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# Poor energy poor: Energy saving obligations, distributional effects, and the malfunction of the priority group



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## HIGHLIGHTS

- The paper discusses distributional effects of energy efficiency obligations.
- Significant distributional effects occur when measures are implemented.
- Significant distributional effects occur when costs are passed on to the customers.
- Suppliers face problems to identify energy poor households.
- The priority group contradicts the scheme's intention of cost minimisation.

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## ABSTRACT

The European Union's Energy Efficiency Directive forces the Member States to install energy efficiency obligation schemes. In a first step, this paper identifies the distributional effects caused by this policy instrument which occur when energy efficiency measures are implemented (phase of delivery) and when its costs are passed on to the society (phase of financing). In the phase of delivery, suppliers prefer to implement measures at the property of those customers which enable them to minimise their costs, i.e. enterprises with large energy savings potentials and high-income households who can contribute a greater share of the costs. In the phase of financing, distributional effects occur when the costs of the scheme are passed on from the obliged suppliers to their customers, primarily affecting less competitive customers, i.e. households and small enterprises. In the British scheme, the so-called priority group was installed in order to decrease distributional effects and to support energy poor households. In a second step, this paper evaluates approaches to reduce energy poverty and indicates ineffectiveness, high transaction costs and incoherency with the aims of the obligation scheme. Alternative approaches to tackle energy poverty are briefly described.

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## 1. Introduction

Although the issue of energy poverty is increasingly put on the political agenda since the beginning of the 1990s, Moore (2012) shows that the definition of energy poverty is still not fully developed and varies across EU member states. Policies specifically focussing on the energy poverty are still rarely employed as many similar policies (e.g. heating supports) support people solely defined as poor in income, which is only one of three aspects of energy poverty. Great Britain is to be considered a pioneer country concerning the public perception and, consequently, the political will to fight energy poverty. Boardman (1991) introduced the '10% definition' which, in short, says that a household is energy poor as

soon as its costs to heat the most important rooms to a sufficient level exceed the threshold of 10% of its income. Due to the introductive work of Boardman (1991) the definition is regularly applied in British and European reports. Great Britain installed several programmes to support energy poor households, among them the so-called priority group subtarget within the supplier energy efficiency obligation programme.

Energy efficiency measures are broadly accepted as adequate measures to reduce energy poverty because the consumption of energy (the volume and the total costs) required to achieve certain levels of utility decrease. In the case of energy poverty, the rebound effects of efficiency measures may even be desirable, e.g. when indoor temperatures are increased and negative implications on health are avoided (on the negative implications of energy poverty see Rudge, 2012; Ormandy and Ezratty, 2012). As energy poor households predominantly are low income, the upfront costs of energy efficiency measures hinder investments. Aside of

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that, they are often situated in non-renovated, energy inefficient (and thus low-cost) residences in which, moreover, renovations underlie the tenant–landlord problem.

### 1.1. Energy efficiency obligations

Energy efficiency obligation (EEO) schemes are an innovative policy instrument aiming to increase the energy efficiency. In Europe, EEO schemes are already in force in Great Britain, Denmark, France, Italy and the Flemish region of Belgium. Great Britain obliges the major six retailers of electricity and gas operating in the country. The implementation of energy efficiency measures is only eligible in the residential sector. The suppliers recover their costs via the price of energy sold. In the obligation scheme in force from 2008 to 2012, British suppliers have to achieve 40% of the savings in the so-called priority group. The priority group accounts for approximately 40% of the British households. No other European EEO scheme has focused on the energy poverty yet. In Italy, electricity and gas network operators are obliged. Regulation allows for the recovery of the costs of energy efficiency measures via pre-defined network tariffs. Although the scheme is open to all sectors, measures are predominantly implemented in the domestic sector. In France, the EEO scheme has been installed in 2006 obliging electricity, gas, LPG and oil retailers. The French scheme is open to all sectors (except for facilities included in the European CO<sub>2</sub> Emission Trading Scheme), but the majority of measures is implemented in the domestic sector. Denmark obliges network operators for electricity, gas, and district heating. Oil retailers voluntarily joined the scheme. Roughly 50% of achieved energy savings are attributable to non-domestic sectors. Flanders runs a small EEO scheme which obliges the electricity network operators. In the beginning of 2011 it became clear that Poland will install an EEO scheme.

### 1.2. Energy efficiency directive

EEO schemes have first been proposed by the Energy Service Directive 2006/32/EC. In December 2012 the more ambitious Energy Efficiency Directive 2012/27/EU entered into force. According to article 7, Member States shall install EEO schemes at the national level. Energy distributors and/or retail energy sales companies are obliged to save 1.5% of the energy delivered to final customers excluding energy for transport purposes. However, article 7 also lists alternative policy instruments the member states may apply in order to achieve the 1.5% target. Article 7 also addresses the reduction of energy poverty by means of increased energy efficiency: *'Within the energy efficiency obligation scheme, Member States may: [...] include requirements with a social aim in the saving obligations they impose, including by requiring a share of energy efficiency measures to be implemented as a priority in households affected by energy poverty or in social housing'*.

## 2. Methodology and basic assumptions

Basic literature on the theoretic and practical functioning and the design of EEO schemes is provided by Bertoldi and Rezessy (2008), Bertoldi et al. (2010), Child et al. (2008), Mundaca et al. (2008), Pavan (2008), and Perrels (2008). Many of these papers also describe the British priority group subtarget. Moser (2012) analysed existing European schemes and conducted 36 expert interviews in order to optimise the interdependent design elements of an EEO scheme. The interviews also investigated whether provisions on energy poverty shall be included in EEO schemes and, if yes, how these provisions should be designed. Expert interviews were conducted, first, with suppliers, energy service

companies, authorities and scientists concerned by the British, French, Italian, Polish and Danish EEO schemes. In a second stage, policy makers, retailers, network operators and experts on energy poverty were interviewed. Although the second stage primarily focused on Austria many statements and results can be generalised.

## 3. Distributional effects of EEO

In all European EEO schemes, suppliers are obliged to verify that energy savings have been achieved at the property of final customers. As the obligation is put on the suppliers, they represent the demand side of the market for verified energy savings (i.e. white certificates). Thus, they are the parties temporarily bearing the costs of the verified savings, before they pass on these costs to their customers. Energy efficiency measures do not necessarily need to be implemented by the obliged suppliers. They may assign contractual partners to deliver the savings or buy verified savings from third parties. Accordingly, the phases of delivering and financing energy efficiency measures are two different concerns in EEO schemes which are independent from each other. Thus, distributional effects caused by the delivery and financing are to be investigated separately.

### 3.1. Delivery of savings

Suppliers comply with the obligation by redeeming or demonstrably holding verified savings resulting from energy efficiency measures. These measures can be

- implemented by contractual partners,
- purchased from third parties (e.g. energy service companies),
- delivered by the obliged parties (e.g. distribution of CFL) or
- activated by the obliged parties (e.g. subsidies).

In an EEO scheme's ideal-theoretic design, the actual implementer may make use of all flexibilities concerning eligible end-use sectors, energy carriers, energy efficiency measures, and time of implementation as well as the tradability of savings amongst actors and over time in order to minimise its costs per unit of energy saved (Mundaca et al., 2008). An ideal-theoretic scheme may differ from an optimal one as there are administrative and transaction costs, and the optimal design of an EEO scheme is strongly related to the circumstances (Mundaca, 2007). These flexibilities theoretically guarantee the minimisation of costs borne by the society, because minimisation of the costs borne by the implementers/suppliers implies minimisation of the costs passed on to the final energy customers. Cost minimisation of firms is a fundamental postulate of economic theory (Pindyck and Rubinfeld, 2009) and is assumed to hold in the case of liberalised energy markets (and energy efficiency markets).

Although implementation costs vary significantly depending on the type of the energy efficiency measure and, moreover, costs vary for one type of energy efficiency measure, we assume one representative measure with fixed total costs and fixed energy savings assigned to its implementation. In some EEO schemes, other energy efficiency policy instruments like subsidies and tax rebates are considered complementary to the EEO scheme, i.e. the measure's total costs which are carried by the implementers and the final customers are reduced by the governmental supports. For example, in Italy, additional funding of local governments and feed-in tariffs for photovoltaic plants are considered complementary (Capozza et al., 2006). In the French case, the experts interviewed point out the importance of the co-existence of the scheme and the governmental tax rebates. First, the tax rebates

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