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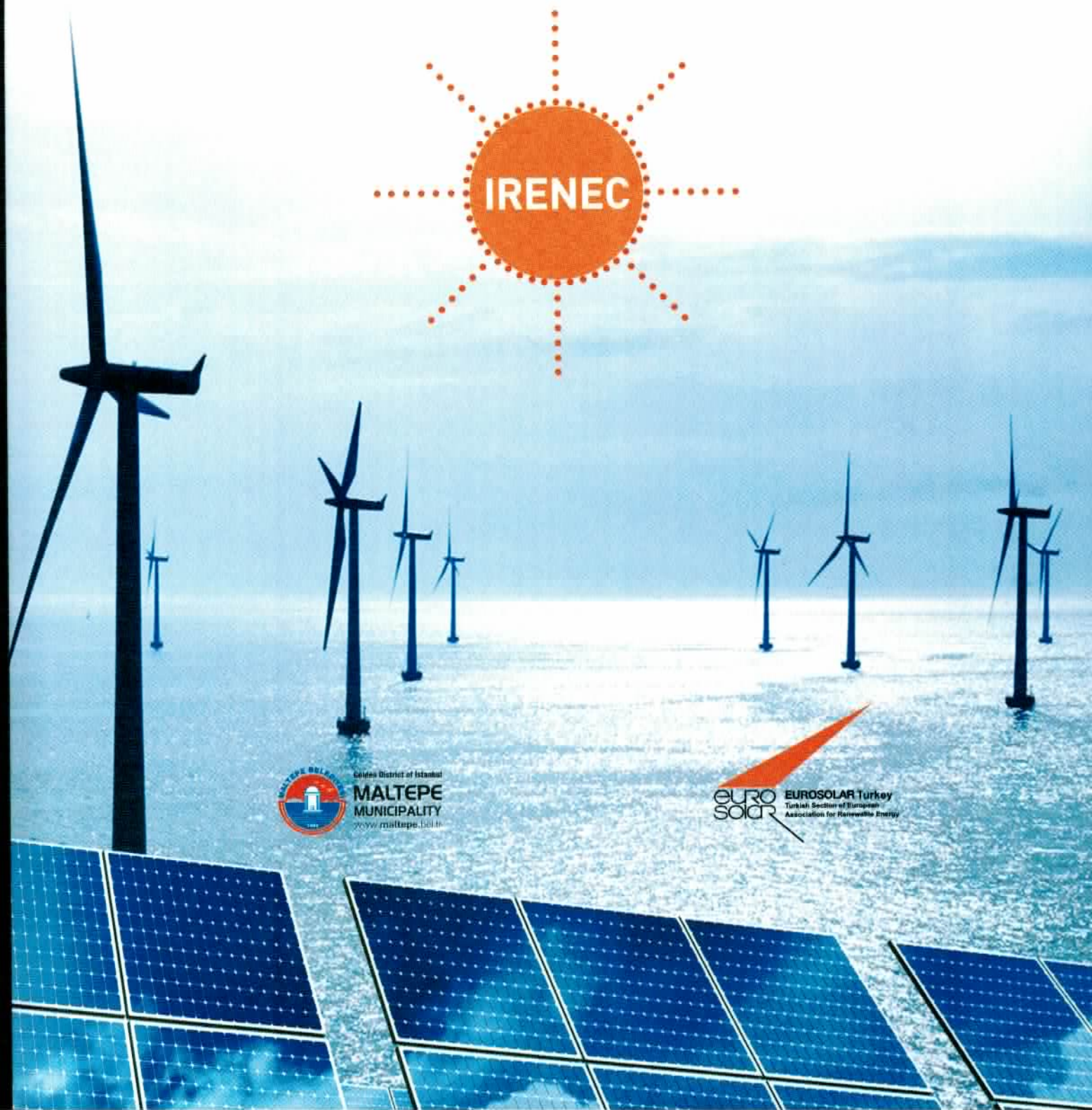

ANALYSIS OF ENERGY SAVING OBLIGATIONS FOR UTILITIES IN EUROPEAN IMPLEMENTING COUNTRIES

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ABSTRACT

In terms of addressing climate change in a cost effective way, reducing demand for energy and improving efficiency became one of the key policy objectives. Therefore, the European Union has set a target for 2020 of saving 20% of its primary energy consumption compared to BAU projections. But this target is threatened to be failed from today's point of view. Accordingly the European Commission has published a proposal for a new energy efficiency directive (COM (2011) 370 final). One of the main proposed measures is the national implementation of mandatory energy saving measures which impose supplier obligations on energy savings.

Within the EU the utility energy saving obligations (ESOs) are currently implemented in United Kingdom, France, Italy, Denmark and the Flemish region of Belgium. However, design features of programs differ from country to country fundamentally. Thus, in this paper the ESOs for Utilities are analyzed by considering how these obligations work in implementing countries whereby attention is given to identify the differences between country-specific implementations and which advantages or disadvantages may arise from them.

Keywords: Energy efficiency, utility obligations, country experiences

1 INTRODUCTION

Energy efficiency obligations mean in general that the energy suppliers and/or distributors are obliged to achieve a specific energy saving target in a specific timeframe. After implementation of different energy saving measures they obtain certificates which are commonly called as "White Certificates (WC)" that can be traded and exchanged, but this issues is not a pre-condition.

Understandably this policy is not welcomed by utilities for different reasons. In general they don't want to force their costumers to take efficiency measures as they should not be called to account for the behaviours of costumer. The other main argument is that such kind of measures disrupt the competiveness (e.g. increasing of end energy prices through recovering of cost from customers or some market players may be discriminated or privileged).

On the other hand, there are several arguments which support the setting of these measures. Fundamentally, utilities differ from other companies as their product represents a necessity for modern human life which deserves also key attention in public regulation. The production of this commodity is accompanied by environmental problems. In this respect the utilities claim to overtake their responsibility by undertaking energy efficiency measures. Hoverer, in practice in a liberalized market it appears that this works in general appropriately by obligating them to undertake such measures. Beside that end users – especially in the residential sector – are not aware of their benefits if they purchase energy efficiency goods or carry out energy saving measures and traditionally they think myopic, i.e. they want to recover their investment in short term while utilities calculate the amortization over a longer time period.

2 GENERAL INFORMATION ON UTILITY OBLIGATIONS IMPLEMENTED IN EUROPEAN COUNTRIES

Figure 1 illustrates the general utility structure in Europe. This graph also depicts which countries impose obligations on what type of utilities as well as their target sectors. Subsequently, the general frameworks of implemented utility obligations are explained briefly by country.

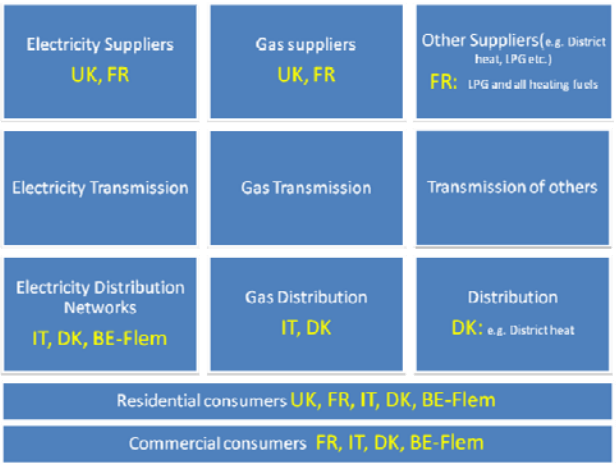

Figure 1: General utility structures in Europe, which utilities are obligated by implementing countries and related sectoral coverage (residential and commercial consumers).

2.1 EEC-CERT in United Kingdom

The energy efficiency commitment (EEC) is a legal requirement imposed on electricity and gas suppliers in order to improve energy efficiency in the UK's household sector. EEC is not a tradable certificate mechanism but bilateral trade of energy savings between two suppliers is allowed. The suppliers (retailers) are obligated to increase energy efficiency in households in the regulatory rounds in 1998, 2000, 2002, 2005 and 2008. During these periods, although the name of instrument has been changed, the continuity of implementations has been maintained [1]. In 2008 the name EEC was changed to CERT (Carbon Emission Reduction Target) and obligation is expressed in CO_2 savings (i.e. carbon weighted by the carbon content of saved energy fuel) as the carbon emission reduction has high policy priority in UK's energy policy.

2.2 Italy

The utility obligation scheme in Italy has been implemented since July 2004 with the aim of increasing end-use energy efficiency. The obligation is imposed to electricity and gas distribution companies (distribution system operators) which have at least 50,000 customers [2]. The reduction target is set in primary energy, accounted in tons of oil equivalents (toe), and the saving can be derived through actions among end-users [2]. Before 2008 targets were set separately for low and high voltage consumers. This has been changed to distinguish among residential and non residential consumers from 2008 on. One of the central elements of this scheme is the trading of certificates which are called EET (Energy Efficiency Titles).

2.3 France (ESC- Energy Saving Certificates)

The energy efficiency obligations to the energy suppliers in France started in 2006 for a 3 year period with initially the aim to use the energy efficiency potential especially in the building sector. Currently the scheme covers all sectors (industry, residential, tertiary, transport) and comprises about 50 electricity, gas, LPG, heating and cooling suppliers whose sales to the building

sector exceed a certain threshold (i.e. 100 GWh/a for LPG and 400 GWh/a for others) as well as all household oil suppliers [1]. The target is set in final energy.

2.4 Belgium Flanders (REG-Rational Energy Use)

In Flanders region utility obligations have been imposed on 16 electricity distributors since 1st of January 2002. The obligation is expressed in primary energy and does not allow the trading of certificates. Targets are defined separately for residential and non-residential sector. According to [3] a saving in size of 2% (of average supplied electricity in previous two years) has to be achieved for the residential sector, whereas a saving target of 1.5% is set for the non-residential sector.

2.5 Denmark

In Denmark energy efficiency obligations are set for electricity, natural gas and district heating grid companies. The target is set in final energy so that any kind of energy in terms of final energy is reduced. While the obligation is imposed on grid companies, most of activities have been implemented by commercial daughter companies [4]. The annual target was 2.95 PJ and has been over-achieved by grid companies between 2006 and mid 2009 whereby 47% of total savings were achieved in private enterprises, 7% in the public sector and 44% in the household sector (for more detail see [5]).

2.6 Comparison of key parameter

Table 1 summarizes for the assessed countries the definition of energy efficiency targets and their compliances in the previous obligation periods as well as the height of target set for the current period. Accordingly, it can be seen that except Denmark (based on average of 2006 and 2007 where a couple of district heat distribution networks could not fulfill their obligations [4] all countries have achieved their targets and the targets for the current period have been extended. On the other hand this table also shows how far these programs consider lifetimes of saving and discount rate[1].

Table 1: Summary of energy saving targets, target achievement and calculation parameters

	UK	**France**	**Italy**	**Denmark**	**BE-Flem**
Measurement unit of saving	Carbon	Final energy kWh cumac[2]	Primary energy (toe)	Final energy	Primary energy
Compliance period	3 years	3 years	1 year (multi annual target period)	1 year (multi annual target period)	1 year (multi annual target period)
Previous Target°	2005-2008 130.2 TWh (fuel standardised energy)	2006-2009 54 TWh lifetime discounted	2005-2009: 6.5 Mtoe (75.6 TWh)	From 2006 2,95 PJ/a (0.82 TWh/a)*	In 2008: Total 0.58 TWh /a
Target achievement°	180 TWh	65,2 TWh	6,6 Mtoe (76.8 TWh)	2,87 PJ/a (Average of 2006 und 2007)*	0.58 TWh in 2008 (annual)
Current Target	Between 01.04.2008-31.12.2012 293 MtCO2	2011-2013 345 TWh (cumac)	Cumulative saving 6 Mtoe in 2012	(from 2010) 5.4 PJ/a (1.5 TWh/a)*	Not apparent
Lifetimes of saving	Differ by measures (discounted physical lifetime)	Differ by measures (discounted physical lifetime)	5 years (8 years for heating and air conditioning measures)	First year saving only (one-year lifetime)	First year saving only (one-year lifetime)

[1] Discount rate in respect of saving can be understood as deterioration of technical measures over its lifetime actualizing annual savings for different measures with different life spans.

[2] Cumac: The word cumac means added and discounted

Discount rate	in CERT no discounting	4%	No discounting	No discounting	No discounting
Dominant measures in terms of saving	Insulation	Heating equipments	Lighting	Horizontal technologies in Industry	Glazing, boilers, insulation

°Source of entire row: [3] except * [4] and [6]

3 WHAT CAN BE LEARNED?

The comparative analysis indicates that it appears of key relevance to point out which advantages or disadvantages the different design features do have. Thus, Table 2 offers a list of advantages and disadvantages for certain design features as derived from literature.

Table 2: Summary of advantages and disadvantages of selected design features

Design Features	**Country**	**Advantages**	**Disadvantages**
Lifetime energy saving	FR, UK	More capable of promoting structural actions like building improvements measures	
Annual (first year energy) saving	FL,DK	First year saving ensures that new projects are implemented each year [7]	Discrimination of longer life measures such as building improvements. Promoting measures mainly with short payback time
Short life time of measures	IT		Discrimination of longer life measures such as building improvements. Promoting measures mainly with short payback time [9]
Annual progress report	UK	Obliged companies must report on annual progress which allows to monitor the activities [7]	
Annual Targets	DK,IT, Bel FL	Give the system administrator the possibility to correct for any implementation flaws [7]	
Obligation holder: distribution companies	Bel-FL, IT, DK	• Distribution companies are local monopolies, often under regulated tariffs, thus more stable. • With an appropriate tariff structure their revenues can be decoupled from sales of energy [8]. • Obligation on distribution companies stimulated third actors like ESCOs (Energy Service Companies)	• These companies don't have direct link to final users [8] • Lack of interest of energy companies under obligations • Lack of skills to deliver energy efficiency by distributors and/or high cost of in house implementing as compared to market-sourced certificate purchase (as the case in IT) [8].
Obligation holder: suppliers	UK, FR	• The suppliers have a stronger link to end-users • They can take advantage of the marketing and retail skills [8] • Suppliers have financial resources and knowhow.	• Supplier obligation could conflict with their revenues which are from selling energy [8] • Competition might be distorted.

4 CONCLUSIONS

It can be concluded that a well designed and implemented utility obligation would contribute to reduce the energy consumption. Since design and implementations play decisive role the attention should be given to learn from other countries. In this respect it is important for each country to define its own priorities; which sectors should be targeted or which energy unit should be set as measure for accounting the saving obligations.

As summarized above imposing obligations on distribution companies or suppliers have advantages as well as disadvantages. The question for a country which utility should obligated can be answered through different considerations like which sectors should be covered, should ESCOs

be encouraged, how the costs should be recovered etc. The measurement or calculation of savings has also an essential impact on the selection of measures to be taken. Considering of lifetime saving leads to implementation of measures with high investment costs and long lifetimes such as thermal insulation of buildings.

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BIOGRAPHIES

Demet Suna – Demet Suna is working as researcher at Vienna University of Technology, Energy Economics Group. She holds a degree in electrical engineering (Power Engineering and Electrical Drives) at YILDIZ Technical University in Istanbul as well as at Vienna University of Technology. Her major fields of research are market deployment strategies for Renewable Energy as well as for Energy Efficiency. She is working currently in several national and international projects dealing with modelling and evaluation of energy efficiency policy instruments.

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