

European experiences with white certificate obligations: A critical review of existing evaluations

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Executive summary

Energy saving obligations and credits, better known as ‘white certificate obligations’, have been introduced in Great Britain in 2002, in Italy in 2005 and in France in 2006. They oblige energy companies to achieve certified amounts of energy savings by inducing their customers to adopt energy efficient technologies. Companies that fall short of their pre-assigned target are allowed to buy certificates from others that exceeded theirs or from qualified third parties, such as energy service companies.

This policy is advocated as a market-based instrument for internalizing externalities associated with energy use. Proponents of the instrument frequently put forward an additional argument for its implementation: To meet their energy savings targets, energy companies are forced to identify and address some of the market failures that occur in the markets for energy efficiency.

The flexibility offered by the instrument involves a variety of potential delivery routes. This poses several challenges to the economic understanding of the instrument, as well as to its empirical evaluation.

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First, to keep measurement and verification costs reasonable, energy savings are typically certified through standardized *ex ante* calculations. These calculations assume conventional installation and utilization of energy efficient technologies, two elements that in reality carry much heterogeneity. In this context, there is little chance that standardized calculations reflect real energy savings, so the effectiveness of the instrument regarding carbon dioxide emission reductions is difficult to assess.

Second, white certificates obligations force energy companies to offer solutions to energy efficiency market failures: financing provisions (subsidies, borrowing facilities) to address liquidity constraints, energy audits to address information gaps or performance guarantees to address principal-agent problems. This raises empirical issues: Given the variety of services energy companies may offer to meet their obligation, how to delineate the cost they bear? This problem further complicates cost-effectiveness assessment of the instrument.

Third, an energy-saving obligation placed on energy companies is a peculiar constraint: Saving energy directly conflicts with the business goal of selling energy. Yet at least in theory, the British, French and Italian energy markets have been liberalized according to rules set out by European directives. In this context, energy companies can overcome the above-mentioned conflict by passing-through the cost of the obligation onto their energy prices. However, whether the identified change in energy revenue (if any) is commensurate with the cost of the obligation is empirically hard to test.

In this paper, we review existing evaluations of European experiences with white certificate obligations and investigate how these analyses have coped with the evaluation challenges discussed above. We identified three evaluation sequences, each driven by a specific question. A first phase occurred at the time when the national obligations were implemented (2004-2009). As very few *ex post* data were available and the theoretical underpinnings of the instrument were still not well understood, the analysis focused on *ex*

ante microeconomic modelling. A hybrid subsidy-tax view of the instrument emerged, according to which energy producers offer subsidies to consumers for the purchase of energy efficient durables and pass through the subsidy cost onto energy prices. This view raises some issues that have not been further investigated: What are the distributional consequences of the instrument if the subsidy is granted to some consumers while being paid by all of them through higher energy prices? Beyond price-signals, does the instrument address information gaps and other market failures?

A second evaluation phase occurred after completion of the first periods of the obligations (2008-2012). As data became available, analysis focused on assessing the static efficiency of national obligations, that is, their cost-effectiveness and benefit-cost performance. A substantial effort was put into estimating the costs borne by obligated parties, taking effectiveness as given by standardized calculations. A finding robust to all countries was that energy efficiency measures were delivered cost-effectively, yet consisted mainly in low-hanging fruits. Certificate trading between obligated parties was very limited. The analysis did not offer convincing results about the degree of free-riding, the reliability of standardized calculations and the specific effect of the instrument within a broader policy portfolio.

A third evaluation phase started recently with consumer and stakeholder surveys conducted by public bodies. Attention is shifted from grossly quantifying the costs of the obligations to more finely assessing their dynamic effect on consumer decision-making and industrial organizations. While these works reveal that subsidies are key to trigger energy efficiency investment, they also underline information provisions as an important factor. Organizational change occurred differently in all countries and seemed to depend strongly on specific institutional environments. Though informative, the relevance of these surveys is

limited by issues such as the absence of control groups, so that no serious conclusion can be drawn about the additionality of white certificate obligations.

The main lesson from this critical review is that beyond country-specific outcomes, existing evaluations find benefits of white certificate obligations that largely exceed their costs. The instrument seems to address informational and organisational failures that occur in energy efficiency markets. Yet confidence in these insights is low. As of today, no econometric analysis of any national experience with white certificate obligation has been conducted. Quantifying the specific effect of the instrument on effective energy savings, on energy efficiency market transformation, and any energy price increase that may result from the obligation is a priority for future research. On the theoretical front, more work is needed to better understand the distributive impacts of the instrument, the type of market failures it can best address, its articulation with overlapping instruments and its political economy implications.