources, is a growing area of interest for marketers and researchers and it is really interesting that most of the papers using holiday review websites as data sources are published by researchers from the domain of computer and information sciences. [10] [11]

To evaluate the reliability of website information, we had to refer to computer science journals and adopt scientific methodologies, such as comparing the aggregate ratings with the outcomes provided in “Alexa.com”. We collected the outcomes of randomly, uncorrelated and independent sites from “google.com”. We had to simulate what a random tourist would do in order to choose a nightlife destination. The querying process took place in April 21st 2015 and included reports and comments uploaded from the beginning of 2013 till the 20th of April 2015.

Following, we compared with the outcomes as published by Alexa. This gave us a realistic evaluation scenario in which we measure the reliability of website information for sites that users would normally visit if they have queried for the top European islands nightlife destinations. For each destination, we used a weight rate in order to evaluate the reliability. For the top sites (the top 10,000 in popularity) the rate was 1, for the medium popularity sites the rate was 0.6 and 0.2 for the rest. The function we used is the following:

\[ P(isl) = \sum_{n=1}^{\infty} (\text{weight}) \times \text{frequency} \]

This function was based on empirical findings of scientific papers such as the “Tourist Information Evaluation Using a Social Network” [6] and the “Re-evaluating the Wisdom of Crowds in Assessing Web Security” [9].

<table>
<thead>
<tr>
<th>Analyzed geographic zone:</th>
<th>European Islands</th>
</tr>
</thead>
<tbody>
<tr>
<td>Period of analysis:</td>
<td>2013/01/01 – 2015/04/20</td>
</tr>
</tbody>
</table>

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Number of analyzed sites | 76

Table 1: Research Information

Our aim was not only to estimate the weighted likelihood appearance of the Top European islands for nightlife holidays in the internet, but also to define, according to the Fodness function, the factors that determine the difference of the appearance possibilities. Fodness in 1994 had pointed out, typologies grounded on a psychological theory of motivation. The extensive multivariate analysis of people’s statements about holiday motives, lead Fodness to propose a model based on five motivation types, which he refers to as “functions”. The five proposed motivational functions are: knowledge, punishment minimization, self-esteem, ego enhancement and reward maximization. Many of the previous typologies of motivation are integrated by Fodness’s five-function approach. Moreover, his function allowed a segmentation of tourists that is efficient in predicting both their other characteristics and their behavior.

Based on Fodness’s motivational function, we had to adjust the typology to the most frequently appeared words and phrases (as uploaded on the sites) in order to measure the tourists motivations for each European island.

In order to define, according to the Fodness function [3], the factors that determine the difference of the appearance possibilities of the European islands, we used our sample of 76 sites with comments and statements of bloggers and guests, where internet users impart their own reality.

The typology we have applied is presented at the following figure:
Figure 1: Fodness’s 5 motivational Function

The methodology of word counting, despite its simplicity, is regarded as a surprisingly accurate approach to characterize texts according to Pullman (2005); Bird (2009) and Stringam and Gerdes, (2010) [12]. Our fundamental goal of this approach was to improve the quality of inferences made by the analysis of communication [12].

4. Results

We collected the outcomes of randomly selected sites, containing articles with titles such as:

- The best nightlife island in Europe
- The best party islands in the Europe etc

The querying process took place in April 21st 2015 and included reports and comments uploaded from the beginning of 2013 till the 20th of April 2015. We excluded sites from countries tourism authorities and tour operator proposal due to the possible lack of objectivity. Our research led to Table 2 and Figure 2:

<table>
<thead>
<tr>
<th>DESTINATION</th>
<th>P(d)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ibiza (Spain)</td>
<td>0.84</td>
</tr>
<tr>
<td>Mykonos (Greece)</td>
<td>0.68</td>
</tr>
<tr>
<td>Majorca (Spain)</td>
<td>0.44</td>
</tr>
<tr>
<td>Hvar (Croatia)</td>
<td>0.43</td>
</tr>
<tr>
<td>Cyprus (Cyprus)</td>
<td>0.35</td>
</tr>
<tr>
<td>Ios (Greece)</td>
<td>0.32</td>
</tr>
<tr>
<td>Corfu (Greece)</td>
<td>0.24</td>
</tr>
<tr>
<td>Santorini (Greece)</td>
<td>0.22</td>
</tr>
<tr>
<td>Tenerife (Spain)</td>
<td>0.22</td>
</tr>
<tr>
<td>Pag (Croatia)</td>
<td>0.21</td>
</tr>
</tbody>
</table>

Table 2: Top ten nightlife islands in Europe 2013-2015 according to internet sites

The results showed that Ibiza (Spain) and Mykonos (Greece) followed by Majorca (Spain) and Hvar (Croatia) are the leaders of nightlife tourism among the European islands. In order to define the determinants that make these islands to stand out, we had to focus on specific characteristics of their nightlife culture based on the network research and the experiential confessions of guests and bloggers, based on the five motivational functions of Fodness. At Table 3 we can view the results of each motive, for the top five European islands nightlife destinations, as emerged from the word – phrase frequency counting of each destination.
It is obvious, that tourists who visit nightlife resorts are not motivated from punishment minimization such as relaxation and quite beaches, or from the need for knowledge such as visiting museums and archaeological monuments. The motivations that make the top nightlife destination stand out from the rest of the islands are Self-esteem and ego enhancement (“value-expressive function” or Social Status) and, of course, Reward maximization.

<table>
<thead>
<tr>
<th>Fodness’s five motivational functions:</th>
<th>Punishment minimization</th>
<th>Knowledge</th>
<th>Self-esteem</th>
<th>Reward maximization</th>
<th>Ego enhancement</th>
</tr>
</thead>
<tbody>
<tr>
<td>IBIZA</td>
<td>4,70%</td>
<td>1,00%</td>
<td>14,40%</td>
<td>18,30%</td>
<td>14,40%</td>
</tr>
<tr>
<td>MYKONOS</td>
<td>9,20%</td>
<td>1,30%</td>
<td>13,30%</td>
<td>16,80%</td>
<td>13,90%</td>
</tr>
<tr>
<td>MAJORCA</td>
<td>4,20%</td>
<td>1,7%</td>
<td>13,70%</td>
<td>16,40%</td>
<td>13,70%</td>
</tr>
<tr>
<td>HVAR</td>
<td>6%</td>
<td>2%</td>
<td>13%</td>
<td>14%</td>
<td>11%</td>
</tr>
<tr>
<td>CYPRUS</td>
<td>13,00%</td>
<td>1,5%</td>
<td>12,90%</td>
<td>14,60%</td>
<td>10,30%</td>
</tr>
</tbody>
</table>

Table 3: Empirical results of the top five European nightlife islands

In order to make clearer how these scores have arisen we present some indicative examples for the top destinations:

**Ibiza:**

Ibiza is the most popular destination in almost every list of European party islands. Selected phrases that prove the ego-enhancement and self-esteem profile (social status motivation) of this destination are presented below:

“Ibiza is a party island famous for its world class, summer club parties and has achieved notoriety as a destination for young travellers due to its infamous super-clubs, which during the summer are packed with world famous DJs, glamour models and celebrities”

“The cosmopolitan Ibiza Town…”

“If you haven’t been there yet, you’ve dreamt of being there - party scene here is epic, attracting the rich and famous and world-renowned DJ Start planning the party sailing holiday of your life!”

“The fanciest and most expensive clubs, where you will see tons of VIP booths and nicely dressed people”
The differentiation factor of Ibiza is not only social status as exposed from the phrases above, but also the reward maximization motive. Reward maximization is correlated with sexual indulgence. According to Tiefenbacher, Day, & Walton, (2000) social status enhancement may be through the pursuit of hobbies, continuing education, ego enhancement and even sexual indulgence. The reward maximization motive was directly or indirectly expressed via expressions that reveal the sexual indulge motivation of guests. Some typical examples are the following:

“The hedonistic reputation of Ibiza goes back to the 1960s when it garnered a word of mouth profile amongst counter-culture travelers for having a laid-back atmosphere and glorious landscapes”.

“The island is more than just a hotspot for young hedonists; it also attracts tourists for its beautiful scenery”

**Mykonos:**

Mykonos is the second most popular nightlife holiday destination, according to our findings. The word and phrases frequency counting revealed that the social status motive and the sexual indulge motive, as expressed via the reward maximization theory, are the most significant factors for the ranking of Ibiza and Mykonos. Typical examples expressing social status motive (self-esteem and ego-enhancement) are the following:

“The most cosmopolitan destination amongst the Greek islands and widely recognized as one of the best travel meccas”

“Very popular among celebrities, Mykonos features a cosmopolitan nightlife and a lifestyle of its own”

“Mykonos is particularly renowned for its cosmopolitan nightlife and beautiful beaches. Many international celebrities visit the island every summer”

“The most glamorous and expensive of all the Greek Islands – boasts everything you need for a perfect beach holiday in Greece”.

It is important to stress that Papatheodorou (2001) concluded that, although highly priced, Mykonos is the Greek island that attracts more tourists than any other island. Moreover, it’s not only Mykonos cosmopolitanism that satisfy the need for social enhancement, but also the respect for diversities, satisfy guests’ need to experience what they do not usually do at home. That is one of the definitions of reward maximization motive according to the Fodness typology [3]. Some typical phrases from bloggers, reporters and tourists are the following:

“Islands like Mykonos and Lesbos have long been top gay destinations for some fun in the sun among gays and lesbians”.

“I love the vibe of the island and it’s very gay-friendly as well”

“Mykonos has it all for you. The island is also known for its gay scene, which sees thousands of people arrive each year looking to let their hair down for a week or two”
In 2009 Kamenidou, Mamalis and Priporas, tried to identify key dimensions and their relative importance in determining consumer choice. The most favorable variables of Mykonos as a destination image were: Nightlife, Beautiful place, Sun, Beach and “sexually” wild place. [13]

5. Discussion - Conclusion

In order to define the reasons, why Ibiza and Mykonos stand out when talking about nightlife destinations, we proceeded to a word and phrases frequency counting and distribution to the five motivational functions of Fodness. Our findings revealed that the self-esteem and ego-enhancement (“social status motivation”) and reward maximization motive were much more significant than punishment minimization and knowledge.

A number of empirical studies have addressed prestige motivations in tourism. Out of all such empirical investigations, Riley has been the first who focused only in prestige motivations research. Relative exclusivity and personal/empathetic desirability were found to be the two underlying dimensions of prestige-worthy leisure travel [11].

Our findings maintain that nightlife tourism is viewed by many as containing a “certain degree of . . . mystique and prestige”, which immanently brings a sense of elitism with it. Guests returning from a self-indulgent week in a sunny paradise, probably enjoy their temporarily elevated status back at the office. [14]

Mathieson and Wall in 1982, suggested that prestige is a very important factor for tourists as a motivation for travelling. In addition, previous research indicates that social status and prestige assume particular relevance, whilst social status is an important condition influencing destination selection, and this is proved by the results we have presented [15].

According to Fodness [3], one of the five reasons for travel is the “value-expressive function” which has to do with self-esteem and ego enhancement (or social status). Social status enhancement in nightlife destinations, may be through the pursuit of hobbies (such as dancing), ego enhancement and even sexual indulgence. The reference to hedonism, sexual indulge and tolerance to diversities, were crucial deferential factors for selecting a nightlife destination. Hedonism relates to the idea that most human behavior is guided by the desire to seek pleasure. Guests respond emotionally and derive pleasure from engaging in memorable social interactions with other guests and locals. Nightlife tourism can be understood as a “liminoid realm associated with transition, absence of status distinctions and equality, communitas, anonymity, less constrained behavior in general, and sexual behavior in particular” [14].

Talking specifically about women, Wickens (1997) in her study of female tourists' sexual behavior in Greece, found that women explained their sexual permissiveness in terms of a “license for thrills” facilitated by the unique social atmosphere in tourism. Ragsdale, DiFranco, and Pinkerton (2006) pointed out the need to research women's sexual behavior in tourism as it may be an arena for self-exploration and a source of self-discovery [16]. These studies concluded that
women could perform beyond routine norms, statuses, and rules of appropriateness applied to women’s sexual behavior, either with steady or casual sexual partners. [14]

Little research attention has been given to the gay tourist market, the destinations most commonly visited by gay men, or their holiday motivations and experiences. Three dimensions of gay tourist motivation were identified: ‘gay social life and sex’, ‘culture and sights’ and ‘comfort and relaxation’. Men who had visited southern European gay resorts (Gran Canaria, Ibiza and Mykonos) had significantly higher scores on the first dimension; whereas men who had visited European cities (Amsterdam, Paris and Prague) and had travelled further afield (sub-Saharan Africa and Australia) had higher scores on the second dimension” [17].

6. Conclusions

Our findings could provide important implications to the competitors’ authorities in order to develop strategies improving their nightlife profile. It is of great importance that our findings revealed aspects that have not been given scientifically attention. Natural beauties and images, sunny beaches and graphic architecture are factors expected as granted when visiting a Mediterranean island, but intense nightlife is offered from only a few. When researching for nightlife tourism motivations, we faced factors such as prostitution, drugs and alcohol abuse. On the other hand, our findings reveal the importance of social status and reward maximization as crucial motives.

In our internet search of the nightlife islands, we found that destinations offering special prices and “happy hours” were not at the top of the lists. The technique of special offers in order to attract tourists is not correlated with the social status motivation. Famous musicians, disk jockeys and celebrities in well-designed attractive music clubs is a much better advertisement than “cheap drinks”, in order to pursue a financially upgraded touristic profile. Cosmopolitanism and prestige images of a destination must be built on a basis of attracting higher income guests.

The reward maximization motive, as explained, is related with a hedonistic atmosphere including male and female guests. In touristic destinations related with sex tourism, research is targeting to prostitution and strip clubs patronage. Top nightlife destinations, although satisfy the sexual indulgence motivation, are correlated with free spirit and sexual wild image. The natural need for women and men to perform beyond routine norms, statuses, and rules of appropriateness applied to sexual behavior. The gayfriendliness factor is a part of this free spirit, which has nothing to share with prostitution and other illegal factors.

In conclusion, the upgrade of a social status image and the culture of respect to human diversities could lead a nightlife destination, to attract tourists with higher incomes and impact their will of spending. Nightlife tourism is a form of modern cultural tourism, thus local authorities and business should strive to improve the destination’s social status image and discourage the illegal (e.g. drugs and prostitution) activities.

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16
Retail strategies of companies operating in the gasoline industry: The case of EKO S.A.

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Abstract

The gasoline industry is part of the broader energy sector and constitutes a vital driver of the global economy. This paper especially focuses on road fuel retail networks and gives an overview of their complex operational and strategic issues. In this context, related critical success factors, benefits and problems are discussed. The paper also investigates, through a case study, the retail strategies of the Greek leader (i.e. EKO S.A.), against the basic global trends in the road fuel retail sector. The reasons behind the adoption of specific strategies are also outlined, while making reference to all critical parameters in operations, legislation etc. By evaluating EKO’s retail strategies, we concluded that they largely stay in line with the basic trends followed by most gasoline companies operating worldwide. The continuous development of EKO’s Company Owned Management Operated (COMO) network and the promotion of non-fuel products and services on fuel stations, underline the company's commitment for sustainability and overall customer satisfaction. The strengths and areas for improvement for the company are also highlighted, taking into consideration the fierce economic recession that is currently engulfing Greece.

Keywords: Retail Strategies; Gasoline Industry; EKO S.A.; COMO network.

1. Introduction

Energy is a vital part of our everyday life and influences economies, societies, entrepreneurship etc. Fuel is energy and the fuel market involves oil companies operating in the fields of oil extraction, refining, logistics storage, distribution and
retail (for an in-depth structural analysis of the Greek Oil Sector see Fafaliou and Polemis, 2012).

This paper concentrates more on issues dealing with the road fuel retail networks. The road fuel retail sector includes all the service stations (distributors) that sell petrol, diesel fuel and LPG to end customers. Running a service station can take various forms in terms of ownership (for the major classification schemes see Shepard, 1993; Deck and Wilson, 2004; Borenstein and Bushnell, 2005).

The Greek road fuel retail sector is characterized by heterogeneity, since a variety of fuel station types coexist. The sectors’ environment is highly competitive, since Greece has the largest number of service points per capita in the EU. The road fuel retail sector in Greece is mainly classified into two categories: (i) independent fuel stations and (ii) branded fuel stations.

Independent fuel stations operate with “unbranded” fuel products. These distributors are not contractually bounded to buy their products from a specific oil company. Usually, they buy from the wholesale market, choosing the oil company that offers the lowest price. However, the oil companies do not enrich this product with the additives they sell in their “branded” retail network. This contractual strategy is adopted in many countries, including Argentina (Coloma, 2002), Netherlands (Bettendorf et al., 2003), Norway (Dahlstrom and Nygaard, 1994), Canada (Eckert and Douglas, 2005), etc.

Branded retail fuel stations operate under a specific company’s brand name. These stations could be further classified according to their operating set up, as follows:

- COMOs (Company Owned, Management Operated) and COCOs (Company Owned, Company Operated). In this case, land is owned by the oil company (or it is leased for a long period). Business is run by the same company, which also sets the retail prices.
- CODOs (Company Owned, Dealer Operated). In this case, land is owned by the oil company (just like COMOs), but business is run by an independent distributor/entrepreneur. The latter is contractually linked to the oil company and is free to set the retail prices.
- DODOs (Dealer Owned, Dealer Operated). In this case, land is owned by the distributor/entrepreneur (or it is leased for a long period). Just like CODOs, the entrepreneur is contractually linked to the oil company and is free to set the retail prices.

According to Polemis (2013), fuel stations in Greece are approximately 6,500 and 400 out of them, are unbranded/ independently operated. The majority of them belong to the CODO and DODO category and only a small percentage are COMOs/COCOs.

- The purpose of this paper is twofold:
  - To give an overview of the complex operational and strategic issues the road fuel retail networks are facing. In this context, related critical success factors, benefits and problems will be discussed.
To investigate, in a case study, the retail strategies of the Greek leader (i.e. EKO S.A.), against the basic global trends in the road fuel retail sector. The reasons behind the adoption of specific strategies will also be outlined, taking into consideration all critical parameters in operations, legislation etc.

The remainder of this paper is organized as follows. In Section 2 critical success factors are mentioned and amongst others, the importance of location, size of petrol station, economies of scale and the expansion of operations in non-fuel activities are analyzed. Section 3 concentrates on the benefits arising from effective strategic planning (i.e. economic, social and environmental) and reckons in critical success factors as regards the operation of road fuel retail networks. In Section 4 reference is made to some vital possible problems for road fuel retail networks, including issues that arise from contractual matters, prizing etc. In Section 5 the EKO S.A. case study is presented, starting with the analysis of the strategic model followed by the company during the recent years. The reasons behind the adoption of specific strategies are also outlined. Finally, the strategy of EKO S.A. is compared against the basic global trends in the road fuel retail sector. In Section 6 the major strengths of EKO are identified and proposals for further improvement are given. Finally, in Section 7 some general conclusions are drawn.

2. Critical Success factors

Critical success factors are those few things that must go well to ensure success for an organization (Boynlon and Zmud, 1984). It is crucial for a company to recognize, support and encourage the critical success factors that potentially lead to sustainable existence and development. In the road fuel retail sector, a number of critical factors have been recognized and revised over the previous years: location, customer service, expansion of non-fuel activities, achievement of economies of scale are some examples, which will be analyzed below. The contribution and importance of these factors to fuel stations is widely supported in the literature (see Nault and Dexter, 2003).

2.1 Location

Lee & Schimidt (1980) state that accessibility to the fuel station is of vital importance and directly affects fuel volumes. Sites on crossroads or corner sites that offer easy access and visibility are more preferable. Fuel stations that are close to work or home (Smalley, 1999) or major routes/national roads (Netz and Taylor, 2002) also seem to have an unquestionable advantage (see also Espey, 1996; Graham and Glaister, 2002).

2.2 Expansion of non-fuel activities

Retail networks worldwide often offer non-fuel products and services. These may include: food (simple quick snacks or fast-food burgers, salads etc.) and non-food goods (car accessories, lubricants, tobacco products etc.) and services (oil change, car wash, car fixing, postal services etc.). All the above can lead to increase in profit margin and market share (Chan et al., 2005). Riboldazzi (2010), states that non-fuel
products may be sold at fuel stations under the brand name of the oil company or through strategic alliances with other companies (eg. BP/Safeway).

2.3 Economies of scale

In order to achieve economies of scale, a company must rationalize its network, enhance productivity, reduce costs etc. For example, serving a large number of fuel stations shrinks distribution costs and leads to high levels of productivity. Note that Borenstein and Bushnell (2005) questioned the pervasiveness of these economies of scale. By supporting large-scaled fuel stations (and perhaps limit the number of the small ones), a company may experience increased profitability. In order to achieve effective development, strategic alliances may also be encouraged with other companies in fuels or non-fuels (i.e. oil companies may come to an agreement to cooperate in storage or distribution).

2.4 Investment in technology and control systems

Riboldazzi (2005) refers to retail technology as a tool that creates added value to retailers and consumers. Modern technology is indeed a crucial enabler the fuel stations can use, in order to operate more efficiently. Especially ERP systems can track inflows and outflows of petrol in the service station, as well as any kind of products and services purchased and sold from the site, dramatically improving the monitoring of all transactions.

2.5 Size of fuel station

The size of the fuel station contributes to convenience for the customer to be served. Thus, large fuel stations with plenty of pumps offer faster customer service and avoidance of traffic in the court. Subsequently, this may lead to increased sales. According to Sheth et al. (1999), convenience value is correlated to the time and effort needed to acquire a product. Smalley (1999) also state that customers avoid fuel stations that delay their service due to traffic.

2.6 Differentiation

Differentiation can be examined here in terms of two factors: (i) price and (ii) service quality offered to the customer. The first factor (price) includes several discounts and bonus schemes (e.g. "with x liters of diesel you get a free car wash"). Of course, for prizing issues localized regulations should be taken under consideration (for prizing issues see also Karrenbrock, 1991; Slade, 1992; Borenstein and Shepard, 1996; Borenstein et al., 1997; Vita, 2000; Barron et al., 2004; Sartorius et al., 2007). In addition, loyalty cards are introduced by some oil companies, which essentially connect consumption with reward to the customer. Every time a consumer visits the fuel station and uses its loyalty card, gets reward points which can be redeemed for products, services or discounts, when they reach a certain amount. The second factor (service quality) includes all critical dimensions for customer satisfaction (e.g. reliability, responsiveness, competence, courtesy etc.). Borenstein & Bushnell (2005) note that adequate customer service satisfaction, for
a branded fuel station, might patronize customers to visit other fuel stations of the same brand.

3. Benefits

The benefits associated with road fuel retail networks operation mostly derive from efficient and realistic business planning, extensive involvement of people and technology, legislative support etc. For the purpose of this paper, the basic benefits are presented under three categories: economic, social and environmental.

3.1 Economic

Economic advantages have to do basically with profits and development. If the business is doing well, shareholders will gain earnings from dividends and firm value. A profitable company attracts investors, earns funds and fulfills its purpose using more sophisticated business tools.

The extension to non-fuel activities benefits the business in manifold ways. Fuel stations can experience more traffic as the customer may not come to the service point requiring only fuels, but a variety of products and services as well. According to Weirauch (2000), visionary companies in the US are turning fuel stations into convenient transitory stops or even final destinations, where the customer can find a variety of products and services. By offering a wide range of non-fuel products in fuel stations, total gross margin increases, since food or lubricants gross margin is significantly higher than fuel's. Thus, the total turnover of fuel stations is increased, and subsequently profits are increased, given that the operational costs are adequately controlled.

The benefits from achievement of economies of scale are reflected in reduced costs and efficiently handling operational processes. When costs are reduced, productivity rises, business is expanding and future prospects of the business become more positive.

Differentiation in providing incentives (i.e. offering discounts and reward gifts), better service quality and lower price makes customers loyal to the fuel station, which leads to repeated visits. According to Seiders et al. (2005), repurchasing behavior is highly correlated with customer satisfaction, and is also influenced by competitive intensity and convenience. It is imperative for fuel stations to be able to keep track of every promotional action and measure its effectiveness. If it is satisfactory, it should be maintained or repeated on a regular basis.

3.2 Social

Social benefits may arise from the sustainability of the business. If fuel stations are profitable and keep going in time, the employees will keep their jobs. In addition, if new sites enter the market, new employment opportunities will be generated. The same is evident in the macro-level, as far as refineries and branded oil companies are concerned.

Apart from economic benefits to governments and contribution to GDP, all the taxes and VAT included in the fuel retail price, have social benefits as well, since a part of
them is used for the needs of society i.e. in education, health etc. Thus, given that some social needs are indirectly financed by the operation of such companies, more benefits arise to the society when these companies are profitable and sustainable.

3.3 Environmental

Elkington (1997) refers to environmentalism’s influence to affect societies, as far as consumption and saving resources for future generations is concerned. Over the past years there have been substantial changes in the EU environmental initiatives that have impacted road fuel retail sector. As far as fuel quality directives are concerned, the elimination or banning of leaded gasoline is suggested and limitations of the sulphur content in gasoline and diesel is imposed. Furthermore, the use of biofuels is encouraged. Biofuels advantages are focused on emissions and green house reduction, power performance and economy, energy balance and security, toxicity safety and recycling, economic development etc.

By applying ISO 14001 standard (i.e. the most widely adopted environmental standardized management system) to the refinery or the fuel station, many benefits arise. Hamschmidt and Dyllick (2006) support that certification under ISO 14001 for a company has several positive effects including improved cost control with better management over waste and pollution, compliance with legislation, demonstration of commitment to the environment and reduction in costs for energy, insurance and waste disposal.

4. Potential problems

A first problem, inherent to the road fuel retail sector, is double marginalization (i.e. two companies operating at different vertical levels in the same supply chain apply their own markups in prices). Hastings (2004) state that Company-operated fuel stations, which are directly supplied from the refinery, do not possess this problem. This allows them to sell at lower prices than other competitors. Barron et al. (2008) confirmed that COCO stations’ prices were lower than other fuel stations operating under the same brand, which purchase their branded products through a jobber or fuel racks. Independent fuel stations buy from the wholesale market on the basis of cheapest price, so they can sell relatively cheap. The main problem in this case is that competition among the fuel stations becomes overly fierce in terms of pricing and usually independent fuel stations are the ones that face the hardest hit. Ultimately, the COCOs seem to have the power to influence the level of prices, regardless of the real demand and supply.

Large hypermarkets, operating in the fuel business, also tend to sell at low prices. They often use fuel as an adjunct to their core business in order to attract customers. Since their core business operates with higher gross margin, they can accept lower gross margin for fuel products. However, this often causes market instability.

Problems may also arise from contractual issues between the refiner and the retailer. Through these binding agreements fuel stations operation is controlled to a great extent by the oil company, so disagreements may arise. Tension can also be
created in terms of profits, since both parties try to keep as much as they can for themselves (see also Barron and Umbeck, 1984).

Various problems also arise from customers’ inconvenience, often derived from facilities of unsuitable location or size. Bainbridge (2000) refers to convenience as a vital force that drives the road fuel retail sector. Unsatisfied customers definitely search for alternatives, so the fuel stations experience damage to their reputation and declines in their profitability.

5. The case of EKO S.A.

EKO S.A. is an oil company having a significant market share in the Greek domestic market. In this section, EKO’s business model and strategy is examined, focusing on the company’s road fuel retail network.

From the start of its operation, along with several mergers and acquisitions, EKO followed the model of Dealer Owned Dealer Operated (DODO) and Company Owned Dealer Operated (CODO) fuel stations. In 2005 the company expanded its strategic commercial position, introducing Company Owned Management Operated (COMO) fuel stations.

During the recent years, it can be observed that the total number of fuel stations of the whole EKO’s network is continuously decreasing. It is mainly the number of CODOs that decreased dramatically, since many of them closed down during the recession, while others became COMOs. DODOs’ number also decreased, albeit in a slower rate, while the number of COMOs significantly increased. EKO makes a further internal classification of its fuel stations into four groups: (i) prime, (ii) core, (iii) secondary and (iv) tail. In every one of the four groups there are CODO, DODO and COMO stations allocated.

There are a number of reasons behind the above strategic decisions:

- The double marginalization problem. One of the principle reasons the COMOs increase more and more in numbers, is that through this model the company eliminates the “double margin” of price markups, since there are no intermediates.

- Better control of the market. In cases where price competition is evident, it is crucial for EKO to be able to respond instantaneously to changes and also maintain control of the local market. As a price setter at local level, EKO can prevent other CODOs and DODOs from driving the market down to very low prices and consequently low margins.

- Maintenance of dominant position and strengthening of the brand name. Since EKO fully controls COMOs, it can impose more stringent standards of quality. This practice leads to increased customer satisfaction, which in turn establishes good reputation for the company.

- The need to adjust to the recession. The past years that Greece is in recession, there is a significantly decreasing consumption of fuel. Responding to this challenge, EKO expanded the range of products that can be sold in COMO stations, by cooperating with other food and non-food chains; quick snacks,
beverages, instant coffee, lubricants, car accessories, books, kid toys, oil change and car wash usually have high profit margins, contributing significantly to the company's financial performance.

- Rationalization of the network. Due to the general economic instability in Greece, EKO is trying to rationalize its road fuel retail network in order to achieve economies of scale and increased productivity. The main reason behind the internal classification of prime, core, secondary and tail fuel stations is to focus on the most important fuel stations in terms of turnover rate and try to transfer best practices to the other fuel stations of the network.

Given its strategic decisions, EKO needs to address a number of important issues, as follows:

- Increased operational capital requirements. The development of COMOs is high-demanding. The company practically becomes a retailer offering fuels, food and non-food products, which increases the need for operational capital.

- Long-term commitment for fuel stations operation. In order for a fuel station to operate as a COMO, EKO needs to invest a lot more than CODOs and DODOs, mainly for buildings and mechanical equipment. Thus the company bears greater risk and becomes less flexible to move away from the business.

- Increased monitoring costs. Since EKO has to fully control COMOs, the need for monitoring the business is increased; more sophisticated technology needs to be used, daily data and statistics should be elaborated at the service points and more people need to be involved in the related processes.

EKO's strategy seems to be reasonable as compared to the global trends in the road fuel retail sector. In the 1990’s there was a worldwide trend towards dealer operated fuel stations. Nowadays this trend has changed towards company operated fuel stations and EKO seems to absorb this shift.

Similarities are also found as regards the introduction of non-fuel products in fuel stations. In several countries like Norway, Ireland and Germany, non-fuel sales contribute significantly to total revenues. In EKO’s COMO stations the contribution of non-fuel sales to total gross profit has reached the significant percentage of 13%.

On the other hand, differences can be found in trends like the growth of hypermarkets as fuel retailers. This is very common in countries like France and UK and, in a lesser extent, in Portugal and Spain. EKO and generally the Greek market do not seem to follow this trend. Differences may also be found in regulatory schemes under which EKO and similar companies operate in the EU compared to the US, mostly in terms of contracts’ duration limitations, government intervention, exclusive supply contracts between major refineries and fuel stations etc.

6. Discussion of strengths and areas for improvement for EKO S.A.

The mass media and the society in Greece are generally worried about criminal practices the fuel stations may adopt, like adulteration of fuel or stealing fuel pumps. Thus, customers have become more suspicious when visiting a fuel station, despite the fact that government inspectors make frequent inspections on site and impose huge fees when legal standards are violated. EKO, in an effort to eliminate...
customer's suspiciousness, introduced a program called “EKO Guarantee”, which imposes self-controls on fuel, from the refiner and storage facilities to fuel stations and customers. The program today contributes to the good reputation of EKO’s brand and differentiates the company from the competition. Furthermore, EKO reformed its diesel and unleaded products introducing a new series focusing on quality and savings in burning.

‘Mystery’ shopping technique is also used in all types of EKO fuel stations, in order to obtain feedback for service quality provided to customers. The results often lead to training programs, encouragement for improvement and sometimes special rewarding events are organized.

EKO has also introduced a system (i.e. “Euromat”) which enables full control of vehicle tank filling. This type of control can be obtained from both the company (centrally) and the owner of the vehicle (remotely). Such innovations further strengthen the position of EKO in competition.

As the COMO network expands, more sophisticated ERP systems are installed to the fuel stations. In addition to control benefits, EKO receives invaluable data in the form of comprehensive reports which serve as enablers to strategic decisions. Furthermore, due to new legislation, all fuel stations in Greece are obliged to have a verified digitalized electronic system of fuel inflows and outflows. EKO is already in partial compliance with this legislation, staying ahead from the competition.

Addressing the problems arising from the Greek economic recession, EKO gives great emphasis in saving costs, as a way to ensure sustainability. Continuous weekly and monthly internal meetings take place, setting targets of re-opening closed fuel stations, planning specific actions to prevent failure, producing savings in fixed and variable operational costs, optimizing distribution processes etc.

As far as suggestions for improvement are concerned, the most prominent thing that can be proposed to EKO pertains to facing the price competition. EKO, just like other dominant oil companies, focus more on brand loyalty, quality in fuels and customer satisfaction, while low pricing is not a first priority. Of course, most of the competition does not invest heavily on development and improving service quality, as EKO does. Thus, other fuel stations are able to offer their products cheaper. Nowadays, due to economic recession in Greece, most customers move towards the cheapest prices, which negatively impacts EKO’s turnover.

Thus, EKO is advised to set very competitive prices for some products in very specific time periods, in order to attract customers to try these products along with customer service and potentially turn them into repeaters. These products should be encountered and communicated by EKO in terms of low pricing and not only as a solution for economy in consumption.

Another suggestion concerns the internal price discrimination of EKO’s fuel stations. A commercial “unwritten rule” dictates that high volumes and better locations are entitled to higher discounts. Thus, fuel stations situated in big cities usually have lower prices than the ones operating in province locations. In this case, EKO is advised to give more emphasis on training programs especially designed for the
latter. In order to help them boost profitability, EKO should also encourage and support them to introduce non-fuel products and services to their fuel stations.

7. Conclusions

Retail fuel stations were the main focus of this paper. Some general observations that can be drawn from this study include the following.

Oil companies and retail fuel stations are trying to operate profitably by expanding the range of products and services they offer on site, including non-fuels (e.g. food, beverages, lubricants, car accessories, oil change, car wash etc.). There is an international trend towards developing convenient fuel stations that potentially induces repeated visits from the customers. EKO seems to follow this trend by increasing its COMO stations, in an effort to eliminate “double marginalization”, gain better control of the market and maintain its dominant position. EKO’s strategy also involves the rationalization of its road fuel retail network. Some issues that need to be addressed as regards the expansion of COMOs are the increased operational capital requirements, the need for long-term commitment for fuel stations operation and the increased monitoring costs.

A number of strengths and best practices were also identified in relation to EKO road fuel retail network. In order to address customer’s suspiciousness as regards adulteration of fuel or stealing fuel pumps, EKO introduced a program that ensures product quality by monitoring fuel all the way from the refiner to customers. The practice of ‘mystery shopping’ is also used in order to obtain feedback for service quality offered on site. Furthermore, as far as monitoring and controlling is concerned, modern technology is used, including sophisticated ERP systems that produce comprehensive reports. Alongside, frequent meetings take place addressing issues of sustainability, saving costs etc.

Areas for improvement in EKO’s fuel retail strategy include facing the price competition and addressing the internal price discrimination. Firstly, EKO was advised to set lower prices for specific time periods in order to attract customers and make them try the products and services, experience the difference in service quality as compared to low-cost fuel stations and eventually turn them into repeaters. EKO was also advised to initiate training programs especially designed for fuel stations with low volumes (usually in province areas) and to provide them with access to markets of non-fuel products, so as to boost their sales.

Further research could be undertaken to examine, through case studies or empirical research, the retail strategies of other oil companies operating worldwide, mainly for comparative reasons. A suggestion for directly extending the current study is to analyze EKO’s financial data in order to provide support for greater understanding of the company’s strategic decisions, including the expansion of the COMO network.

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A Review of Graffiti Impact for Real Estate Advisory Services: Local Government Case Study

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Abstract

In previous articles, the author outlined a number of cost engineering management; project financing and property management issues that could be further integrated into engineering and technological education and improve current practices. The property management is a very serious issue. The increased globalised competitions beyond European & national status and the need to meet continuously changing academics, customers, clients, designers, managers, contractors and local government requirements have forced the property and facilities management participants to consider the proposals for adaption of international practices. One of the property management issue in the Greek real estate market should focus on tackling Graffiti
vandalisms on properties in cities such as Athens, Piraeus, other and draw up property management tools for protecting public buildings and historical centers as added value factor. This paper reviews the Graffiti Impact for Real Estate Advisory Services in Greece and an emphasis is given for Local Government Services. Advisory proposal is outlined as legal issue for the protection of public real estate properties by Graffiti vandalisms. The proposal is to adapt fast track procedures to tackle the problem as it is generated at site and simultaneously the society should be more aware for building environment protection in historical city centers.

Key words: Building Environment, Graffiti Vandalism, Property Management, Real Estate Advisory Services, Added Value.

1. Introduction

In previous articles, A. R. N. Molson outlined a number of cost engineering management, project financing, facilities and property management issues that could be further integrated into (3a) engineering and technology education, (3b) civil engineering and construction industry and (3c) improve management practices. The integration of industry and engineering and technology education for sustainable development was based on a case study of the Greek Construction Industry and its Property Market [1, 2, 3, 4, 5 & 6].

Molson has stated that [1, 2, 3, 4, 5, 6]

The role of professional engineers, valuers and estimators in a less buoyant period of economic activity must be aligned to construction industry and property market needs, hence providing better services for citizens, financial institutions and investors. The professionals should be able to manage development projects, respect legislation, the building environment and engineering technology, as well as citizens’ affordability and investors’ contributions.

Molson affirms that (2006), [1, 2, 3, 4, 5]

Residential properties in urban areas, Athens and other areas in Greece should respect: the legislation, building environment and engineering technology, citizens’ affordability and contribute to the economic and social welfare of Greece.

Molson has said (2010), [1, 2, 3, 4, 5]

The Greek real estate Market produces expensive products with low returns and high maintenance costs in a long term period, discouraging investors and new buyers. Simultaneously, the housing credit system has faced a huge reduction in applications for housing mortgages.

Demands are being made by the Greek real estate market to produce low-cost, quality, affordable buildings with long-term useful file, as well by the Greek governmental bodies to increase property taxation.

Molson’s professional view is that [1, 2, 3, 4, 5]
The successful implementation of projects in both engineering and construction is vital, in order to maintain estimates within budgets and to achieve targets and milestones (scheduling) set up by Financial Institutions, investors and other public and private bodies. The impacts of overrun budgets and time schedules, of poor estimates and project control reports are always negative messages to the marketplace and the public. Industry must concentrate on practical improvements.

Molson’s cost engineering expert opinion is as follows [1, 2, 3, 4, 5]:

The increasingly global nature of capital investments in facilities and of finance for future development projects has seen a concomitant rise in the requirement for construction related experts, accurate international location factor(s) cost data and developing cost models / location cost factoring. By developing location factors using a factoring method for an activity or, a group of activities/tasks for the construction of a new designed approach multi-storeyed built building, professionals with international and regional cost estimating or quantity surveying experience could contribute to a better cost management system for construction financing, design, planning, budgetary control and monitoring of project developments or, property investments, and to the Higher Engineering and Technological Education Institutions’ initial preparation of students - graduates in the use of advanced numerical, statistical and forecasting techniques and further research, finally, to the industrial practitioners’ to test the validity of cost models and implement new building design proposals.

Molson’s professional and academic view is that,

The increased globalised competitions beyond European & National status and the need to meet continuously changing academics, customers, clients, designers, managers, contractors and local government requirements have forced the property and facilities management participants to consider the proposals for adaption of international practices.

The following Tables 1.0 & 2.0 illustrate the sampling of Graffiti Vandalisms in Athens City Center (2015).

Table 1.0, ‘Graffiti Vandalisms on Properties in Historical City Center in Athens’
Pic. 1. Central Post Office at Syntagma Square

Pics. 2, 3: Graffiti Vandalism Monastiraki Area.

Pics. 4, 5: Graffiti Vandalism Monastiraki Area, Traditional Vacant Buildings.

Pics. 6, 7: Graffiti Vandalism Thision Area.

Pics. 8, 9: Graffiti Vandalism on Commercial Properties.

Pic. 10: Graffiti Vandalism on Commercial Vacant Property (previous use as Luxurious Cava Shop), Down Other Assets in Thision Area.
Table 2.0, ‘Graffiti Vandalisms on Properties in Athens City’

Pic. 11: Removed Graffiti Vandalisms on Historical Greek Orthodox Church in Athens.

Pic. 12: Vacant or under sale buildings suffer more Graffiti attacks in the historical center of Athens City.

Pic. 13: Graffiti on the facade of a public building.

Pic. 14: It is no common to observe Graffiti on Bank’s Properties, resulting and unsecure residential zone.

Pics. 15, 16: Graffiti Vandalism is permanent damage on properties in Athens City residential or mixed in use areas e.g. Exarcheia, Neapoli, Lofos Strefi, Ampelokipoi, Patisia, Kypseli, Gyzi, Goudi, other.

Pics. 17, 18: External fencing of shops prevents vandalism on commercial properties. Below, The historical book shop of Kazantzaki has not escaped from Graffiti.
In the research methodology, after photographing the graffiti vandalism as sampling, the researcher copied the photos into a spreadsheet, one cell per photograph and then photos inserted in the subject documentation as Tables. Recognizing that the scope of each photograph was conducting a sample of Graffiti Vandalisms and analyzing each piece of graffiti was assigned one or more of the graffiti impacts on properties.

It is agreed that property management is a very serious issue. One of the property management issue in the Greek Real Estate Market (GREM) should focus on tackling Graffiti Vandalisms on properties in Cities such as Athens, Piraeus, other; The local Authorities or Real Estate Advisory Group Services should draw up property management tools for protecting public buildings and historical centers as added value factor in the revaluation process. This paper reviews the Graffiti impact for Real Estate Advisory Group Services in Greece and an emphasis is given for Local Government Services. The advisory proposal is outlined as legal property issue as factors for the protection of public real estate properties by Graffiti Vandalisms.

The subject proposal is to adapt fast track procedures to tackle the Graffiti Vandalism problem as it is generated at site and simultaneously, the society should be more aware for building environment protection in historical city centers, traditional buildings and subways – railway facilities and buildings.

It is observed and it is also agreed that, the Graffiti Vandalism is targeting subways and railways assets, the traditional buildings and the historical or commercial centers of towns and cities and then is expanding in neighborhoods and other residential areas. The Graffiti Vandalisms written in Greek, English, Arabic languages were recorded in the subject sampling.

2. Feed Forward Process in Vandalism on Real Estate Properties

Molson’s states that,

The main ‘Graffiti vandalism feed-forward process in Real Estate Advisory Group Services is shown in Fig. 1.0 and it represents the three elements as time, location and type of properties involved in the destruction of real estate properties profile.
The author has observed that the vandalism and graffiti on subways and railways are major contributors to their fleet maintenance activities and that the cost of repair due to the removal of Graffiti vandalism is considerable. The above statement was confirmed following several interviews with management and traffic control staff of Athens Piraeus Urban Rail Transport S.A. (which were taken place in the period Sept. 2014 - May 2015). Thus, the Graffiti Vandalism phenomenon travels from Piraeus Main Subways Station to Athens City Center; and it is agreed that the subways and railways play an important role in the process for tackling the Graffiti Vandalism problem.

2.1 Graffiti Vandalism Review & Survey In Greece (2015)

The term ‘Graffiti’ is generally used as an all-encompassing label for any illegal writing or drawing on buildings, trains, fences etc. There are various types of graffiti. The most prevalent is the practice of ‘tagging’ an identifying word, with spray paint or a wide felt tip pen, in a publicly visible place. Tagging is commonly described as being a derivative of the ‘hip hop graffiti culture’ originating in the USA in the 1970’s. Other types of graffiti include, political/social, humorous, racist, malicious and gang graffiti. An understanding of the differences among the types of graffiti is useful for understanding the practice of graffiti and developing and undertaking strategies to deal with it. The term ‘Graffiti’ is generally used as an all-encompassing label for any illegal writing or drawing on buildings, trains, fences etc. There are different forms of graffiti, the most prevalent being the practice of ‘tagging’ an identifying word with spray paint or a wide felt tip pen in a publicly visible place [7]. Graffiti is a well studied practice, as noted by Alonso: ‘...psychologists, sociologists, linguists, law enforcement, anthropologists and geographers have studied graffiti. It has been examined to understand adolescent personality, ancient cultures, sexual attitudes, artistic style, gender differences, behaviour, communication, female suppression and territoriality [8].

Graffiti, the unauthorized written, scratched, marked, sprayed, or affixed defacement of public or private property, is considered by some to be a social crime, an act of youthful vandalism, which needs to be erased because of the ISSN-1791-1133
feelings disgust/fear in engenders in the general populace (Cohen 1973; Craw et al., 2006; Grant 1996; Hasley and Yound 2006; Lachmann 1988) [9, 10, 11, 12, 13, 14].

The concept of graffiti is not an entirely recent phenomenon, with markings made on the surfaces of walls being traced as far back as 20,000 BC to Ancient Roman times. Graffiti’s current form, however, is generally acknowledged as finding its origins in Philadelphia and New York in the late 1960s. In 1973 the Razor Gallery in New York presented a show containing a number of graffiti writers: it was the first exhibition of its kind to showcase the works in a formal gallery setting. This positive representation was short lived however, as the subway system became increasingly saturated with graffiti during the New York fiscal crisis of the mid 1970s. Graffiti soon came to be associated with deviance and urban decay and local authorities began portraying graffiti writers as a danger to the proper functioning of civic life (Dickinson 2008; Iveson 2008) [17, 23, 24].

M. Taylor & I. Marias (2009) states that in recent years a move has been taken place (in Australia) to distance illegal graffiti from its legally sanctioned counterpart, urban art (e.g. murals, permission structures) through creating a conceptual distinction between ‘Graffiti as crime’ and ‘Graffiti as cultural expression’; (Alvi, et. al/2001; King and Setter, 2003) [15, 16, 17]. Thus, the author in this paper discusses the graffitists’ illegal actions, namely the vandalisms made by idiots, vandals, wayward youth, lazy youth, demonstrators, spray gangsters; other. M. Taylor & I. Marias (2009) [17] states that illegal art is denigrated as being visual pollution that causes property defacement / damage / destruction (Craw at al., 2006; King and Setter, 2003; Garner et al., 2006) [15, 16, 18].

Molson’s affirms that,

“Graffiti vandalism is not serving the local communities and businesses either do not contribute to social engagement – reintegration of broken societies”.

M. Taylor & I. Marias (2009) [17] states the costs of its removal is borne on taxpayers for instance, the cost to Western Australian State taxpayers is estimated to be around 25 million dollars per year; to Australian taxpayers federally over 300 million and to taxpayers internationally 6.8 billion dollars (Callinan 2002, Hasley and Young 2006, WALGA 2006) [19, 13, 20]. It is often internationally observed that public or professional library is asked to confirm or locate a relevant legal report, article, paper or document attributed to Government or Real Estate Investor, other body that says Graffiti vandalism lowers property values by e.g. -15 to -20 percent. Unfortunately this kind report does not exist in the Greek Real Estate Market, at least to the best of our knowledge as well as that of my literature review. It is agreed that an anti-vandalism campaign in the 1970s took place in the U.S.A. and later professional and academic studies discussed that Graffiti and Vandalism in the wider context of the economic impact of urban property crime:

“Households experience disutility from crime near their homes and as a result would be expected to reduce their bid prices for housing in areas where crime is more prevalent. This theoretical prediction is largely borne out in the existing literature on crime and property values, although the degree to which higher crime affects property values is a matter of debate. Much of the difference in estimates likely depends on estimation techniques, the measurement of crime as well as property
values, and the size of the sample studied” (see, http://sbber.memphis.edu/publications/perspectives.html, Crime and Property Values, Business Perspectives, Summer 2007).

“Our results indicate that the average impacts of crime rates on house prices are misleading. We find that crime is capitalized at different rates for poor, middle class and wealthy neighborhoods and that violent crime imparts the greatest cost”. (see http://link.springer.com/article/, Crime & residential choice: a neighborhood level analysis of the impact of crime on housing prices, Journal of Quantitative Criminology, Dec 2006.

Garner et al. (2006) [18] maintain that graffiti tagging is a reflection of the society in which graffiti artists live and it sounds very logical and similar conditions of what is the current situation in Greece. It is agreed that the Vandalism Graffiti is made by youth graffiti artists to all directions and all place including public places thus there is no factor such as to paint boring in view public places. Dickinson 2008; Iveson 2008, have stated that there remains a common perception in Australia that graffiti is a social problem and a threat to the normality of civic life.

M. Taylor & Ida Marias (2009) [17] concluded that the commissioning of urban art murals (socially constructed artefacts) are not a general panacea for solving the graffiti proliferation problem.

The way in which graffiti has developed in each city has had a direct relationship to the built form of that particular place in terms of the architectural, cultural and design history (Manco 2002) [21].

It is agreed that Graffiti as Vandalism is illegal in most cases and reflects the social and economic problems in Athens and Piraeus regions following the last seven years economical destruction of Greece. It is widely agreed that the removal programs and actions are costly activities for owners, public authorities or property management services, especially in this period of time when most firms try to survive from economic recession and financial collapse.

It is widely agreed that a local Authority e.g. Borough Council / City could prohibits graffiti vandalism on public place as location or property as permanent heavy of light structure. The legal department of the authority could draw up the relevant codes and norms e.g. the bylaw facilitates public authority staff to enter a private or public authority property with façade on road and remove graffiti at the expense of the property owner if the property owner fails to remove graffiti in response to a formal notification from the Borough Council Notice (by letter, e-mail. FAX, telephone conference call, etc.).

It is widely known in Greece that the illegal Graffiti is crime when the subject case fulfill the requirements of articles Nr. 382, 2nd paragraph and Nr. 383, 4th paragraph of civil codes and a prosecution report has been submitted to local Attorney of Athens or Piraeus (as Case study).

According to the Hellenic Constitution and in particular the article Nr. 102, the Government had allowed to the local Authorities to undertake actions for example, in the case of Graffiti Vandalism. According to the laws Nr. 3463/2006 and in particular the article 75, paragraph 1, cases (Β.4) & (Ο.6) & Nr. 3852/2010, article 75, paragraph 6, the local Authorities are responsible (Financial Committee) for the cleaning of public places and also for the protection of museums, historical monuments, archaeological sites, caves, historical sites, other, including all properties and facilities, thus the proposal fast truck response to Graffiti Vandalism is within the context of local Authorities’ responsibilities ( www.et.gr ).

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In addition, according to the article 178 of Nr. 3463/2006, the local Authorities should protect, manage and maintain their properties at high standards of quality, costs and returns. The public Real Estate properties are also protected by property protection laws as applied. The author has carried out a research survey to the Central Government Bodies in Greece (in the period 2014-2015), a structure questionnaire was submitted in 2015 and the outcomes revealed that there is a gap in fast truck response for tackling the Graffiti Vandalism within 24hrs in major Cities e.g. Athens and Piraeus. The survey also identified areas for further legal studies and projects development in the Real Estate Advisory Group Services with an emphasis given on public sector for positive tackling of Graffiti Vandalisms and its associated hazards and risks for vandals. The subject factors have been identified and further discussion is needed, in order to tackle down the Vandalisms as illegal actions made on private or public properties. The listed factors are shown below:

- Additional financial support to the local Authorities for special tool kits and equipment, for property & facilities management services and to provide a technical support Helpline.
- Anti-Graffiti Campaigns, Seminars, Workshops and Programmes.
- Legalize Graffiti as Art and request demands only for the cost of cleaning or removal.
- Fast Truck Response within 24hrs.
- Hotline facilities for reporting crimes, such as Graffiti Vandalisms on public or private properties.
- Legalized a fast truck response mobile unit.
- Set up basic criteria for cleaning or removing illegal Graffiti and maintain Graffiti Art as legal in the Decision Making Process (DMP). Evaluate the basic criteria such as building environment, art work environmental value, economic value, aesthetic value (reduction in taxpayers losses as it is a costly long term problem), innovative graffiti designs, other.
- Tackling policies for illegal Graffiti Vandalisms.
- The co-operation of all Governmental Bodies involved in the Decision Making Process.
- To incorporate the terms of legal Graffiti and Vandalism Graffiti in the Greek legislation in order to comply with the proposal basic criteria.
- Update Rental Agreements / Lease Agreements in public sector (e.g. lack of code for clearing Graffiti from public places, buildings and structures).

Molson affirms that, [22] The importance of laws in a legal sense is greater when clients commit more funds to new construction projects that should be kept within the budget constraints and design, respect legislation and simultaneously decrease financial risks. The user’s problem is that of handling and controlling legal information; and the usage of knowledge management systems in the subject.

2.2 Proposal Fast Truck Actions Tackling Graffiti Vandalisms On Properties

Molson states below,
The sample of Real Estate Advisory Group Proposal Fast Track Actions to the public or private owners of real estate properties in urban environment. It is agreed that the application of actions in practice should prevent or respond to a Graffiti Vandalism with an emphasis given to the local Authorities. The sample of proposal actions are shown in Table 3.0.

**Table 3.0 ‘Proposal Fast Track Actions To Tackle Graffiti Vandalism’**

<table>
<thead>
<tr>
<th>Development of A Strategy for Actions Protecting Real Estate Properties From Graffiti Vandalism</th>
<th>Public Sector Administrative Advice &amp; Leaflets</th>
<th>Technical Actions &amp; Leaflet For local Authorities</th>
<th>Property &amp; Facilities Management Strategy For Owners</th>
</tr>
</thead>
<tbody>
<tr>
<td>Call Emergency Anti-Graffiti Vandalism Unit in order to inspect the site and starts works.</td>
<td>Plant shrubs and bushes in front of walls e.g. for public or local authority buildings.</td>
<td>Fast Track Estimates for all types of properties damaged &amp; set up tenders when it is required.</td>
<td>Apply film to glass surfaces (e.g. windows, facades) to help protect them from harm and Graffiti vandalism.</td>
</tr>
<tr>
<td>Cover Graffiti Vandalism within 24 hours.</td>
<td>Feed Forward Process until the problem stops.</td>
<td>Motion lights with alarm Combination of motion lights and mobile CCTV systems / BIM</td>
<td>New technologies for anti-graffiti protection from vandalisms into glass with acid or sharp objects.</td>
</tr>
<tr>
<td>Free or discounted paint of one colour from local suppliers or Technical Services od local Authority.</td>
<td>More lighting around the property especially in secluded areas or public places.</td>
<td>When lights get activated, the central police monitoring department to record all actions around the public property.</td>
<td>Aply Web based system, using online service request system for inspection, tools kit, free one colour, etc. Report on Hotline could be made by phone e.g. 2222.</td>
</tr>
<tr>
<td>keep some painting colours in storage.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Use dark pain a dark background makes it less likely the graffiti will stand out.</td>
<td>Attorney Advice Helpline (free of charge).</td>
<td>Award First Prize to local Authorities initiatives and fast truck response.</td>
<td>Rough surfaces or chain-link and lattice fencing are also more difficult to paint on.</td>
</tr>
<tr>
<td>Create database with wall colours of public buildings.</td>
<td>Lawyer Advice &amp; Contract manager for small works.</td>
<td>Operate telephone help line for information about Anti-Graffiti Vandalism Campaigns / Projects.</td>
<td>Set up obstacles to prevent vandalisms.</td>
</tr>
<tr>
<td></td>
<td>Law enforcement Support Individual or Community.</td>
<td>Operate Graffiti Holine to report vandalism at regional or national level for local Authorities.</td>
<td>Plant shrubs and bushes in front of walls or fences to make them less accessible.</td>
</tr>
<tr>
<td>Select the right type of fence.</td>
<td>A small tax has to be added on postal stamps or on cell phones operators in order to support Anti-Graffiti Campaigns.</td>
<td>Encourage Anti-Graffiti Campaigns using local Media including newspapers, legal signs, other.</td>
<td>Paint subways and railways firms’ assets such as wagons, trains, fences, walls, buildings, etc. with anti-graffiti colors as protection.</td>
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<td>---------------------------------</td>
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</tr>
<tr>
<td>Marketing Strategy that Graffiti has artistic value when it is not vandalism.</td>
<td>Professional Associations &amp; Institutions should ask, Athens’s &amp; Piraeus city council members or a large local hardware store for free or discounted paint and any resources they might have to assist owners for fast track response.</td>
<td>The motorized Fast Truck Response unit with tool kits.</td>
<td>Protective external wall coatings to all new buildings with value above 500.000 Euros</td>
</tr>
<tr>
<td>Mobile CCTV cameras / monitoring control centers at public buildings. Development of fast truck in implementation of Graffiti management strategies and policies for local Authorities.</td>
<td>The legalization of Graffiti depends on Commercial added value could offer in the damaged area. Proceed the naming and shaming of adult offenders 7 vandals to local Media by Police. Banning the sale of spray-cans and markers with a tip width greater than 6mm to minors. Restriction of the sale of spray paint based on age.</td>
<td>Develop blog for advising owners and users e.g. the blog of The Texas Association of REALTORS.</td>
<td>The creation of unique and vibrant public spaces for illegal Graffiti or rental of public walls for graffiti for members of artistic associations, institutions, other. Eplanatory workshops to address the issue of high risks for accidents of Graffiti Vandalism on railways and subways, vehicles, etc. Promote art mural schemes, group and associations as a way to control members’ activities and change culture.</td>
</tr>
<tr>
<td>Investigate possible revitalisation of neglected public or private spaces.</td>
<td>Security staff and video surveillance on trains and platforms, buildings entrances and walls with publicity visible views. Support &amp; Integrate all designing out-crime schemes in the built environment from Unis to Institutions.</td>
<td>Offering awards in cash to passengers of public transports or local inhabitants providing information about Graffiti Vandals on Public Buildings or other properties with value above 500,000 Euro.</td>
<td>Award with cash the shopkeepers who refuse to sell material such as spray paint to people they suspect may engage in graffiti vandalism.</td>
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<td>Award with cash the shopkeepers who refuse to sell material such as spray paint to people they suspect may engage in graffiti vandalism.</td>
</tr>
</tbody>
</table>

Molson states that,

The impact of Graffiti Vandalism on Real Estate Property Management are a serious property & facilities management issues for local Authorities.

Molson affirms that:

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40
One of the property management issue in the Greek Real Estate Market (GREM) should focus on tackling Graffiti vandalisms on properties in Cities for example in Athens, Piraeus & other Cities and Towns.

The author also argues that,

The Real Estate Advisory Group Services for Local Government Services / Authorities / Municipalities / Borough Councils / Housing Estates and other governmental bodies should draw up fast truck property management tools for protecting public buildings, public places and historical Cities centers as an added value factor in the REV (Real Estate Valuation) process.

It is agreed that the Greek Government Bodies consider as an important factor in the Decision Making Processes, (a) the total cost for cleaning or removing Graffiti Vandalisms on thousands of residential and commercial properties e.g. in Athens and Piraeus Districts; and also (b) the luck of available funds especially of the private ownerships. It was observed in the period 2014-2015 that, Graffiti Vandalisms were written on various surfaces, including all types of walls, lighting columns, fences, telephone booths, public transports, bus stops, subways, railways, street furniture, bus shelters, traffic lights, pavements, vehicles, bikes, public conveniences, conveniences in hospitality venues, light or heavy structures and buildings, tunnels and windows/doors. The author has shown the vandals to operate as small groups of two or three members or as largest groups, writing in a publicly visible place especially in darkly hours, but sometimes they acted during the light, targeting canteens, abandoned traditional buildings and building sites. The identified impacts of Graffiti Vandalism on properties in this research survey are presented in Table 4.0.

**Table 4.0 ‘Impact of Graffiti Vandalism On Real Estate’**

<table>
<thead>
<tr>
<th>Graffiti Vandalisms as Factors / Impacts on Real Estate Properties &amp; Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>Understanding the impact of Graffiti Vandalism on Real Estate Properties in Athens &amp; Piraeus Districts in Greece</td>
</tr>
<tr>
<td>Less Positive View of the neighborhood</td>
</tr>
<tr>
<td>Graffiti does not help boost property values</td>
</tr>
<tr>
<td>Graffiti Vandalism cover all areas in a period of Economic recession.</td>
</tr>
<tr>
<td>Graffiti Vandalism damages private or public property.</td>
</tr>
</tbody>
</table>
Graffiti is a crime that costs the community hundreds of thousands of dollars or Euro each year in painting and removal costs or reduction of property values.

Money allocated to Graffiti Vandalism clean up is no longer available to other valuable community initiatives and programs.

Graffiti requires valuable resources for cleaning and restoration of public places, historical or traditional buildings.

Graffiti Vandalism is not punished with Community Service in order to remove Graffiti on properties.

Graffiti Vandalism negatively impacts on Athens and Piraeus Cities image. It simultaneously put off the investments from traditional commercial and office areas.

The poor Community consultation of tackling and preventing Graffiti Vandalisms.

Luck of control of spray possession on public places.

Graffiti as Artistic creations could boost property value of neither buildings nor the vacant land plots.

Graffiti Vandalism is a social problem and it is not provoked by Real Estate Agents or Owners to manipulate the values. It is a widely spread damage and cover hundreds of Hectares.

The luck of Graffiti Clean-Up Community Service Orders Scheme at Local Authorities to response within 24hrs.;

Vandalism Graffiti has negative impact on Real Estate Appraisals.

Graffiti on walls or fences may help the Real Esatet Agent to promote the location, but it reduces the value of property in the negotiation process.

Graffiti Vandalisms as large scale damaging projects negatively impact on investment potential.

The Graffiti Vandalisms have an negative impact decreasing the return on residential real estates in a long term period. Thus it is very important the property manager to understand the fast truck procedure on cleaning Graffiti within 24 hours.

Graffiti is not less positive reaction of social activity and represents a long term damage on building (as Architectural point of view).

The author argues that the large scale of damaged made by Graffiti Vandalisms is beyond the visibility of local inhabitants and it seems that it is a common attraction for visitors and tourists or distraction of propertied for public state or private owners in Athens and Piraeus districts. The public buildings and places, archeological and historical sites should be protecting by security guards in order to prevent Graffiti Vandalims and the incorporation of the facilities such as mobile CCTV systems, infrared cameras and mechanized removal units is vital.

3. Conclusion

It was observed that most of Graffiti Vandalisms in Athens and Piraeus Districts are related to the forms of Political / Social, Advertising & Malicious and other types of forms such as Racist and Gangs are not very popular. It was observed that the vandals applied more than five colours (black, white, green, red, blue, yellow, orange, other) in effort the surfaces to talk.

Callinan R., 2002 [7], has stated that it is well accepted that an effective way to frustrate graffiti writers, and reduce graffiti, is to remove it as quickly as possible and to keep removing it when it reappears – this is referred to Rapid removal is successful because it undermines the prime motivation of graffiti writers, which is to display their work for themselves and other writers to observe. In this paper, the
author promotes the proposal for rapid response within 24hrs from reporting time by mechanised mobile units like special forces for anti-graffiti vandalisms actions. The specification of the strategy should also incorporates security forces / special force response unit in order to stop the strongest graffiti groups to repeat they crimes at the same location.

It is agreed that Graffiti in most public places is generally removed by the local Authorities after a tendering process selecting the contractors to clean, remove or restore the damage made by Graffiti Vandalisms. There is a need to speed of maintenance small works by the technical services of local Municipalities. It is very seldom to identify private property owners to act rapidly for removal of Graffiti Vandalisms. It usually takes weeks or months in order the property owners to react and speed up the works of removal for Graffiti Vandalisms; Many owners are complaining for the cost of materials and equipment used; The local Authorities should be adapted with the current technological advances and their Technical and Property management services should to be supplied with best equipment (e.g. Graffiti Blasters, advanced CCTV equipment, etc.), protective coatings for surfaces and most effective removal / cleaning products. The proposal Real Estate Advisory Group Services could comprises members of the local Authorities or of a private independent firm (see CIOB, RICS, ABEng, other) with speciality in Real Estate Property & Facilities Management that could provide advisory services to the local Authorities and evaluate the Anti-Graffiti Vandalism initiatives and strategies; It is agreed that the local Authority is responsible for monitoring the works of removal for Graffiti Vandalisms on surfaces by contractors or technical services. The proposal in this paper is to adapt fast track procedures to tackle the problem as it is generated at site within 24hrs and simultaneously the Greek society should be more aware for building environment protection in historical city centers.

References


[8] A. Alonso, Urban Graffiti on the City Landscape, paper presented at the Western Geography Graduate Conference, San Diego State University, 14/2/98, p 1. For other literature on the subject of graffiti see the reading list in NSW Graffiti Solutions Handbook for Local Government, Planners, Designers and Developers, New South Wales Premier's Department, pp 105-109, 2000.


APPENDIX I

Analysis

Quantitative Analysis

The following table shows the results for each category of observed graffiti in sampling, as percent:

- Social (60%)
- Politics (20%)
- Schooling Communication (6%)
- Religion (4%)
- Racist (4%)
- Other (4%)
- Gangs (2%)

A number of categories did not perform well in this sampling and the main categories are Social and Politics, thus there is an on-going Graffiti crime with drivers the current politics and social affairs.
Renewable energy consumption, carbon dioxide emissions and economic growth: Evidence from Europe and Greece

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Abstract

This paper aims at examining the relationship between energy consumption deriving from renewable energy sources, carbon dioxide emissions and economic growth expressed as GDP per capita. Data comes from the International Energy Agency (IEA) and BP Statistical Review of World Energy Consumption. The used dataset involves European countries including Greece. The analysis is based on descriptive statistics and hypothesis test and reveals that all variables are related, suggesting the importance of renewable energy in promoting economic growth. The following is consistent with other papers reviewed in this study.

Keywords: renewable energy sources (RES), energy consumption, carbon emissions

1. Introduction

During the last decades, increasing environmental pollution, constant increase in energy prices and consumption with a simultaneously demand for a healthy human environment are the main reasons for scientific research and technology to focus on energy preservation and renewable energy sources. Climate change due to increase in atmospheric CO\textsubscript{2} concentration is considered to be a major environmental, social and economic threat \cite{1, 2}. In Brundtland Report during World Commission on Environment and Development, the need to weigh the obligations to future generations to the needs of present generations, called sustainable development was highlighted for the first time. The need for a safe, environmentally sound, and economically viable energy pathway that will sustain human progress into the distant was recognized which will come from efficient energy use and the development of renewables \cite{3}. Moving towards sustainability, the EU set a target of increasing the share of renewable energy sources (RES) up to 20% of total energy consumption by the year 2020, while Greece has committed to achieve renewables penetration of 18% on total energy consumption \cite{4}. Greece
reflected in its national targets for achieving sustainable development in the National Strategy for Sustainable Development [5].

2. Literature Review

The following chapter includes articles examining the relation between renewable energy consumption and economic development. This chapter is divided into different sections with respect to geographic coverage with a separate subsection for Greece.

2.1 Global level

There is an abundance of studies about renewable energy sources on a global level. In a comprehensive study, a methodology called responsible investment composite index (RERII) was used for data including over 50 countries. It was shown that the index is country dependent and can be used to identify a country’s comparative advantages and disadvantages [6]. In another survey, the determinants of renewable energy consumption are approached by using panel data for 64 countries over the period 1990-2011. The article’s main findings over this period reveal: the impact of environmental degradation is statistically significant in all panels; oil prices have a small and negative impact on renewable energy consumption; changes in per capita GDP significantly affect renewable energy consumption only in high- and low-income countries and changes in trade have a statistically significant effect on renewable energy consumption for all the panels with the exception of the high-income panel [7]. Furthermore, in another interesting paper about the bi-directional long-run relationship between renewable energy consumption and GDP growth, the results revealed that the relationship between the variables becomes more significant in higher income countries. Renewable energy consumption was found to have an important role in promoting GDP growth for most of the investigated countries. In addition, it is noted that renewable energy is important, because it increases energy security of a country [8]. Another survey uses panel techniques to examine the causal relationship between output, renewable and non-renewable energy consumption and international trade for a sample of 69 countries during the period 1980-2010. It is suggested that economic growth cannot be achieved without expanding international economic exchanges. Even though there is no short-run causality between output and renewable energy consumption, there is long-run bidirectional causality between output and renewable energy consumption [9]. Moreover, in a recent paper about the need of renewable to be cleaner, results reveal that the variation in the supported hypotheses is due to a number of characteristics including the development level of the country on which a study was conducted [10]. In addition, it would be necessary to examine the issue of renewable energy consumption and income in emerging economies globally. In a recent article, about renewable energy consumption and income for a panel of emerging economies results show that increases in real per capita income have a positive and impact on per capita renewable energy consumption. The paper concludes that relatively small increases in per capita income are likely to lead to large increases in renewable per capita energy consumption so across time, renewable energy consumption per capita in emerging economies is expected to grow faster than real per capita income as economic development takes place [11]. Also, an interesting paper about renewable and non-renewable energy consumption ISSN-1791-1133
and economic growth relationship including G7 countries indicates co integration relationship among variables in consideration [12]. Several paper study the relationship between renewable energy consumption, CO2 emissions and economic growth in the case of OECD countries. Issues such as non-renewable and renewable energy consumption and CO2 emissions, renewable and non-renewable energy consumption and economic activities, renewable energy consumption and economic growth, public policy influence on renewable energy investments and urbanization and renewable and non-renewable energy consumption in OECD countries are studied [13,14,15,16].

2.2 Country level

The relation between renewable energy consumption and economical growth in specific countries is the main topic of several papers. In a paper about Pakistan, the results reveal that renewable energy consumption, capital and labour boost economic growth. Also, the analysis shows the feedback effect between economic growth and renewable energy consumption [17]. In another paper about China, sample shows that high correlation exits between economic welfare variables and renewable energy. Although it was found that increase in per capita annual income of rural and urban households is not closely related with the share of renewable energy [18]. A recent survey about energy consumption and economic growth in the USA notes that only one causal relationship was found from biomass-waste-derived energy consumption to real GDP. No causal relationship was found between real GDP and all of the other renewable energy types. Researchers’ findings indicate that there is a causal relationship from waste-derived energy to real GDP. For policy purpose, the results of this study suggest that countries should concentrate on energy producing from waste as an alternative energy resource [19].

In addition, as far as BRICS (Brazil, Russia, India, China and South America) countries are concerned, it was found that renewable energy consumption has a positive effect on economic growth and vice versa. This effect is particularly significant in Brazil compared to other countries [20]. On the contrary, in a review about the relationship between renewable energy consumption and economic growth nexus in Turkey test results show that renewable energy consumption has a negative impact on economic growth [21].

2.3 Europe

In an interesting study about fossil & renewable energy consumption, greenhouse gases and economic growth with evidence from a panel of EU countries, the main finding was the existence of a U shaped relationship between GHG emissions and real GDP in EU countries, meaning that economic development itself cannot lead to the reduction of emissions [22]. In addition, several papers try to estimate the European energy mix for 2030 and the role of renewable energy sources. As a result, a proposed model considers the following to be preferential technologies, and employs them in the maximum shares allowed: wind (on-shore and off-shore) energy, hydro (small and large) energy and nuclear energy. The results for 2020 confirm failure to meet the emissions reduction targets. In order to reach them, it is necessary to increase the maximum share of zero-emissions technologies by 1–2%, except for the case of solar PV. For 2030, RES technologies appear to be the key in order to reach emissions reduction targets, with a weight of between 34.5%
and 43%. It should be highlighted that on-shore wind energy is the RES technology with the greatest weight, accounting for 20.28%. On the contrary, biomass and solar photovoltaic energies would be unnecessary in order to reach efficiency in terms of minimum costs. Finally, it is concluded that an efficient, safe and environment-friendly energy future in the EU seems to be closely tied to RES [23, 24].

In the case of emerging European countries, an analysis about energy consumption and GDP concludes:

(1) Time series become stationary after the first difference with few exceptions (Hungary for oil consumption, and Poland for renewable consumption).

(2) Existence of long-run relationship (cointegration) between energy consumption and GDP per capita.

(3) Valid short-run unidirectional relationships, for Hungary (conservation hypothesis for renewable consumption), Poland (conservation hypothesis for gas consumption, and growth hypothesis for coal and total energy), Turkey (conservation hypothesis for coal consumption), Romania (growth hypothesis for coal consumption).

(4) Extended valid short-run unidirectional relationships, on the 10% significance level for Hungary (conservation hypothesis for gas consumption, and feedback hypothesis for total consumption), Romania (growth hypothesis for total energy, gas and oil consumption), and Bulgaria (feedback hypothesis for renewable energy consumption) [25].

2.4 Greece

As far as Greece's evidence about renewable energy consumption, CO2 emissions and economic growth, relevant literature is reviewed.

To begin with, it would be extremely useful to investigate the findings which come up from a survey about development of renewable energy resources in Greece. The National Renewable Energy Plan, adopted by the government in 1988, set some ambitious targets for the development of renewable energy resources in Greece. A review of the state of development of these resources indicates that the plan's objectives for the year 2000 were not met. The slow pace of development is attributed to a number of financial, regulatory, structural and attitudinal constraints. The nature and severity of these constraints are analysed, and a comprehensive strategy designed to overcome them is proposed. At the core of these problems, there are two obstacles: the lack of political commitment and the resistance of some institutions that appear to feel threatened by the development of renewable energy sources. The question that remains is whether public demand is strong enough to force the government to decisive and effective action [26].

In a comprehensive review about the role of renewable energy sources within the framework of the Kyoto Protocol for the case of Greece, it is mentioned that planned interventions should not be limited to the electricity generation sector, but must also cover all energy demand and supply sectors [27].

In a study examining the overview of challenges, prospects, environmental impacts and policies for renewable energy and sustainable development in Greece, the ISSN-1791-1133
current status of the electrical energy market was presented, energy legislation, green house gas emissions, energy consumption trends and future prospects of sustainable development in Greece. The study described current issues relevant to the renewable energy sources (RES) such as the climatic factors that affect the penetration of RES into the Greek energy mix, the current regulation status, the barriers and evaluation of their contribution in the energy balance. Renewable Energy (RE) potential in Greece is very high especially in the cases of solar and wind resources. It should be mentioned that the Aegean Sea region is very rich in RES. Islands with high potential energy savings in the residential sector are Lesbos, Lemnos, Samothrace, Chios, Andros, Patmos, Kea, Kimolos and few others, while at the same time, Rhodes, Naxos, Amorgos, Syros, Ios and Kythnos are islands that present lower potential [28].

Biomass and especially fuelwood is one of the main fuels for heating in many countries. A survey on fuel wood public attitude revealed that there is a pro-environmental attitude among the citizens. They seem to be concerned about issues of environmental protection and the importance of sustainable development [29]. As the price of fuelwood is relative low, comparing to oil or gas, demand for fuelwood rises over the years. During questionnaire surveys conducted in Northern Greece (Grevena and Kozani prefectures), concerning residential consumption of fuelwood, the average fuel wood consumption for households consuming fuel wood was estimated to be 11.5 tons, with heating purpose as the main fuelwood use. The respondents stated that they prefer fuel wood because it is less expensive than oil. The supply of households with sufficient fuel-wood quantities in low prices could be achieved through reforestation and the establishment of forest plantations on agricultural land [30, 31]. In another study, it is emphasized that economic crisis has turned consumers preference in Greece towards fuelwood. Towards that preference turn, scenarios concerning fuelwood demand and cost are examined. The paper concludes that a possible extreme fuelwood demand can lead to a stronger raise in expected cost than a conservative increase in demand [32]. The problem of optimizing increased fuel wood transportation costs is addressed in a recent publication. The optimal design of a supply chain network aims to reduce the overall cost and thus it is able to provide multiple benefits to both companies and customers [33]. During a comparative work concerning the investigation of wood fuels involvement in green energy supply schemes at northern Greece and the case of Thrace, it is clear that the wood fuels' exploitation in Greece enhances energy and monetary autonomy, improves the sustainable management of forestry species, and fosters the production and delivery of indigenous high quality energy for heating and cooking, while minimizing operational, maintenance and transportation costs [33, 34, 35, 36, 37].

Concerning photovoltaic systems, weather conditions in Greece make the country suitable for solar technologies. The first PV systems were connected to the mainland power grid in May 2007 and up to June 2012 more than 820 MWp had been installed, covering 55% of the 2014 national PV target capacity of 1500 MWp. Taking into account the accelerated construction rate, which was 26 MWp/month during 2011 and 49 MWp/month during 2012, as well as the fact that 33% of the total PV contracted capacity is already installed, it becomes obvious that the 2014 PV target capacity is highly feasible despite the economic crisis the country is
facing. The only potential threat in PV penetration enlargement may be technical problems such as the delay of transmission grid expansion [38]. In a study concerning photovoltaic developments and the will of citizens to invest, it was found via cluster analysis that two clusters exist with the second cluster (61% of cases) to be more willing to invest in photovoltaic, mainly for residential applications. The investors profile is at the mid-level income, either private or public employees, and approximately half are university or technical school graduates [39].

Moreover, it would be useful to study the issue of renewable energy applications in Greece and what is the public’s attitude. A survey was conducted, during the period between December and March 2009–2010, based on a representative sample of local habitants in the wide area of central Peloponnnesus. The conclusions drawn from this survey suggest high levels of awareness concerning general knowledge questions by percents that reached almost 95% in all cases examined. Furthermore, most of the respondents (approx. 72%) were aware of the potential benefits of RES to the environment and recognized this type of electricity generation as being important for climate change mitigation. Concerning the existing and future installations in the region, respondents appeared highly supportive towards RES-based projects [40]. Concerning public opinion towards renewables and especially wind energy, a survey conducted to Andros Island where a wind park is in operation since 1992, revealed that the people of Andros consider renewable investments as an acceptable solution regarding energy efficiency that may also contribute to the creation of new working positions. They also believe that the RES installation must be focused towards environmental protection [41].

3. Analysis

We are interested in comparing renewable energy consumption coming from wind energy, solar energy and biomass (excluding hydro electricity and nuclear energy), in conjunction to economic development.

In this survey we used data for 27 European countries for the year 2012 coming from the BP database and the IEA database. We also included data for Russia. For the specific dataset, the mean energy supply per capita for the year 2012 was 3.4 tons of oil equivalent (TOE). Variables used in the analysis include GDP per capita and renewable energy consumption per capita. It must be noted that the used data from for renewable energy from the BP’s database, only includes wind energy, solar energy and biomass. Thus hydro electricity is purposely not included in the renewable energy calculations we performed.

By using the method of two step cluster analysis, two clusters were identified from the initial countries sample. In the first cluster which consists 55.6% of the sample, high GDP per capita countries with high consumption of renewable energy as well were classified while on the second cluster which consists 44.4% of the sample, countries with low GDP per capita and low consumption of renewable energy sources were classified. Clusters can be seen in figure 1 and table 1.
Figure 1: Countries Clusters according to GDP/cap and Renewable energy consumption/cap

Cluster Distribution

<table>
<thead>
<tr>
<th>Cluster</th>
<th>Number of countries</th>
<th>% of Combined</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>15</td>
<td>55.6%</td>
</tr>
<tr>
<td>2</td>
<td>12</td>
<td>44.4%</td>
</tr>
<tr>
<td>Combined</td>
<td>27</td>
<td>100.0%</td>
</tr>
</tbody>
</table>

Table 1: Countries Clusters according to GDP/cap and Renewable energy consumption/cap

As we can see in table 2, the average GDP/cap for countries belonging in cluster 1 is 39040 USD per person while the second cluster has an average GDP/cap of 18,675 USD. Concerning the consumption of renewable energy sources the first cluster consumes 0.254 tons of oil equivalent (TOE) from renewable energy sources while the second cluster consumes 0.04 TOE. It is remarkable countries of the first cluster have a considerable deviation while the countries in the second cluster appear to be more concentrated around their mean.

<table>
<thead>
<tr>
<th></th>
<th>GDP_POP (in thousand USD)</th>
<th>RENEW/POP (in TOE)</th>
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<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>Std. Deviation</td>
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<table>
<thead>
<tr>
<th>Cluster</th>
<th>GDP per cap (in thousand USD)</th>
<th>Renewable energy per cap (in tons)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>39.04</td>
<td>7.43</td>
</tr>
<tr>
<td>2</td>
<td>18.67</td>
<td>5.76</td>
</tr>
</tbody>
</table>

Table 1: Clusters according to GDP per cap (in thousand USD) and Renewable energy per cap (in tons)

Turning our attention to carbon dioxide emissions (CO2), in figure 2, we notice that the first group of countries with high consumption of renewable energy sources such as Germany pollutes the environment more than some other countries in the second group with a lower consumption of renewable energy sources such as Bulgaria. This is in accordance with the positive energy consumption thus carbon emissions relation to economic development.

In figure 3, European countries are depicted according to renewable energy consumption, (in percent of total energy consumption) and economic development (GDP /cap). The positive relation between gdp/cap and renewable energy use is obvious in this graph. Countries with higher gdp/cap tend to rely more on renewables in the form of solar and wind energy. Renewable energy consumption considered in this article only includes wind energy and solar energy. Data for hydro electricity and nuclear energy are purposely not included in our calculations as we seek to identify the penetration of wind, solar energy and biomass as these types are more accessible to private investors.
4. Conclusions

By using data covering 27 European countries for the year 2012, this work investigates the relation between GDP, renewable consumption and CO2 emissions. By using cluster analysis we indicate that there is a relation between GDP, per capita and renewable energy consumption. Particularly, we investigated the correlation between renewable energy consumption in the form of wind energy, solar energy and biomass. Our results indicate that there are two countries clusters with respect to income. Countries with a low gdp per capita have less energy consumption from renewables than the countries with higher gdp per capita. These results are compatible with results from various reviewed studies concerning the causal relationship between renewable energy consumption and economic development.

Finally, as further research, it is interesting to study the case of Greece, and more specific the variation of renewable energy consumption and CO2 emissions for different regions of the country.

References


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