

IEA Expert Roundtable on Industrial Productivity & Competitiveness
Impacts of Energy Efficiency

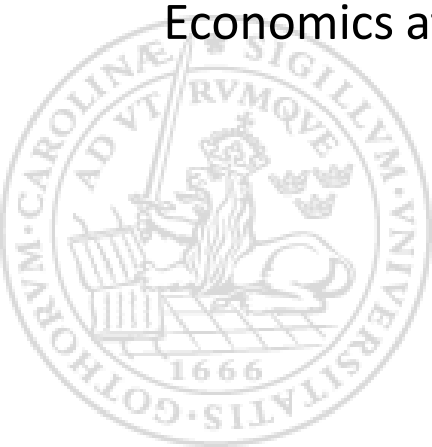
Benefits of energy efficiency in competitive energy markets

Transferring lessons from other areas to industrial energy efficiency

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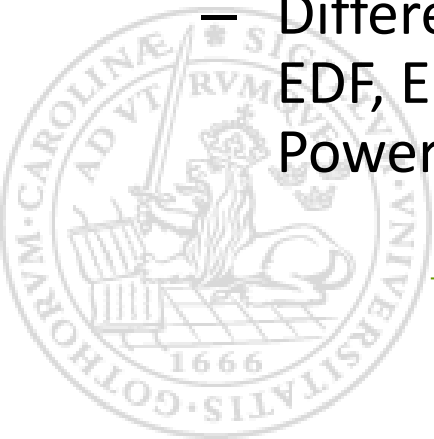
Key messages

- Energy saving obligation quotas changing business mindset of energy suppliers (empirics and game theory)
 - ‘Increased competitiveness’
- Economics of CSR strategies of energy companies reveal increasing attention towards energy efficiency related business
 - ‘Increased competitiveness’
- Policy instruments are critical to tap/trigger multiple benefits of increased energy efficiency

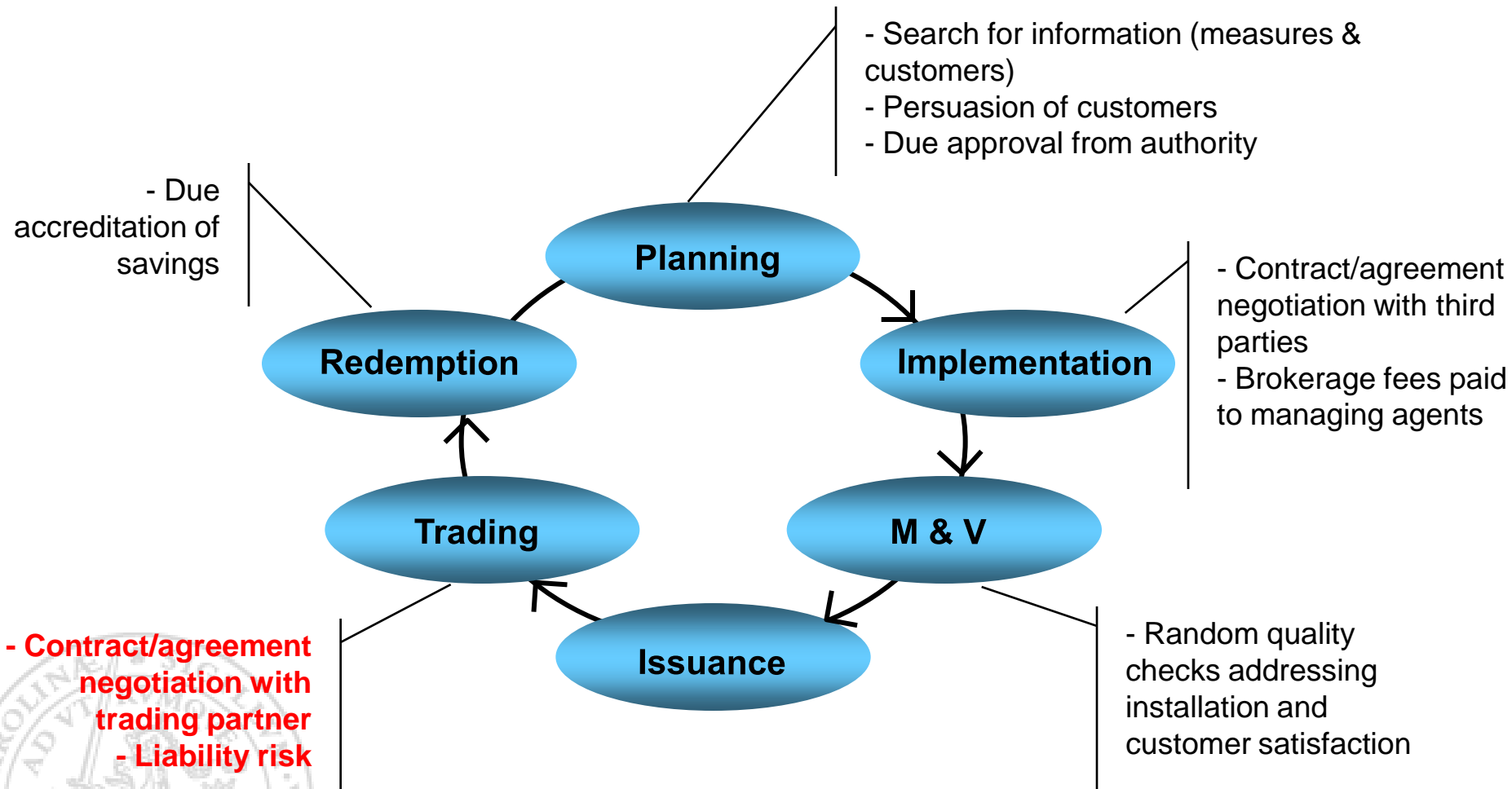


Research framework

- Tradable certificate schemes for energy efficiency improvements
 - Transaction costs analysis of market behaviour
 - TRC & C-Eff., + Survey/interviews directed to 8 energy suppliers in the UK
 - Simulation game
 - Lack of trading, but WHY?
- CSR strategies of EU energy companies
 - Economic analysis (EE and RE)
 - Different cases across European countries: Centrica, E.ON, EDF, Endesa, ENEL, Iberdrola Renovables, RWE, Scottish Power, Unión FENOSA and Vattenfall



Tradable Certificates for EE (1)



Tradable Certificates for EE (2)

- Why 'trading' activity was very low during EEC-1?
 - Several aspects.... BUT
 - Increased competitiveness:
 - *Strategic business learning experience*
 - *Diversify product & service portfolio*
 - *Increased customer portfolio*
 - *Support brand strategy (and avoid financing the branding of competitors)*



Tradable Certificates for EE (3)

Mundaca, L. (2007). Transaction Costs of Tradable 'White Certificate' schemes: The Energy Efficiency Commitment as Case Study. *Energy Policy* 35 (8): 4340-4354.



Energy Policy 35 (2007) 4340–4354



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Transaction costs of Tradable White Certificate schemes: The Energy Efficiency Commitment as case study

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Abstract

This paper analyses the nature and scale of transaction costs (TCs) borne by obliged parties under a "Tradable White Certificate" (TWC) scheme. Taking the first phase of the Energy Efficiency Commitment (EECI) in Great Britain as a case study, several sources of TCs were considered, such as search for information, persuasion of customers, negotiation with business partners, and measurement and verification activities. Information was obtained through interviews and a questionnaire distributed to obliged parties. Results show that the most significant sources of TCs were related to search for information, persuading customers and negotiating with managing agents/contractors to implement energy efficiency measures. Perceived high TCs related to contract negotiation and liability risks slightly reduced the low trading level. The scale of TCs was estimated to be around 10% and 30% of total investments costs for the lighting and insulation segments, respectively. The results indicate that, despite the presence and scale of TCs, the EECI scheme generated energy savings that yielded net societal benefits. Estimated financial benefits range from 0.6 to 6 p/kWh for insulation and lighting savings, respectively. When avoided external costs due to electricity savings are included, estimated economic benefits range from 3 to 8 p/kWh. Several lessons from the EECI can be drawn for TWC schemes. Among others, it is found that informative policy instruments to raise awareness among end-users are critical if a TWC scheme is to deliver cost-effective energy savings. In all, the nature and scale of TCs under TWC schemes will differ because of a number of endogenous and exogenous determinants.

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Keywords: Energy efficiency; Tradable White Certificates; Transaction costs

1. Introduction

Greater energy efficiency plays a fundamental role in achieving a sustainable energy future. The continuous oil price escalation, increased awareness of the need for energy security, and energy-related environmental problems—including the threat of human-induced climate change—are all contributing to a reassessment of rational energy use. As the policy debate focuses more on achieving greater energy efficiency across all end-use sectors, the key challenge for policy makers is to choose the right portfolio of instruments to address institutional and market barriers and imperfections.

Recently, much more attention has been given to the role of marketable certificates for achieving higher energy

efficiency. Some European Union (EU) member states (France, Italy, the United Kingdom [UK]¹) have implemented tradable certificate² schemes to improve energy efficiency in end-use sectors (so-called "Tradable White Certificates" [TWC]), and other countries (e.g., The Netherlands) are exploring possible design options. A TWC scheme involves achieving a mandatory energy-saving target against the "business-as-usual" scenario. Obligated parties (e.g., energy distributors or suppliers) are required to meet individual targets set by the government; one option is to trade certified energy savings, which encourages parties to seek market strategies for least-cost compliance. At EU level, the proposed Directive on "Energy End-use Efficiency and Energy Services"

¹With the exception of Northern Ireland; in other words, Great Britain.

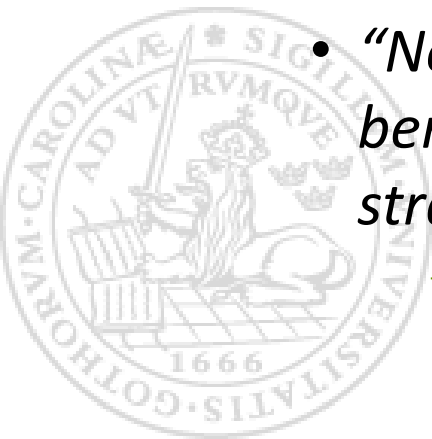
²Note that in this paper the words "permit" and "certificate" are used interchangeably.

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Tradable Certificates for EE (4)

- Simulated EU-wide trading market
 - Demand: Participants across six EU countries; Supply: mathematical bottom-up model
 - Three different schemes simulated, trading sessions via internet
 - Low level of trading (<10%), among numerous sources:
 - *Strategic business learning experience*
 - *“Obligated parties” → negative impacts on energy sales BUT positive impact on customer loyalty*
 - *“Non-obliged parties” → Awareness about multiple benefits of energy efficiency (‘autarky’ compliance strategy)*



Tradable Certificates for EE (5)

Mundaca, L. Neij, L., Labanca, N., Duplessis, B. & Pagliano, L. (2008). Market Behaviour and the to-trade-or-not-to-trade dilemma in 'Tradable White Certificate' schemes. *Energy Efficiency* 1(4): 323-347.



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Market behaviour and the *to-trade-or-not-to-trade* dilemma in 'tradable white certificate' schemes

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Abstract This paper provides an empirical analysis of market behaviour under 'Tradable White Certificate' (TWC) schemes. It focuses on the entire set of 'flexibilities' granted to obliged parties to meet a mandatory energy-saving target cost-effectively, i.e. range eligible measures, eligible end-use sectors, banking provision, market engagement of non-obliged parties, and trading as such. We found that market behaviour responds to the unique design and context in which TWC schemes are implemented. Contrary to expectations, limited trading is observed so the 'to-trade-or-not-to-trade' dilemma is further analysed. A real TWC market has emerged only in Italy, where obliged parties (i.e. energy distributors) show preference towards 'to-trade'. In Great Britain and France, an autarky compliance approach is identified, with obliged parties (i.e. energy suppliers) showing preference towards 'not-to-trade' driven by, among many factors, commercial benefits of non-trading (e.g. increased competitiveness). At the same time, results

show clearer indications of cost-effectiveness for Great Britain than for Italy. In general, high energy-saving effectiveness is observed, but low ambitious saving targets and pitfalls in the regulatory framework need to be considered to further develop TWC markets. Initial market and institutional conditions strongly suggest that trading might not be an immediate outcome. Ambitious energy targets can trigger a more dynamic usage of all flexibilities by eligible parties and thus active behaviour in TWC markets.

Keywords Tradable white certificate schemes · Market behaviour · Commercial benefits of non-trading · Ex-post policy evaluation

Introduction

In theory, the creation of tradable white certificate (TWC) markets allows obliged parties—hereafter the 'parties'—to meet a mandatory energy-saving target at lowest possible costs.¹ The Government, usually in cooperation with stakeholders, sets the target. Supporting the expanding willingness to experiment with market-based approaches in Europe (OECD 1999), TWC markets are created to take full advantages of market forces and to work in favour of increased energy efficiency; i.e. it is up to the parties to decide how to meet their given target cost-effectively. Parties are also given the option to trade certified energy savings to meet their individual

¹ For a detailed description of TWC schemes, see Bertoldi and Rezessy in this special issue.

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Economics of CSR

- Strong present in *all* commercial and ‘sustainability’ strategies
- ‘Capitalizing’ the value of increased energy efficiency
- Visible outlets: ESCOs and Smart Grids (‘Active houses’)



Key messages

- Increased competitiveness → value creation
 - Energy saving obligation quotas changing – TCEE (empirics and game theory) → Early movers!!!
- Increased competitiveness → value creation
 - Economics of CSR → Early movers!!!
- Policy instruments are critical to tap/trigger multiple benefits of increased energy efficiency
 - ‘Impact problem’ (‘unbundling’) in policy evaluation

