ELSEVIER

Energy Policy 31 (2003) 1–2

ENERGY POLICY

www.elsevier.com/locate/enpol

Preface

Green certificates and emission trading

Greenhouse gas (GHG) reduction targets are to an increasing extent at the core of the energy and environmental policies of the European Union and its member states. Looking back at the Kyoto protocol the European Union has agreed on a common GHG-reduction of 8% during the period 2008–2012 relative to 1990. Although this protocol is not ratified the reduction targets mentioned do prepare guidance for the policies of the European Union and its member states.

In the implementation of these GHG-targets, the deployment of technologies based on renewable energy resources is expected to play an important role. In its White Paper on a strategy for developing renewable energy technologies the EU-Commission has launched a goal of covering by renewable energy supplies 12% of the European Union's gross inland energy consumption by 2010. These supplies would be mainly biomass, hydropower, wind energy and solar energy. Next to biomass, wind energy is foreseen to be the main future contributor (European Commission, 1997).[1] In line with this the European Commission (European Commission, 2000) has recently launched a directive on the promotion of renewable energy technologies for power production (RES-E). This includes a proposal on the share of RES-E in the individual member states in 2010, based on the percentage of each country's consumption of electricity. Thus the directive signals need to include renewable energy technologies as one of the serious options in achieving the targets for GHG-reductions.

To reach these targets for RES-E deployment a number of different policy instruments are on hand. Among the highly relevant ones is the establishment of a market for tradable green certificates (TGCs), which within the past few years have gained an extensive interest in Europe and elsewhere. Markets based on green certificates or equivalent instruments are already established a number of places, among these Australia, Holland, England, Italy and Texas. Other countries are in the preparation phase. Sweden and Belgium (Flanders) are moving fast towards certificate-schemes, while although an early mover the Danish Parliament has postponed the introduction in Denmark until 2004–2005.

The initiatives to establish national green certificate markets are very much in line with the fixed targets for renewable development launched by the EU-commission. Although the different countries have not chosen the same concept for establishing national green certificate markets, nevertheless there seems to be a good starting point for establishing an *international* green certificate market. An important feature of the TGC-approach is actually the possibility of international trade in certificates. This will ensure a cost-effective siting of renewables and their development. The renewable technologies will be established in countries with the highest production potentials and where renewable energy can be produced at the least cost. Problems in fulfilling the national quotas will be handled by importing TGCs, while the surplus of certificates may be exported to countries with a shortage. This ensures that the national targets for developing renewable energy technologies are reached in the most cost-efficient way.

But how a TGC-market will function, both on its own and interacting with other policy instruments and markets is not a trivial matter. This special issue of Energy Policy takes its starting point in a recently held workshop on tradable green certificates and tradable emission permits, which received financial support from the Danish Energy Agency's Energy Research Programme. The workshop was held in Copenhagen September 10–11 2001 with 40 participants from eight European countries. Most of the workshop contributions focused on tradable green certificates, which is reflected in the selection of the nine papers in this issue.

The papers are divided into three parts. Part one consists of three papers that give an introduction to the theoretical challenges related to TGC systems. Part two provides three surveys of national systems of tradable certificates and permits. Finally, part three consists on three studies of the interplay between TGCs and tradable emission permits (TEPs).

Part one consists of three papers by Nielsen and Jeppesen, Fristrup and Lemming. The paper by Lene Nielsen and Tim Jeppesen considers the possibility for constructing a unified system for TGCs within the European Union. They find that the proposed systems

[1] The 12% target includes large-scale hydro, for which the potential for further exploration in the EU is very limited for environmental reasons.

0301-4215/03/$ - see front matter © 2002 Elsevier Science Ltd. All rights reserved.
PII: S0301-4215(02)00111-8

differ on four crucial points which have to be harmonised prior to a common TGC market: technologies eligible for certificates; market stabilisation mechanisms, demand initiating mechanisms; and finally coexisting regulatory schemes directed at renewable energy. The paper by Fristrup discusses the problems related to ensure the overall efficiency of a TGC system with a mandatory demand put on electricity consumers. In order to create sufficient incentives for deployment of new production capacity, the existence of multiple sources of renewable energy covered by the TGC system or just large differences in cost might lead to unintended gains to existing producers of renewable energy. The paper by Lemming describes how the financial risks to potential investors in wind turbines as well as the existing owners will be affected by the introduction of a TGC system. Producers will be exposed to fluctuations in both wind and TGC prices. Fortunately, these two factors will likely be in counter-variation which leads to potential gains by applying proper forward strategies in the TGC markets.

Part two is focused on national trading systems and consists of three papers by Lorenzoni, Boots and Varma. The Paper by Lorenzoni describes the new support mechanism for renewables energy technologies in Italy, based on the green certificate concept, which was introduced by January 2002. Boots looks at the certificate system introduced in the Netherlands, especially addressing how the certificate system and a future emission trading scheme may interact. The paper by Varma looks at the cost-effectiveness of UK's Climate Change levy, its implications on competitiveness of firms and the environmental impact.

Part three is related to the interactions between TGCs and emission trading and three papers are included. Jensen and Skytte make a theoretical study on the interaction between TGC, TEP and power markets. They show that due to the interaction between the markets different settings of the quotas for TGCs and TEPs result in counterintuitive effects on the consumer prices. Morthorst looks at the complex interplay between three international markets for green certificates, emission trading and liberalised power trade, especially seen in relation to achieving national targets for emission reduction. Finally, Ravn et al. describe an empirical model for the Baltic Sea area including trade in power, certificates and emission permits. To a certain extent they demonstrate the effects of interacting markets found by Jensen and Skytte and by Morthorst.

Poul Erik Morthorst, Klaus Skytte and Peter Fristrup
Guest editors
Risø National Laboratory

References

European Commission, 1997. Energy for the future: Renewable sources of energy. White Paper, 26/11/97.

European Commission, 2000. Proposal for a directive of the European parliament and of the council on the promotion of electricity from renewable energy sources in the internal electricity market.

P.E. Morthorst
Riso National Laboratory, Research Specialist Systems Analysis Department, P.O. Box 49, 4000 Roskilde, Denmark
E-mail address: p.e.morthorst@risoe.dk