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Energy Policy

journal homepage: www.elsevier.com/locate/enpol

Financial impacts of UK's energy and climate change policies on commercial and industrial businesses



Chye Peng Ang^a, Bruce Toper^b, Ajay Gambhir^{a,*}

^a Grantham Institute for Climate Change, Imperial College London, South Kensington Campus, London SW7 2AZ, England, United Kingdom

^b Energy Knowhow Limited, Hertfordshire, United Kingdom

HIGHLIGHTS

- Cumulative impacts of policies on energy prices and bills were studied.
- Projected bills for one site are higher than those projected by the UK government.
- Results of existing theoretical studies may not be fully representative.
- Impact of policies is not considered significant with respect to competitiveness.

ARTICLE INFO

Article history:

Received 30 April 2015

Received in revised form

24 October 2015

Accepted 14 December 2015

Keywords:

UK energy policies

UK climate change policies

Energy bills

Energy efficiency

ABSTRACT

This study provides a detailed case study assessment of two business sites in the UK, to understand the policy drivers of increases to their energy costs and energy bills, considering all current UK energy and climate change policies. We compare our findings to more generalised, theoretical calculations of the policy cost impact on energy costs and bills – we have found no other studies as comprehensive as ours in terms of policy coverage.

We find that for one site the government has over-estimated the likely energy savings due to energy efficiency options. Such differences in estimates should be taken into account when considering the efficacy of climate change policies on future energy savings. The overall impact of energy and climate change policies on costs will be of the order 0.4% of total business costs by 2020. This provides an important metric for the near-term cost of mitigation to meet longer-term climate change goals.

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1. Introduction

Addressing the challenge of climate change will require significant levels of emissions reductions from all sections of the economy. This will entail both the more efficient use of energy, as well as the decarbonisation of energy supply (IPCC, 2014). A number of countries including the UK have enacted policies to achieve such aims. The Climate Change Act commits the UK to reducing its greenhouse gas emissions by at least 80% from 1990 levels by 2050 (Great Britain Climate Change Act, 2008). Most of these policies work by setting an explicit or implicit price on energy use or carbon emissions, or by providing subsidies or tax breaks to encourage investment in energy efficient or low carbon technologies. A key concern over such policies is the impact that

they have on energy costs for both businesses and households (Bassi et al., 2013).

In recent years, a number of studies have attempted to investigate the extent of cumulative impacts of the UK's energy and climate change policies on businesses' energy prices and bills. There is a general consensus among these studies that energy and climate change policies will result in an increase in businesses' energy prices and bills. However, the extent of impacts varies quite significantly among the studies largely because of differences in methodologies, assumptions and coverage of policies. Furthermore, the analyses of existing studies on the impacts of policies on energy prices and bills, are broadly speaking, based on hypothetical energy users with certain assumed energy consumption and energy mix. However, the impacts of policies on energy prices and bills depend largely on the sector the business belongs to and its energy consumption and energy mix. Hence there is a research gap around specific analysis of specific businesses, covering all relevant policies.

* Corresponding author.

E-mail addresses: bruce.toper@energyknowhow.co.uk (B. Toper), a.gambhir@imperial.ac.uk (A. Gambhir).

The primary objective of this study is to assess the cumulative impacts of the UK's energy and climate change policies on the energy prices and bills of real businesses. It examines both the actual cumulative impacts on energy prices and bills in the past, as well as the cumulative impacts in the future. Secondary objectives of the study are to examine the businesses' energy saving measures for mitigating the impact on energy bills, the barriers to the implementation of such measures, as well as the impacts of the policies on competitiveness loss and carbon leakage for the businesses studied. In examining these, this study provides an in-depth detail of how energy and climate change policies affect real companies and how these real companies respond to the impacts of policies on energy prices and bills. This allows us to go beyond theoretical studies found in existing literature; and compare real life findings against theoretical ones. This paper begins by describing the research methodology used to address the objectives of the study and a brief review of the literature material (Section 2). Section 3 presents the results for the businesses being assessed and Section 4 analyses the results and offers a discussion on the findings of the research undertaken. Section 5 provides a summary of the key findings and conclusions.

2. Methods

2.1. Literature review

A comprehensive review of the existing literature was undertaken to examine the past, existing and recently announced UK's energy and climate change policies affecting businesses, as well as studies relating to the cumulative impacts of these policies on businesses' energy prices and bills, competitiveness loss and carbon leakage.

2.1.1. UK's energy and climate change policies

A description of past, existing and recently announced energy and climate change policies in the UK, in chronological order of their implementation is shown in Table 1. As can be seen by the table, there is a large and complex policy landscape affecting business energy bills.

2.1.2. Cumulative impacts of policies on energy prices and bills

There is a limited number of studies that have evaluated the cumulative impacts of UK energy and climate change policies on businesses' energy prices and bills (DECC, 2013a, 2011; CCC, 2014, 2012; Waters Wye Associates, 2011, 2010).

The study by DECC (2013a) analyses the cumulative impacts of energy and climate change policies on energy prices and bills in 2013, 2020 and 2030, for medium-sized energy users and energy intensive users. Policies assessed in the 2013 study include CCAs, CCL, CPF, CRC, Ecodesign Directive, EMR, EU ETS, FITs, Green Deal and RO. Fig. 1 and Table 2 show the results of the analysis. The impact of policies on unit energy prices differs among the different types of users since policy impacts depend on the sector the business belongs to and its energy consumption and energy mix. The impact on unit gas price stays fairly constant, whereas the impact on unit electricity price rises over time due to increased impact of the CPF, EU ETS, EMR, FITs and RO.

The impact of policies on unit energy prices translates to a 26% and 22% increase in energy bills for a non-CRC and CRC participants respectively in 2020. For energy intensive users policies are estimated to add between 6% and 36% to the energy bills in 2020. The lower end of the range reflects relatively gas intensive users who meet their electricity needs through onsite generation and therefore are not affected by policy costs passed on from energy suppliers. The higher end of the range reflects relatively electro-

intensive users who buy all their electricity from an energy supplier. For both CRC participants and energy intensive users, the main drivers of increase in electricity bills by 2020 are the EMR, RO and CPF. By 2030, the main drivers are the EMR and EU ETS.

In another study, the UK Committee on Climate Change (CCC (2014)) examines the cumulative impacts of energy and climate change policies on energy prices and bills between 2004 and 2013, 2013 and 2020, as well as 2013 and 2030, for commercial and industrial users. Policies assessed include CCL, CCAs, CfDs, CPF, CRC, EU ETS, FITs and RO. Table 3 shows the results of the analysis. For commercial users, these policies are estimated to add 4.2 p/kWh (or 67%) and 6.2 p/kWh (or 86%) to the unit electricity price in 2020 and 2030 respectively. For industrial users, policies are estimated to add 3.6 p/kWh (or 68%) and 5.9 p/kWh (or 98%) in 2020 and 2030 respectively. Tables 4 and 5 compare the CCC findings against that from the DECC study. The impact of policies on unit energy prices in absolute terms is comparable in both studies. However, in terms of percentage increases, the figures from the CCC study are generally higher, which means that lower wholesale and network costs were assumed in the CCC study.

In another separate study conducted by a consultancy, Waters Wye Associates (2010), for the Energy Intensive Users Group (EIUG) and the Trades Union Congress, results show that by 2020, policies are estimated to increase energy bill by £5.3 million or 17%, compared with what the bill would have been without policies. This is in the higher end of the range in DECC's estimate of 6–17% for gas intensive users.

2.1.3. Cumulative impacts of policies on competitiveness loss and carbon leakage

Competitiveness risks could arise if energy and climate change policies disadvantage certain business sectors in international competition, impacting profits and employment and driving location of plants to other countries. This relocation could lead to what is known as carbon leakage (CCC, 2013). In terms of the impacts of energy and climate change policies on competitiveness and carbon leakage in the UK, some studies suggest that energy and climate change policies would only negatively impact a few manufacturing industries. In another study, the CCC (2013) estimates that higher electricity prices from energy and climate change policies could reduce the total profits of electricity intensive industries by £150 million to £600 million in 2020. However, it highlights that the profit impacts are commensurate with support under the already announced policies and thus reaches a conclusion that competitiveness risks are limited and manageable. On the contrary, industry studies point to significant competitiveness risks from rising energy costs. For example, a recent survey by the EEF (2014) found that the most cited risk to growth for manufacturing in 2004 is rising input costs – mainly the cost of energy. Certain studies have also attempted to examine the impact of energy and climate change policies on the way businesses make decisions relating to investment and relocation. In general, studies show that decisions made are based on much more than just climate change policies and the costs induced by them.

2.2. Research approach

The case study approach is well suited for this study because of its ability to address the research objectives appropriately. Both quantitative and qualitative research methods were employed to meet the objectives of this study. As the impacts of policies on energy prices and bills depend largely on the sector the business belongs to and its energy consumption and energy mix, a two-case study approach was adopted to investigate the financial impacts of policies on energy prices and bills for a commercial sector business and an industrial sector business. These sectors are as defined in

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