Summary of the review of the electricity certificates system

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R A P P O R T

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Norwegian Water Resources and Energy Directorate and Swedish Energy Agency
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Summary of the review of the electricity certificates system by the Swedish Energy Agency and the Norwegian Water Resources and Energy Directorate (NVE)

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Glossary

Term	Explanation
Electricity certificates system	Market-based support system for electricity produced from renewable resources pursuant to laws and regulations on electricity certificates.
Electricity certificate	Proof issued by the government that one MWh (megawatt hour) of renewable electricity has been produced in accordance with the laws and regulations on electricity certificates.
Electricity producer with entitlement to electricity certificates	Power producer that is entitled to electricity certificates in accordance with the laws and regulations on electricity certificates.
Quota obligation	Electricity suppliers and others with a quota obligation must procure electricity certificates and have an obligation to cancel a stated number each year.
Cancellation	Cancelling electricity certificates in order to fulfil the annual electricity certificate obligation.
Quota obligation fee	A fee that those with a quota obligation must pay for every certificate in their annual quota that has not been cancelled. The fee is intended to give suppliers and others an incentive to fulfil the quota obligation.
Electricity consumption with quota obligation	Electricity consumption for which there is a quota obligation. Comprises electricity consumption that is subject to duty on electricity.
Quota	Ratio that designates how great a proportion of electricity consumption with quota obligation must be cancelled each year.
Quota curve	A curve that shows annual electricity certificate quotas over the effective lifetime of the electricity certificates system from 2012 to 2035.
Renewable electricity production	Electricity produced from renewable energy sources, such as water, wind and sun, as well as geothermal or bioenergy.
Transition system	The transition system applies to plants that came into operation before 1 January 2012. Laws that determine which plants that qualify for the system differ in Norway and Sweden.
Electricity certificate surplus	Electricity certificates that have been issued but not cancelled represent the electricity certificate surplus.
Grid-contingent investable electricity volume	Projects that have, or can be expected to have, a final licence and for which there is capacity in the central grid, so that it is possible to invest in and develop the project by the end of 2020. The same thing is meant by the terms "investable" and "realisable".
Technical adjustment	Necessary adjustments in electricity certificate quotas so as to fulfil the obligations in the agreement on electricity certificates between Norway and Sweden. Thus this does not involve any raising of ambition.

Introduction

The purpose of this report is to summarise the content of the national reports that the Norwegian Water Resources and Energy Directorate (NVE) and the Swedish Energy Agency have prepared, commissioned by the Ministry of Petroleum and Energy and the Ministry of Enterprise, Energy and Communications respectively, in connection with the first Norwegian-Swedish progress review of the electricity certificate system. The two ministries will make use of the reports from NVE and the Swedish Energy Agency in their further work of considering possible changes to the electricity certificate system.

The electricity certificate system is rooted in the agreement of 2011 between Norway and Sweden on a common electricity certificate market, and in the laws and regulations of both countries. The agreement between Norway and Sweden states that any changes in the electricity certificate system must be made in connection with a so-called progress review, in which the two countries jointly perform investigations and discussions in order to ensure that the system is working as intended. The first progress review of the Norwegian-Swedish system is to be performed before the end of 2015.

NVE and the Swedish Energy Agency have each been commissioned to report by their respective ministries: The Ministry of Petroleum and Energy in Norway and the Ministry of Enterprise, Energy and Communications in Sweden. The work on the basis for the progress review has been performed in collaboration between the Swedish Energy Agency and NVE. A great deal of good input has also come from those active in the market.

The responses to the assignments from the ministries may be found in: "*Kontrollstation för elcertifikatsystemet 2015 (ER 2014:04)*" and "*Kontrollstasjonsrapport: NVEs gjennomgang av elsertifikatordningen NVE-rapport 05/2014"*.

The Ministry of Enterprise, Energy and Communications' assignment to the Swedish Energy Agency in brief

In the assignment to prepare a basis for the progress review, the Swedish Energy Agency was asked to look at the following topics:

- Analyse and propose any changes to the quota curve that may be necessary for Sweden to be able to fulfil its obligations under the agreement for a common electricity certificate market with Norway.
- Identify and assess risks that might lead to the pace of development not being as anticipated up until 2020.
- Investigate the role of peat in the electricity certificate system and analyse the consequences of any phasing out of peat.
- Analyse the historical development of the electricity certificate market, including with regard to electricity certificate prices, holdings and the phasing out of power stations with entitlement to electricity certificates.
- Analyse the way in which the market functions, including with regard to sales turnover, liquidity, number of market participants and market equilibrium. On the basis of the

analysis, the Swedish Energy Agency is to propose any measures that might improve the way in which the market functions.

The Ministry of Petroleum and Energy's assignment to the Norwegian Water Resources and Energy Directorate

In the assignment to prepare a basis for the progress review, NVE was asked to look at the following topics:

- Analyse the need for an adjustment in the annual electricity certificate quotas so as to fulfil Norway's obligations in the agreement with Sweden.
- Consider whether there is sufficient access to projects in renewable electricity production in Norway and Sweden to achieve the target of 26.4 TWh of new renewable energy. NVE is also to consider the risk that the pace of development is not developing sufficiently to achieve the target.
- Consider the present design of the quota curve and discuss the advantages and disadvantages of replacing the statutory electricity certificate quotas with a collective quota obligation in accordance with the agreement.
- Assess the present structure of quota obligation fees against possible alternative fee structures.

Summary of the recommendations

Presented below is a summary of the recommendations from NVE and the Swedish Energy Agency. The background to the recommendations is described more fully in the respective national reports.

Adjustment of the quota curve

New estimates of electricity consumption with quota obligation and production from the transition scheme indicate that the present electricity certificate quotas are insufficient to meet the obligations in the agreement on electricity certificates between Norway and Sweden. The Swedish Energy Agency and NVE therefore propose adjustment to both countries' quota curves. This means an estimated increase in demand of 61 TWh. 28 TWh of this is to be cancelled during the period 2016 to 2019 and the remainder during the period 2020 to 2035.

The adjustment of the electricity certificate quotas is due to new estimates of electricity consumption with quota obligation and new expectations for annual production of power plants in the transition system. In Norway, the electricity certificate quotas would be adjusted downward, giving an estimated reduction in demand for electricity certificates of approximately 14 TWh during the period 2016 to 2035. The reason for the adjustment is new estimates of electricity consumption with quota obligation that are higher than those used as a basis for calculating the statutory electricity certificate quotas in Norway. In Sweden, the electricity certificate quotas would be up 75 TWh in the same period, which is based on lower electricity consumption with quota obligation than anticipated and the issue of more electricity certificates

to power plants in the transition system. The objectives for the common Norwegian-Swedish electricity certificate market are unchanged..

NVE and the Swedish Energy Agency recommend that the principles that are taken as a basis for technical adjustment in this progress review work, which are harmonised between Norway and Sweden, are also used for future progress reviews.

Access to projects and risk factors

NVE and the Swedish Energy Agency consider that there is good access to investable projects in both Norway and Sweden and that the situation is in place for the target of 26.4 TWh of new renewable energy to be achieved. In the national report, an assessment is made of access to investable projects in both countries. The methods used to perform this analysis in Norway and Sweden are different. However many factors could affect the extent to which Norway and Sweden attain the target.

NVE's national report describes the following risk factors:

- NVE believes that any delay in the necessary grid measures, at both central and regional grid levels, could involve a risk to the fulfilment of the goal.
- NVE believes that time pressures affecting various market participants could be a risk to target fulfilment, since time is short to 2020. To be included towards the target, power plants must be in operation before the end of 2020.
- NVE believes that a lack of finance for projects may involve a risk to target fulfilment. NVE believes that complete and correct market information is important so that the market receives correct price signals and can therefore make investment decisions on the best possible basis.
- NVE believes that it is important for the tempo of licence processing to be maintained over the next few years so that there are enough available projects to invest in.

The Swedish Energy Agency's report states the following:

- The Swedish Energy Agency considers that a lack of opportunities for financing projects could involve a risk that the target is not achieved.
- The Swedish Energy Agency considers that delays in Svenska kraftnät's planned measures for the central grid could involve a risk to target fulfilment.
- The Swedish Energy Agency considers that uncertainty about political goals for renewable energy after 2020 could represent a risk to target fulfilment.

Quota obligation fee

NVE recommends that the present formulation for the quota obligation fee should be kept. It is currently 150 per cent of the volume-weighted average price of electricity certificates in Norway and Sweden. Sweden has had this fee structure since 2005.

An important criterion for the choice of fee structure is that the fee must be higher than the price of electricity certificates so as to give market participants an incentive to fulfil the quota obligation. Under the present structure, the fee has been higher than the annual market price every year since the system started. Also the cancellation percentage has been around 99.9 per cent every year. There is therefore little to indicate that an alternative formulation for the quota obligation fee would increase the incentive to fulfil the quota obligation. In spite of the fact that in theory the market price could be higher than the quota obligation fee under the present formulation, in NVE's assessment the fee is the best suited to maintaining the high cancellation percentage.

The Swedish Energy Agency has also performed an analysis of the formulation of the quota obligation fee in the part of its assignment that studied the way in which the market functions. The Swedish Energy Agency also recommends that the present formulation is kept.

Statutory TWh obligation or continued statutory electricity certificate quotas

In its national report, NVE analysed the present formulation of the quota curve. The advantages and disadvantages of replacing the statutory electricity certificate quotas with a collective quota obligation in accordance with the agreement on a common electricity certificate market between Norway and Sweden were discussed.

NVE recommends that the TWh obligation in accordance with the agreement between Norway and Sweden is established in the electricity certificate legislation with legislative or regulatory rules for how this volume should be converted into shares. This would give better predictability for the market participants.

To allow the number of electricity certificates to be cancelled by each market participant with a quota obligation to be calculated, the TWh obligations must be converted into shares. NVE recommends that the share is calculated in advance and that it is fixed for a period of four years at a time. The share would be published before the first year of the period. This would simplify the system for the market participants with quota obligations. Deviations that arise would be adjusted during the following four year period according to rules determined in the electricity certificate legislation.

Market improvement measures

In its report, the Swedish Energy Agency looked at the way in which the market functions and puts forward the following recommendations:

- The Swedish Energy Agency proposes that an annual analysis should be made of the relationship between the current electricity certificate quotas and the factors on which the

electricity certificate quotas are based. The Swedish Energy Agency proposes that this analysis is presented at annual seminars.

- Developments over the next few years should be carefully followed so as to consider whether the next progress review should be held earlier than planned.

- The Swedish Energy Agency believes there is a need for a database of power production with entitlement to electricity certificates, with information about projects with licences to build, investment decisions and plants under construction. Whether companies should be under a statutory obligation to report such information should be investigated.
- The Swedish Energy Agency recommends that a requirement should be introduced for Swedish electricity suppliers to report invoiced electricity consumption every quarter.

The role of peat in the electricity certificate system

In its national report, the Swedish Energy Agency describes the role of peat in the electricity certificate system. Peat represents only a small proportion of electricity production with entitlement to electricity certificates and reducing the proportion further is being considered. For power stations based on peat that have entitlement to electricity certificates, the electricity certificates are a more important support for their competitiveness than is the case with power plants using other fuels. Removing their electricity certificate support would probably reduce the peat sector's sales turnover. However the effect is limited by the fact that a considerable proportion of the total consumption of peat is in plants that are not included in the electricity certificate system. To summarise, peat means little to the electricity certificate system, but the electricity certificate system has a certain, but limited, significance for the peat sector. If circumstances remain unchanged, the Swedish Energy Agency recommends that peat-based electricity production with entitlement to electricity certificates should continue to have such entitlement.

Appendices

Table 1: Estimated annual changes in demand in Sweden – The target for 2020 is unchanged

	[A]	[B]	[C]	[D]=[A]x[C]	[E]= [AxC]-[AxB]	
	Estimated electricity consumption with quota obligation - Sweden 2014 (TWh)	Current quota obligation - Sweden (ratio)	Swedish Energy Agency's recommendation for new quota obligations in Sweden (ratio)	Estimated quota obligation with recommended quota (TWh)	Estimated change the in electricity certificate demand per year (TWh)	Estimated change in the electricity certificate demand accumulated per year (TWh)
2016	93,1	0,144	0,230	21,5	8,0	8,0
2017	93,0	0,152	0,246	22,9	8,8	16,8
2018	92,8	0,168	0,262	24,3	8,7	25,6
2019	92,6	0,181	0,276	25,6	8,8	34,4
2020	92,5	0,195	0,266	24,6	6,6	40,9
2021	92,2	0,190	0,250	23,1	5,6	46,5
2022	91,9	0,180	0,235	21,6	5,1	51,6
2023	91,7	0,170	0,222	20,4	4,8	56,4
2024	91,4	0,161	0,205	18,7	4,0	60,4
2025	91,1	0,149	0,184	16,8	3,2	63,6
2026	90,9	0,137	0,161	14,6	2,2	65,8
2027	90,6	0,124	0,140	12,7	1,5	67,3
2028	90,4	0,107	0,124	11,2	1,5	68,8
2029	90,1	0,092	0,108	9,7	1,4	70,2
2030	89,9	0,076	0,091	8,2	1,4	71,6
2031	89,9	0,061	0,071	6,4	0,9	72,5
2032	89,9	0,045	0,053	4,8	0,8	73,2
2033	90,0	0,028	0,037	3,3	0,8	74,1
2034	90,0	0,012	0,021	1,9	0,8	74,8
2035	90,0	0,008	0,013	1,1	0,4	75,3

$$\text{Quota (ratio) [C]} = \frac{\text{Estimated quota obligation (TWh) [D]}}{\text{Estimated electricity consumption with quota obligation (TWh) [A]}}$$

Table 2: Estimated annual changes in demand in Norway – The target for 2020 is unchanged

	[F]	[G]	[H]	[I]=[F]x[H]	[J]= [FxG]-[FxH]	
	Estimated electricity consumption with quota obligation - Norway 2014 (TWh)	Current quota obligation - Norway (ratio)	NVE's recommendation for new quota obligations in Norway (ratio)	Estimated quota obligation with recommended quota (TWh)	Estimated change in the electricity certificate demand per year (TWh)	Estimated change in the electricity certificate demand accumulated per year (TWh)
2016	80,40	0,108	0,092	7,4	-1,27	-1,3
2017	80,60	0,127	0,110	8,9	-1,36	-2,6
2018	80,90	0,146	0,128	10,4	-1,46	-4,1
2019	81,20	0,165	0,145	11,8	-1,59	-5,7
2020	81,30	0,183	0,170	13,8	-1,04	-6,7
2021	81,40	0,182	0,170	13,8	-0,98	-7,7
2022	81,50	0,181	0,169	13,8	-0,95	-8,7
2023	81,50	0,180	0,169	13,8	-0,92	-9,6
2024	81,60	0,179	0,168	13,7	-0,89	-10,5
2025	81,70	0,176	0,167	13,7	-0,70	-11,2
2026	81,70	0,164	0,158	12,9	-0,50	-11,7
2027	81,80	0,151	0,146	12,0	-0,39	-12,0
2028	81,90	0,132	0,126	10,3	-0,50	-12,6
2029	81,90	0,113	0,107	8,8	-0,45	-13,0
2030	82,00	0,094	0,089	7,3	-0,38	-13,4
2031	82,10	0,075	0,071	5,9	-0,29	-13,7
2032	82,10	0,056	0,054	4,4	-0,20	-13,9
2033	82,20	0,037	0,036	2,9	-0,11	-14,0
2034	82,30	0,018	0,018	1,5	-0,01	-14,0
2035	82,30	0,009	0,009	0,7	-0,01	-14,0

$$\text{Quota (ratio) [H]} = \frac{\text{Estimated quota obligation (TWh) [I]}}{\text{Estimated electricity consumption with quota obligation (TWh) [F]}}$$

Table 3: Estimated annual changes in demand in the common Norwegian-Swedish electricity certificate market

	[K]=[E]+[J]	
	Estimated net change in the electricity certificate demand per year in the Norwegian-Swedish electricity certificate market (TWh)	Estimated net change in the electricity certificate demand accumulated per year in the Norwegian-Swedish electricity certificate market (TWh)
2016	6,77	6,8
2017	7,43	14,2
2018	7,26	21,5
2019	7,22	28,7
2020	5,52	34,2
2021	4,59	38,8
2022	4,15	42,9
2023	3,87	46,8
2024	3,11	49,9
2025	2,53	52,5
2026	1,68	54,1
2027	1,09	55,2
2028	0,99	56,2
2029	0,96	57,2
2030	1,00	58,2
2031	0,65	58,8
2032	0,56	59,4
2033	0,70	60,1
2034	0,78	60,9
2035	0,40	61,3

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