Editorial: Tradable White Certificates—a promising but tricky policy instrument

Article *in* Energy Efficiency · November 2008

DOI: 10.1007/s12053-008-9027-5

2 authors:

Nicola Labanca
Independent Researcher
63 PUBLICATIONS **1,733** CITATIONS
SEE PROFILE

Adriaan Perrels
Finnish Meteorological Institute
148 PUBLICATIONS **1,692** CITATIONS
SEE PROFILE

Energy Efficiency
DOI 10.1007/s12053-008-9027-5

Editorial: Tradable White Certificates—a promising but tricky policy instrument

Nicola Labanca · Adriaan Perrels

Received: 26 September 2007 / Accepted: 25 June 2008

A new design with old roots

In the wake of a steadily expanding climate policy portfolio tradable white certificates (TWCs) are an energy-efficiency policy instrument, which is receiving increasing attention from policy makers worldwide. Many policy makers regard them as an effective instrument to improve security of supply, to minimize negative environmental impacts of energy conversion and to maximize economic efficiency of climate policies.

Tradable white certificates have their roots in several preceding instrumental designs. Firstly, there is a heritage of integrated resource planning (IRP), demand side management (DSM), energy-saving obligation schemes for energy utilities. IRP started already in the 1970s and was enlarged to DSM and utility obligation programs in the 1980s (e.g. Hirst 1992; Schweitzer et al. 1991; Waide and Buchner, in this volume). The second line of heritage for TWCs comes from the development of the tradable property rights. Even though the idea has been around already for more than 40 years (Coase 1960), the implementation started only to pick up in the late seventies ('bubble-concept', Atkinson and Tietenberg 1991) and, more seriously, with the introduction of a cap-and-trade system for SO_2 in the USA in the eighties. Since then, a strong trend[1] favouring market-based instruments was prominent in many OECD countries. More specifically, the existing TWC systems have many features in common with greenhouse gas emission trade systems (notably EU ETS) and with green certificate systems, such as RECs (Gillenwater 2008a, b).

Essential features of tradable white certificates

TWCs are typically used in combination with an obligation scheme whereby market actors (usually retail energy suppliers or distributors) are obliged to achieve a certain amount of end-use energy saving among customers (usually a percentage of the sales measured in physical terms). Target compliance of the

N. Labanca (✉)
Dipartimento di Energia,
end-use Efficiency Research Group (eERG),
Politecnico di Milano,
Piazza Leonardo da Vinci n. 32,
20133 Milan, Italy
e-mail: nicola.labanca@polimi.it

A. Perrels
Government Institute for Economic Research VATT,
P.O. Box, 1279, 00101 Helsinki, Finland
e-mail: adriaan.perrels@vatt.fi

[1] Such trend was pushed in its turn by the rediscovery of Coasian concepts of property rights and further boosted by the notion of (possible) double dividend of tradable obligations.

obligated party requires submission to the system regulator (or another designated authority) of a number of certificates commensurate with the energy-saving target. The obligated party, i.e. the energy company, can obtain white certificates either by implementing energy-efficiency improvement measures among end-users or by purchasing white certificates from a third party. Energy-efficiency projects need to be validated and verified in order to make them eligible for white certificates. In principle, white certificate systems apply the additionality rule, meaning that TWCs are only granted to energy-efficiency projects that result in energy savings beyond business as usual. However, additionality may be interpreted in various ways.

TWCs constitute an elaborate instrument, which can be characterised by the following design features:

- a rather strict focus on savings in *energy end-use*, with limited relaxations regarding sustainable building design in which (local) renewable energy use, energy saving, and storage are integrated;
- *binding and meaningful targets* expressed in energy units, implying beyond business as usual energy-saving efforts;
- provisions to ensure that certified energy savings are *additional* to a well-specified baseline;
- extensive *monitoring and verification* systems by independent organisations;
- inclusion of *penalty systems* for breaching regulation and non-achievement of targets;
- provisions to promote or even mandate *transparency and harmonisation* in energy-efficiency project and programme assessments, thereby paving the way for the tradability of certificates;
- certificates are *tradable* or could be made tradable with a limited set of additional regulations.

All in all, TWC schemes are rather demanding with respect to design and operation of the system. This feature makes many countries rather cautious when contemplating white certificates. Furthermore, from an economic point of view it is easy to raise suspicions regarding the administration and transaction costs, interaction effects, etc. Therefore, we considered it useful to compose a special issue of the Energy Efficiency Journal on white certificates in which the strengths and weaknesses of the system are discussed and compared to alternative policies for promoting energy saving.

The principle challenges for designing and administering a TWC system

The inclusion of tradability of white certificates is usually justified with a reference to the aim of achieving the overall target against the lowest cost for society. However a series of preconditions should be satisfied for certificate trading to actually contribute to this purpose. Firstly, the definition of the energy-saving targets and their attribution to obligated parties (energy companies) should actually entail *scarcity*, otherwise a zero certificate price results (cf. the EU ETS price collapse in 2006/2007). Furthermore, the market of white certificates should be sufficiently diverse, in terms of types and number of players, both at the demand and the supply side. Yet, in practice, especially the demand side (obligated parties) may cause trouble due to already existing monopolistic tendencies in the energy markets. At the same time, the certificate market should be sufficiently transparent and liquid in order to be able to realise the cost-efficiency of the mechanism. The optimal market would have a large number of trading parties that have sufficient information on products, prices, location of the savings potential in the customer base, and opportunities to trade, although it should be taken into account that the higher the number of trading parties, the higher is the administrative burden of the system regulator. In general, market transparency and liquidity can be enhanced by, among others:

- Exchange platforms which publish volume and price of transactions;
- Allowing (limited) banking and borrowing of certificates;
- Providing certainty on demand (e.g. by formulating both long-term and intermediary targets);
- Development of a forward market;
- Introduction of financial products
- Auxiliary services with respect to the identification and surveillance of the energy-saving potential
- Broadening, under certain conditions, the scope of the market (e.g. linking to other systems, allowing for imports and exports of certificates), but this option involves many complications;

Besides trading, several other design flexibilities may be exploited to increase the effectiveness and the efficiency of TWC schemes. The most relevant flexibilities are the number of obliged parties, eligible

technologies, eligible energy end-use sectors, energy carriers and the approaches adopted to measure and verifying energy savings.

Last, but not least, a TWC scheme interacts with other energy policy instruments that were already in place prior to the introduction of the TWC scheme. Such interactions may strongly affect both the TWC scheme's and the other instrument's performances. These interactions can yield opportunities for integration, thereby enhancing the benefits of the mechanism (s), but they can also undermine the effectiveness of other instruments and hence necessitating their abolishment or redefinition. In some cases, neglect of interactions could pervert the operations of the policies, e.g by implying double counting of the energy-efficiency projects certified.

It may, hence, be argued that the design of a TWC scheme could look very different in different countries, depending on the priorities set by policy makers and depending on the country or market area addressed. It is not easy to draw definitive conclusions about the TWC scheme design options that might make TWCs more effective and efficient than other policy instruments, as plenty of factors influencing scheme outcomes do exist and such factors often strongly depend on the country and the contexts where TWCs are implemented.

However, the recent proliferation of certificate-based energy-saving obligation programmes start to provide a growing base of empirical material concerning TWC scheme implementation and operation (white certificate schemes have been or are going to be implemented in several countries on both sides of the Atlantic as well as in Australia; e.g. Voogt et al. 2005; see also Bertoldi and Rezessy, Pavan, and Crossley, in this volume). There are now better possibilities for analyzing the existing empirical evidence around TWC schemes, concerning their effectiveness and efficiency and the relations between the performance and the various schemes' design characteristics.

The themes tackled in this special issue

We have, hence, decided to invite some of the most experienced specialists existing in this research sector to participate in this special issue. On purpose, we invited specialists with diverse backgrounds. Similarly, we also invited people that would not hesitate to critically review the alleged merits of white certificates. The questions raised range from basic design requirements to overall macro-economic effectiveness. Key questions concern among others:

- What are the key variables influencing TWC schemes performances and how could these be possibly improved in the countries where white certificates are in place?
- Under what conditions can a TWC scheme be more effective and cost-efficient with respect to other existing energy policy instruments?
- What is the additional value or benefit that a TWC scheme brings to the existing energy policy portfolio?

Such questions outline the main subjects of the papers included in the present special issue.

Some of these papers were, right from the start, meant to clarify a particular aspect of the white certificate system. In those cases, it was expected that a full paper was submitted. Furthermore, with respect to two actually operating systems (Italy and New South Wales), it was requested to provide an account of the operations and achievements so far. These papers add important empirical evidence to the occasional material presented in the other papers. In addition, some experts were requested to provide review papers, more or less in the fashion of a discussant. These authors also got the opportunity to read some contributions of other authors. In most cases, these discussant papers go beyond merely commenting the results and conclusions of others papers, and truly pose a discussion in their own right.

The paper written by Paolo Bertoldi and Silvia Rezessy describes the concept and the main elements of a tradable white certificate scheme and discusses design and operational features that are key to achieve the overall saving targets. Such paper looks also at a number of open issues, most importantly, the possibility of creating a voluntary market for white certificates via integration into the carbon market.

Marcella Pavan analyzes, in her paper, the major design elements of the Italian TWC scheme, illustrates the overall progress and the emerging issue at 3 years after scheme activation and suggests a series of complementary measures that could contribute to improve its performances.

David Crossley provides a comprehensive overview of the trading scheme for energy-efficiency

certificates operating in the Australian State of New South Wales and the Australian Capital Territory. After discussing some of the major issues emerged in relation to this scheme, he illustrates how the recent activities undertaken by the Australian territory governments and by the Commonwealth Government to redesign the Australian emission trading scheme may affect the future of energy-efficiency certificates.

Whereas the concept of white certificates and the experiences matured under the existing TWC schemes is the main subject of the articles above mentioned, the other manuscripts in the present special issue mostly take the analyses reported in these articles as a starting point to address the general research questions we have proposed.

Steven Meyers and Stephan Kromers focuses, in their paper, on the energy-saving measurement and verification methodologies that may be considered under TWC schemes and on the possible options to reduce transactions costs.

Paul Waide and Barbara Buchner provide a review of the experiences with utility energy-efficiency schemes, notably in the USA. After a comparison with the more recent schemes implemented on both sides of the Atlantic as well as in Australia, they attempt to assess what is new about white certificates and what may make such certificates more effective than utility financed and/or operated energy-efficiency schemes that have been implemented since the early 1970s.

Rachel Child et al. provide with their paper the results of a systematic analysis related to the interactions and possible integration of white certificate schemes with green certificate schemes, the European Union Emission Trading Scheme (EU ETS), the building energy certification introduced in Europe through the Energy Performance in Building Directive and other energy policy instruments used in the European Member States including fiscal instruments, soft loans and voluntary agreements.

The paper written by Luis Mundaca et al. reports the results of an empirical analysis on TWC market behaviour focusing on what in the article is referred to as the *to-trade-or-not-to-trade dilemma* and on the set of flexibilities that may be given to obliged actors to meet their energy-saving target in a cost-effective way.

In his paper, Adriaan Perrels analyses under what conditions a TWC scheme can have equal or superior effectiveness and economic efficiency as compared to other instruments and performs a comparative assessment of a TWC scheme with an energy tax as implemented in two European countries.

Torstein Bye and Annegrete Bruvoll show how brown certificates with exemptions, green certificates and white certificates work as a combination of taxes and subsidies, how the effects of these energy policy instruments depend on energy market demand and supply elasticities and on the sequence of their introduction.

Acknowledgement Many of the manuscripts in this special issue are based on work carried out in the EuroWhiteCert project[2] financed by the European Commission and concluded in April 2007 (Contract number EIE/04/123/S07.38640). Without the research activities accomplished under the EuroWhiteCert project and the support received by all the participating organizations, the present special issue would not have materialized. We would, hence, like to thank all the experts who have contributed to the development and the successful conclusion of this project.

Next to the contributors to this issue we also like to thank the experts that have participated in the peer-review process, and, last but not least, the journal's editor-in-chief Paolo Bertoldi, who kindly provided his valuable support for the publication of the present special issue.

References

Atkinson, S., & Tietenberg, T. (1991). Market failure in incentive-based regulation: the case of emissions trading. *Journal of Environmental Economics and Management*, *21*, 17–31.

Coase, R. H. (1960). The problem of social cost. *Journal of Law and Economics*, *3*, 1–44.

Gillenwater, M. (2008a). Redefining RECs—Part 1: Untangling attributes and offsets. *Energy Policy*, *36*(6), 2109–2119.

Gillenwater, M. (2008b). Redefining RECs—Part 2: Untangling certificates and emission markets. *Energy Policy*, *36*(6), 2120–2129.

Hirst, E. (1992). Price and cost impacts of utility DSM programs. *Energy Journal*, *13*, 75–90.

Schweitzer, M., Hirst, E., & Hill, L. J. (1991). Demand-side management and integrated resource planning: findings from a survey of 24 electric utilities. *Oak Ridge National Laboratories and Martin Marietta for US Dept. of Energy*, ORNL/CON-314. http://www.ornl.gov/~webworks/cpr/v823/rpt/46047.pdf

Voogt, M., Luttmer, M., & de Visser, E. (2005). Review and analysis of national and regional certificate schemes—*EuroWhiteCert project—task report work package 2*, http://www.ewc.polimi.it/dl.php?file=Report%20on%20certificate%20trading%20schemes.pdf

[2] Visit the project website at www.eurowhitecert.org for more information.