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Optimizing the Framework Conditions for Renewable Energy and Cleantech Solutions Using Grants, Feed-in Tariffs and Tax Incentives – A Project Outline

by
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Introduction

I was recently given the honour to moderate a session at the 2009 Nordic Climate Solutions conference regarding the subject: Optimizing the Framework Conditions for Renewable Energy. The official outline of the subject was the following: *"Investing in renewable energy can seem difficult when price on oil is volatile and investors are asking for certainty and price signals. What conditions are needed in order for renewable to be competitive with fossils?"*

In this brief presentation I have summarized some of my considerations in this context. An interpretation of this outline at least gives rise to the statement that investing in renewable energy is in fact considered difficult in many situations. The reasons for this are many, including the continuing existence of a performance span (supply) compared to fossils. There is hardly any doubt that this assumption still holds true and will continue to do so in a number of years, even though the span is closing. Moreover, it lies implicitly in the above outline that investing is hard, as a consequence of volatile fossil prices (demand). I shall not try to argue that fossils are not facing volatile pricing. If externalities are in fact internalized and reflected in the price of a fossil based product, this will

(ceteris paribus) improve the competitive situation for renewables which are not causing such externalities. This objective may be achieved by various means by creating a carbon-price signal, including carbon taxes and cap and trade (emission trading) schemes. Such a conclusion points towards the next issue regarding the regulatory framework, since we cannot expect the market to carry out this task if regulation is not provided to a certain extent.

The pace of the economic shift/conversion and the prevalence of new technologies are critically dependent on legislation and regulation as driving forces. There is an ever returning request for a stable regulatory framework, which also implies that a sufficient framework is presently absent. This is in line with the impressions from previous conferences and the ongoing debate, where a demand for a "Steady or stable regulatory framework" is often presented. Only when such a framework exists can research and investment decisions be made.

General policy drivers

Increasing the price of emissions

An important instrument is cap-and-trade systems, which impose limitations on maximum emission rates while issuing negotiable/tradable quotas/permits. Such a system has been introduced by the Kyoto protocol and in the EU as regards greenhouse gases. However, binding limitations on the emission of greenhouse gases – covered by the Kyoto Protocol – were not implemented until 2008. From 2012, the emission reductions are governed by the Copenhagen protocol hopefully agreed upon at COP15. In theory, this system should create a market situation where renewables are in fact becoming a more attractive alternative if the fossil prices are high at the same time.

Within the field of taxation the energy taxation directive exists, which also refers to the Kyoto Protocol in its preamble[1]. The directive which may be viewed as EU's duty contribution to comply with the Kyoto Protocol also includes minimum rates to energy products and has as one of its targets a partial harmonisation of duty rates in order to realize EU's Internal energy market[2]. Quota companies will typically be subject to CO_2 taxes which may be said to constitute double regulation[3]. Such

[1] See directive 2006/96 on restructuring of EC provisions on taxation of energy products and electricity. Please for instance refer to *Dias Soares* in EC Tax Review 2007-4, p. 184 et seq., who refers to the existing double regulation of the energy sector as a consequence of this directive and the quota directive.

[2] See *Pagh* in TfM 2007, 415.

[3] See the explanatory notes to law no. 464 of 9.6.2004 (L 229), item 3.6 and the Report of the Danish Ministry of Taxation: Omfanget af dobbeltregulering af CO_2-udledningerne ved kvoter og afgifter, March, 2006. Please refer to this double regulation in an EU context, *Dias Soares* in EC Tax Review, 2007-4, p. 184 ff. The author argues that double regulation leads to loss of efficiency that cannot be based on environmental profits which could justify compliance with the Lisbon strategy. Please also refer to the same author in Chalifour et al (red.):

companies will have an incentive to reduce CO_2 emissions equal to the quota price plus CO_2 tax, but outside the quota system, the incentive will only equal the CO_2 tax.

Parallel to this, a number of countries have introduced specific environmental taxes including carbon taxes. The countries include UK, Denmark, Sweden, Norway, Finland, Netherlands, some US states, Switzerland, British Columbia in Canada[4]. Significant players are however still on the fence[5].

Policy goals

Especially the roadmap for renewable energy under EU auspices may function as a driver in this development within Europe[6].The roadmap contains a stated objective that 20 per cent of the collective energy consumption must come from renewable energy sources by 2020. Other proposals are that CO_2 quotas should not be allocated free of charge and that the subjective scope should be expanded, e.g. to include ship and air traffic. Similar developments are seen throughout the world.

Design of a regulatory framework

To overcome the above mentioned challenges, a number of approaches are available in order to provide better opportunities for renewable energy. Basically two overall approaches are available: *technology push* and *demand pull*. The actual design comes in many forms, varying from the direct economic grant/subsidy to different forms of tax incentives for R&D activities and/or investors. Evidently, I have left out a number of other issues which should be addressed in order to achieve an overall goal of optimizing the conditions for renewable energy sources and cleantech solutions.

Governmental support to any given renewable energy source is based on a political objective to improve the technology and the market potential. However, researchers have successfully demonstrated that a political decision to support a specific renewable technology does not by itself guarantee that this specific technology becomes reliable and efficient[7]. Technological development is a

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Critical Issues in Environmental Taxation – International and Comparative Perspectives, vol. V, 2008, p. 205 et seq., in which it is demonstrated that no sound arguments seem to exist to withhold double regulation. *Sullivan* analyses in Tax Analyst: Energy – a special supplement to tax notes, state tax notes, and tax notes international, 2006, p. 29 et seq., "carbon tax" towards "cap-and-trade" systems but does not include the situation that double regulation might occur.

[4] See to this *Gnaerdinger* in Tax Notes Int'l July 20, 2009, p. 169 et seq.

[5] See *Wei* in Tax Notes Int'l October 19, 2009, p. 166 et seq. regarding China's considerations regarding the implementation of a carbon tax reform. China's Ministry of Finance recently released a carbon tax report.

[6] See COM(2006) 848 final: Renewable Energy Road Map. Renewable energies in the 21st century: building a more sustainable future.

[7] See *Skytte et al.:* Støtte til vedvarende energi, 2004 presenting a checklist regarding policy recommendations on support schemes, p. 164 et seq.

complex and dynamic process. The design of an optimal incentive structure should take into consideration existing dynamics in the system, removal of barriers and the lifecycle of the specific renewable in question. Eager proponents of the "send-more-money"-philosophy should be realistic about this. To my knowledge there is no proof of which design is the optimal design in this respect.

Types of incentives

Incentives for the use of renewable energy sources can be designed in a number of different ways and no specific design seems to be preferred among policymakers around the world. It is a well-known fact that *taxation* plays a leading role as an instrument in climate policy and environmental policy[8]. This may be in the shape of taxation on pollution and emissions (discouraging) or by the introduction of special taxation incentives (encouraging)[9]. Taxes can even be used to internalize environmental externalities[10]. Within the field of tax, a number of different incentives have been seen[11]:

- Subsidies/grants (tax exempt)
- Reduced corporate income tax rates
- Tax holidays
- Investment allowances and tax credits (reductions in taxes that are based on the amount of investment and are in addition to normal depreciation)
- Accelerated depreciation (allowing businesses to write off depreciation more rapidly)
- Exemptions from indirect taxes, such as import tariffs on inputs.
- Export processing zones (special zones for exporters); enterprises in such zones are typically exempt from all indirect taxes and, in some cases, all direct taxes.

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[8] See *Cooper* in Tax Analyst: Energy – a special supplement to tax notes, state tax notes, and tax notes international, 2006, p. 103: *"...It is important to our country that the tax laws continue to provide needed tax incentives..."*.See moreover for instance *van den Brink* in ET 2008, p. 251 et seq., Tax Analyst. Energy – a special supplement to Tax Notes, State Tax Notes, and tax notes international, 27 November, 2006 and *Hemmingsen*: Miljøskatter, 1997, and *Hemmingsen* in Julebog, 1996: Miljøskatter – et nyt beskatningsinstrument, p. 39 et seq., on the role of taxation in the climate area. On the latest reorganisation of Danish green taxes, see *Clausen* in UfS 2008, p. 2927 et seq.

[9] See for instance *Haseeb Ansari* in Deketelaere et al (ed): Critical Issues in Environmental Taxation – International and Comparative Perspectives, vol. IV, p. 2006, p. 51 ff. and on green tax reforms in Europe, *Ekins & Speck* in Chalifour et al (red.): Critical Issues in Environmental Taxation – International and Comparative Perspectives, vol. V, 2008, p. 77 et seq.

[10] See *Ashiabor*: Fostering the Development of Renewable Energy through Green taxes and Other Instruments, Bulletin, 2005, p. 295 et seq.

[11] See *Bakker* (ed.): Tax and the Environment – A world of possibilities, 2009, p. 20 et seq.

At least from the perspective of tax incentives, it has been stated that policymakers should bear in mind the following issues when designing such initiatives[12]:

- The reason why incentives are introduced
- Whether tax incentives really influence the behaviour of taxpayers
- Costs related to tax incentives
- Administration costs
- Complexity
- Governance and corruption problems
- Distortion of the market.

In the remainder of this brief presentation I shall try to illustrate some of the approaches used throughout the world in recent times with respect to creating incentives for renewable energy sources. Not all incentives are of a fiscal nature. Moreover, it is seen that some initiatives are of a general nature and concern the general business environment or country rather than a specific renewable energy source[13].

A recent example of direct subsidies is the *Swedish* 2009 contribution for solar panels ("solcellsbidrag"), contributing op to 60% of the investment cost within certain limits for businesses, organizations and individuals. See e.g. *Feuk* in NyTeknik, 9 March 2009, www.nyteknik.se/nyheter/energi_miljo/solenergi/article533368.ece_and_svt.se, 14 July 2009. The arrangement has been planned for 2009-2011.

Spain has introduced a special tax regime for solar power investments, including fixed tariff, accelerated depreciation (up to 30% per year) and upfront 6% tax credit (carry forward for 10 years).

The *United States* economic stimulus package (The American Recovery and Reinvestment Tax Act of 2009) includes a range of energy incentives, including an extension of Production Tax Credits and Investment Tax Credits and the introduction of a new tax credit (Advanced energy investment credit), the latter being 30% of qualified investment an any qualifying advanced energy project. The act includes an expansion of the amount of New Clean Renewable Energy Bonds and Qualified Energy

[12] See *Bakker (ed.):* Tax and the environment – A world of possibilities, 2009, p. 22 et seq.

[13] See in general *Bakker* (ed.): Tax and the Environment – A world of possibilities, 2009, p. 77 et seq. with country reports and *Deketelaere et al (eds.)*: Critical Issues in Environmental Taxation – International and Comparative Perspectives, vol. IV, p. 2006, and *Chalifour et al (eds.)*: Critical Issues in Environmental Taxation – International and Comparative Perspectives, vol. V, 2008 regarding various issues on the matter.

Conservation Bonds. Moreover, the act includes a provision increasing a tax credit for qualified energy efficiency improvements and certain residential energy property expenditures[14].

The *Chinese province of Guangzhou* has introduced a specific tax exemption for Cleantech companies, which includes 100% tax exemption for corporate tax for the first three years and 50% exemption for the following three years[15].

Germany has introduced very favourable fixed tariffs regarding electricity from renewables. The German feed in tariff (FIT) has received a lot of attention and recognition and is generally regarded as the best example of an effective FIT law. The German FIT law has been in development since 1979. In 2000, the Erneuerbare-Energien-Gesetz (EEG), otherwise known as the 2000 Renewable Energy Sources Act, was introduced. The EEG introduced a number of changes, including a differentiation in tariff rates depending on the renewable energy type, size and site. It also extended the range of technologies to be covered and replaced the StrEG's percentage-based rates with fixed rates over fixed periods – 20 years from the start of operation of each new qualifying plant. The tariff rates were determined by scientific studies, which determined the tariff figure that would allow profitability and the use of state-of-the art technology. The EEG Amendment in 2004 committed Germany to increase the share of renewable energy in the country's total electricity supply to 12.5% by 2010, and to at least 20% by 2020. The tariff rates in the 2004 Amendment ranged from EUR 0.0539 per kWh for electricity generated from wind, to EUR 0.5953 kWh for solar electricity from small facade systems. The rates at which the guaranteed tariff would reduce each year (annual digression rates) were also set fairly high in the amendment, ranging from 1%-6.5% annually depending on the technology. The tariff rates are set to reduce annually in this way, because it encourages technical innovation and cost cutting in the renewable energy sector.

As a recent example, *Bulgaria* has increased the feed-in tariffs regarding renewable energy sources.[16] With a decision dated 30 March 2009, the State Energy and Water Regulatory Commission (SEWRC) adopted a new feed-in tariff applicable until 1 April 2010. The increase specifically concerns one of components of the price calculation of electricity which is now app. EUR 32.93. To this, an add-on amount of 95% of the add-on of the previous year. Significant changes were also introduced regarding the length of the renewable energy contracts have been made lengthier (e.g. up to 25 years for photovoltaic projects).

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[14] See *Cunningham* in International Tax Review, March 2009, p. 41, *Hinckley & Bravo*: Additional Support for Green Energy, Deloitte, February 2009, *Stretch & Kummer*: An analysis of the tax provision in the American Recovery and Reinvestment Act of 2009, Deloitte, *Doggett*, Reuters: Lawmakers okay tax breaks in Obama plan, Jan. 22, 2009, Law 360, April 2, 2009: Stimulus Potential For Cleantech, and *Smith & Stamper* in Grant Thornton: Taking Advantage of tax incentives for cleantech companies, 2009.

[15] See http://cleantech.com/news/print/4233.

[16] See e.g. *Rizova-Clegg* in DLA Piper Bulletin, 23 April 2009.

In *Denmark* there are fixed tariff regarding electricity produced from renewable energy. Windmills can receive feed in tariffs. The actual payment depends on the date of the connection of the mill to the grid. E.g. a tariff of DKK 0.25 per kWh for 22,000 hours are provided for mills installed after 2008. Biogas plant can receive a fixed tariff of DKK 0.745 per kWh or DKK 0.405 per kWh, when biogas is used in combination with other fuels. Biomass plant may receive a grant of DKK 0.15 per kWh. Other renewable installations, including wave power, solar power, fuel cells may receive a fixed tariff (including the marked price) of DKK 0.60 per kWh for 10 years and DKK 0.40 per kWh for the following 10 years. Solar cell panels may be used to store energy on the grid, which gives the producer a right to make use of a similar amount of electricity without paying certain consumption taxes. Alongside, Denmark has adopted a system of Tradable Renewable Energy Certificates (VE-beviser) which are tradable financial instruments. The certificates are issued to producers of renewable energy who may sell the certificates and make additional profits from renewable energy projects. The consumers are obliged to purchase certificates regarding a certain amount of their energy consumption. The price of the certificates varies. Moreover, a certain amount of public funds are available to support renewable energy. Individuals owning windmills or parts of a windmill may chose to be taxed according to a specific regime in Denmark. More than DKK 3,000 include 60% as taxable income. If this is used, no expenses can be deducted from the gross taxable income, including depreciations. If this regime is used, the windmills will, as a result, be considered used only for private purposes. If, on the other hand, the income is taxed according to normal tax legislation, the mill will, as a result, be considered used only for business purposes.

Perspective

The objective of this paper has been to shed light on the need for optimizing the framework conditions for renewable energy and cleantech solutions through a stable regulatory framework. We have demonstrated the existing directions in the design of such a framework and specifically illustrated different design strategies by way of grants, feed-in tariffs and tax incentives. All of which have been used widely in recent times in different countries. It is my guess that the world will see much more to incentives systems for renewable energy sources and cleantech solutions in the time to come. Based on this, it is obviously relevant and needed to conduct research regarding the optimal design of framework conditions and the economic and legal implications of different mechanisms.