SECURING REGULATORY STABILITY IN A RENEWABLE PORTFOLIO STANDARD – THE CASE OF THE NETHERLANDS

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Abstract

The Dutch support schemes for renewable electricity production are in different ways characterised by regulatory instability. At the moment, the replacement of the present feed-in-system with a demand-side Renewable Portfolio Standard (RPS) is discussed in the Netherlands. A RPS can create higher economic efficiency in the realisation of sustainability targets than a feed-in-system. However, the presence of regulatory instability creates more uncertainties for investors in a RPS than in a feed-in-system. These uncertainties can result in a low effectiveness and cost-efficiency of a RPS. Therefore, this paper considers possibilities to structurally break the trend of regulatory instability for the design of a RPS for the Netherlands. In order to do so, the origin of regulatory instability was further explored based on theories on regulatory governance in the utility sector. Based on this, this paper proposes to internationalise the RPS. Internationalization of the Dutch RPS connects and adapts the design and execution of the Dutch RPS to the RPS of another Member State of the European Union. This will structurally secure a stable RPS, as it fully restricts the ability of the Dutch government to unilaterally change or cancel the RPS. In order to further explore the potential of internationalisation, the main characteristics of a Dutch RPS connected to the existing Swedish RPS were defined. This revealed several advantages of a connection to the Swedish RPS, next to securing regulatory stability. It creates a higher cost-efficiency and a better functioning of the certificate market connected to the RPS compared to a Dutch RPS. However, these advantages of a joint RPS have to be carefully weighed against a possible stimulation of the Swedish economy by the Dutch electricity consumers.

Keywords: Renewable Portfolio Standard; the Netherlands; regulatory stability; regulatory governance

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1. INTRODUCTION

At the moment, a new support scheme for renewable electricity is considered in the Netherlands. The main objective of this support scheme is to contribute to the national target on the share of renewables in the total energy consumption laid down by European Directive 2009/28/EC. The Dutch government has translated this target in the objective to realise 37 percent of the total electricity supply from renewable sources in 2020. A demand-side Renewable Portfolio Standard (RPS) is for various reasons seen as an interesting option to achieve this objective. Firstly, it creates a continuous incentive for renewable electricity producers to seek cost reduction. Furthermore, the selection of technologies for renewable electricity generation is made by market forces rather than government evaluation. Lastly, a RPS can be directly linked to government policy targets (Berry and Jaccard 2001; Lipp 2007; Langniss 2003).

In general a RPS exists of three main components, namely a right for producers of renewable electricity to receive certificates, a quota obligation for suppliers creating a demand for these certificates and a market that brings the renewable electricity producers and electricity suppliers together. Currently, renewable electricity generation is in general not competitive with conventional electricity generation (Jansen 2004). Therefore, the main principle on which a RPS operates is that the sales of certificates provide sufficient additional revenue for renewable producers over and above that from the sales of electricity, in order to make investments in renewable electricity generation profitable.

However, the history of support schemes in the Netherlands reveals a trend of regulatory instability. The International Energy Agency (2009) states that "such stop-start policies drastically undermine the effectiveness of the financial support the government provides and harm the long-term development of renewables". Therefore, they recommend the Dutch government to stabilize policies for a sufficient term to underpin a sustainable investment climate (IEA 2009).

So, in general regulatory instability is damaging for the long-term effectiveness of any support scheme. In addition, regulatory instability will also drastically decrease the short-term effectiveness of a RPS (Lipp 2007; MacGill, Outhred et al. 2004; Langniss and Wiser 2003). Therefore, the expected advantages of a RPS can only be realised in the Netherlands under the precondition that its design is able to structurally break the current trend of regulatory instability in the Dutch support schemes. For this reason, it is interesting to further investigate what possibilities there are to realise this. In order to do so, the following research question will be answered in this paper:

'Which design of a RPS for the Netherlands can provide a stable framework for investments in renewable electricity generation?'

In order to answer this research question the following steps will be completed in this paper. Section two will offer more understanding of the main issue that can undermine regulatory stability in the energy sector. Subsequently, section three will assess the degree in which this issue was applicable to the former Dutch support schemes for renewable electricity. Then, section four will assess the degree in which the Dutch institutional environment is able to constrain future instability in a RPS. Based on the understanding from the previous sections, section five will identify a starting point for designing a Dutch RPS that can offer a stable investment climate for renewable electricity generation. Section six will propose concrete options for design based on this starting point. In section seven one of these options will be further detailed in order to explore its potential in realising stability and its overall performance and feasibility.

2. MAIN ISSUE IN REALIZING STABILITY IN THE REGULATION OF THE ENERGY SECTOR

Spiller and Tomassi (2005) offer an interesting viewpoint on the stability of energy regulation, by approaching regulation as the outcome of complex intertemporal exchanges among policy makers. From this perspective, they identify the concept of 'governmental opportunism' as the main issue in realising stability in regulation of the energy sector. Governmental opportunism is "understood as the incentives politicians have to expropriate –

once investments are made – the utilities' quasi rents, so as to garner political support" (Spiller and Tomassi 2005, p. 518). Spiller and Tomassi (2005) relate the high degree of governmental opportunism in the energy sector to the combination of three specific features of this sector, namely:

- Production assets that are characterized by specific, sunk investments
- A whiff of monopoly, due to the economies of scale and scope
- A set of consumers that closely approximates the set of voters.

Due to the first feature, electricity producers are willing to operate even when prices are below the average costs, as operating costs do not include a return on sunk-investments. To this respect, laying down additional regulation after investments are made does not have to influence the supply in a sector that is dominated by specific, sunk investments. Furthermore, the whiff of monopoly inherently demands a certain degree of regulation. Lastly, the feature of mass consumption contributes to the political sensitivity of the energy sector. The combination of these three features creates that indirectly expropriating utilities can offer a government political support by simultaneously realising relatively low prices and the maintenance of service or a green image. For this reason, the combination of these three features of the energy sector induces governmental opportunism. Now that it is clear why regulation in the energy sector can be subject to governmental opportunism, the concept of governmental opportunism will be further applied to the former Dutch support schemes for renewable electricity and the proposed RPS.

3. DUTCH SUPPORT SCHEMES FOR RENEWABLE ELECTRICITY

This section will start with providing a short overview of the different support schemes that were implemented in the Netherlands over the last 14 years. The first support scheme, implemented in 1997, was a voluntary RPS introduced by the energy sector itself. This system was replaced by a fiscal system in 2000. After several changes in its design, this fiscal system was replaced by a Feed-in-Premium (FiP) in 2003. This FiP was unexpectedly stopped for biomass co-firing in 2005 and completely cancelled in 2006. In 2008 a similar FiP was implemented after an interim period of two years. In 2010 this system was again stopped. On a short-term the latest FiP will again be replaced by a new FiP after a short interim period. This new FiP has a more narrow and market-based scope in determining the eligible production units for receiving subsidy. Lastly, it is thus proposed to replace this more market-based FiP with a RPS around 2015.

Now the concept of governmental opportunism will be applied to these often unexpectedly changed and replaced support schemes. Although in the first place certain rational reasons can be found for the need of system replacements, at the same time it can be concluded that these rational reasons did not always necessarily had to result in a complete system change. Instead, smaller adaptations in the present system would have been sufficient. From this perspective the need for system adaptations was often used by the Dutch government as a stepping stone to fully replace the support schemes, in order to fulfil their needs in gaining political support. To this degree governmental opportunism thus indeed seems to be present in the former support schemes, resulting in a highly erratic environmental policy for the electricity sector.

However, the definition of 'governmental opportunism' has to be broadened to a certain degree to be applicable here. Often the sudden and unexpected replacement of or changes in former support schemes did not directly result in expropriating quasi rents, as a renewable generator who is offered subsidy by a feed-in-premium scheme will receive subsidy until the pre-defined term for this subsidy ends. For this reason, it can be observed that governmental opportunism did not always occur for economic reasons, as was proposed by the definition of Spiller and Tomassi, but rather for ideological reasons. However, the unexpected changes in support schemes and related uncertainty in future possibilities for renewable electricity generation did heavily interrupt the earlier established and thus expected investment framework. The renewable electricity sector is a sector which is surrounded by a technological learning process and therefore heavily investing in a learning curve. For this reason, breaking the promised investment framework for short-term electoral gain can be seen and defined as governmental opportunism, despite its specific reasons.

Based on the reasons described above, it is assumed that the former support schemes were at least to a certain degree affected by governmental opportunism. The possibility of governmental opportunism will now be translated to a RPS. Once renewable electricity producers have made investments within a RPS, the government is able to adapt the design of the RPS in such a way that the certificate price will be too low to earn back their investments. However, due to the sunk character of investments in renewable electricity this will not necessary affect the total renewable electricity generation on the short-term and therefore not harm the short-term effectiveness of a RPS. At the same time the costs for the end-consumer of the RPS will be reduced, due to a lowered certificate price. From this, it can be concluded that the short-term costs of governmental opportunism in a RPS are relatively low in comparison to its potential benefits, which might further induce governmental opportunism in a RPS. Therefore, the next section will assess how effective the Dutch institutional environment was so far in realising regulatory governance that limits governmental opportunism and how the design of the RPS can embrace this.

4. INSTITUTIONAL ENVIRONMENT OF THE NETHERLANDS

For the future stability of the RPS it is vital that the possibility of governmental opportunism is limited by the Dutch institutional environment. From an empirical perspective it can be assumed that Dutch institutional environment is not able to effectively limit governmental opportunism, as more than five different support schemes were unexpectedly adjusted, stopped and replaced in response to the needs of the incumbent government since 1997. Therefore, it is assumed that the Dutch institutional environment will also not be able to bind future governments in adapting the rules and procedures in a RPS according to their needs.

For this reason, the main challenge for the design of a RPS is to reposition itself in the institutional environment of the Netherlands. Otherwise the RPS will alternate with the identity of the ruling politicians, resulting in unstable policy and not providing the necessary certainty for investors (Spiller & Tomassi 2005). Therefore, the design of the RPS has to lay down robust procedural and policy rules that restrict the ability of future governments to randomly intervene in the design of the scheme. Another option is to delegate the responsibility for the governance of the RPS from the central government to a party that is not directly connected to electoral politics. The main argument for delegation is that it will lead to a more objective and substantive governance of the RPS and therefore a more consistent and predictable policy. In order to further investigate the opportunities for these two options for the design of a RPS, they will be related to the dynamics that the former support schemes were subjected to. This will result in the definition of a starting point for structurally securing stability in a RPS.

5. STARTING POINT FOR STRUCTURALLY SECURING STABILITY IN THE RPS

In this section we will further explore how the ability to constraint governmental opportunism is again constraint by the social, technical, legal and economic circumstances of the renewable electricity sector. Firstly, it can be observed that former Dutch support schemes were often confronted with developments or shocks in their environment. Support schemes faced changing social preferences and visions regarding realising a sustainable energy supply. Furthermore, they faced changes in the (perceived) potential of the available technologies for renewable electricity generation. Besides, they were subjected to changes in related European and national legislation. Moreover, they were confronted with the effects of an economic and financial crisis. In addition, the dynamics did not only have an exogenous origin, as support schemes were also often confronted with unexpected or undesired outcomes.

This description reveals that support schemes for renewable electricity require substantial regulatory flexibility, in order to be able to effectively respond to the significant internal and external dynamics that they face. If the regulatory flexibility to respond to these dynamics will be largely reduced by the design of the RPS this can result in ineffective and/or inefficient regulation, as it leads to regulation that does not fit the existing circumstances. For this reason, laying down restrictions on the ability to adjust the design of a RPS will not offer

a suitable starting point for constraining governmental opportunism. Instead the option that remains is to move the responsibility for the governance of the RPS away from the central government with the objective to enable adjustments of the regulation in response to external and internal dynamics, while being insensitive to the randomness of politics. Therefore, this research proposes that a RPS can be stable and therefore effective if the responsibility for the execution, monitoring and adjustment of the RPS is delegated to a party that is not directly linked to electoral politics. For this reason, possible options to move the governance of the RPS to a party that is not directly connected to electoral politics will be the starting point for the development of several conceptual design alternatives in the next section.

6. INTERNATIONALISATION; CONNECT AND ADAPT THE RPS TO A FOREIGN RPS

In this section several concrete options will be identified that can more structurally secure the stability of a RPS and thus offer a consistent investment climate for renewable electricity. Starting point for the identification of these options is that the design of a RPS can secure stability if it delegates the responsibility for the governance of the RPS to a party that is not directly connected to electoral politics. Based on this starting point, it is proposed to internationalise the RPS. In this section, it will be elaborated how and why the principle of internationalisation can break the current pattern of regulatory instability. Furthermore, several concrete alternatives for the design of a RPS will be identified based on this principle.

Internationalisation of a RPS connects the Dutch RPS to a foreign RPS. In order to do so, the design and rules for this RPS will be laid down in an international agreement. Furthermore, also the execution, monitoring and possible adjustment of the RPS will fall under the responsibility of recurring bilateral consultations between two countries. For this reason, internationalisation delegates the responsibility for the RPS from the Dutch central government to an international cooperation. This will structurally separate the need for regulatory flexibility from political dynamics, as the Dutch government will be restricted by substantive international agreements and cooperation in their desire to change the system. For this reason, internationalisation of the RPS fulfils the starting point that was proposed to secure stability in a RPS.

The implementation of a European RPS is not very likely on the short-term (Jansen and Uyterlinde 2004). However, regional convergence of support schemes is promoted by the European Commission (European Commission 2011). Articles 11 and 6 of Directive 2009/28/EC have laid down a legal foundation to couple the support schemes of different Member States (MS), which makes this possible. At the moment, Sweden, Belgium, the UK and Poland have also implemented a RPS. The RPS of the Netherlands can be coupled to one of these systems. For this reason, the following alternatives for the design of a RPS can provide an answer to structurally break the trend of instability in the Dutch stimulation measures for renewable electricity:

- Connect and adapt the design to the Swedish RPS
- Connect and adapt the design to the British RPS
- Connect and adapt the design to the Belgian RPS
- Connect and adapt the design to the Polish RPS

The connection of the Dutch RPS to a neighbouring RPS is consistent with the emergence of a North-West European electricity market, which has made significant progress the last years. So far, this resulted in the realisation of a single electricity market for France, the Benelux and Germany. Furthermore, also the network management has been partly internationalised. From this perspective, the harmonisation of the RPS on a (partly) North-West European level can also be viewed as part of a larger development and possibly a logical next step in this development.

An additional advantage of internationalising the RPS is that it entails a geographical market expansion for the trade in the certificates connected to the RPS. A geographical market expansion improves the ability of a RPS to stabilize misbalances in the renewable certificate market (Jansen, Lensink et al. 2011). In addition, it reduces the possibility of market power (Jansen, Lensink et al. 2011). Lastly, it often leads to more market transparency with a stronger drive towards a larger role for central trading platforms (Jansen, Lensink et al.

2011). These effects of geographical market expansion will also further enhance the stability of the RPS, as it decreases the possibility of unwanted outcomes of the RPS and therefore the need for unexpected interference in its design.

However, also certain disadvantages and challenges regarding the internationalisation of the RPS need to be taken into account. Firstly, this option can lead to the support of foreign renewable electricity generation facilities and thus the support of a foreign economy by the Dutch end-consumers. Coupling the RPSs can become unpopular in the 'importing country'. For this reason, differences in the national technical and economic circumstances have to be taken into account when evaluating this option. Furthermore, combining the designs of the schemes can be difficult. When the Netherlands wants to couple itself to an existing foreign RPS it will have to adapt itself to the foreign system, as this system is already locked-in due to the required stability of a RPS. In this respect, the Netherlands will not be able to choose a design that completely fits their circumstances and preferences. Therefore, also a trade-off will have to be made between the degrees of freedom in the design of the Dutch RPS and the advantages of a connection of the RPS to the one of another MS.

In order to further explore the degree in which these advantages and disadvantages are present in a connection of the Dutch RPS to the RPS of another MS, one of the options for design identified above will be further detailed in the next section. Therefore, one option will be selected from the alternatives for design identified above. Regarding this selection, it is interesting to determine which of these alternatives has a high potential regarding feasibility and performance. From this perspective, a connection to the Swedish system is preferred. At various occasions the Swedish government stated its wish to engage in an international expansion of its RPS (SEA 2009). For this reason, the feasibility of this option is high. Furthermore, the RPS of Sweden is increasingly effective in reaching fairly ambitious system targets, in comparison with the RPSs of Poland, Belgium and the UK. In this respect, the Swedish RPS is one of the most efficient national support schemes in Europe (Jansen, Lensink et al. 2011). This makes the potential performance of a RPS combined with Sweden also high. For this reason, the alternative for design, that connect and adapts the design of the RPS to the Swedish RPS, will be further detailed in the next section.

7. DEVELOPMENT OF THE DESIGN OF A DUTCH RPS CONNECTED TO SWEDEN

The Swedish RPS came into force in 2003 and is laid down in the 'Act Concerning Electricity Certificates (2003:113)' (Linden, Uyterlinde et al. 2005). The main characteristics of the Swedish RPS are that it is fully technology neutral and excludes existing large scale hydro power (Bergek and Jacobsson 2010). In this section the main characteristics of the design of a 'Dutch RPS connected to the Swedish RPS' will be defined. This RPS will from now on be referred to as the 'joint RPS'. First, relevant pre-conditions for the design of the joint RPS will be identified by a description of its context.

7.1 CONTEXT OF THE DESIGN OF A RPS CONNECTED TO SWEDEN

Firstly, the main motivation for participation in the joint RPS for the Netherlands and Sweden, next to securing its stability, will be discussed. Jansen, Lensink et al. (2011) state that "the key driver towards the establishment of a market-based joint support scheme is to achieve higher efficiency in target compliance by capitalising on the gains from trade". Higher efficiency can be achieved because a joint RPS stimulates to allocate technologies for renewable electricity generation to the location where production costs are the lowest. In case of a Dutch-Swedish cooperation, the Netherlands can expand its current position in biomass co-firing, while Sweden can expand its current position in small scale hydro and wind power (Jansen, Lensink et al. 2011). Another cause for increased efficiency in the joint RPS is that Sweden at relatively moderate costs can produce additional renewable electricity on top of complying with its target, while the Netherlands has to meet its target at relative high marginal costs (Jansen, Lensink et al. 2011).

However, the difference in marginal costs for achieving the targets in Sweden and the Netherlands also creates disadvantages of a connection to a joint RPS for both countries. Firstly, it can result in a net import of certificates of origin from Sweden by the Netherlands. For this reason, a part of the Dutch renewable electricity

generation will move to Sweden in a joint RPS. Jansen, Lensink et al. (2011) concluded – based on a quantitative analysis of the connection of the Swedish RPS to a Dutch hybrid RPS – that a maximum of 9 TWh of Swedish certificates will be imported by the Netherlands per year in 2020. This represents about 8 percent of the total electricity production in the Netherlands in 2020. Furthermore, this is expected to result in a capital flow of about 30 million euro from the Netherlands to Sweden per year in 2020 (Jansen, Lensink et al. 2010).

Secondly, as the joint RPS is expected to result in exporting renewable electricity for Sweden, the projected certificate price of the joint RPS is higher than the projected certificate price of the Swedish RPS. To this regard, the connection of the RPS is expected to result in a rise of costs of the RPS for the Swedish end-consumer (Jansen, Lensink et al 2011). However, at the same time it seems that a joint scheme will entail a decrease of the electricity price in Sweden, due to a higher share of renewables in the total electricity production. Exploratory research of Jansen, Lensink et al. (2011) shows that this second effect is likely to be more dominant, but more profound research has to confirm this. However, this study does show that the possible rise in costs for the Swedish consumer at least to a certain degree will be balanced with a decrease in the electricity price due to the existence of a joint RPS. For this reason, the possible rise of costs for the Swedish consumers is not defined a serious threat for the feasibility of the joint RPS at this point.

7.2 CHARACTERISTICS OF THE DESIGN OF A RPS CONNECTED TO SWEDEN

In order to determine the main characteristics of a joint RPS it is important to understand which system elements and processes are unified and which of these aspects remain separated in the joint RPS. The starting point for this distinction is the quota and the question whether the joint RPS is based on a single quota or two national quotas. The quota in a RPS is the percentage of the total electricity supply of an electricity supplier for which it has to purchase the certificates that are linked to the RPS. The national targets that were set down in Directive 2009/28/EC are not equal for every MS. Furthermore, the national targets cannot always be translated directly into the quota size of a RPS, as not all renewable electricity generation is eligible for participation in a RPS. For this reason, the establishment of a single quota in a joint RPS will always result in the situation where the end-consumers of one MS contribute to the realisation of the national target of another MS. Therefore, two quotas will be introduced in the joint RPS: one for Sweden and one for Netherlands. The compliance with these quotas can however be realised by purchasing renewable electricity produced either in the Netherland or Sweden. This will still enable the advantages of a joint RPS. Although the quotas are separate, a bilateral decision is required if a MS wishes to change its quotas once fixed. The reason for this is that both quotas determine the possibilities for investment; the Swedish producers anticipate on the Dutch quotas and vice versa.

In order to enable the separation of the quotas but in the same time allow the tradability of certificates among the two countries, the following processes and aspects of the joint RPS will be separated or unified. Firstly, a single trade platform is required to establish a unified certificate price for the joint RPS. Furthermore, the certificate accounts of the market parties need to be operated on a central level, in order to allow that Dutch suppliers can obtain Swedish certificates and vice versa. Moreover, these centralized certificate accounts enable a centralized trade platform. The control of the certificate accounts of the suppliers on compliance with the quota at the end of the accounting period can be performed separately by the MSs. Also the issuing of certificates to domestic renewable electricity production eligible for the RPS can be done separately. In order to realise a compatible execution of the separate processes in the joint scheme, these processes need to be executed according to unified rules.

Based on this division of processes in a joint RPS, the main characteristics of the joint RPS will be further determined. Firstly, the scheme's duration and the term on which the quotas are fixed are important, as this sets the future framework for investment. The Swedish design has set down the RPS until 2030. This is also the period for which the quotas are fixed. As this part of the Swedish system is locked in, the Dutch government will also have to set its quotas at least until 2030. The fixation of the quota until 2030 will strongly contribute to the predictability of the investment climate and therefore the effectiveness of the joint RPS (Tilburg, Jansen et al. 2006).

Secondly, the allocation of the administrative responsibilities within the joint RPS is an important aspect of its design, as this can further determine the stability of this scheme. From this perspective, the administrative responsibilities of the RPS have to be allocated to a cooperation of the regulators and the transmission system

operators of the Netherlands and Sweden. This will secure more regulatory discretion in the administration of the system, which can further enhance consistency and predictability in the execution of the RPS.

Thirdly, the possibilities for the banking of certificates are an important design choice, as this determines the flexibility that producers and suppliers have to respond to temporary surpluses or deficits of certificates on the market. In this respect, the possibility of banking can reduce price volatility on the certificate market. The banking of certificates means that producers and suppliers can use certificates to meet the quota in another accounting period than the one in which they were generated (Espey 2001; Rader and Hempling 2001). The Swedish design allows the banking of certificates for an unlimited period and amount (Linden, Uyterlinde et al. 2005; SEA 2009). Next to flexibility for market parties, banking also leads to a more liquid market and more possibilities for capturing economies of scale in the size of renewable energy facilities in combination with the increasing quotas (Rader and Hempling 2001). Furthermore, the possibility of banking also decreases the transparency of the certificate market, which will undermine the possibility of market power in the certificate market (Tilburg, Jansen et al. 2006). For this reason, this aspect of the Swedish system can and has to be adopted in the design of the joint RPS.

Fourthly, the establishment of a minimum certificate price is an important design choice for the joint RPS, as it can further reduce market risks for renewable electricity producers (Bennink, Blom et al. 2010; Espey 2001). For the following reasons, this additional guarantee on a return on investment is not necessary for a joint RPS. Firstly, a joint RPS secures long-term consistency and predictability in the governance of this scheme. Secondly, the geographical expansion of the certificate market in a joint RPS offers a more stable certificate market. Thirdly, the proposed design of the joint RPS allows unlimited flexibility in the banking of certificates. Fourthly, the joint RPS is planned until 2030. The combination of these features of the joint RPS offers producers sufficient possibilities to prepare for the future demand for certificates and to balance temporary deficits and surpluses on the certificate market on the long-term. Therefore, an additional guarantee on a return on investment within the joint RPS, by the means of a minimum price, is not required. The advantage of the lack of a minimum certificate price is that there is no risk of over-stimulation by the joint RPS.

Another important characteristic of the joint RPS are the possibilities for technology differentiation. The Netherlands has a relative steep supply curve of renewable electricity compared to Sweden (Jansen, Lensink et al. 2011). This can result in relatively high marginal costs to fulfil the both quotas, which again can result in extensive economic rents for certain producers within the joint RPS. Furthermore, this will decrease the possibilities for technology diversity and the stimulation of relative immature technologies for the Netherlands. For these reasons, the Netherlands needs to be able to offer additional support to relative immature technologies within a joint RPS. The introduction of additional subsidy for Dutch immature technologies in the joint RPS is not at odds with the proper functioning of the certificate market (Jansen, Lensink et al. 2011). In this respect, the technology neutral character of the Swedish system does not have to form a limitation on the possibilities for the Netherlands to differentiate support for technologies within a joint RPS. Therefore, the joint RPS can and has to provide additional Dutch support for Dutch immature technologies.

The last main characteristic of the joint RPS is its market design. Certificates can be traded bilateral and on an exchange in the Swedish scheme. This aspect of the Swedish scheme is locked-in, as Swedish suppliers and producers already have committed themselves to long-term contracts. Therefore, the joint RPS will have to adopt the Swedish market design. With a market design that does not oblige a centralized trade of certificates, vertical integrated companies will have a competitive advantage in comparison to production- or supply-only companies. For this reason, the market design of the joint RPS does not fully secure an equal starting point for all type of energy companies. This might be an aspect of the joint RPS in which the Netherlands is limited in realising a design for the RPS that fully fulfils its preferences.

8. CONCLUSIONS

This article had the objective to answer the following research question:

'Which design of a RPS for the Netherlands can provide a stable framework for investments in renewable electricity generation?'

This question was answered by realising a better understanding of the origin of regulatory instability in the energy sector. In order to so, the ability of incentive regulation in the utility sector – like a RPS – to uphold itself well-established and stable was linked to the institutional environment of this regulation (Spiller and Tomassi 2005). This showed that regulation in the energy sector can be subject to governmental opportunism, due to a combination of its specific economic features. Furthermore, it was empirically confirmed that the Dutch institutional environment is not able to effectively limit this form of opportunism. In the search for possible manners to limit governmental opportunism in the RPS, was identified that delegating the responsibility for the governance of the RPS from the central government to a party that is not under the direct influence of electoral politics is an appropriate manner to do so. The general notion behind this is that delegation will lead to a more objective and substantive governance of the RPS and therefore a more consistent and predictable governed policy. Based on this starting point, it was proposed to internationalise the RPS. The internationalisation of a RPS means that the design and execution of a RPS is connected and adapted to an (existing) RPS in another MS.

In this respect, internationalisation of the RPS delegates the responsibility for the RPS from the Dutch central government to an international cooperation. This will structurally secure the stability of the RPS, as it will restrict the Dutch government in their desire to change the system by substantive international agreements and cooperation. As Sweden, Belgium, the UK and Poland have implemented a RPS at the moment, the RPS of the Netherlands can be coupled to these systems. From these options the option that connects the RPS to Sweden was selected to be detailed further, because Sweden has the highest potential regarding feasibility and performance in comparison to the other alternatives.

Detailing this alternative further explored the potential of this option. It showed that a RPS connected to the Swedish scheme does not have to result in a significant loss of degrees of freedom in the design of the RPS for the Netherlands. Firstly, it is still possible to additionally support relative immature technologies within a joint RPS for the Netherlands. Secondly, most aspects of the Swedish design contribute to the stability and a proper performance of the RPS. The only aspect of the Swedish RPS which might conflict with the Dutch preference regarding the design of a RPS is the design of its certificate market.

Furthermore, several synergies for the performance of the joint RPS were identified during its development. Firstly, the connection to the Swedish RPS will result in lower marginal costs for the Netherlands in realising their national target laid down in Directive 2009/28/EC. A disadvantage is that it will also result in a cost increase for the Swedish end-consumer. However, it is expected that this can be balanced by a decrease in electricity prices for the Swedish consumer in a joint RPS. In addition, the joint RPS can result in more technology specialisation, in which the Netherlands can expand its current position in biomass co-firing, while Sweden can expand its current position in small scale hydro and wind power. This can further improve the economics of a joint RPS. Lastly, the geographic market expansion that entails a connection of two RPSs creates the following advantages:

- A more stable certificate market
- A strongly reduced potential for market power
- A stronger drive towards centralized trade and related market transparency

Finally, the feasibility of the joint RPS will be discussed. For the reasons described above – a structurally secured stability and a better overall performance of the scheme in comparison to a national RPS – the motivation for the Netherlands and Sweden to commit them to a joint RPS can be high. However, the disadvantages of such a system also have to be taken into account. A joint RPS can result in subsidizing the Swedish economy by the Dutch end-consumer. Furthermore, it decreases the possibilities of the Netherlands to further develop economic activities in the generation of renewable electricity. These are serious concerns that undermine the feasibility of the joint RPS. The trade-off between the advantages and disadvantages of a joint RPS, identified here, will be further discussed in the next section.

9. DISCUSSION

This section will further discuss the trade-off between the expected advantages and disadvantages of a joint RPS for the Netherlands, identified during this research. The main advantages of the joint RPS in comparison to a Dutch RPS are a higher degree of stability and a higher cost-efficiency of the scheme. The main disadvantages of a joint RPS are the possibility of stimulating a foreign economy and the reduction of the potential for further economic activity and the broadening of industrial capabilities in the generation of renewable electricity. For this reason, the main trade-off in the choice between a joint RPS and a national RPS can be summarized as the choice between a stable, proper functioning and efficient support scheme and exploiting the full potential in economic growth in activities regarding the generation of renewable electricity.

Regarding this choice the following aspects are interesting for further discussion. Firstly, the ability to fully exploit the potential for economic growth in renewable electricity generation is also limited by the presence of a proper and stable support scheme. So far, the Netherlands was not able to fully exploit the potential for economic growth due to its rather fragmented and erratic stimulation policy. From this perspective, the Netherlands might already lay behind on certain neighboring countries in the development of an industry for renewable energy technologies. In this respect, a well-established and stable support scheme may be preferred to the complete preservation of the potential for economic growth in renewable electricity generation. A joint RPS at least offers a stable framework for investment for the remaining potential of economic growth within this scheme. In this regard, it can be identified that a joint RPS will remain a significant potential for economic growth in renewable electricity generation. As the Dutch target for the share of renewable electricity in the total electricity generation lies at 37 percent and it is expected that 8 percent renewable electricity is imported from Sweden in the joint RPS in 2020, the Netherlands can still realize a share of 29 percent renewable electricity in the total domestic electricity production within the joint RPS in 2020. By comparison, the current share is 9 percent (CBS 2010).

Furthermore, the trade-off identified in this research has to be positioned in the future development of European legislation regarding renewable electricity generation. It is expected that the support schemes for renewable electricity generation will be harmonized on a European level on the long-term (Lauber 2004; Jansen, Uyterlinde et al. 2004). This research showed that it is possible to adopt an international RPS but at the same time allow customized national support for relative immature technologies. This makes it possible to harmonize the stimulation of renewable electricity on a European level but at the same time offer possibilities to cope with differences in the physical circumstance of MSs. For this reason, a hybrid RPS can be a very suitable support scheme to be harmonized on a European level. From this perspective, competition with other countries on the development of an industry for renewable electricity might be inevitable on the long-term. In this respect, the introduction of a joint RPS can be a logical step to prepare for this.

Finally, the formulation of environmental policy often involves many decision-makers and can affect numerous stakeholders with different value systems and different concerns about specific aspects of the policy (Greening, 2004). Relevant stakeholders regarding the introduction of the RPS are energy companies, NGO's, consumer- and employer organisations. This section provides some directions to approach the discussion on the consequences of the internationalisation of the RPS and steers in the direction of a joint RPS. However, the starting point of this paper was securing regulatory stability in a RPS. From this perspective, it is relevant to understand that long-term commitment to the joint RPS from the Dutch stakeholders is also vital for the stability of this scheme (Lipp 2007). For this reason, it is important that the stakeholder dialogue on the possibility of internationalisation emphasises on creating understanding of the possible outflow of capital.

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