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Energy research Centre of the Netherlands

REVIEW OF INTERNATIONAL EXPERIENCE WITH RENEWABLE ENERGY OBLIGATION SUPPORT MECHANISMS

The main policy instruments currently used in the EU Member States to achieve the targets set for electricity produced from renewable energy sources are:

1. the quota obligation system,
2. the feed-in tariff system,
3. the tendering system.

The current study, commissioned by Dutch Ministry of Economic Affairs, aims to review the experience gained with the quota obligation system, and thus to provide background information to enable the Dutch Government to better determine its own position in national and European discussions on renewable electricity support schemes.

The report provides an overview of the regions where obligation systems have been implemented and contains a detailed evaluation of the performance of the obligation systems in the USA, the UK and in Sweden. The obligation systems in these countries have been evaluated based on the following criteria:

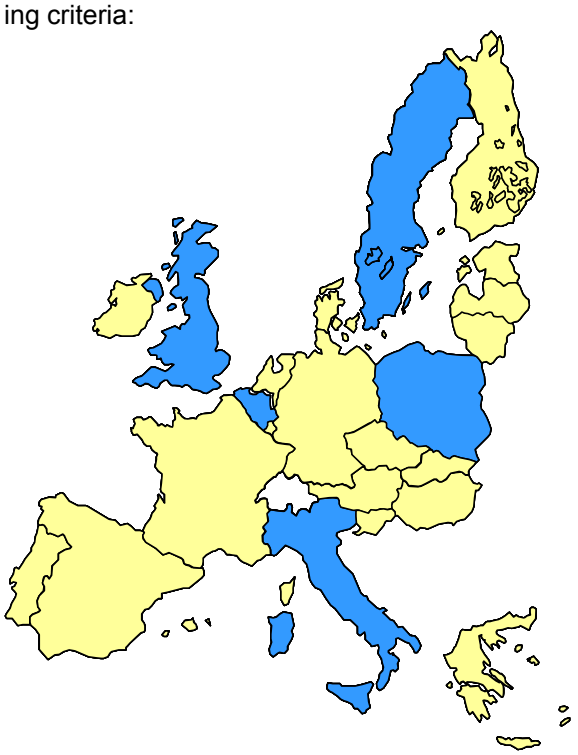

Figure 1 *Support mechanisms in EU-25*

- *Effectiveness*: Defined in terms of achieving a large amount of RES-E capacity added or production generated, this indicator relates to the quantitative impact of the obligation system in promoting new renewable energy.

- *Market efficiency*: Obligation systems are often argued to result in cost competition and therefore a minimization of costs in supporting renewable energy. In principle, well defined obligation markets should lead to such competition and therefore an efficient allocation of resources in support of renewable energy. Do obligation/TREC markets function well in practice, minimizing the cost of supporting renewable energy?

- *Certainty for RES-E industry:* Growth of RES-E capacity ultimately depends on the decisions of individual investors. This criterion assesses whether or not the system is perceived as stable in the short and long term from the perspective of investors.

- *Cost effectiveness*: This measure is defined as the costs per kWh of RES-E, including the 'dead weight' costs such as transaction costs, overcompensation of certain market actors etc.

- *Stakeholder support for the system:* The success of the obligation system may depend, in part, on the level of support the system has from various stakeholders. Widespread stakeholder support may also indicate a well-functioning policy.

- *Equity:* From a government point of view and for long-term sustainability of the system, a fair distribution of costs and benefits of RES-E implementation over various stakeholders is important.

Overall conclusions for each criterion:

Effectiveness
Definite conclusions on the effectiveness of quota obligation systems in terms of reaching the set RES E targets cannot yet be drawn. Where targets have not been achieved, it has been primarily due to poor policy design and a lack of certainty for renewable energy producers; permitting barriers have also arisen. In addition, there are some instances of strategic behaviour of obligated actors leading to unwanted side effects. These teething problems may well be solved over time when the actors become more familiar with the system and market forces bring about a more stable equilibrium. In addition, several revisions are being proposed to address the problem of long-term security and to create a conducive environment for negotiating long term TREC sales contracts, which will also reduce the incentive for strategic behaviour. Experience in the US shows that if certificates are delivered under long-term agreements, the effectiveness of an obligation can be high and compliance levels can be reached. Whether and under what circumstances such long-term contracts are available will be a key determinant of success for obligation policies.

Market efficiency
In Europe, market efficiency generally is rather poor because of the limited number of participating actors and/or producers, and because of the limited degree of long term contracting. It is expected that, over time, as the market size increases and as the systems are revised to facilitate long term contracting, market efficiency will improve leading to lower long and short-term TREC prices.

In the US, where the obligation system was introduced earlier and negotiating long-term contracts is more common, market efficiency is generally satisfactory in a number of states. In other states, however, short term TREC trade dominates, and that trade is sometimes at high prices that are more driven by penalty levels than by supply and demand. To some extent, this is a remarkable observation, contrary to what intuitively is perceived by many as efficient. If TRECs are delivered under long-term agreements, the TRECs are effectively withdrawn from the market and the price may not be known publicly. This hampers liquidity and transparency of the short term TREC market, but to the extent that renewable energy developers are able to deliver lower cost renewable generation with the certainty of a long-term contract, such contracting will lower the cost of compliance with the obligation and thereby increase efficiency.

Certainty for the renewable energy industry
A sufficient level of certainty for the renewable energy industry is imperative for a well functioning obligation system. A precondition is to set long-term RES E targets: ten years ahead appears to be the minimum horizon, which is already a long period from a political point of view. Uncertainty due to short-term TREC price fluctuations is notably a problem in the UK due to the recycle payment. Revisions of the obligation system as a result of a review can also easily lead to greater uncertainty among RES E producers. This may limit the government's flexibility to adjust the system in the course of time.

Cost effectiveness
Obligation systems can encourage cost reduction and competition, but its design is more complex than a feed-in tariff. An obligation system will generally stimulate the lowest cost and least risky renewable technologies, thereby allowing a set target to be met in an efficient way. Moreover, the total costs of an obligation system can be capped by the size of the quota and the level of the penalty. Short-term TREC markets can lead to overcompensation of existing capacity or low-cost production, but this can be countered in several ways. First, by technology-specific (investment) subsidies, creating a more level playing field in the TREC market, or by developing technology or vintage tiers under the obligation system. Furthermore, the cost effectiveness of an obligation system can be improved by (1) using penalty revenues to stimulate renewables, instead of flowing to the state; and/or (2) encouraging a high level of compliance by setting a relatively high penalty.

The system employed in various US states, where obliged suppliers offer long-term contracts to producers in competitive tenders, seems to have the benefit of combining effectiveness and cost efficiency. Without the use of some of the mechanisms described above, and absent careful design, international experience shows that obligation systems will not lead to cost-effective outcomes.

Stakeholder support for the obligation system
Generally speaking, there is sufficient support for the obligation system from the key renewable energy stakeholders, both in Europe and in the US. The obligation system is often perceived to provide more long term security, at least relative to earlier support policies in the countries in which obligation systems have been introduced, because obligation systems may be less prone to changing political circumstances, compared to other RES-E support instruments. Most criticism therefore is not so much directed against the system itself, but more against specific design elements of the system. Those that have initially opposed obligation systems have generally been the obliged suppliers and industrial customers. In addition, in those countries with well-functioning feed-in tariff systems, obligation systems are often opposed by renewable energy industry lobbies, which have grown accustomed to the existing support system and do not want to risk a new and uncertain policy.

Equity
Equity aspects should be duly taken into account when designing a quota obligation system to ensure sufficient long-term support from the main stakeholders. Obligation systems seem to be less suited for small RES-E producers. Other important aspects are the exemptions of particular groups from the system, and the creation of a level playing field for RES-E technologies.

Final remarks
The evaluation of international experiences with the obligation system gives rise to a mixed picture. Although an obligation in theory is effective and cost effective, it seems too early to conclude that the system delivers these promises in practice. On the one hand this is due to the limited period of implementation that makes it hard to distinguish between the direct effect of the system and some teething problems that will be solved in due time. On the other hand, the conclusion can be drawn that the obligation is a complex system, which will only function well if designed carefully.

It does seem worthwhile, however, to continue monitoring the experiences with the obligation system abroad, because this will further reveal whether the system is indeed effective and cost effective in practice. In the longer term, e.g. beyond 2010, the introduction of an obligation system in the Netherlands could be considered.

Finally, as the design of support schemes is being improved, it appears that the basic concepts of both the obligation system and the feed in system have been refined in such a way that the two systems are gradually converging. An important difference between the two systems however remains, namely that an obligation system relies more on market forces whereas the feed-in system is based on a greater involvement of the government.

More information?
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