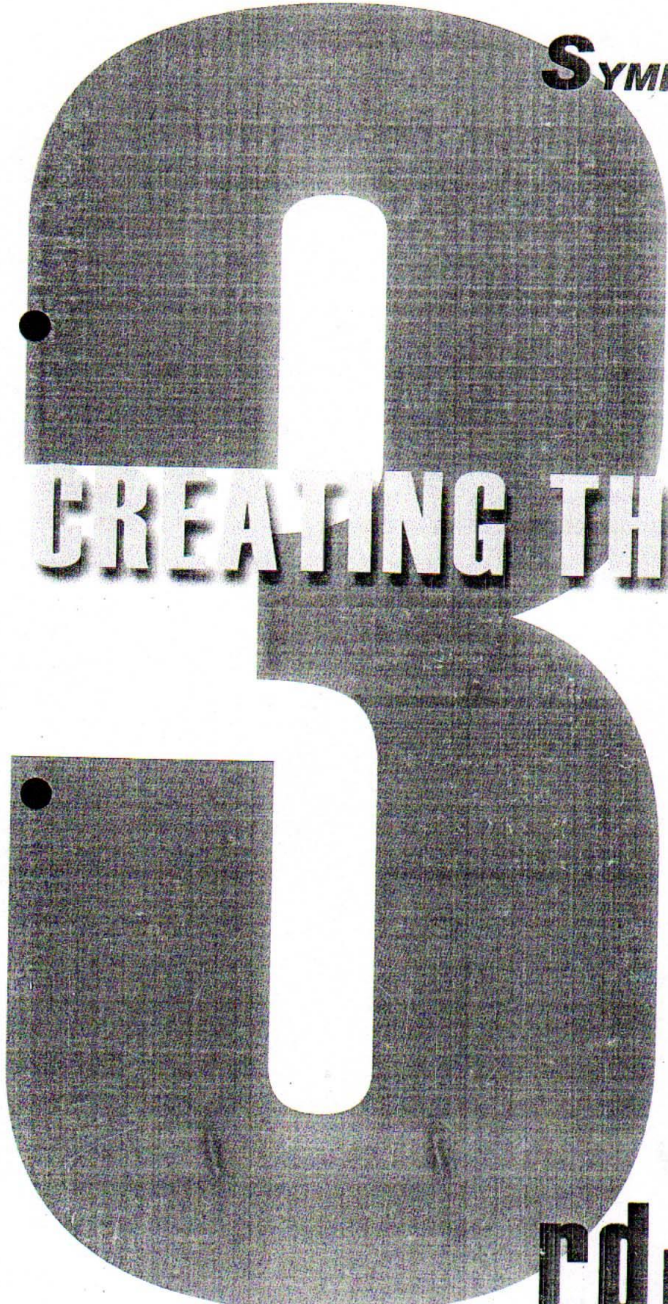


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ENERGY EDUCATION AND DEMAND-SIDE MANAGEMENT OF ENERGY IN NORTHERN CYPRUS

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ABSTRACT

In this paper, an attempt is made to present briefly some important aspects of energy education in Northern Cyprus. Also suggestions concerning the demand side management of energy at all levels have also been made.

Keywords: Energy education, demand side management, curriculum development, help desk, call center

1. INTRODUCTION

Energy is the basic resource of human life. The importance of energy is an essential factor to be considered in economic growth, development of a strategy for improving the quality of life of human beings, improvement of the quality of energy supply, limiting the hazardous gas emissions to atmosphere. Global environmental problems and the life of fossil fuels forced people to use the non-renewable energy resources economically and educate themselves in using this energy without polluting the environment. To educate human beings, a new local and globally structured energy education programme is developed for educating people at all levels and manage the energy in demand side.

In Northern Cyprus energy is produced by only the local state-run utility company, Cyprus Turkish Electricity Authority, KIB-TEK and in 2003 a private company set up a new integrated

system with capacity 35 MW on a set-run basis.

From the KIB-TEK statistics a need for serious considerations regarding the uncertain load growth, rising cost of fuel, high cost of new capacity and environmental constraints can be seen easily.

The mission of KIB-TEK is simply to supply electricity for consumer demand but has no demand side management program but only supply side management.

Educating people in efficient usage of electricity and providing a demand side management program to KIB-TEK will both help to reduce the peak power demands and investment costs to new power plants. Also the application of new programs will help to reduce global hazardous gasses (such as carbon dioxide, carbon monoxide, sulfuric oxide, Nitrogen oxide etc.) emissions to atmosphere.

2. OBJECTIVES OF ENERGY EDUCATION AND DEMAND SIDE MANAGEMENT

The objectives of energy education and demand side management of energy includes [1]:

- a- To develop an understanding among students and public how energy crises happen and the nature of energy crises
- b- To make the students and public aware of various types of renewable and non-renewable energy resources

- c- To make students and public to suggest solutions to energy crises.
- d- To make students and public to be aware of the air pollution, green house
- e- To make students and public to be aware of energies available in their countries .
- f- To make the students and public to criticize and suggest solutions to global environmental problems due to pollution
- g- To make the students and public aware of the types and causes of the pollutants
- h- To suggest the ministry of education and the university boards to add energy education courses into their curriculums as General Education Program (GER) courses.
- i- To make the students and public aware of how to use and choose the electrical apparatus that are using in their houses.
- j- To make the students and public how to reduce their electricity bills by effective usage of electricity and using energy efficient apparatus.
- k- To suggest the government and the electricity board to develop a new demand side management policy and educate people in electricity consumption.
- l- To suggest the government and press to educate people with promotion and advertisements
- m- To make the people to suggest new energy policies to government and KIB-TEK and help the related sides to apply these policies
- n- To make the students to help the peoples in these education activities volunterely.

3. STATISTICAL STUDENT POPULATION, INTERNET USAGE AND ENERGY PRODUCTION / CONSUMPTION DATA

The students are the main factors of integrating an energy education program

effect, ozone layer, and effect of these on human health.

to daily lives of human beings and to make the demand side management program successfull. Therefore, the student ratio to total population of N. Cyprus is an important factor in the success of energy education and demand side management program of energy.[2]

3.1. Primary, secondary and university student population in N. Cyprus

The population of N. Cyprus is about 216 940 (expected population in teh year 2003). It is easy for N. Cyprus to give energy or any other education to people via schools by making some adjustments and additions of some courses to the course curriculums of the schools. There are 18684 students in pre-primary and primary schools, 14 976 students in secondary schools and 27763 students [2] (both TRNC, TR and foreign students since they are the energy consumers in TRNC) in the universities which forms 28.308%of the total population. The total number of students in N. Cyprus is approximately 61423 which is 28.313 %of the total population. By educating the students in schools about the energy utilization a very good base can be formed and voluntary education activities can help to educate all the N. Cyprus citizens[2].

Same energy education programs can be applied to the soldiers in military services, government officers and workers and also the rest of the population via newspapers, television programs and internet. The call or help center will serve a 24- hours period to internet users and many telephone lines may be put active to help the people.

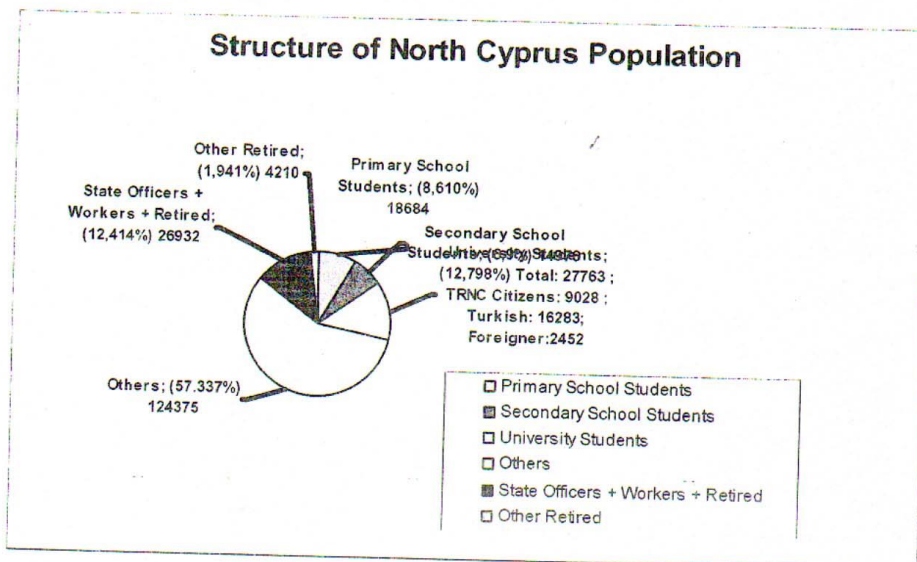


Figure 1: Structure of N. Cyprus population

This education program can definitely be successful because it is directly related with the family budgets and their economies.

The percentage of population which can be educated under a common program (students, state officers, workers and retired people) is 42.662 % of the total population. If each member of this group is activated to educate only one of his friends or parents out of this group, this means whole of the population can be adjusted with a single common program in a short time interval.

3.2. Internet usage in N. Cyprus

Internet is widely used in N. Cyprus in schools, houses or internet cafes. Almost all primary, secondary and university students can manage to reach internet web pages and benefit from the data on these web pages. Apart from the students, most of the government officers, can reach to internet pages. This huge range of internet usage creates an easy way to educate people in any case. As long as the education is addressed to their benefits, people can show respect more easily than the other activities.

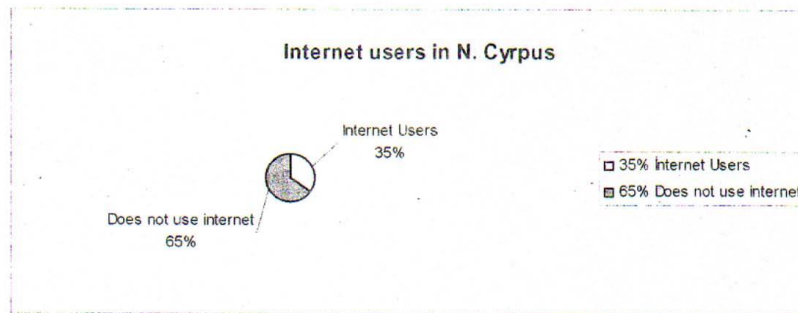


Figure 2: Internet usage in N. Cyprus [4]

Education and the effectiveness of the call or help desk via internet is also a good way of educating people. 35% of the population can access to internet and ask any questions or get information from the program [4].

3.3 Demand side energy management in N. Cyprus

In N. Cyprus only KIB-TEK is authorized in energy production and transportation. With only a supply side management of energy it is not possible to make future plans.

Demand side management and efficient energy utilization considerations

- a- Lifetime of fuel oil (60 to 100 years)
- b- Air and environmental pollution
- c- Rising prices of fuel oil due to its lifetime

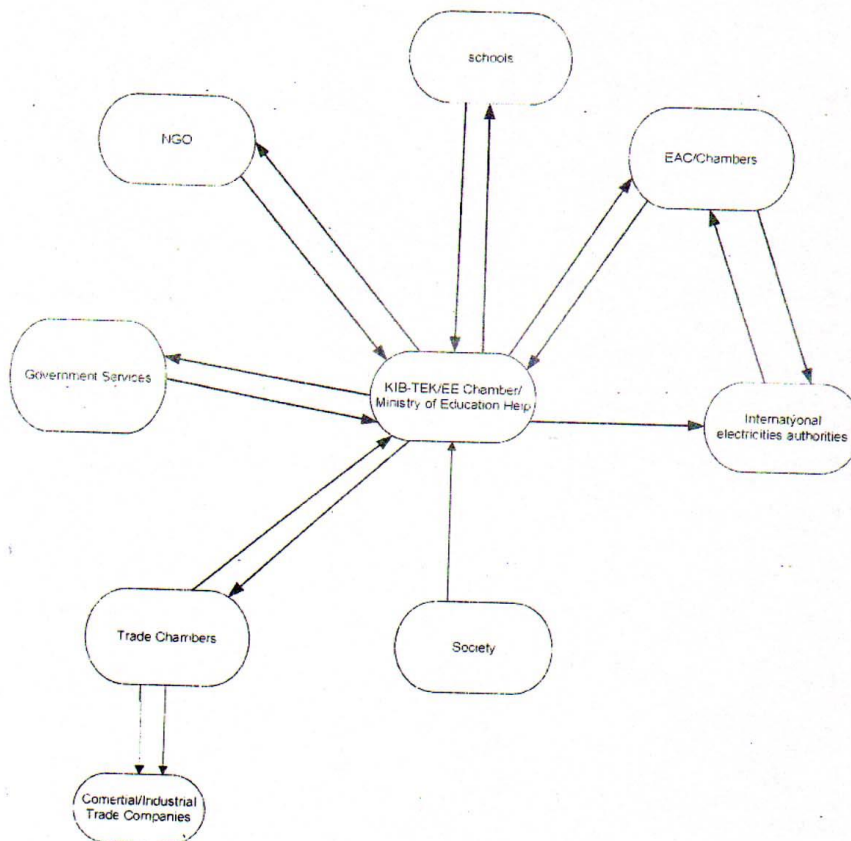
Since energy utilization in houses in N. Cyprus forms a largest ratio on total energy consumption demand side management program of energy is a

compulsory program in energy savings and limitations in environmental hazardous gas emissions.

For the demand side management of energy in N. Cyprus, some projects must be developed which are

- a- Effective energy utilization in buildings
- b- Application of thermal isolation standards and rules in buildings
- c- Effective energy utilization in governmental buildings
- d- Energy saving methods educational activities
- e- Short film presentations
- f- Television programs
- g- Energy efficient electrical equipment import rules and regulations
- h- Promotions in energy efficient electrical equipment usage
- i- Application of OFF Peak tariffs and multi scale electrical meters
- j- Promotion programs for the applications of renewable energy resources (ie Photovoltaics)
- k- Same application programs for industrial sector.

4. DATA FLOW DIAGRAMS OF DEMAND SIDE MANAGEMENT (DSM) AND ENERGY EDUCATION (EEDUC)



Diagrammatic Representation of Demand Side Management of Energy Utilization

Figure 3: Proposed data flow diagram of demand side management (DSM) of energy in N. Cyprus

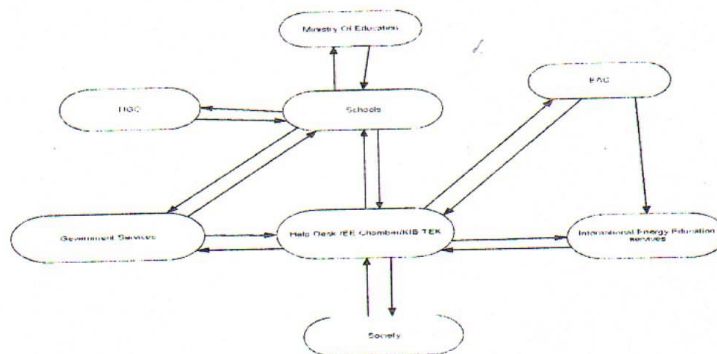


Figure 4: Proposed data flow diagram of energy education (EEDUC) in N. Cyprus

5. DISCUSSIONS AND CONCLUSIONS

Application of an energy education program in N. Cyprus is compulsory for two reasons. The first one is the pure economic situation of N. Cyprus. The N. Cyprus economy does not give chance to make investments of 5MW power plant per year. Therefore, educating people in utilization of energy will reduce the amount of investment made for the new power plants and postpone the investment time periods to later times. Secondly, educating people in energy utilization and developing a demand side management program, will reduce the power plant requirements by a considerable ratio, and this will indirectly reduce the hazardous gas emissions to atmosphere. Environmental acts force all polluting sources to take precautions in emission limitations.

The structure of the population in N. Cyprus is very suitable for the application of a new demand side energy management and energy education programs. 28.313% of the population is

already active students which can be educated to serve as different education sources. The help or call center will help to people with a 24 hours service in energy education. 35 % internet users is a good potential for the help or call center to survive.

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