



NordREG  
Nordic Energy Regulators

# Grid investments in a Nordic perspective

Report 3/2010



# **Grid investments in a Nordic perspective**

## **Report to EMG**

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## Preface

The Nordic energy regulator's cooperation through NordREG is based on a strong consensus and common understanding of the Nordic market and the value of a well functioning common Nordic electricity market linked to the further European electricity markets.

The Nordic system operators have a tradition of common network planning, which is now transferred into the framework of ENTSO-E. However, in spite of strong political support for commonly agreed investments, the experience shows that there are several obstacles to the realisation of these plans. Causes that have been mentioned are differences in the national legislation as well as in the processes for approval of network investments. Furthermore, clear models for decision making and financing are missing, especially in the case of projects which affect more than two countries or when the distribution of costs and benefits is perceived to be unequal.

The Electricity Market Group (EMG) under the Nordic Council of Ministers has requested NordREG to map and analyze the differences in the legislation and licensing processes in the Nordic countries and to investigate possible ways of financing common network investment projects.

NordREG established a task force under the Transmission and Wholesale WG to undertake the task. As the Danish regulator DERA do not have explicit competence with regard to investment decisions, the Danish Energy Agency has represented Denmark in the task force. Members of the task force have been Margareta Bergström (EI), Brita Bohman (EI), Ritva Hirvonen (EMV), Anders Højgaard Kristensen (DEA), Jørund Krogsrud (NVE), Skule Nilsen (NVE), Jon Sagen (NVE) and Kjersti Vøllestad (NVE).

With this report, delivered to EMG as a response to their request, the task force has concluded its work.

## Summary

In a letter of 20 November 2008, the Electricity Market Group (EMG) under the Nordic Council of Ministers requested NordREG to carry out an assignment related to transmission network investments in the Nordic countries. The assignment to NordREG was divided into two tasks; to map the differences in the legislation and licensing processes in the Nordic countries and to analyse these differences and possible ways of financing common network investment projects.

In the second half of 2009 the consultant Econ Pöyry was engaged to support in the finalisation of this project, mainly concerning possibilities for Nordic financing. The final text is however the sole responsibility of the task force.

A draft version of the final report was delivered to EMG in December 2009. At the same time the report was sent to the Nordic TSOs together with an invitation to a workshop at Gardermoen on 26 January 2010. The comments from the TSOs are included in appendix 2 of the report.

### Mapping

A short summary of the results of the mapping is presented below together with the headings specified by EMG. The results of the comparison of the relevant factors are also summarized in table 1.

*To map the processes and evaluation criteria of the national authorities applied for approving investments and handling the necessary licences with regard to those aspects that are especially relevant for network investments that deliver common benefit to several Nordic countries.*

Acts and regulations in all Nordic countries are written with reference to national conditions and do not take into account explicitly the Nordic perspective. The building of a high voltage transmission line requires a license in all Nordic countries and the licensing processes are quite similar in all Nordic countries. However there exists some differences e.g.

- In Norway and Sweden the line-route is decided by the licensing authorities. In Denmark the line route is decided by the environmental authorities and in Finland the route is defined during the Environmental Impact Assessment process.
- For building a line an explicit socio-economic assessment is only required in Norway and Denmark.

In all Nordic countries the relevant authorities (regulators) apply an assessment criterion that building of cross-border lines shall foster the development of the electricity market, but the criterion may not explicitly state that the Nordic perspective should be taken into account.

*To map the legislation, regulations and mandates that are relevant for the national transmission system operators possibilities to participate in projects related to network investments in other Nordic countries and to map the processes and evaluation criteria of*

*the national transmission system operators that are relevant for their possibility to participate in such projects.*

The processes and evaluation criteria for investment projects considered by the TSO's are quite similar for all Nordic countries. All countries base their evaluation to a high degree on common criteria used under the former Nordel-cooperation. The Nordel criteria imply that socioeconomic benefit is necessary for an investment project to be carried out. The Nordel criteria evaluate socioeconomic benefit of both interconnectors and national investments which might affect the Nordic electricity market, which means that the Nordic benefit of the investment is considered.

All countries include all identified transmission projects in the national Grid Master Plan, which is updated annually and forward looking.

*To map the possibilities of national transmission system operators to sign agreements that deal with various forms of common financing/Nordic financing of network investments in the Nordic countries.*

Generally, it can be stated that there are no rules or legislations in any of the Nordic countries that explicitly regulate the issue of common financing within Nordic countries. There seem to be few formal limitations on TSO participation in investments in other countries. However there are no explicit rules regulating this. The fundamental tasks of the TSOs as defined in laws, regulations and bye-laws have a primarily national perspective, and the lack of an explicit framework describing how TSOs may participate in common Nordic investments may to some degree constitute an obstacle to such projects.

*To map the rules regulating the ownership of the network and what kind of possibilities there are for shared ownership of network (with other Nordic transmission system network operators) in the various countries.*

In Denmark, Finland and Norway there seems to be no explicit acts or regulations that regulate the ownership of the main grid. However in practice, the transmission grids are today mainly owned by the national TSOs. In Sweden, cross-border lines should only be owned by Svenska Kraftnät or a company where Svenska Kraftnät has decisive influence.

It is possible for a foreign party to have (shared) ownership of network in all Nordic countries and all Nordic countries accept foreign ownership of network assets inside their country under certain conditions.

*To map how the EU's current legislation influences Nordic cross-border network investments and to assess how the future EU legislation (3<sup>rd</sup> package) may influence this.*

As an overall conclusion the 3<sup>rd</sup> package may not in it self constitute an obstacle to Nordic cross-border network investment cooperation. Such a regional approach is in line with the new obligations imposed on Member States, national regulatory authorities and TSOs to engage in regional cooperation to close the existing regulatory gaps between national jurisdictions to mend the imperfections of the internal market.

Close regional cooperation in the development of transmission networks is also important to reach stated objectives for the internal market to work properly. In this way, the Nordic cooperation may serve as model for other regions to enable network investment of

common regional benefit as opposed to mere national approaches to investments in transmission networks. Hence, we assume that both the European Commission and the new Agency for Cooperation of Energy Regulators (ACER) will be positive towards enhanced Nordic grid investments and regional Nordic co-operation in this regard, as this will facilitate well functioning electricity markets and be an advantage for the internal electricity market as a whole.

## **Possible models to finance grid investments**

In the second part of the report differences between the Nordic countries are analyzed and possible models to finance grid investments of common interest are evaluated together with organisational aspects. These analyses do not necessarily cover all possible models and aspects. The evaluation is intended as input to further work, and not as our final recommendation of any specific arrangement.

Alternative ways for the financing of common network infrastructure projects were studied and evaluated with regard to incentives to invest, market consequences and their legitimacy. The alternatives that were regarded as viable were tariffs complemented with congestion rents (in accordance with the provisions in the third package). Since the benefits of investments may be unequally distributed, investment contributions between TSOs could be a feasible way to distribute costs in a better way among the TSOs. Alternatives that were not considered feasible were a Nordic trading fee meaning a fee per kWh traded in some predefined manner, e.g. based on trading in the financial or physical market, or be applied to all balance-responsible entities in the Nordic market. The Nordic fee was considered likely to be against EU legislation.

Two models combining financing and organisation alternatives were identified. The first model was the multilateral voluntary cooperation within the new EU framework. In this model cooperation structure would be based on the new EU framework with a common planning process but with national decisions and ownership. Financing of the network infrastructure investments would be done by using national tariffs and congestion income, combined with voluntary investment contributions between TSOs to achieve a better match of costs and benefits at the national level.

The second model relied on joint Nordic decision committee, which implies formalized cooperation through joint committee responsible for a common planning process but in addition making binding investment decisions. In this model, too, financing would be realised through the use of national tariffs and congestion income, combined with investment contributions between TSOs to achieve a better match of costs and benefits at the national level. The decision committee would need the authority to make decisions on financing, including the obligation to use investment contributions to balance costs and benefits.

Any move towards closer cooperation with regard to Nordic transmission investments will require a corresponding development of the national regulatory systems towards increased cooperation. The need for regulatory changes to respond to the different levels of cooperation will depend on the choice of financing and organisational model.

In the case of the voluntary cooperation model, the impact on regulation will be relatively small, but it may be desirable to introduce some clear guidelines at the national level

regarding payments between TSOs. If a joint planning committee is established, the Nordic regulators should perform some supervisory function, i.e. ensure that the committee adheres to certain principles and reporting requirements, and if necessary ensure that the costs of the committee are covered through the national network tariffs.

Table 1: Comparison of factors relevant to Nordic network investments

Issue	Denmark	Finland	Norway	Sweden	Identified obstacle	Proposition
Licensing of <b>domestic</b> transmission infrastructure (authority, criteria)	Minister A positive national socio-economic benefit required	Regulator (EMV) The construction of the line is needed to secure transmission of electricity	Regulator (NVE) A positive national socio-economic benefit required	Regulator (EI) Investment has to give positive socio economic values for the market (could be national, Nordic or European).	Assessment criteria do not include any Nordic/regional aspects	To develop the licensing framework to include the Nordic/regional network development aspect
Licensing of <b>cross-border</b> transmission infrastructure (authority, criteria)	Minister A positive national socio-economic benefit required	Ministry The line is needed to secure transmission of electricity and the line has to be justified for development and reciprocity of the electricity market	Regulator (NVE) A positive national socio-economic benefit required	Government Investment has to give positive socio economic values for the market (could be national, Nordic or European)	Assessment criteria do not explicitly include any Nordic/regional aspects	To develop the licensing framework to include the Nordic/regional network development aspect
Ownership of the transmission network	No specific rules that would limit the ownership of the whole transmission network e.g. to the TSO	No specific rules that would limit the ownership of the whole transmission network e.g. to the TSO	No formal requirement, however, a license is needed from the regulator to own the transmission network	SvK shall own the transmission network and have a decisive influence (51% ownership) of the cross-border interconnectors	In Sweden, no other companies than SvK can own transmission lines	To enable the participation of another TSO into network infrastructure project, the national legislation needs to be amended

Participation of TSO into the investment in another country (law)	No specific rules in legislation	No specific rules in legislation	No specific rules in legislation	No specific rules in legislation	The current national legislation does not explicitly address the issue of a TSO making/participating in a network infrastructure investment in another country	To support the participation of the TSO into financing of transmission lines in other countries, the national legislation needs to be amended
Participation of TSO into the investment in another country (network regulation)	The legal rules on economic regulation do not contain any specific rules on this. Depends on application.	The legal rules on economic regulation do not contain any specific rules on this. Depends on application.	The law does not prohibit this. The regulator has approved that the TSO can recover payments to Svk for network infrastructure costs in Sweden through the national tariff.	No specific rules on this. However, the mode of operation (state utility) and the related decision making on investments may create an obstacle.	The current national legislation does not explicitly address the issue of a TSO making/participating in a network infrastructure investment in another country from the economic regulation point of view	To support the participation of the TSO into financing of transmission lines in other countries, the national legislation with regard to network regulation needs to be amended

## Background

In a letter of 20 November 2008, the Electricity Market Group under the Nordic Council of Ministers requested NordREG to carry out an assignment related to transmission network investments in the Nordic countries. The assignment was based on the decision made by the Nordic energy ministers at their meeting in Umeå in autumn 2008.

According to the assignment NordREG was asked to deliver the following tasks:

### Task 1: Mapping

1. To map the processes and evaluation criteria of the national authorities applied for approving investments and handling the necessary licences with regard to those aspects that are especially relevant for network investments that deliver common benefit to several Nordic countries.
2. To map the processes and evaluation criteria of the national transmission system operators as well as legislation, regulations and mandates that are relevant for their possibilities to participate in projects related to network investments in other Nordic countries.
3. To map the possibilities of national transmission system operators to sign agreements that deal with various forms of common financing/Nordic financing of network investments in the Nordic countries.
4. To map the rules regulating the ownership of the network: what kind of possibilities there are for shared ownership of network (with other Nordic transmission system network operators) in the various countries?
5. To map how the EU's current legislation influences Nordic cross-border network investments, restricted to the situations that are especially relevant for those network investments that bring common benefit to several Nordic countries. Additionally, it is requested to assess how the future EU legislation (3<sup>rd</sup> package) may influence this.

### Task 2: Analysis based on mapping

1. Analysis of such eventual differences in the processes, criteria, legislation, regulations and mandates in the Nordic countries that can create an obstacle to network investments that will bring benefit to several countries, and in this context also the expected effect of the EU legislation.
2. Possibilities for Nordic financing (e.g. increasing possibilities to use the network tariffs levied on own customers to finance investments that will bring Nordic benefit, congestion income/market levy from Nord Pool actors etc.).

A status report with preliminary findings from the mapping points 1- 4 was delivered to EMG in May 2009.

In the second half of 2009 the consultant Econ Pöyry was engaged to support in the finalisation of this project. Their contributions are primarily related to task 2.2 Possibilities for Nordic financing. The final text is however the sole responsibility of the task force.

A draft version of the final report was delivered to EMG in December 2009. At same time the report was sent to the Nordic TSOs together with an invitation to a workshop at Gardermoen on 26 January 2010. Four Nordic TSOs participated at the workshop and contributed with comments on the report.

In its 2009 status report to Nordic Council of Ministers EMG stated that they will continue working with the material, with the aim of identifying areas where the Nordic perspective can be strengthened, or the rules and procedures harmonised. With this final report NordREG provides its input to EMG's further work in this area. The EMG will send the report for consultation with stakeholders.

The mapping of different legislation, licensing procedures and processes for grid investments are presented in the first part of the report. A short summary of the findings are given after each separate topic.

In the second part of the report differences between the Nordic countries are analyzed (2.1) and possible models to finance grid investments of common interest are evaluated (2.2). Different models of possible financing sources and models for organising common financing are discussed. We also present evaluations of different aspects of these models. These analysis do not necessarily cover all possible models and aspects, and the evaluation is intended as input to further work, and not as our final recommendation of any specific arrangement.

# 1 Mapping of grid investment approval processes in the Nordic countries

## 1.1 Processes and evaluation criteria of the Nordic national authorities regarding grid investments

*To map the processes and evaluation criteria of the national authorities applied for approving investments and handling the necessary licences with regard to those aspects that are especially relevant for network investments that deliver common benefit to several Nordic countries.*

### 1.1.1 Denmark

#### 1.1.1.1 Licensing procedures

*Licensing of grid companies*

Ownership and operation of the grid requires a license according to article 19 of the Danish Electricity Act. A licence is issued with a validity of 20 years. Criteria are financial and technical capacity. At the first round in the present legal regime, licenses were granted to existing distribution companies. The overall system responsible is the Transmission System Operator (TSO) Energinet.dk, whose activities are regulated in separate legislation. Energinet.dk is also responsible for coordination and long-term grid planning.

*Licensing of new lines or changes to existing grid*

According to article 21 in the Danish Electricity Act, new transmission lines or substantial changes to existing lines for a voltage level of 100 kV and above require advance approval by the Minister. The authority is in most cases delegated to the Danish Energy Agency. New lines with a voltage level below 100 kV do not require approval according to the Electricity Act.

An application for permission to invest in the transmission system can be granted if there is a need for the line i.e. if the investment is necessary. Elements to be taken into consideration appear from the section 1.1.1.2 below.

The preamble of the Electricity Act stipulates in addition that the objective of the Act is to ensure that electricity supply is carried out in respect to among other things the socio economy.

The definition of a substantial change to an existing line is not explicit in the legislation, but is usually applied if an upgrade adds additional capacity to the line or if the visual impact changes significantly. Finally the legal principle of proportionality<sup>1</sup> applies as well.

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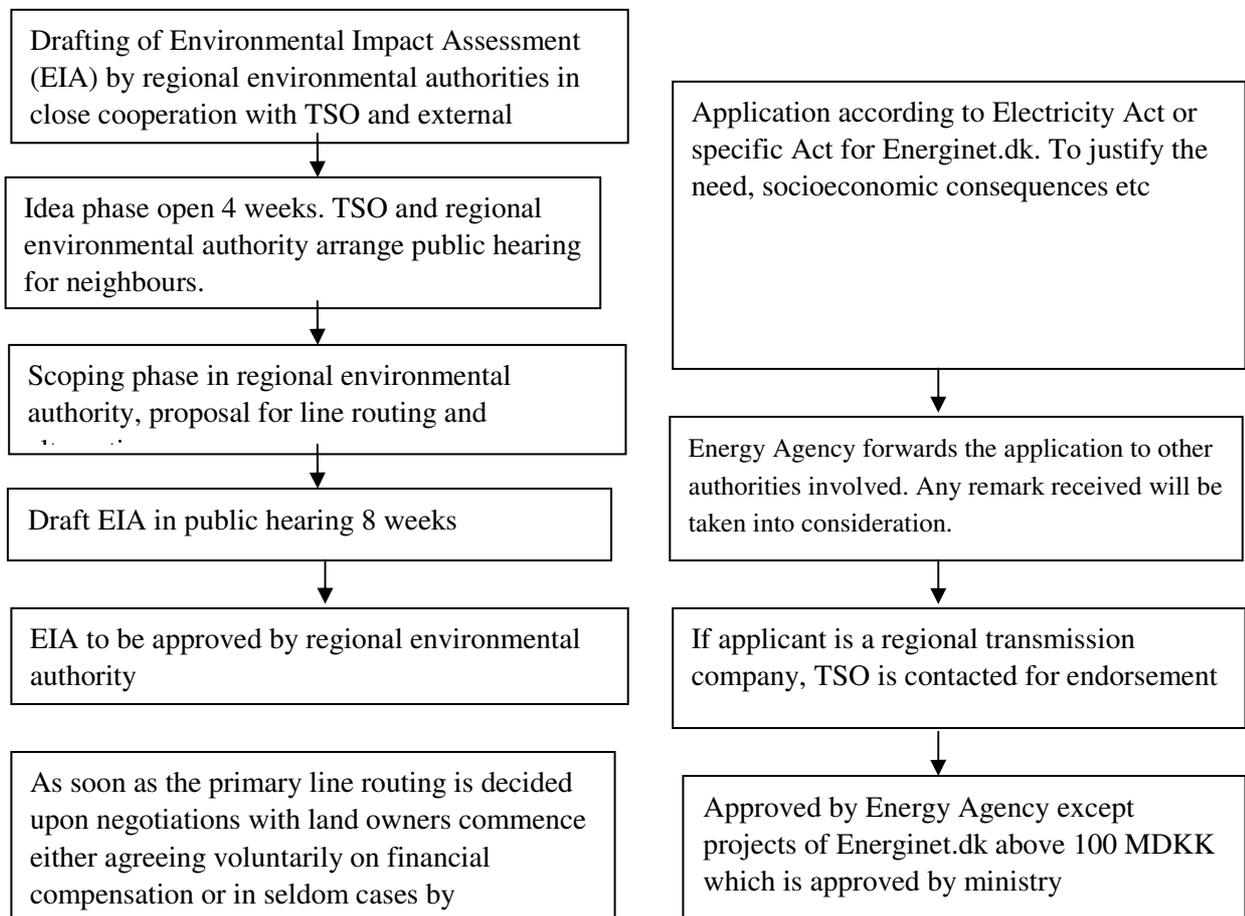
<sup>1</sup> In this case the **principle of proportionality** means that refurbishment generally does not require permission from authorities, but if eg. a complete interconnector is replaced by a new cable parallel to the existing cable a permission is required

The Danish Electricity Act does not apply to the national TSO Energinet.dk which is regulated by a separate Act; “Act on Energinet.dk”. However approval of investment decisions is identical to the above mentioned.

Acquisition of land is the responsibility of the grid company. Standard rates for compensation are negotiated between associations of grid companies and Energinet.dk on the one side and association of Danish farmers on the other side. Those standard rates are used for negotiations and most cases are settled voluntarily. Only in few cases it is necessary to acquire land by expropriation.

Applications for licenses to construct interconnectors to neighbouring countries are treated according to the same procedures. There are no other dedicated regulations or approval procedures for interconnectors.

The licensing procedure is shown in the flow chart below.



The flow chart illustrates the three independent procedures taking place in advance of construction of a new cable or overhead line (Approval according to the Electricity supply Act, Approval according to the Act on Planning and Agreements with Land Owners or Expropriation). The environmental assessment is carried out in most projects, though some underground cabling projects are exempted. Authorities are usually not involved in land acquisition, only in the few cases an expropriation is necessary, the court system intervenes.

### **1.1.1.2 Assessment criteria**

An application for permission to invest in the transmission system can be granted if there is a need for the line i.e. if the investment is necessary. Criteria for approval of investments are stated in the legislation as follows:

- to increase the security of supply
- for support the emergency preparedness
- to enable a functioning competition in the electricity market
- to integrate renewable production

An element of the approval process is the assessment by Energinet.dk of the project according to current Grid Code – which is the Nordel Grid Code in the eastern part and the UCTE Handbook in the western part of the country.

Environmental assessment of a new transmission project is not included in the responsibility of the Ministry of Climate and Energy, but is carried out by the municipalities or for larger projects, the Ministry of Environment.

Laying-out of underground cables are not included in the EIA-Directive whereas construction of new overhead lines requires an EIA. The municipalities are responsible for projects spanning max 2 municipalities. The Ministry of Environment is responsible for projects spanning more than two municipalities.

New guidelines for underground cabling and expansion of the electricity transmission grid were approved by the Parliament in November 2008. The guidelines stipulate that all new transmission connections with rated voltage above 100 kV shall be constructed underground. The only exemption is an upgrade of three existing 400 kV overhead lines. The existing 132 and 150 kV grids will be cabled underground within the next 20 years according to a cabling action plan drafted by Energinet.dk in cooperation with the other owners of the grid.

## **1.1.2 Finland**

### **1.1.2.1 Licensing procedures**

According to the Electricity Market Act, Energy Market Authority (EMV) grants licenses for high voltage lines (110 kV or higher voltage) located within Finland. Interconnectors of 110 kV and above require a license from the Ministry. Approval of a network investment plan is not required in Finland. A precondition for granting a license to build a

high voltage line is that the construction of the line is necessary to ensure the transmission of electricity. Additionally, to build a cross-border line it is furthermore required that its construction is appropriate for the development and reciprocity of the electricity market.

The applicant shall have the license to operate the network (distribution, regional or transmission network) granted by EMV.

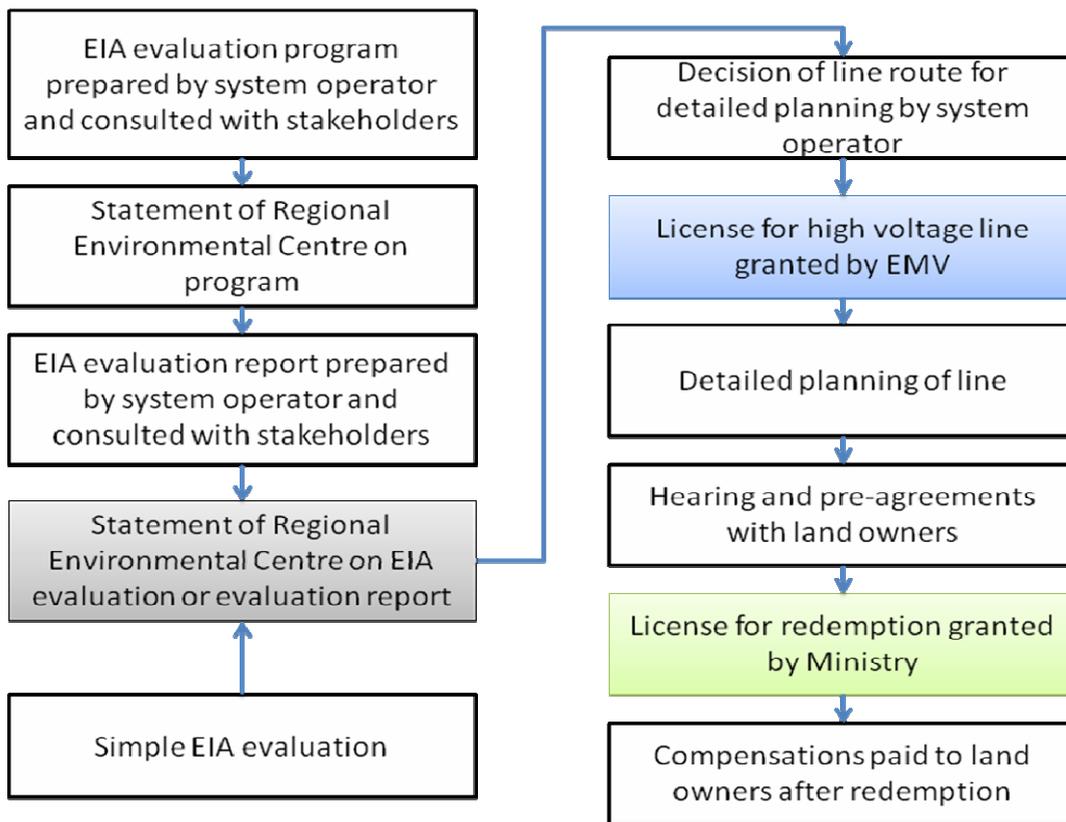
The application for the license shall include the following information (as defined in the Governmental Decree on electricity markets):

- information about the builder of the line
- main specifications and route of the line with starting and ending points
- cost estimate and building time table
- assessment of the necessity of the line to ensure transmission needs
- assessment of environmental effects and applicability to regional land use
- opinion from network operator, whose network the high voltage line is to be connected
- opinion from distribution system operator, which has responsibility within the region
- other information necessary for handling of the application

Furthermore, the application for a license for cross-border interconnector shall include the applicant's view on the appropriateness of the line as regards development and reciprocity of the electricity markets.

The decision on an application for a license given by EMV can be appealed to a regional **Administrative Court** and afterwards to the **Supreme Administrative Court**.

The figure below presents an overview of the process to build high voltage lines in Finland.



### 1.1.2.2 Assessment criteria

The application to build a line is assessed according to very general criteria set in the Electricity Market Act. The prerequisite for approval of the license is that the line is needed to ensure the transmission of the electricity. Furthermore, for cross-border interconnectors the prerequisite is also that its building is appropriate as regards development of electricity markets and reciprocity. The license may also include necessary provisions.

EIA has to be performed for high voltage lines above 110 kV according to the EIA legislation. For 110 kV lines and lines below 15 km a simpler process is applied and a report on environmental effects shall be made. The full EIA procedure may also be required for individual projects where harmful environmental impacts are likely, on the basis of the decisions made by the Ministry of the Environment.

The license given by EMV does not define the route of the high voltage line between the starting and ending point of the line. The route is defined during EIA process for high voltage lines higher than 110 kV (i.e. 220 kV and 400 kV lines). The EIA includes the environmental assessment of alternative routes of power lines. All interest groups as well as the municipalities and governmental units may give declarations about the EIA program and EIA report prepared by the TSO. The regional environmental centre (REC) provides then summaries of these declarations and adds its own declaration. The content of the REC declaration should be taken into account in the planning process of the power line. The precise line route is then chosen by the TSO after the EIA procedure is finalised. After the EIA process and when the license has been granted the TSO can launch the

redemption process of the land. The government grants permission for redemptions, which decision can be appealed to the Supreme Administrative Court by the land owners.

From the license it shall become clear how the assessment based on environmental impact assessment legislation has been taken into account.

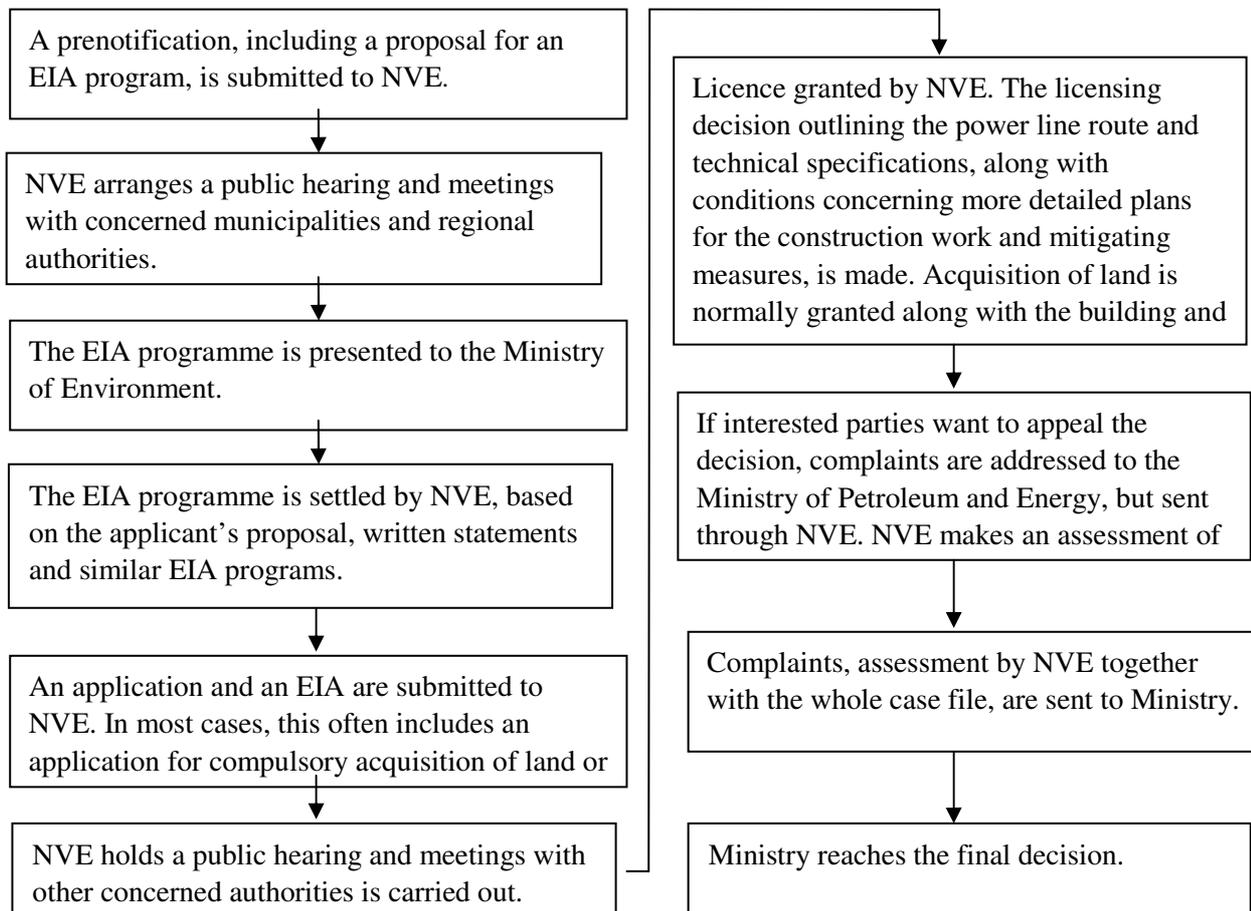
### 1.1.3 Norway

#### 1.1.3.1 Licensing procedures

The Norwegian Water Resources and Energy Directorate (NVE) is responsible for the licensing process of power lines and other electrical installations in Norway. The licensing process is mainly the same for power lines between Norway and other countries as for power lines within Norway's borders. In addition to the licence to build and operate an cross-border transmission line, a licence to export/import electrical energy is required. An application for an export/import licence must be submitted to the Ministry of Petroleum and Energy (OED).

Power lines of more than 20 km and a voltage of 132 kV or higher require a notification and an EIA, according to the Environmental Impact Assessment Regulations.

When the new Planning Act entered into force the 1<sup>st</sup> of July 2009, all power lines and other electrical installations individually considered under the Energy Act are exempt from the provisions of the Planning Act, except the EIA regulations. This implies that applications to build a power line are undergoing one single process, under NVEs authority. The process is outlined below.



### **1.1.3.2 Assessment criteria**

The Energy Act states that:

*“The Act shall ensure that the generation, conversion, transmission, trading, distribution and use of energy are conducted in a way that efficiently promotes the interests of society, which includes taking into consideration any public and private interests that will be affected.”*

Through the licensing process, NVE make sure that the purpose of the Energy Act, as quoted above, is fulfilled. More specifically, the criteria considered in the process are divided into benefits/advantages and costs/disadvantages of the specific energy project.

The benefits/advantages of a transmission line can be:

Enhanced security of electricity supply

Reduced bottleneck effects

Reduced energy loss in the grid

Market benefits from the trade of electricity

The disadvantages/cost of a transmission line can be:

Investment costs

Environmental effects, such as

Visual effects on landscape, cultural monuments/areas, residential areas and recreational facilities, areas of importance to the tourist industry, etc.

Risk of bird collisions, general disturbance for wildlife, consequences for the natural environment

Inconveniences for agriculture, forestry, fisheries and other businesses

Land use

Electromagnetic fields and noise

Some of the advantages/disadvantages above are possible to quantify, like the investment costs and the market price of bottleneck effects and energy loss. However, most of the disadvantages are in reality uncertain as well as non-quantifiable, such as the impacts and costs of visual effects, noise and influence on the natural environment. The licensing decision is hence based both an assessment of costs and benefits, and on an exercise of judgment by NVE when it comes to other advantages or disadvantages of a specific power line.

#### **Particular assessment for cross-border power lines**

The jurisdiction of the Energy Act is Norway, and possible costs or benefits for other countries are not taken into consideration within the scope of this legislation.

Nevertheless, it is a requirement in the Regulations on Environmental Impact Assessment to assess possible social, economic and environmental impacts for other countries

concerned, and to coordinate the EIA impact assessment with the other countries involved.

This implies that a licence can only be given to grid projects which are beneficial to Norway, based on the assessment criteria listed above. Hence, a grid investment in Norway which is considered positive for another Nordic country cannot be given a licence, unless it is also positive for Norway, even if the total benefits exceed the total costs for the two countries together.

Licences that are granted according to the Energy Act concern building and operating energy installations, as well as ownership to the installations. Ownership is however to be interpreted as total control of and access to the physical installations, either through real ownership or through contracts that ensure such control. Joint ownership of a cross-border power line is hence possible.

The Norwegian Energy Act does not limit the possibility to build and operate the main grid to the Norwegian TSO. Other national grid companies or foreign TSOs or grid companies are allowed to apply for and may be given a licence pursuant to the Energy Act. It will, however, require that the company establish an office in Norway in order to meet our requirements regarding minimum staff necessary to act as a responsible operator of the installations.

## **1.1.4 Sweden**

### **1.1.4.1 Licensing procedures**

An electrical high-voltage line can not be built or used without a licence (network licence) from the Government. There are no special rules regulating an cross-border line. The license applications for an cross-border line thus follow the standard licensing procedure.

The Government has appointed the Swedish Energy Markets Inspectorate (the Inspectorate) to fulfil the duties of the network authority<sup>2</sup>. The Government may authorize the network authority to consider matters concerning network licences that do not relate to an cross-border line. Regarding cross-border lines, (as well as most lines over 145 kV), the Government takes the decision. All lines owned by the Swedish TSO, Svenska Kraftnät, have voltage over 220 kV and are thus generally decided by the Government. However, these decisions are usually based on recommendations from the Inspectorate.

An application for a network licence is always sent to the Inspectorate who is responsible for the licensing process of power lines in Sweden. This applies also for lines where the Government makes the final decision. All power lines require a notification and an EIA, according to the Environmental Impact Assessment Regulation (Miljöbalken) as well as a

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<sup>2</sup> In the following the Energy Markets Inspectorate is used except in citations from the Electricity Act.

statement by the County Administrative board regarding the project's expected environmental effects.<sup>3</sup> A technical description is also required.

The handling process is in short as follows: Before submitting a case to the Inspectorate, the company that applies for a license has to consult all concerned parties including the public. Upon receiving a new case and making sure it is complete, the Inspectorate will send the documentation out for consultation to relevant authorities and land owners as well as the public concerned. If no objections appear, the Inspectorate will make a decision or a recommendation (in case of lines where the Government has the decision power), taking the criteria mentioned in section 1.1.4.2 (below) into consideration. If there are objections from the consultation, the parties concerned are obliged to comment on the objections from the counterparty. A network licence is granted for forty years, if it relates to a line, this might however change in accordance with a new proposal that is expected to enter into force in July 2010. With this new proposal a license will be granted without time limit and only be retried upon request.

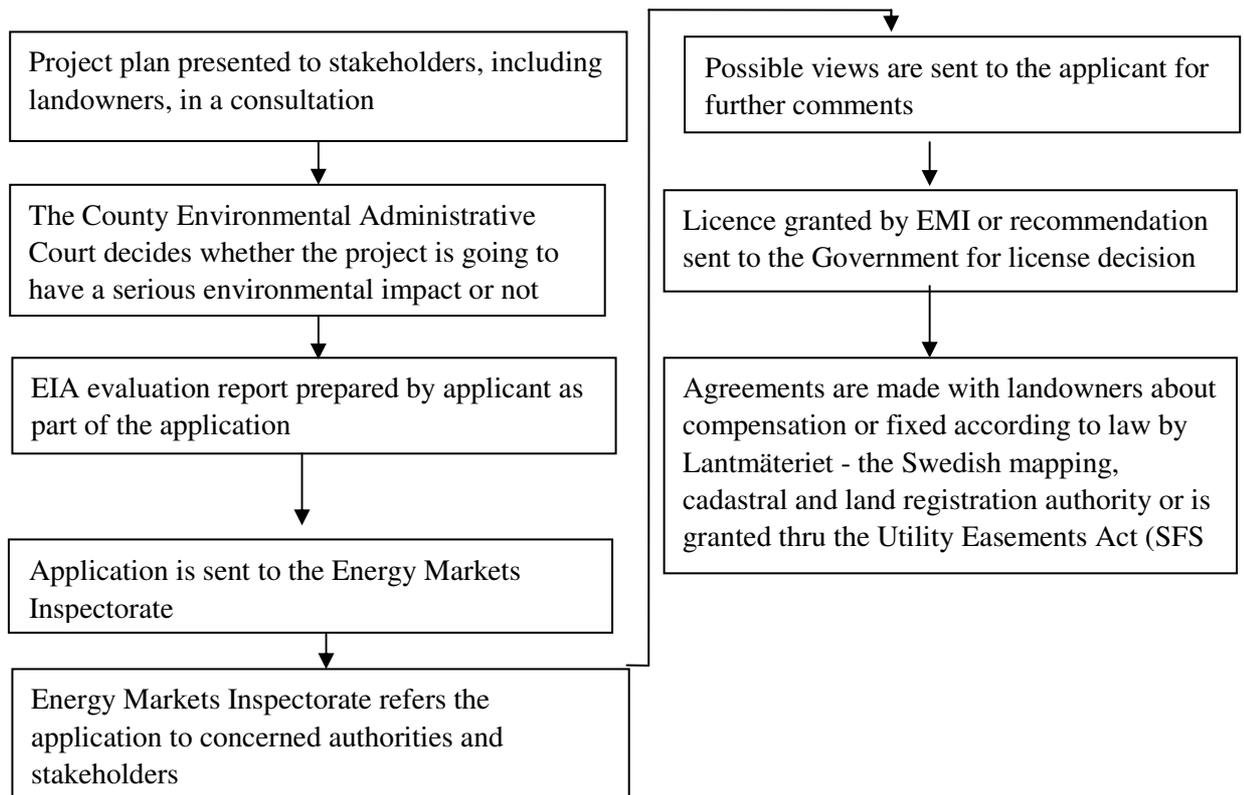
The Inspectorate's decision is subject to possible complaints from concerned parties. Formal complaints must be addressed to the Ministry of Enterprise, Energy and Communications, but sent through the Inspectorate.

When a complaint is received, the Inspectorate has to make a formal check of the complaint, e.g. is the complaint received in time (within three weeks from the date of the decision) . Then the complaint, together with the whole case file, is sent to the Ministry of Enterprise, Energy and Communications, which reaches the final decision after a thorough assessment of the Inspectorate's formal process and exercise of judgement.

If the license is granted through a decision by the Government however, which is always the case regarding cross-border lines, the possibilities to appeal are very limited. In practise these decisions are not appealed upon, hence the license procedure in these cases will be faster.

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<sup>3</sup> These requirements could be changed according to a new proposal of changes in the Electricity act and some related laws, expected to enter into force in July 2010. It is not likely however that this will concern inter-state-lines.



#### 1.1.4.2 Assessment criteria

There are certain preconditions for a grant of a network licence. A network licence shall relate to a cable with a basically fixed route (line network licence) or a cable network within a specific geographical area (area network licence). In the following, area network licenses are disregarded.

A line network licence may not violate a detailed municipal or community plan or area regulations. However, if the purpose of the plan or regulations is not counteracted, minor deviations may be accepted. For a network line to be granted a license the applicant has to motivate that the line is necessary and the company applying is capable and suitable to run an electrical line or network.

When considering matters concerning the grant of a line network licence, the provisions of Chapters 2 to 4, Chapter 5, Section 3, Chapter 6 and Chapter 16, Section 5 of the Environment Code shall also be applied. In short, the provisions are as follows: Chapter 2 states that before a measure is made, the performer is obliged to obtain the necessary knowledge about the impact the measure is going to have on the environment as well as the public and also take appropriate precautionary measures to prevent the measure from inflicting harm on the environment or the public. The performer is obliged to, within reason; choose a location where the measure is going to have as little environmental impact as possible. Chapter 2 also states the principle that the polluter shall pay for any damage caused by the measure. Chapter 3, 4 and 5 addresses the issue of best usage of land and water areas. Chapter 6 describes the Environmental Impact Assessment. Chapter 16 explains the process of examination of matters. An environmental impact statement shall form part of an application for a line network licence. A network licence may only be granted if the facility is suitable from a public perspective. In addition, a network

licence may only be granted to a party who, from the public perspective, is suitable to engage in network operations.

Under the Utility Easements Act (SFS 1973:1144) a party wishing to use a space within a property unit for a utility or other device can obtain the right to do so (a utility easement). Questions concerning utility easements are examined by cadastral procedure. A utility easement procedure is handled by a cadastral authority (Lantmäteriverket). The Act applies, among others, to a high voltage power line for which a concession is required.

### **1.1.5 Summary**

Acts and regulations in all Nordic countries are written with reference to national conditions and do not take into account explicitly the Nordic perspective.

The building of a high voltage transmission line requires a license in all Nordic countries. The licensing process for cross-border lines is generally the same as for internal lines in Norway and Denmark. In Norway the licensing authority is the regulator NVE and in Denmark the licensing authority for lines above 100 kV voltage is the Minister and for investments below 100 million DKK the Danish Energy Agency. In Sweden and Finland differences exist. In Sweden the Government takes decisions concerning cross-border lines (and lines with a voltage level above 145 kV). Licenses for other lines are granted by the Swedish regulator Energy Markets Inspectorate (EI). In Finland the Ministry of Employment and the Economy grants the license for high voltage cross-border lines (voltage equal or higher than 110 kV). Licenses for internal high-voltage lines (voltage equal or higher than 110 kV) are granted by the Finnish regulator EMV.

The licensing processes for building a high voltage transmission line are quite similar in all Nordic countries, but there exists some differences e.g.

In Norway and Sweden the line-route is decided by the licensing authorities. In Denmark the line route is decided by the environmental authorities and in Finland the route is defined during the Environmental Impact Assessment process.

For building a line an explicit socio-economic assessment is only required in Norway and Denmark.

In all Nordic countries the relevant authorities (regulators) apply an assessment criterion that building of cross-border lines shall foster the development of the electricity market, but the criterion may not explicitly state that the Nordic perspective should be taken into account. The authorities (regulators) apply these criteria in evaluating the applications for licenses. Nationally there exist also other criteria (either more general or more detailed) which should be taken into account when license decision is considered and these may overrule in some cases the Nordic market aspects.

An Environmental Impact Assessment for high voltage transmission lines is required in all Nordic countries. There are some minor differences to which transmission lines (e.g. length of line, voltage level of line) EIA should be applied.

In Norway a licence from the Ministry of Petroleum and Energy to export/import electrical energy is required in addition to a licence from NVE to build and operate the cross-border transmission line. The import/export license may require that capacity is

used for implicit auctions. In other Nordic countries export/import license is not required for cross-border lines. In all Nordic countries the prerequisite for building of the high voltage lines is the license (or exemption) for operating the network.

In Norway and Denmark the acquisition of the land is dealt with in relation to the building license. In Sweden compulsory acquisition of land is not handled together with the licensing procedure, but it is dealt with through a cadastral procedure and the right to use land is granted by the cadastral authority. Also in Finland the compulsory acquisition of land is handled in separate process and acquisition is granted by the Council of State based on the proposal from Ministry of Employment and the Economy.

## **1.2 Legislation, regulations and mandates relevant for the national TSO's regarding grid investments in other Nordic countries**

*To map the legislation, regulations and mandates that are relevant for the national transmission system operators' possibilities to participate in projects related to network investments in other Nordic countries.*

The relevant legislation on the regulation of the Nordic TSOs is found in national laws, regulations and administrative provisions. The most relevant legislation is listed below. For a comprehensive list, please see Appendix 1 to this report.

In the four countries the framework for the electricity market is regulated in the Energy Act in Norway, in the Electricity Acts in Sweden and Denmark and in the Electricity Market Act in Finland.

### **1.2.1 Denmark**

Only regulation applicable to the National TSO is described here

- Act 1384 about Energinet.dk dated 20-12-2004
- Ordinance 686 Economic regulation of Energinet.dk dated 30-06-2005
- Ordinance 1463 System operation and application of the transmission grid dated 19-12-2005 with subsequent changes

The act about Energinet.dk describes rights and obligation for the Danish TSO e.g. planning requirements, expenses allowed to be financed by the transmission tariff etc. The economic framework for the TSO is specified in the ordinance no 686. It is a non-profit business, where the tariffs annually are adjusted according to expenses. The company is owned by the State represented by the Minister for Climate and Energy.

All Danish legislation is available through [www.retsinformation.dk](http://www.retsinformation.dk)

### **1.2.2 Finland**

The following legislation and EMV decisions are relevant for the Finnish TSO regarding grid investments in other Nordic countries:

- Electricity Market Act (386/1995)
- Governmental Decree on Electricity Markets (65/2009)
- Electricity system license including system responsibility (Decision 133/411/98)
- Decision on Assessing the Reasonableness of the Pricing of Electricity Transmission Network Services in 2008-2011 (Decision 515/424/2007)

The Electricity Market Act sets the requirements how the power system shall be developed and requirements for licenses of high voltage lines. Specific requirements for licenses are set in Governmental Decree on Electricity Markets. In the electricity system license EMV has ordered the TSO (Fingrid) to be system responsible and meet the

requirements set for the system responsibility in the legislation. The decision on pricing defines the principles for the reasonableness of the pricing using income cap with efficiency and quality of supply incentives.

The Finnish legislation does not contain any provisions that would prohibit Fingrid from making investments into the transmission grid or owning transmission grid outside Finland. However, an important element affecting this would be the interpretation and application of the Electricity Market Act by the EMV when it makes the confirmation decision on the principles for the reasonableness of pricing. This is a decision to be made prior to each regulatory period.

### **1.2.3 Norway**

The following Act, Regulations and Licenses are relevant for the Norwegian TSO regarding grid investments in other Nordic countries:

The Energy Act - lov 29. juni 1990 nr. 50.

Regulations to the Energy Act – forskrift 7. des. 1990 nr. 959

Regulations governing inter alia income caps and tariffs for network operations – forskrift 11. mars 1999 nr. 302

Regulations relating to the system responsibility in the power system – forskrift 7. mai 2002 nr. 448

License for International Connections

The Energy Act is an enabling act establishing the overall legal framework for the electricity sector within the territorial borders of Norway. Through different licence schemes, the act regulates inter alia the construction and operation of electrical installations, electricity trading, control of monopoly operations, export/import arrangements, metering, settlements and invoicing, the physical market for power trade, system co-ordination, etc. The Ministry of Petroleum and Energy has pursuant to the Regulations to the Energy Act sub-delegated to NVE extensive powers to issue secondary legislation and also licences concerning all aspects apart from the license for export/imports of electricity. NVE has, inter alia, issued the Regulations governing income caps and tariffs and the Regulations relating to the system responsibility in the power system. Neither the Energy Act nor the secondary legislation contain any provisions that may be seen as an obstacle to Statnetts possibility to make grid investments, build or own transmission grid abroad.

### **1.2.4 Sweden**

The only legal regulation is in:

- the Electricity Act (SFS 1997:857)
- the Electricity Regulation, for Svenska Kraftnät, in the Instruction from the Government. (SFS 1991:2013)
- Utility Easements Act (SFS 1973:1144)

There are no special provisions regarding investments by Svenska Kraftnät in other Nordic countries. However, Svenska Kraftnät is a state utility with the purpose of owning and managing the Swedish main transmission grid and those interconnections that are of importance for the Swedish electricity market.

There does not seem to be any legal provisions that would deny Svenska Kraftnät or a company owned by Svenska Kraftnät to make investments in other countries.

Especially, being a state utility, Svenska Kraftnät cannot transfer money between years. This situation limits the possibilities of ear-marking money for special purposes, especially dedicating congestion income to future investments.

Regarding lines built in Sweden by the TSO of other Nordic countries, examples of cross-border lines connected to the regional network are related in section 1.5.4 below.

### **1.3 Processes and evaluation criteria of the national TSO's regarding grid investments spanning more than one country**

*To map the processes and evaluation criteria of the national transmission system operators that are relevant for their possibilities to participate in projects related to network investments in other Nordic countries.*

#### **1.3.1 Co-operation of the Nordic TSOs**

The Nordic TSOs have a long tradition in planning and operation of the Nordic power system, also including the market issues. This work has been organised through the Nordic co-operation (formerly organised through Nordel). The Nordic TSOs have created the common Nordic Grid Master Plan (NGMP) based on the socio-economic benefit for the whole Nordic market area. The first plan was published in 2002 and updated in 2004, when the prioritized cross-sections for the Nordic power system were launched. These plans are now under realisation: Nea - Järpströmmen was taken into operation in October 2009. Great Belt connection is planned to be in operation in 2010, and Fenno-Skan2 in 2011. Svenska Kraftnät has in principle made a decision about the South link (extended later to South-West link) and it is planned to be ready about 2015. A letter-of-intent has been signed by the Danish and Norwegian TSOs about Skagerak 4 connection; it will be finished in 2014 at the earliest.

The last NGMP was published in spring 2008 covering three cross-sections to be strengthened: Modification of the South link into the South-West link with added capacity, Fardal - Ørskog and the Arctic connection. Connection between Northern Finland and Northern Sweden needs further studies and these studies are now in the pipeline.

Nordic TSOs have created common criteria to prioritize investment alternatives and estimate the benefits of various alternatives:

- Benefit from functionality of the common electricity market
- Consumer benefit
- Producer benefit
- Change in congestion revenues
- Increase the security of supply
- Effect of an investment on active power losses
- Effect on Loss of Load Probability (LOLP)
- Effect on Energy Rationing
- Benefits in Ancillary Services
- Reserves
- Extent of regulating power market
- Reduction of Market Power

The starting point is the benefit for the whole Nordic market area, not benefits to separate countries or separate interest group (consumers or producers).

The common planning also requires that you must have:

- commonly worked out scenarios about the future development of the Nordic power system and its surrounding regions
- a market model for the area covering production and generation and also the future prognoses of the power and energy balances
- a Nordic grid model

In the future Nordic planning will be a part of the Baltic Sea grid planning area. It will be carried out under the System Development Committee of ENTSO-E starting from the autumn 2009.

The principle of Nordic cooperation has been that the Nordic grid plans have been worked out together using the common evaluation criteria. The investment decisions concerning investments within one country have been made by the local TSO. Each TSO has been responsible for the investment costs on its own territory. Investments related to interconnections between countries have been carried out and financed on a bilateral basis.

### **1.3.2 Denmark**

The national TSO Energinet.dk is according to law obliged to carry out long term planning of the electricity system serving as base for assessment of changes in the market, security of supply, operation of the system and R&D – all of which are important for an environmentally friendly and efficient transmission of electricity.

According to this obligation, Energinet.dk continuously identifies and assesses projects of interest. The process concerning the projected cable, Skagerak 4, between Denmark and Norway is explained below as an example. It should be stressed that the project is in its planning phase and is not at present approved by neither Norwegian nor Danish authorities.

An expansion of the interconnector between Jutland and Norway was assessed in Nordel 2002-04 leading to the recommendation of the project in the joint Nordic strategic plan from 2004. This project was one of five interconnector projects identified necessary to support the integration of the national electricity markets into a single market place. (Cf. point 1.3.1.)

Subsequently the project was adopted into the long term plans of the Danish TSO. Negotiations with the Norwegian TSO and feasibility calculations continued and led to a joint declaration from the two TSOs in 2007 that they agree on the principles for the investment.

The Danish TSO has drafted a business plan describing the benefits of the investment for Danish society (The same operation is carried out in Norway). In summer 2008 both TSOs finalised their evaluations and arrived at the same conclusion of having positive impact for both countries and an investment decision was taken by the end of 2009. Final approval by the Danish authorities are expected mid 2010.

A precondition for the Danish investment decision was that the economic impact for society was positive in 'both ends'.

### **1.3.3 Finland**

According to the Electricity Market Act, the Finnish TSO Fingrid, shall maintain, operate and develop its power system and the connections to other power systems in accordance with its customers' reasonable needs, and to secure, for its part, the supply of sufficiently high-standard electricity to its customers. System responsibility within the Electricity Market Act requires that Fingrid shall upkeep and develop its activities and services within the system responsibility and maintain, operate and develop its electricity system and other equipment needed for fulfilling the systems responsibility and the connection to other systems, so that the prerequisites for an efficiently functioning electricity market can be ensured

#### **1.3.3.1 The investment process**

Investment needs are identified through customer contacts and regional and national planning. Investments will be included in Fingrid's Grid Development Plan, which is updated annually. The grid development plan is based on scenarios with a timeframe of 10-20 years.

The ownership agreement of Fingrid does not rule out investments in other countries. However, the Board of Fingrid (consisting of members representing owners of Fingrid) approves the investment plan and investments in other countries have to be approved by the Board.

When identified investments, based on the needs of the customers, have been approved by the Board of Fingrid, they are realised through the process described in 1.1.2.1. The

process from identification of an investment project to the commissioning of the line may take up from 5 to 10 years, depending on redemption and appeal processes.

### **1.3.3.2 Evaluation criteria**

Several issues (e.g. costs, benefits of alternatives and security of the power system achieved with alternatives) are relevant in the decision of an investment and selection between several alternatives. Fingrid applies the common Nordic criteria presented in chapter 1.3.1 when developing its network. These criteria are applied when alternatives for building are explored along with the reasonable needs of the customers and the security of the system. Among the alternatives explored is also the more efficient utilisation of the present network to ensure secure operation of the power system with larger amounts of flows. Some of these criteria can be evaluated only qualitatively - e.g. impacts to environment. Furthermore, evaluation of security needs some minimum requirements to be set, which take into account the most important aspects in the complex field of security measures.

The needs of customers are mapped by regional planning, where needs for consumption and production are studied regionally and needs for new lines are mapped. These regional plans are combined to national planning, where alternatives for new lines are compared against the common Nordic criteria. Furthermore, other solutions (like system protection schemes, active reactive compensation etc.) besides the new line investments are also studied.

### **1.3.4 Norway**

Statnett, the Norwegian TSO, is state owned. According to the articles of association, the company is responsible for operating and developing the Norwegian main power grid in accordance to economic rationality for the benefit of the Norwegian society. If a domestic problem is best solved by grid investments in another Nordic country, such an investment is a feasible option to Statnett. Furthermore, Statnett should on its own, or in cooperation with other parties, plan, build, possess and operate transmission facilities.

As a general rule, alternatives to building new lines will always be explored as a first option. This may be better utilisation of existing infrastructure in the form of system protection scheme or voltage upgrades. If no other economically feasible option exists, investments in new lines will be made provided it is economically beneficial for the Norwegian society.

#### **1.3.4.1 The investment process**

Investment projects are identified through a range of different channels. The need for refurbishment and reinvestments in existing components, reoccurring bottleneck situations in a certain region, prospects of large new production schemes (like renewable plans) or consumption sites, are examples of triggering factors for grid investments.

New investments will be included in Statnett's Grid Development Plan (GDP). This is both a planning tool and a tool for general communication of Statnett's overall view of future challenges and proposed solutions in the main power grid. The GDP is based on scenarios, and is updated annually.

When an investment project is identified (and communicated through the GDP), the first step in realisation is a technical assessment followed by a notification to the regulator (NVE) Then the handling of the project follows the process described in 1.1.3. When a licence is granted or maintained after a complaint, Statnett will make its final decision on whether to build or not. The whole procedure from notification to an operational grid component may take up to 10 years.

#### **1.3.4.2 Evaluation criteria**

Several issues are relevant in the decision of whether to realise an investment or not. The most prominent relates to benefit-cost, environmental impacts and security of supply issues.

Foremost, the economic (social) surplus represented by a benefit-cost ratio has to be positive for Norway if a project is to be built. However, in a joint investment with a foreign partner, a negative domestic surplus may be countered by a positive monetary transfer negotiated in the trade agreement with a foreign partner if the overall economic surplus from the project is positive.

Some impacts of an investment might be difficult to measure and even harder to value in monetary terms. Environmental consequences are one example. Environmental impacts are hardly measurable, but is qualitatively evaluated and, if possible, counteracted by pylon/line design and colouring, route planning and other similar arrangements. Another example is that of “well functioning markets”. Improving the behaviour of the power market is of great value to society, but is hard to measure in real terms. Such issues, if they arise, are therefore in most cases evaluated qualitatively only.

Security of supply issues may also be difficult to measure. However, whenever possible, security of supply issues are calculated and valued as an integral part of the benefit-cost calculations. Statnett’s policy for grid utilization states minimum security requirements that have to be met at any time, and anywhere in the Norwegian main grid. A realistic risk of getting outside the minimum requirements will trigger investments and/or other countermeasures regardless of economic surplus.

#### **1.3.5 Sweden**

When the Swedish TSO, Svenska Kraftnät, decides to start the process of developing the grid for a Nordic benefit, this will usually be based on the plans for the Nordic grid developed together in Nordel.

In its decisions regarding what project to invest in, Svenska Kraftnät takes the Nordic benefit into account with regard to investments in interconnectors or investments in the own transmission grid which affect the Nordic electricity market.

Hence, in order to evaluate which grid investments should be carried through, Svenska Kraftnät, like the former Nordel co-operation, uses a method where the Nordic socioeconomic benefit of a certain grid reinforcement is compared with the investment cost. The method builds on an analysis of how a number of benefit parameters change as a result of a given grid reinforcement. Together, these parameters constitute the socioeconomic benefit as defined by Nordel. (As shown in 1.3.1).

### **1.3.6 Summary**

The processes and evaluation criteria for investment projects considered by the TSOs are quite similar for all Nordic countries. All countries base their evaluation to a high degree on common criteria used under the former Nordel-cooperation. The Nordel criteria imply that socioeconomic benefit is necessary for an investment project to be carried out.

The formal requirement of national socioeconomic benefit of a project is explicit in the Danish and Norwegian licensing procedures. This requirement is also reflected in the TSOs investment process and evaluation criteria.

In Finland common Nordic criteria as defined within the former Nordel cooperation are considered and compared with the possibilities for national upgrading of the transmission network. Investment projects, as considered by Svenska Kraftnät, are based on the NGMP. The socioeconomic benefit of both interconnectors and national investments which might affect the Nordic electricity market is evaluated by the Nordel criteria, which means that the Nordic benefit of the investment is considered.

To what extent these differences regarding evaluation criteria are likely to result in different evaluation of actual investment projects, has not been examined.

All countries include all identified transmission projects in the national Grid Master Plan, which is updated annually and forward looking.

## **1.4 National TSO's possibilities to go into contracts regarding common Nordic investments**

*To map the possibilities of national transmission system operators to sign agreements that deal with various forms of common financing/Nordic financing of network investments in the Nordic countries. This mapping should consider the regulatory aspect; what kinds of investment costs are allowed to be included in the asset and tariff base for each TSO?*

### **1.4.1 Denmark**

Bilateral Nordic transmission projects involving Denmark have usually originated from the joint Nordic grid planning, which has been carried out within the Nordel cooperation.

The national TSO is free to enter into financial agreements. Danish legislation does not explicitly regulate this issue. However, agreements regarding financing can affect the benefit for the Danish society. This element is included in the assessment of an application according to Danish legislation. It is thus the impact on the overall social economy for Denmark which determines the approval of an interconnector and whether it can be included in the tariff base. After approval by authorities for an investment the costs can be covered by the national transmission tariff which is imposed on all domestic consumption.

The national TSO can establish subsidiary companies dedicated to a particular activity e.g. construction of a jointly owned interconnector.

### **1.4.2 Finland**

Fingrid owns the Finnish side of the high voltage interconnectors to the other Nordic countries (i.e. to Sweden and Norway). These ownerships have originated either from bilateral network investment plans (e.g. AC connection from Finland to Sweden and Norway, Fenno-Skan 1) or from a common Nordic Grid Plan (e.g. Fenno-Skan 2).

The Finnish Electricity Market Act does not explicitly address the issue of network investments in other countries. The income required to finance the investments is regulated by the provisions set by EMV. So far only investments made within national borders (also including interconnectors on Finnish side) are included presently in the regulated asset base for setting the income cap for the revenues collected through the grid tariffs. Costs of investments in other countries and whether and how they would be treated in the regulatory asset base have not been assessed in the current regulatory framework.

### **1.4.3 Norway**

This issue is not explicitly addressed in Statnett's articles of association. Statnett is thus free to go into contract with other TSOs. When investing in non-domestic infrastructure, the company must assure that the investment trigger a positive net welfare benefit for Norway.

Statnett's income, generated from the grid tariff, is regulated through an income cap determined by the regulator NVE. Investments within the main grid will alter the cap as investment costs enter the cost base. Statnett then collects income from the investment through changes in the grid tariff. The regulations today do not allow foreign investments to be included in Statnett's revenue cap. However, if an investment in another country benefits the Norwegian power system, Statnett might have to help finance the project in order to get it carried out. Under such circumstances Statnett may apply to NVE to get the investment costs included in the revenue cap. If NVE considers the investment as beneficial for the Norwegian power system, Statnett can include the applied investment in their revenue cap for a limited time period. The investment will however not be a part of Statnett's asset base.

If a non-domestic investment cost is not included in the revenue cap by NVE, Statnett may still carry out the investment. In such cases, Statnett will make its investment decision based on normal businesses principles, and within the regulation of that particular country.

### **1.4.4 Sweden**

The Swedish law does not explicitly address the issue of Swedish investments in other Nordic countries. On the other hand, there are many connections between Sweden and other countries and there are some examples of how costs are divided in relation to the present cables.

#### **1.4.4.1 Regulation**

The Swedish Parliament decided on the 16<sup>th</sup> of June to replace the present rules regarding the reasonableness of grid tariffs with a so called ex ante regulation of grid tariffs. The law (2009:892) regarding changes in the Electricity Act (1997:857) implies that the Energy Markets Inspectorate during 2011 shall decide so called income frames for all grid companies except the main grid for a regulation period of four years. With regards to the main grid, the Energy Markets Inspectorate shall instead submit a suggested income frame but the decision is taken by the government.

The government has given the Energy Markets Inspectorate the task to suggest how the ex ante regulation should be constructed and to suggest changes in the Electricity Act. A report regarding certain principles was submitted to the government in October 2009<sup>4</sup>. Currently the Inspectorate is working on the details of the model.

Chapter 4, Section 9 in the Electricity Act regulates grid tariffs for a line with a voltage of 220 kV or more (national transmission line). The calculated costs for the transmission network shall be assessed together for the grid owners (Svenska Kraftnät) all national transmission lines in the country with the exception of cross-border lines. However the government has the right to decide if a paid connection fee to the national network shall give the right to use also cross-border lines to one or several countries or parts of a country. Such regulations can be introduced for countries which can be said to form a level playing field and a common market together with the Swedish electricity market. Such regulations apply to interconnections between Sweden and Denmark, Norway and Finland, which are connected to the national transmission grid. These interconnectors shall be included in the grid for which the assessment is to be made.

The capital base shall be calculated on the basis of those lines which are used by the grid owner to deliver its services.

#### **1.4.4.2 Investment decision**

Svenska Kraftnät has the right to decide on investments of up to 100 million SEK by themselves. Investments over 100 million are specified in their over all investment plan, The investment plan has a three years horizon and is included in the Governments yearly budget proposition to the Parliament for approval. So far the parliament has very rarely put any restrictions to Svenska Kraftnäts ability to full fill their investment plans.

#### **1.4.5 Summary**

Generally, it can be stated that there are no rules or legislations in any of the Nordic countries that explicitly regulate the issue of common financing within Nordic countries. There seem to be few formal limitations on TSO participation in investments in other countries. However there are no explicit rules regulating this. The fundamental tasks of the TSOs as defined in laws, regulations and bye-laws have a primarily national perspective, and the lack of an explicit framework describing how TSOs may participate in common Nordic investments may to some degree constitute an obstacle to such projects.

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<sup>4</sup> EI R2009:09 Förhandsreglering av elnätsavgifter – principiella val i viktiga frågor

In each country the TSO is allowed to include the investment in transmission lines within national borders in the regulated asset base, which is the basis for the national tariff base. With regard to investments in other countries, the rules are not that explicit. On the basis of experience, there are possibilities for exceptions, at least in Norway, where costs on investing in other countries in certain cases can be included in the income cap for a specific time period. When it comes to other Nordic countries, such situations have not occurred so far and no decisions have been taken.

## **1.5 Rules regulating the ownership of the main grid in the Nordic countries**

*To map the rules regulating the ownership of the network: what kind of possibilities there are for shared ownership of network (with other Nordic transmission system network operators) in the various countries.*

In this report *shared ownership of a network* mean that two or more companies from various countries own a particular network asset together. This may be a power line within one country, or an interconnection crossing national borders as overhead line or sea cable. In a legal sense this may be done by an undivided joint property, a new company for the purpose, or by dividing the total network into specific parts.

The issue of ownership is closely related to the regulation of the grid tariffs in the countries concerned, since ownership is only possible when the costs for a line can be regulated in the tariff.

### **1.5.1 Denmark**

Danish legislation does not explicitly regulate the issue of ownership of the main grid. However, sharing of the financial burden derived from the agreement of ownership can affect the benefit for the Danish society, which is an element that is included in the assessment of an application.

This means that the TSO has a certain freedom to negotiate the share of investment and operational costs of an interconnector with the foreign partner. The authorities are not directly involved in those negotiations.

### **1.5.2 Finland**

In the Electricity Market Act there exist no explicit regulations on ownership of the grid asset i.e. network can be owned and operated by different corporations but the operation of the electricity system needs the electricity network operation license. This implies that the system operator can hire or own the system it operates. The income from ownership is regulated under economic regulation by EMV and it treats both these approaches (owned or hired by the operator) equally when allowed revenues are defined.

### **1.5.3 Norway**

In Norway a license is required to own, build and operate any electrical network asset. The license should be given to the company that operates the electric construction. There can be only one operator for each distinct physical asset. The operator company should also have full private-law control connected to the network asset, either by full ownership or by an agreement that give the same control.

Shared ownership of physical assets will require either that one of the owners is the licensee of this asset, or that the shareholders establish a new company to be the license holder. To hold a licence the company must have its own employees, necessary competence and resources. As laid down by the Norwegian Energy Act this is necessary to fulfil the license obligations.

Any foreign owner in Norway will – like a Norwegian owner - need an ordinary license for electric constructions, ref. the Energy Act § 3-1, for physical construction, operation and ownership within the borders of Norway.

Shared ownership to an interconnection crossing national border may be organised in various ways. With regard to land based interconnection the traditional arrangement is that the respective TSO on both sides owns the network (lines, transformers etc) leading up to the border on each side. With regard to subsea DC-cable ownership is traditionally divided with reference to an agreed physical point. Often this point will be the mid-point and such divide the ownership of the cable 50/50, but also other divisions of ownership may be agreed.

The Norwegian Energy Act does not limit the possibility to build and operate the main grid to the Norwegian TSO. Other national grid companies or foreign TSOs or grid companies are allowed to apply for and may be given a licence pursuant to the Energy Act. It will, however, require that the company establish an office in Norway in order to meet the requirements regarding minimum staff necessary to act as a responsible operator of the installations.

### **1.5.4 Sweden**

The basic ownership principle in Sweden is that Svenska Kraftnät shall own and manage the main grid and a large enough part of the interconnections in order to secure the possibility for Swedish producers and consumers to close deals with buyers and sellers abroad. From 1<sup>st</sup> January 1999 a concession for a new cross-border line shall only be given to Svenska Kraftnät or to a company where Svenska Kraftnät has a decisive influence. The provision does not affect concessions given before this date.

### **1.5.5 Summary**

In Denmark, Finland and Norway there seems to be no explicit acts or regulations that regulate the ownership of the main grid. However in practice, the transmission grids are today mainly owned by the national TSOs, and this is the way the national authorities want it. In Sweden, cross-border lines can only be owned by Svenska Kraftnät or a company where Svenska Kraftnät has decisive influence.

In Norway a license is required to own, build and operate any electrical network asset. To hold a licence the company must have its own employees, necessary competence and resources

It is possible for a foreign party to have (shared) ownership of network in all Nordic countries and all Nordic countries accept foreign ownership of network assets inside their country under certain conditions. This implies that the foreign owner will need a licence for building and operating the network. Furthermore, in Denmark the benefit for the Danish society is included in this assessment.

## **1.6 Influence of EU's legislation on Nordic cross-border grid investments**

### **1.6.1 Introduction**

The objective of the following review and analysis is to map how EU's current and new legislation (third package) may influence Nordic cross-border network investments. The focus is on investments that bring common benefit to several Nordic countries and where ownership and/or costs are either shared between two or more TSOs, or a situation where one TSO could want to make an investment in a neighbouring country.

The review is made with reference to three cases which illustrate different aspects of common Nordic grid investments. The three different cases are:

- a) Two of the Nordic TSOs wish to invest in a cable between the two countries. Each TSO will own 50 % of the cable.
- b) The TSO of country A wishes to do an investment in country B, since this economically would be more profitable than doing the same investment in country A.
- c) The Nordic TSOs agree on a "package" concerning net investments which economically in sum will be more profitable for each country and the Nordic countries as a totality, although the single projects separately not necessarily would be economically profitable.

### **1.6.2 Relevant existing EU legislation**

#### **1.6.2.0 Treaty establishing the European Community (EC)**

##### **EC art. 23 – Free movement of goods (EEA art. 10 and 14)**

Electricity was defined as "goods" by the ECJ already in judgement of 27 April 1994 "Almelo", Case C-393/92. The Treaty establishing the European Community (EC-treaty) art. 23 impedes any customs duties on import and export. This article is relevant for

measures unilaterally imposing a duty on a product because of its crossing the border of a country.<sup>5</sup>

The cases described in the introduction above do not imply that an economic burden equivalent to a customs duty may be imposed on imported electricity. The investments will possibly be financed at least in part by tariff payments and in that case the tariffs will have to be distributed equally on all transmitted electricity, being domestic or imported supplies. Thus, the article 23 cannot as such be seen to raise any obstacles for net investments as described above.

**EC art. 28 to 30 – Prohibition of quantitative restrictions between Member States (EEA art. 11-13)**

EC treaty articles 28 to 30 state that every measure that restricts the imports of certain products in any way – or that simply have the equivalent effect as a restriction on imports – are forbidden.

Network investments as described above will most likely increase the transfer capacity of the grid system in the Nordic countries, hence make imports and exports of electricity less restricted by transmission capacity. EC articles 28 to 30 can therefore not be seen as obstacles for network investments as described above.

**EC art. 81 Rules applying to undertakings – prohibition to cooperate in a way distorting competition (EEA art. 53)**

In line with the directive 2003/54/EC of the European Parliament and of the Council of 26 June 2003 concerning common rules for the internal market in electricity, the Nordic TSOs are required to be organized as a separate legal entity.<sup>1</sup> This implies that the TSOs are subject to the legislation applicable for undertakings in the EEC. Article 81 states that an agreement between two undertakings is in contravention with the agreement if it distorts competition. Agreements between TSOs as described above, will normally facilitate competition in the European electricity market.

**EC art. 82 and prohibition of abusing dominant position in the market (EEA art. 54)**

Most of the Nordic TSOs have a dominant position in relation to the central grid. As far as this dominant position is abused in order to achieve economic advantages for the TSO and corresponding disadvantages for the consumers, contract parties or third parties, the abuse is prohibited to the extent that it affects trade between the Member States, ref. EEC art. 82.

None of the examples mentioned above, can be seen to lead to the abuse of the dominant position of Nordic TSOs. They aim at facilitating trade of electricity, to the advantage of both the TSOs, suppliers and consumers and EC art. 82 will usually not constitute an obstacle to network investments as described above as long as investments in transmission networks are carried out in a non-discriminatory manner. It is more likely

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<sup>5</sup> See judgement of the ECJ of 17 July 2008, case C-206/06, section 41.

that TSO activities linked to the operation of the transmission grid could in certain circumstances lead to an abuse of a dominant position, than active measures to develop and reinforce the grid. That might for instance be the case if a TSO is seen to be limiting the amount of export transmission capacity available on interconnectors with the objective of relieving internal congestion on its network.

#### **EC art. 87 – State Aid (EEA art. 61)**

The type of investments described above will be made by a TSO. The transfers regarding the investments mentioned above will be investments in infrastructure, which is to be defined as a natural monopoly. When there is a monopoly, there is no market consisting of entities in competition. State transfers of resources to finance natural monopolies as infrastructure do therefore not constitute state aid in the sense of EC treaty art. 87, as there is no market that can be affected by such a state intervention.

#### **1.6.2.1 Directive 2003/54/EC concerning common rules for the internal market in electricity**

The issues of investment in and the development of additional transmission and interconnector capacity fall more or less outside the scope of this Directive. There are in Chapter III rules on the authorisation procedure for new generation capacity, whilst the Directive contains no equivalent rules on the authorisation procedure for new network capacity.

According to article 8, Member States shall designate one or more TSOs and ensure that they act in accordance with articles 9 to 12. According to article 9 (b), TSOs shall be responsible for contributing to security of supply through adequate transmission capacity and system reliability.

However, article 11 paragraph 5 states that “Member States *may* require transmission system operators to comply with minimum standards for the maintenance and development of the transmission system, including interconnection capacity”. It seems therefore somewhat stated that the TSO is responsible for the development of adequate transmission capacity to ensure security of supply, although the issue of implementing such an obligation seems to be entirely within the discretion and the decision of Member States.

The Directive contains few provisions concerning cross-border networks, whereas such issues are mainly covered by the Regulation (EC) 1228/ 2003.

However, preamble (23) emphasises that interconnection capacities between areas are important for ensuring security of supply and states that the situation should be closely monitored by Member States. It is further stated that the construction and maintenance of the necessary network infrastructure, including interconnection capacity, should contribute to ensuring a stable electricity supply. The directive here puts forward general objectives and policy statements concerning the development of network capacity to safeguard security of supply.

Member States and regulatory authorities have according to article 4 an obligation to monitor the security of supply situation.

Security of supply also depends upon adequate transmission network capacity, including cross border infrastructure. According to a/m article 9 (b), the national TSO is responsible for contributing to security of supply through adequate transmission capacity and system reliability. Article 23 paragraph 1 (g) imposes an obligation on Member States (and the regulatory authority) to monitor whether the TSO has fulfilled such a task.

Member States also have an obligation to submit annual reports to the Commission according to article 23 paragraph 8, which includes inter alia practical measures taken to enhance interconnection.

Pursuant to article 23 paragraph 12, regulatory authorities have a general obligation to contribute to the development of the internal market and of a level playing field by cooperating with each other and the Commission in a transparent manner.

The cases presented above involve measures that will serve the overall objective to ensure adequate transmission network capacity, including interconnectors, and hence contribute to security of supply. It must therefore be concluded that all measures adopted in the cases above are in conformity with the objectives pursued by this Directive.

Measures imposed on Member States, national regulatory authorities and TSOs in the second energy package have been seen as insufficient to meet the general objectives of the internal market. Unequal or discriminatory practices as regards access to the transmission grids still exist among national TSOs, making it more difficult for foreign market participants to gain access to customers in other countries. The supervision by national regulatory authorities has not been effective to address these imperfections. The regulatory gaps in relation to cross-border trade, especially the unequal access to transmission networks, may have influenced negatively on decisions to develop more interconnectors and adjacent networks.

The use of bilateral or unilateral TSO financing through network tariffs, congestion revenues from Nordic connections and a common Nordic grid fee or trading fee should be possible as long as payments are levied on users in a transparent and non-discriminatory manner in line with applicable principles. These principles cannot in general be seen as obstacles for the arrangements made in the three cases, as long as the Member States find acceptable ways to divide the costs among themselves and the network users.

The inclusion of a share of the costs from common Nordic transmission investments in the national tariff cost base should not be at variance with the requirements in the Directive. A common Nordic investment tariff element collected by the national TSOs pursuant to approval of such tariffs (or the methodologies) by the national regulators (co-operating at a Nordic level) should also be in line with the Directive.

It is however not obvious that the establishment of a Nordic investment company collecting transmission tariffs from customers separately from the national TSOs will be in line with the articles entrusting such tasks to the designated national TSO(s). Likewise, article 23 presupposes that Member States designate one or more national regulatory authorities to be entrusted with the task of approving such tariffs (or methodologies) in advance. Handling of complaints will also be an issue. The Directive has no provision for a formal supranational regional regulatory authority. The Directive presupposes that dispute settlements in relation to transmission network tariffs are carried out by competent national bodies, with the function of regulatory authorities, as designated by Member States.

### **1.6.2.2 Regulation 1228/2003 on the conditions for access to the network for cross-border exchanges in electricity**

The Inter TSO Compensation mechanism aims at establishing criteria for the compensation of costs incurred on the part of transmission systems when hosting cross border flows of electricity. It has shown technically difficult to establish such criteria taking into account all relevant aspects of hosting cross border flows of electricity. In addition, it has shown difficult to reach a compromise on how such costs should be calculated and divided. The TSOs have made short term compromises by entering into temporary agreements not resolving the issue in the longer term. According to the Regulation, the Commission is given the authority to adopt binding guidelines resolving the issue. The remaining uncertainties relating to the design and the implications of a future model may to some extent influence on decisions to develop more interconnectors.

According to Article 7, new direct current interconnectors may, upon a request, be exempted from the obligation to use revenues resulting from allocation of interconnections as prescribed in article 6 paragraph 6, third party access according to article 20 and rules concerning the conditions for connection and access to national networks according to article 23 paragraph (2), (3) and (4) of Directive 2003/54/EC.

This rule was introduced by the European Parliament during the legislative process to open up for the development of merchant interconnectors. The provision is aiming at enhancing the competition in the internal market by allowing for interconnectors to be built, where the investment risk is such that the investment would not take place unless an exemption is granted. The conditions for granting such exemptions are very strict. The word “may” should imply that Member States (or the regulatory authorities) are entitled to reject such applications even when the criteria for an exemption have been fulfilled. However, there are some few interconnectors built on basis of such exemption and new merchant interconnectors with exemption may influence on the profitability of TSO built interconnectors and visa versa.

The degree of liberalisation and competitiveness of the internal market depends to a large extent on harmonisation of TSO practices and proper implementation of common principles established pursuant to this Regulation. Non-transparent and discriminatory allocation of cross-border network capacities, different approaches to congestion management and other unequal practices on the part of the national TSOs, have partly been seen as hampering the internal market. In the preamble (3) of the new Regulation No 714 it has been stated that, at present, there are obstacles to the sale of electricity on equal terms, without discrimination or disadvantage in the Community.

Closer cooperation and regional arrangements between the Nordic countries to enable network investments beneficial to the regional or the internal market as a whole, which probably wouldn't materialise unless such cooperation takes place, are steps in the direction of a well-functioning internal market. All cases presented must therefore be considered as measures in conformity with the general objectives pursued in this Regulation.

## **1.6.3 How the new EU legislation (3rd package) may influence Nordic cross-border network investments**

### **1.6.3.1 The third package<sup>6</sup>**

The third energy package consists of five legal texts. Two of these concern natural gas, and are not relevant in this study. For the purpose of this survey, the following three legal texts will be relevant:

Electricity-directive III (2009/72/EC)

Regulation on conditions for access to the network for cross-border exchanges in electricity (714/2009)

Regulation establishing an Agency for the Cooperation of Energy Regulators (713/2009)

The third energy package introduces new legal instruments and imposes more far-reaching obligations on the part of Member States, national regulatory authorities and TSOs to overcome constraints for an internal electricity market.

This implies obligations to engage in regional and community based cooperation within new supranational structures (ENTSO, ACER). This aims at fostering harmonised rules and practices, closing the existing regulatory gaps between national jurisdictions.

The new legal instruments, such as the ownership unbundling of TSOs, more strict independence criteria imposed on national regulators, development of a community wide extensive network code for cross-border trade with harmonised principles applicable throughout the Community and the obligation for national regulators and the TSOs to engage in cooperation at regional and European level, will certainly facilitate cross border trade.

However, by taking a closer look at the different legal texts, it appears that most of these new developments will influence on issues relating to the operation of transmission networks, whilst there is pretty much business as usual when it comes to how the third energy package deals with the issue of securing adequate additional interconnection capacity to facilitate cross-border trade. In this respect, it is important to distinguish between obligations imposed on Member States, national regulators and TSOs and what are mere objectives and policy statements put down.

Member States have in the third energy package been subjected to a clearer obligation to require national TSOs to comply with minimum standards for the development of the transmission system to ensure security of supply, including interconnection capacity.

However, the ENTSO Community-wide ten-year network development plan is clearly non-binding and it also appears clearly that there is no obligation on the part of TSOs to make actual investment decisions based on the regional network development plan.

Consequently, the investment decisions and the authorisation of additional network capacity still appears to be within the exclusive competences of national TSOs and

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<sup>6</sup> The references are based on the final texts of 13 July 2009.

Member States as the case may be. However, a Member State is under an obligation to ensure compliance with minimum standards, although the requirement seems too vague and prudent to make much of a difference. Such a view should especially be valid if considering the transmission network in the Nordic region, where countries are quite well interconnected.

The relevant articles of the new Electricity Directive, the new Regulation on conditions for access to the network for cross-border exchanges in electricity and the new Regulation establishing an Agency for the cooperation of Energy Regulators will be elaborated further in the following.

### **1.6.3.2 Directive 2009/72/EC**

#### **1.6.3.3 Mending imperfections in the electricity market - Ownership unbundling**

An important issue in this Directive is the ownership unbundling of transmission systems and transmission system operators which is an obligation under article 9 paragraph 1et seq. This implies the appointment of the network owner as the system operator on the condition that it acts independently from any supply or production interests. Production or supply undertakings may hold a minor share of a TSO, but may not directly nor indirectly exercise any rights or control over TSO activities.

Ownership unbundling is considered to be the main and most effective measure to mend imperfections in the well-functioning of the electricity market. This is mentioned in the preamble paragraph (4) and (9):

*“(4) However, at present, there are obstacles to sell electricity on equal terms and without discrimination or disadvantages in the Community. In particular, non-discriminatory network access and an equally effective level of regulatory supervision in each Member State do not yet exist.*

*(9) Without effective separation of networks from activities of generation and supply (“effective unbundling”), there is an inherent risk of discrimination not only in the operation of the network but also in the incentives for vertically integrated companies to invest adequately in their networks.”*

The rules on ownership unbundling cannot be seen as an obstacle to carry out investments as described in case 1 above.

As described in case 2, a TSO of country A wishes to do an investment in country B. Even if the TSO of country A retains full ownership over the network installation in country B, a reasonable interpretation of article 9 and 10 implies that the TSO is not required to be certified as a TSO in country B pursuant to article 10.

The certification of a TSO by the regulatory authority in one Member State should also be valid in another Member State, although this is not explicitly stated in the legal texts.

Moreover, the term “transmission system operator” used in article 9 paragraph 1 (a) is in article 2 paragraph 2 defined as being “responsible for operating,....., developing the transmission system *in a given area...*”. Where a TSO of country A merely owns single transmission lines in a country B, it should not be regarded as a TSO in country B according to article 9 and is neither required to be certified as a TSO in that country pursuant to article 10.

As described in case 3, The Nordic TSOs agree on a “package” concerning network investments which economically in sum will be more profitable for each country and the Nordic countries as a totality. Neither the Directive nor the Regulation contains any provisions relating to the sharing of costs and benefits in the development of such networks jointly decided by Member States and TSOs.

According to article 9 paragraph 5, two or more national TSOs may form a joint venture which acts as a transmission system operator in two or more Member States for the transmission systems concerned. This applies to transmission systems in a given area across the borders of two or more Member States.

The creation of a joint venture company between two or more TSOs with the aim to develop and operate interconnections between the countries might be a viable option in relation to Case 3. This option will not contradict the provisions of ownership unbundling, as long as the joint venture complies with the requirements in article 9 paragraph 5.

All cases mentioned above will, provided that the TSOs in question comply with the unbundling requirements in article 9, be conducive to the objectives pursued by the new unbundling requirements. TSOs should be able to make independent and non-discriminatory decisions to develop, grant access to and operate their networks in order to facilitate a well-functioning internal market. The measures described in the cases above cannot be seen as restricted by the enhanced unbundling requirements for TSOs.

#### 1.6.3.3.1 Security of supply

Article 4 imposes a duty on Member States to monitor the security of supply situation. The article has the exact wording as the corresponding article in the second Electricity Directive.

The text of the preamble paragraph (25) states that security of energy supply

*“is an essential element of public security and is therefore inherently connected to the efficient functioning of the internal market in electricity and the integration of the isolated electricity markets of the Member States”*

This is a continuance of the stated objectives in the second Electricity Directive. However, the new texts put even more emphasis on market integration and adequate network infrastructure as essentials, not merely to ensure security of supply, but also as an essential element of public security.

In the preamble paragraph (44) it is also stated that the construction and maintenance of necessary network infrastructure, including interconnection capacity, are important elements in ensuring a stable electricity supply.

Measures as mentioned in the 3 cases on the introduction above must be said to be in line with stated objectives concerning security of energy supply as outlined in the Directive.

#### 1.6.3.3.2 Tasks of TSOs

According to article 12, each TSO shall inter alia be responsible for:

(a) “ensuring the long-term ability of the system to meet reasonable demands for the transmission of electricity, operating, maintaining and developing under economic conditions secure, reliable and efficient transmission systems with due regard to the environment”

This article elaborates the duties of TSOs more precisely than the equivalent article 9 (a) of the second Electricity Directive. The text “..., operating, maintaining and developing under economic conditions secure, reliable and efficient transmission systems with due regard to the environment” has been added to the wording. It’s now explicitly stated that developing of the systems is an integral part of the TSOs duty to ensure the long-term ability of the system to meet reasonable demands for the transmission of electricity. It could be questioned whether possible foreign demand should be taken into account under the term “reasonable demand”.

(c) “contributing to security of supply through adequate transmission capacity and system reliability”.

This article has the exact same wording as the equivalent article 9 (b) in the second Electricity Directive.

(e) “providing to the operator of any other system with which its system is interconnected sufficient information to ensure the secure and efficient operation, coordinated development and interoperability of the interconnected system”.

This article has the exact same wording as the equivalent article 9 (d) in the second Electricity Directive.

These articles do not as such imply any obstacles for the measures undertaken in the above mentioned cases.

#### 1.6.3.3.3 Duties of Member States and the regulatory authority

According article 15 paragraph 5, Member States (or the regulatory authorities) “*shall* require transmission system operators to comply with minimum standards for the maintenance and development of the transmission system, including interconnection capacity”.

This provision has the same wording as the equivalent provision in the second Electricity Directive (article 11 paragraph 5), although with one essential difference. While Member States before did not have an obligation (“may”) to make the TSO comply with minimum standards for the development of the transmission system (including interconnection capacity), the third Electricity Directive now imposes an obligation on Member States to make such a requirement on the TSO(s). However, the term “minimum standards” is

believed to impose a too vague and prudent obligation to represent a significant change if applied in the Nordic context.

Pursuant to article 35, Member States are obliged to ensure the independence of the regulatory authority, not only from market interests as before, but also from e.g. the government, when carrying out the regulatory tasks conferred upon it by this Directive and related legislation. Here the regulatory tasks must be understood as core duties and powers as outlined in article 37 (and 38). Licensing of additional transmission network capacity is not subject to the new strict independence criteria of regulatory authorities and the enhanced independence requirement is neither of significance to the measures as described in the cases mentioned on the introduction.

Pursuant to article 36, the general objectives of the regulatory authority have been outlined and extended compared to the second Electricity Directive. Especially article 36 paragraph a), b), c) and d) contain important policy statements and objectives that should be pursued by the regulatory authority which are relevant for the purpose of this report. Paragraph c) which is of particular relevance, reads as follows; “eliminating restrictions on trade in electricity between Member States, including developing appropriate cross-border transmission capacities to meet demand and enhancing the integration of national markets which may facilitate electricity flows across the Community”. Here the legal text refers to the development of appropriate cross-border transmission network as an example to eliminate restrictions on trade between Member States.

The objective pursued by the measures mentioned in the cases above is very much in line with the general objectives which should be pursued by the regulatory authority according to these paragraphs. However, the relevance is not of great significance as long as the decisions on investments in and the licensing of additional transmission network capacity fall outside the core duties and powers of regulatory authorities as outlined in article 37 (and paragraph 38) and usually fall outside the scope of the competences given to the regulatory authority pursuant to national legislation.

Pursuant to article 37, considerably more duties and powers have been given to the regulatory authority to strengthen the regulatory control with the network operation. However, the relevance of most of these enhanced duties and powers is not of great significance to our cases mentioned on the introduction, due to the same reasons as mentioned in the previous section.

However, as mentioned above under the review of the second Electricity Directive the regulatory authority shall be responsible for fixing or approving tariffs (or the methodology used to calculate) in advance of their entry into force pursuant to article 37 paragraph 6.

Article 14 in Regulation EC 714/2009 cover charges for access to transmission networks and 14(1) states that “charges applied by network operators for access to networks shall be transparent, take into account the network security and reflect actual costs incurred insofar as they correspond to those of an efficient and structurally comparable network operator and are applied in a non-discriminatory manner.”

These two articles may have implications with regard to the possibilities to finance common investments through a Nordic transmission tariff. This is further elaborated in part 2.2 concerning possibilities of Nordic financing on page 56 and 57 of this report.

#### 1.6.3.3.4 Regional Cooperation

Of special interest for the measures mentioned above, is new text imposing duties on Member States (and regulatory authorities) to engage in regional cross-border cooperation, ref. article 6. The region Northern Europe, as specified in the regulation, consists of the Nordic countries, Germany and Poland. The obligation to cooperate on regional level is however not in conflict with the need to develop cooperation within a part of a region as a first step.

This article is new and must be understood as an obligation for Member States and regulatory authorities to cooperate for the purpose of integrating their national markets at one or more regional levels. This obligation also includes a duty to promote and facilitate the cooperation of transmission system operators at a regional level and foster the consistency of national legal, regulatory and technical frameworks. ACER shall facilitate the harmonisation across regions.

The aims of regional cooperation are to harmonise national legal frameworks, resolve cross-border issues, facilitate the integration of the isolated systems forming electricity islands and last, but not least, create a competitive internal market.

Member States are obliged to ensure a minimum of transmission capacity between isolated systems within the region. This duty must be seen as a measure to enhance security of supply through the integration of networks. This obligation is not of significance to the Nordic region, which systems are relatively well interconnected. It is not clear whether this obligation also implies that Member States could face orders by the Commission to develop interconnection capacity or connect isolated areas, if the level is below a “minimum”.

It could be argued that this article involves an obligation for Member States to apply wider assessment criteria when implementing national energy law than the mere national perspective, if relevant. When adopting regulatory decisions under national legislation Member States should also take into account the wider perspective and assess what solution is preferable to meet stated objectives of a more competitive internal market. If this is a reasonable interpretation of article 6, the question arises as to which decisions under national energy law such wide assessment criteria should apply. If this is a reasonable interpretation, Member States also should assess whether national energy legislation needs to be amended to facilitate the implementation of this new requirement to apply a wider perspective than the mere national perspective.

According to article 1 on subject matter and scope, the Directive contains a quite wide definition of scope, which also includes matters such as the production, transmission, distribution and supply of electricity. It could therefore be argued that Member States according to article 6 are obliged to take into account the impacts on the regional and internal market when assessing applications for the authorisation of additional transmission network capacities. However, this is not clearly stated in article 6 and further clarification is needed as to what obligations article 6 imposes on Member States in this regard.

In all Nordic countries the competent authorities apply an assessment criterion that cross-border lines shall be beneficial to the internal electricity market, but the criterion may not always include that the Nordic perspective should be taken into account.

Nationally there exist also other criteria (either more general or more detailed) which should be taken into account when reviewing license applications and these national aspects may overrule in some cases the Nordic or Community market aspect of the case. The balancing of different aspects should be within the discretion of Member states and cannot be seen to contradict article 6.

When assessing article 6 in relation to our three cases, the conclusion is that such regional cooperation is fully in line with the objectives pursued by this article. Moreover, Member States are obliged to engage in regional cooperation to resolve cross-border issues. However, it is not clear to what extent this obligation applies to the cross-border coordination of additional transmission network capacities.

Pursuant to article 38 "*Regulatory regime for cross-border issues*" the regulatory authorities have an obligation to closely consult and cooperate with each other to resolve cross-border issues. In paragraph 2, this obligation is more precisely defined for cooperation at a regional level. The wording of article 38 (previous article 37 in the draft common position of the Council) have been changed since the proposal of a common position from the Council.

The second part of paragraph 2 (a) reads as follows. The regulatory authorities shall cooperate at least at a regional level to: "... enable an adequate level of interconnection capacity, including through new interconnectors, within the region and between regions to allow for development of effective competition and improvement of security of supply,..". The wording has towards the end of the legislative process been changed from an obligation to enable "a minimum level" to "an adequate level" of interconnection capacity. This article places a new role and responsibility on the regulatory authorities in the development of new interconnection capacity. This task is outside the core duties of national regulators, although such tasks may be entrusted to the regulatory authority as additional tasks. However, article 38 seems to impose a duty on the regulatory authorities to enable additional interconnector capacity if needed.

However, the phrase "enable" must here be read as "enable within its competences", since another body within a Member State may hold the competence to authorise new interconnectors, depending on national legislation. This understanding follows from a reasonable understanding of article 38 paragraph 4, i.e. the wording "as appropriate" and "in close cooperation with other relevant national authorities and *without prejudice* to their specific competences". Such decisions also fall outside ACER's powers to adopt legally binding decisions pursuant to the ACER regulation article 8, since the authorisation of additional transmission network capacity is outside the core duties of regulatory authorities pursuant to article 37.

The decision to grant exemptions for merchant interconnectors between two countries pursuant to Regulation (EC) No 714/ 2009 article 17 falls within the competence of national regulatory authorities and perhaps ACER, if the regulatory authorities are not able to reach an agreement or jointly request ACER to make the decision. However, it seems that Member States may deviate from this by giving the authority to grant

exemptions to another national body than the regulatory authority, see article 17 paragraph 6.

An important principle for the cooperation of regulatory authorities has been established pursuant to article 38 paragraph 3, which implies that regulatory authorities shall have the right to enter into cooperative arrangements with each other to foster regulatory cooperation. This must involve a right for the regulatory authorities to enter into arrangements outlining in more details the scope, objectives and procedures for such cooperation taking into account their respective competences pursuant to national legislation. As long as the authorisation of new network capacity falls within the competence of other public bodies at national level, such a right is assumed to be of less significance for the purpose of this report.

The “*extent of the duties*” of the regulatory authorities to cooperate with each other and the Agency may be elaborated by the Commission in Guidelines, ref. proposed new text in article 38 (5). The proposed text limits the competence of the Commission in this respect “*to amend non-essential elements of this Directive by supplementing it*”. The authorisation of additional network capacity is within the exclusive competence of Member States and possible Commission Guidelines on the “*extent of duties*” need to conform to that principle. Nevertheless this must be said to be a part of the Directive opening up for some uncertainty on possible future evolvement of obligations on the part of national regulatory authorities as regards cooperating on cross-border investments.

#### 1.6.3.3.5 Provision of authority to the Commission to adopt binding guidelines

The proposed new text of the preamble, paragraph (63) refers to the authority conferred to the Commission in virtue of the new text of regulation (EC) No 714/2009 to adopt guidelines

*“to achieve the necessary degree of harmonisation. Such guidelines, which are thus binding implementing measures, are, also with regard to certain provisions of this Directive, a useful tool which can be adapted quickly where necessary” (sic)*

Several questions may be raised in relation to this possibility to amend the legislation “quickly”. When the authority of the Commission to amend non-essential elements of the directive in virtue of article 38 (5) opens up for uncertainty, this section of the preamble may open for uncertainty to a greater extent. Seen in connection with the overall wording of the Directive, it must be clear that this paragraph of the preamble can not be given direct effect as formulated. The amendment of binding measures is normally subject to thorough scrutiny and discussion, which impedes that alterations of binding measures could be adapted “quickly”. Nevertheless one must have in mind that the overall aim of this Directive and the new texts are a well-functioning internal market for electricity and security of supply. The authority of the Commission to adopt guidelines is also limited by these aims, and one must therefore presume that this authority will not be used to the detriment of cases as mentioned in the introduction.

The aim of establishing a new Agency for the Cooperation of Energy Regulators (ACER) will most of all be to coordinate the national regulatory authorities and assist the national authorities in cooperating and sharing good practices in relation to market regulation

issues (see the preamble of the ACER regulation, paragraphs (6), (10) and (12), but also to have decision making powers according to articles 7 and 8.

#### **1.6.3.4 Regulation on conditions for access to the network for cross-border exchanges in electricity (714/2009)**

The main objective of this regulation is harmonised legal frameworks and practices concerning access to the current networks for cross-border exchanges of electricity. Additional interconnector capacities are therefore not the main item of the regulation. Notwithstanding this, some of the provisions may affect cross-border investments as described in the above mentioned cases.

The point of departure must nevertheless be that the investment cooperation between two Nordic countries in a new interconnector between the two countries or reinforcement of adjacent national network is presumed to be an advantage for access to the network and in line with and serve the overall Regulation objectives of a competitive and well functioning internal market of electricity.

The obstacles to the sale of electricity on equal terms and without discrimination or disadvantages still occur in the Community. As mentioned above the unequal access to national transmission networks and inadequate regulatory supervision and legal uncertainty in relation to cross-border trade in electricity may have influenced on the level of investments in and the development of sufficient interconnection capacity. Many of the imperfections of the second energy package have been mended in the third package, in particular the lack of effective unbundling of TSOs and regulatory supervision. It remains to be seen if the new measures will have the wanted effect and open up for more cross-border trade and thereby create a more predictable climate for investments in interconnectors.

##### **1.6.3.4.1 Authority of the ACER and the Commission**

The new text of the regulation refers to the regulation establishing ACER (713/2009) and the authority which this regulation confers to ACER with regard to making binding decisions upon the Member States, see the preamble paragraph (23). The preamble paragraph (29) refers to the Commissions authority to adopt guidelines of non-essential elements in the actual regulation.

As mentioned above these competences given to the Commission and ACER imply accepting amendments that are yet unknown.

However, one important aim of the third package is to close the regulatory gaps between the national jurisdictions and to impose an obligation on the regulatory authorities to cooperate in order to close the existing regulatory gaps. The Regulation article 19 states clearly that the regulatory authorities shall cooperate with each others, with the Commission and with the Agency as appropriate to fulfil the aims of the Regulation in compliance with Chapter IX of Directive 2009/72/EC. The cooperative measures in the three cases mentioned are in line with these obligations and no provisions have been found to create obstacles to such cooperation. Although the primary goal for such an obligation to cooperate is not first and foremost to enable network investments that bring

common benefit to several countries, such regional cooperation to harmonise the operation of current infrastructure, will supposedly make it easier to adopt a common approach to enable new infrastructure as well.

The three cases above are all about closing regulatory gaps between national jurisdictions which is in line with the objectives of the new Regulation and the third package in general. No provision is found to be an obstacle to the investment measures mentioned. ACER and the Commission may provide opinions to Member States on the regional cooperation to enable network investments that bring common benefit to more than one country, but cannot be seen to have any authority to impose obligations on Member States nor national TSOs to carry out specific investments or to develop specific interconnectors or other transmission network installations.

#### 1.6.3.4.2 ENTSO-E network development plan

The new text of the regulation article 4 states that cooperation between TSOs on Community level shall take place through European Network of Transmission System Operators for Electricity (ENTSO-E). The aim of this cooperation is to ensure the optimal management and sound technical evolution of the European electricity transmission network.

The article 8 (10) (a), the ENTSO-E has an obligation to adopt a 10-year Community-wide network development plan. This plan will build on national and regional network development plans. The Community plan will therefore include plans of investments as mentioned in the cases above.

According to article 9 (2), ACER shall give a duly reasoned opinion and a recommendation to the ENTSO-E and to the Commission where it considers the draft community wide network development plan submitted by the ENTSO-E does not contribute to non-discrimination, effective competition, the efficient functioning of the market or a sufficient level of cross-border interconnection open to third party access.

According to article 8 paragraph 11, ACER shall provide an opinion on the national ten-year network development plans to assess their consistency with the Community-wide plan and shall if inconsistencies arise recommend amending one of the plans as appropriate.

If some of the measures mentioned in the cases above are included in the plan, ACER may have an opinion about them. ACER may conclude that a measure for example does not contribute to effective competition or that planned measures in general are inadequate. Even if an opinion does not involve an obligation to amend the draft plans, it is to be expected that ENTSO-E or national TSOs pay attention to opinions provided by ACER. This, as well as other tasks conferred to the ACER, may imply uncertainties with regard to regional initiatives such as a common Nordic approach to network investments, as mentioned in the cases above. However, ACER has a duty to take due account of the outcome of regional cooperation between TSOs when formulating its opinions, recommendations and decisions. The same duty applies to ACER when formulating its opinions, recommendations and decisions about regional cooperation between regulatory authorities. If the cooperation reaches consensus on cross-border issues, ACER shall take due account of such regional compromises or agreed outcomes.

However, it is important to note that the regional measures to develop adequate interconnector capacities are not subject to ACERs decision making powers, while issues related to the operation of inter-connectors might be. This implies that inconsistencies between network development plans on the different levels and disagreements between regulatory authorities in this regard fall outside the scope of ACERs decision making powers.

#### 1.6.3.4.3 Regional cooperation of transmission system operators

The new text of the Regulation article 12 (1) states that the TSOs shall establish regional cooperation with ENTSO-E. TSOs shall publish a regional investment plan every two years. This plan replaces Nordels “Nordic Grid Master Plan”. This is not longer a voluntary cooperation, but is clearly an obligatory regional cooperation imposed on national TSOs. However, it appears that there is no obligation on the national TSOs to invest according to plan.

This must be said to be a provision favouring the type of measures described in the cases above.

#### 1.6.3.4.4 Exemption for new interconnectors from the obligation of unbundling, third party access etc.

The text of the regulation article 17 opens for exemptions from the requirement of ownership unbundling, independent system operators, use of congestion revenues, third party access and tariff obligations for new interconnectors. One condition for such exemption is that the investment would not take place if the exemption is not granted . There are also some other conditions that should be fulfilled, for instance that the investment must enhance competition in electricity supply.

Exempted merchant interconnectors pursuant to article 17 may impact on the profitability of TSO built interconnectors and visa versa. The exemption rule aims at complementing TSO built interconnectors and cannot as such be seen as an obstacle to regional cooperation between TSOs to invest in interconnectors, although bilateral or joint venture projects of TSOs may compete directly with merchant lines applying for exemption. Due to the assessment criteria in article 17 paragraph 1 (b), a TSO project may create an obstacle for a merchant project to qualify for exemption and an exempted merchant line may impact on the possibility to achieve socio economic surplus of a TSO project to such an extent that the investment is unlikely or authorisation will not be given.

#### **Commission Guidelines**

According to the text of article 18 (3), The Commission has the authority to adopt guidelines concerning many details of the functioning of the interconnectors, herein

*“c) details of investment incentive rules for interconnector capacity including locational signals”.*

This, in addition to the authority to give guidelines regarding details mentioned in the Regulation art. 8 (6)<sup>7</sup> may potentially have consequences regarding investments mentioned in the cases above.

### **1.6.3.5 Regulation establishing an Agency for the Cooperation of Energy Regulators (713/2009)**

An important aim of this new regulation is a better coordination of the national regulatory authorities in order to obtain an efficient and transparent functioning of the internal market, ref. the preamble paragraph (7).

The Agency for the Cooperation of Energy Regulators (ACER) shall mainly have a coordinating role, and also an advisory role in relation to the Commission.

However, the aim is also to ensure harmonisation in the implementation of the community legislation and close regulatory gaps between national jurisdictions having detrimental effects to the possibilities to reach the overall objective of a well-functioning internal market for electricity. Hence, ACER is also conferred authority to adopt binding individual decisions in the following cases:

on technical issues, ref. art. 7 (1)

on the terms and conditions for access and operational security for infrastructure connecting at least two Member States, where the two countries' authorities have not been able to reach an agreement within six months, ref. art. article 8 and 9.

According to article 8 (2), the terms and conditions for access to cross-border infrastructure shall include:

procedure for capacity allocation,

time frames for allocation,

shared congestion revenues; and

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<sup>7</sup> Art. 8 Tasks of the ENTSO-E

(6) a) network security and reliability rules including rules for technical transmission reserve capacity for operational network security;

b) grid connection rules;

c) third party connection rules;

(...)

g) capacity allocation and congestion management rules;

(...)

i) transparency rules

j) balancing rules including network related reserve power rules;

k) rules regarding harmonised transmission tariff structures including locational signals and inter-TSO compensation rules;

l) energy efficiency regarding electricity networks.

the levying of charges on the users of the infrastructure referred to in article 17

(1)(d) in Regulation 714/2009

This authority may confer some uncertainty regarding the autonomy of the Member States and regional cooperation as relates to measures as mentioned in the cases on the introduction above. It is possible that ACER's ruling could have implications for the margin of discretion to use congestion revenues to finance such projects at regional level. In this regard, it is important to note that the decision making power of ACER is secondary to the powers of the national regulatory authorities. Moreover, if the regional cooperation reaches consensus on such cross-border issues, ACER shall take due account of such a regional outcome when making decisions.

The possible regional arrangements for and each Member States exclusive competence to authorise and decide the adequate level of interconnection capacity and the identification of particular infrastructure projects to be developed, fall outside the scope of ACERs secondary decision making authority. Hence, ACER has no jurisdiction to resolve differences between Member States, national regulatory authorities or TSOs concerning investments in or development of interconnection capacities or adjacent national transmission networks affecting cross-border exchange in electricity.

#### **1.6.3.6 Conclusions regarding how the new EU legislation (3rd package) may influence Nordic cross-border network investments**

As an overall conclusion it must be said that the 3<sup>rd</sup> package may not in it self constitute an obstacle to Nordic investment cooperation as mentioned in the introduction.

If any, some barriers may arise from possible future Guidelines from the Commission or possible future decisions by ACER concerning the discretion to use congestion revenues or other payments levied on customers for the purpose to finance network investments that will bring benefit to several countries, rather than to the sole benefit of only one Member State.

However, such a regional approach to the matter of developing the transmission grid is in line with the new obligations imposed on Member States, national regulatory authorities and TSOs to engage in regional cooperation to close the existing regulatory gaps between national jurisdictions in order to mend the imperfections of the internal market. Moreover, if the Nordic countries succeed in their efforts to apply a regional approach to investments in the national transmission networks, including the development of adequate interconnection capacities, it will not only be in line with the stated objectives in the new EC legislative acts, but will take the regional cooperation to a new level. The cooperative measures discussed in this report go somewhat further than the objectives for regional cooperation imposed by the third energy package. However, close regional cooperation in the development of transmission networks is equally important to reach stated objectives for the internal market to work properly. In this way, the Nordic cooperation may serve as model for other regions to enable network investment of common regional benefit.

Hence, we assume that both the Commission and ACER will be positive towards enhanced Nordic grid investments and regional Nordic co-operation in this regard, as this

will facilitate well functioning electricity markets and be an advantage for the internal electricity market as a whole.

#### **1.6.4 Other EU-legislation of relevance**

Attention must be drawn to Treaty establishing the European Community articles 154 to 156, regarding trans-European networks. The aims set forward in these provisions are given effect through Council Regulation (EC) No **2236/95** of 18 September 1995 laying down general rules for the granting of Community financial aid in the field of trans-European networks. This regulation encourages cross-border investments in inter alia cross-border grid investments, by opening for aid from the Community for such projects. See for instance art. 5 section 3. (b), which mentions priority projects on the energy networks explicitly. The regulation must be said to emphasize how important these types of investments are for the Community, and that the Community wishes to encourage these investments more than to put obstacles to them.

## **2 Analysis based on mapping**

### **2.1 Differences between the Nordic countries that create obstacles to beneficial grid investments**

*Analysis of such eventual differences in the processes, criteria, legislation, regulations and mandates in the Nordic countries that can create an obstacle to network investments that will bring benefit to several countries, and in this context also the expected effect of the EU legislation.*

In chapter 1, we described the present legislation, regulatory framework and decision processes for transmission investments in Denmark, Finland, Norway and Sweden. In this chapter, we discuss whether any of these issues may create barriers to Nordic transmission investments, i.e. investments that bring benefits and/or costs to at least two different Nordic countries. Both national and EU legislation and regulations are relevant. The main issues we discuss are the following (numbers in parentheses refer to the relevant subchapters above):

- Licensing procedures and regulatory evaluation criteria (1.1)
- Possibilities for TSOs to participate in joint Nordic network investments (1.2)
- TSO project evaluation and investment criteria (1.3)
- Possibilities for TSOs to participate in joint Nordic financing of investments (1.4)
- Possibilities for shared ownership in the main grid (1.5)
- EU legislation and regulation (1.6)

#### **2.1.1 Licensing processes and regulatory evaluation criteria**

Each country's Acts and regulations are primarily nationally oriented, and do not necessarily take into account the Nordic perspective. The licensing processes for cross-

border lines are generally the same as for internal lines and are quite similar in all countries. In all countries except Norway, the licence for cross-border lines is granted by the Ministry. In Norway, the licence is granted by the regulator NVE; however, it is required to have a licence from the Ministry to export/import electrical energy in addition to a licence to build an cross-border line.

The assessment criteria are relatively similar in all countries. However, in Norway and Denmark it is required that an cross-border line is socioeconomically beneficial for the nation. EIAs (Environmental Impact Assessments) are required in all countries, but there are some minor differences in the procedures.

In Sweden and Denmark the government takes decisions regarding investment in cross-border lines. In Finland and Norway, the decision is made by the TSO or by any other party who wants to build a cross-border line.

A possible barrier related to the national evaluation criteria may arise if an investment is profitable for the Nordic region as a whole, but not for one particular country. There is then a risk that the investment will be denied a licence in this country, thus stopping the entire investment. If this is the case the financing model should in principle be designed to balance costs and benefits at the national level. As long as the parties agree that the investment as a whole is beneficial the financing model should provide possibilities for countries with higher costs than benefits to be compensated by countries with higher benefits than costs. We return to the issue of financing and distribution of costs and benefits in chapter 3.2.

Provided that a financing model addressing the allocation of costs and benefits among the TSOs were rightly setup, and there were a substantial degree of agreement on how to assess investments, the evaluation criteria should not constitute a barrier to Nordic or regional investments. A main challenge is however that a common financing model is not in place. Financing at present rely on bi-lateral or multi-lateral agreements on a case to case basis. Differences in licensing criteria, e.g. the more explicit focus on national socio-economic benefit in Denmark and Norway, may then constitute a barrier to investments regarded to have a Nordic or wider regional perspective.

### **2.1.2 Possibilities for TSOs to participate in joint Nordic network investments**

There seems to be few formal limitations on TSO participation in investments in other countries, whether by themselves or through joint ventures. However, the fundamental tasks of the TSOs as defined in laws, regulations and bye-laws have a primarily national perspective, and the lack of an explicit framework describing how TSOs may participate in common Nordic investments may to some degree constitute an obstacle to such projects.

In each country the TSO is allowed to include the investment in transmission lines within national borders in the regulated asset base, which is the basis for the national tariff base. With regard to investments in other countries, the rules are not that explicit. On the basis of experience, there are possibilities for exceptions, at least in Norway, where costs on investing in other countries in certain cases can be included in the income cap for a

specific time period. When it comes to other Nordic countries, such situations have not occurred so far and no decisions have been taken.

### **2.1.3 TSO's investment in other Nordic countries - processes and evaluation criteria**

The Nordic TSOs have a long history of cooperation within Nordel and through the development of The Nordic Grid Master Plan. Agreement on certain principles for assessing costs and benefits of investments has also been reached, and a set of prioritized interconnections has also been identified. All of the original prioritized interconnections have made significant progress, and some are in the process of being realized. The Nordel criteria for investments are applied when an investment in an cross-border line is assessed.

In Denmark and Norway, the TSO's investment projects must be socioeconomically beneficial for the nation, whilst the Finnish and Swedish TSOs also take into account the Nordic benefit.

The issue of TSO decision processes and evaluation criteria should in principle not constitute a significant barrier to Nordic transmission investments, again with the provision that the financing model is able to balance national costs and benefits. Furthermore, the principles for cost-benefit analysis of transmission investments must be applied in a consistent manner in all four countries. Hence, there may be barriers in practice.

### **2.1.4 Possibilities for TSOs to participate in joint Nordic financing of investments**

No rules or regulations explicitly regulate the issue of joint Nordic financing in any of the countries. There seems to be no specific legislation that prevents the national TSOs to finance investments in another Nordic country, either alone or through some sort of joint venture.

The incentives for joint Nordic investments may be another matter. Investment in other countries would normally not be included in the regulated asset base, which may constitute a financial barrier to investment. The Norwegian case offers an interesting option, however: If contributing towards the cost of an investment in another country is beneficial for the national power system, the cost of such a contribution may be recovered through Statnett's revenue cap. For instance, the financing of the Swedish part of Nea-Järpströmmen involved a payment from Statnett to Svenska Kraftnät which was then added to Statnett's cost base for the revenue cap. Again, we return to this issue in the next subchapter.

### **2.1.5 Rules regulating the ownership of the main grid in the Nordic countries**

No explicit acts or regulations regulate the ownership of the main grid in the Nordic countries but for sharing of ownership, income and costs on cross-border lines, well-established practices are in existence among the TSOs.

A foreign party can have ownership in the grid in all Nordic countries under certain conditions. The basic ownership principle in Sweden is that Svenska Kraftnät shall own and manage the main grid (transmission lines above 200 kV). Concession for new cross-border lines shall only be given to Svenska Kraftnät or to a company where Svenska kraftnät has a decisive influence. In Denmark, ownership must take into account the benefit of the society. In reality Energinet.dk owns the grid above 200 kV and a part of the grid between 100 and 200 kV. The Energy Supply Act stipulates that the State has the purchasing right and -obligation for the grid between 100 and 200 kV under certain conditions. The aim is that Energinet.dk in the long run shall own and operate the transmission grid above 100 kV. There are no actual examples of third party ownership to transmission lines.

As such, the legislation and rules may pose some restrictions on the freedom to organize ownership of joint Nordic investments. In practice, it may not be very relevant. In any case, the lack of an explicit framework for how such cross-border ownership between the TSOs should be organized may constitute a barrier in itself.

### **2.1.6 EU legislation and regulation**

EU legislation and regulation does not seem to constitute any barriers to Nordic transmission investments as such, but may have some implications for the financing solution and the organizational model, at least in the sense that it creates a (fairly broad) framework which any Nordic common model must adhere to. However, this may not be very restrictive in practice. We return to this issue in the next subchapter.

## **2.2 Possibilities for Nordic financing**

*Task: Possibilities for Nordic financing (e.g. increasing possibilities to use the network tariffs levied on own customers to finance investments that will bring Nordic benefit, congestion income/market levy from Nord Pool actors etc.).*

The purpose of this chapter is to discuss the possibilities for Nordic financing of Nordic grid investments. By Nordic financing we understand a situation where two or more Nordic TSOs, or a common Nordic entity of some kind, agree jointly to undertake and finance an investment in the Nordic transmission grid. Typically, this involves cross-border investments such as a new interconnector, but it may also apply to investments in one country alone as long as there is a common Nordic aspect to the investment and financing decision. We consider only investments involving the TSOs, and do not discuss common investments in the regional transmission grids or distribution grids. Also, we do not consider a common Nordic TSO (or ISO, for that matter) spanning Denmark, Finland, Norway and Sweden, but less comprehensive models for integration and coordination.

The rest of the chapter is structured in the following way:

Firstly, we give an overview and assessment of possible sources of financing.

Secondly, we consider possible organizational models.

Finally, we give our recommendations and identify the implications for the Nordic regulators with regard to Nordic financing models.

We discuss sources of financing and organizational models separately in order to identify and evaluate the most important characteristics of different mechanisms. Of course, any practical model will include both aspects.

### 2.2.1 Sources of financing

We define a source of financing as a form of payment which gives a revenue stream to an investor in a Nordic transmission asset. We choose to disregard financing related to non-user payments (i.e. government budget financing) and focus on payments from network users in line with the standard national models for financing transmission investments. There are in principle several different sources of financing Nordic transmission investments based on user payments:

- *Tariffs – national or Nordic.* Financing through tariffs can be organised in different ways. The agreed share of costs from common Nordic grid investments could be included in the cost base of the national transmission tariffs. The cost can then be included without introducing a common Nordic tariff structure. An alternative model is that the annual costs of Nordic investments are financed through a Nordic tariff component that is collected by the TSO together with tariff elements covering the national network costs. A third model may be a separate tariff collected by a common Nordic transmission investment company. Regarding all these three models there may be concerns as to what extent they are at variance with the European electricity legislation. Some further elaborations are given below in the last paragraph of this section.
- *Congestion income.* Congestion income is defined as the product of area price differences in the Nordic spot market and the capacity on the congested interconnectors. We will also discuss the issue of Financial Transmission Rights in the context of congestion income.
- *Nordic trading fee.* By this we mean a fee per kWh traded in some predefined manner. It may be based on trading in the financial or physical market, or be applied to all balance-responsible entities in the Nordic market.
- *Investment contributions.* Investment contributions are in general understood as a user-specific payment in cases where the investment and benefit in question is related to a specific customer (or a small group of clearly identifiable customers). Such benefit structures will usually not be relevant with regard to Nordic investments, which typically will have a system wide impact, making them unsuitable for direct financing from one or a few network customers. We will in this report use the term investment contributions to describe one-off payments between TSOs to balance the share of costs and benefits of different investments. These one-off payments again need to be financed by tariffs or other financing sources.

The Inter TSO Compensation mechanism (ITC), which is defined at a European level, and consists of payments between TSOs to compensate for the cost of transit power, has been mentioned as a possible financing source in previous Nordic and European studies.<sup>8</sup>

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<sup>8</sup> See Nordel: *Report on Financing and Organisation of Investments in Prioritized Cross-sections. A background report prepared by the Nordel Market Committee in the Nordel project on Enhancing efficient functioning of the Nordic electricity market.* 28 February 2005, and Frontier

For the purpose of this report, we do not consider the ITC mechanism as a financing source in itself. Monetary flows under the ITC system consist of increased tariff payments from the customers of the TSOs obliged to pay transit costs and reduced tariffs for the customers of the TSOs receiving compensation. The ITC system is a European arrangement, and there is no basis for adoption of the system to specific Nordic investments. The arrangement is furthermore not restricted to new investments, but all assets, new and existing, that are influenced by cross-border flows. However, there are aspects of the ITC system which could be interesting for the purpose of Nordic investment financing. Thus, we comment on the possible role of an ITC system or similar at the end of this chapter.

#### *Nordic tariff and EU regulations*

The electricity directive requires that “regulatory authorities shall be responsible for fixing or approving sufficiently in advance of their entry into force at least the methodologies used to calculate.....the terms and conditions for.....connections and access to national networks, including transmission and distribution tariffs or their methodologies” (Electricity Directive art. 37(6)). Any Nordic tariff has to be collected from the national connected customers, and will then be covered by this requirement.

Article 14 in Regulation EC 714/2009 cover charges for access to networks and 14(1) states that “charges applied by network operators for access to networks shall be transparent, take into account the network security and reflect actual costs incurred insofar as they correspond to those of an efficient and structurally comparable network operator and are applied in a non-discriminatory manner.”

The inclusion of a share of the costs from common Nordic transmission investments in the national tariff cost base should not be at variance with these requirements. A common Nordic investment tariff element collected by the national TSOs and under regulation by the national regulators (co-operating on a Nordic level) may also be in line with the requirements in these articles. A final conclusion will require further elaborations and maybe also discussions with the European Commission with regard to their interpretation of these requirements in the European electricity legislation.

With regard to the third alternative it is altogether not obvious that the establishment of a Nordic investment company collecting tariffs from customers (separately from the national TSOs) will be in line with art 37(6) of the Directive. A key point is who will be the responsible regulator for approving in advance these tariffs (or methodologies). Handling of complaints will also be an issue. The European legislation has no provisions for formal regional regulation.

#### **2.2.1.1 Evaluation criteria**

The financing sources that we are assessing all have different qualities and different levels of suitability. These elements can be summarized within the following four evaluation criteria:

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Economics and Consentec, *Improving incentives for investment in electricity transmission infrastructure* (November 2008).

- 1) *Incentives to invest for TSOs or other infrastructure owners*, as measured by the link between the investment and the cost, and the predictability and size of the financial contribution from the source in question.
- 2) *Market consequences*, i.e. if the use of the financing source affects the production or consumption decisions in the Nordic power market in the short (i.e. the demand or supply curve in the spot market) or long term (i.e. investments in power generation or consumption) in a manner which distorts the market and reduces overall economic efficiency.
- 3) The *legitimacy* or *fairness* of using the source, primarily measured by the match between cost and benefit for those who pay the bill for the investments, both at a national level and between consumers and producers of electricity.
- 4) The *feasibility* of using the source, i.e. possible barriers to implementation due to regulations or other issues.

Of course, combinations of some or all of the above sources may be possible. However, we discuss them separately in order to highlight the fundamental characteristics of each source.

### 2.2.1.2 Tariffs

1. *Incentives to invest*. National or Nordic tariffs provide a predictable and stable source of financing given that the asset to be covered is included in the cost base of the investing TSO/TSOs (or a common Nordic entity). Investment contributions between TSOs should also be included in the cost base of the TSO(s) making the payment in order to provide a consistent system (see discussion below). If the overall revenue creates an acceptable return on investment, then tariffs give incentives to invest. If the tariffs intended for financing are not explicitly linked to the cost of investing, the incentive effect may be uncertain. This depends on the incentive regulation in place. A simple rate of return regulation, which entitles the investor to recover all capital costs (depreciation and return on capital) and operating costs including transmission losses through the tariffs, is an obvious example of a regulatory system which gives sufficient incentives (as long as the allowed rate of return is greater than the investor's cost of capital).
2. *Market consequences*. Part of the cost coverage of TSOs will be through tariffs that are not directly related to a given consumer or producer's actual use of the grid.<sup>9</sup> Tariffs reflecting marginal losses or tariffs which give specific price signals are likely to be insufficient to give full cost coverage (see below for a discussion of congestion income). Hence, there is a need for additional tariffs to provide cost recovery. Such tariffs are often referred to as residual tariffs and represent the basis for the calculation of the annual average national G in the current EU draft guidelines on tarification. These residual tariffs will be the source of distortionary signals as they constitute a tax on power consumption and generation. The socially optimal way of designing such tariffs is by using so-called Ramsey

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<sup>9</sup> The topic of optimal network tariffs is covered in a number of works, see for instance Econ Pöyry Report 2008-129 *Optimal network tariffs and allocation of costs* and Bruneekreft, G., K. Neuhoff and D. Newbery (2005): "Electricity transmission: An overview of the current debate", *Utilities Policy* 13, 73-93, for surveys of the literature.

pricing which implies allocating the share of these tariffs according to the inverse elasticity of the demand for transmission. Specifically, the network customers with the highest willingness to pay for using and connecting to the grid will pay the largest part of the total costs. Typically, this will be households, the public sector and small businesses. Applying such a principle will alleviate the negative effects of residual tariffs and would be an important aspect to consider. However, a full implementation of a Ramsey pricing model may have unwanted effects from a wealth distribution perspective. Introduction of a specific Nordic tariff with a different structure than the existing national tariffs will increase the complexity of the tariff system leading to a lack of transparency and affecting market behaviour.

3. *Legitimacy.* The use of tariffs will not necessarily create a balance between the recipients of the benefits and the tariff payments. As mentioned above, there are draft EU guidelines on tariffication that set a maximum range for residual tariffs that can be placed on generation. This implies that load will need to carry the majority of the burden of such tariffs whether national or Nordic, which may be considered unfair if generators receive greater benefits from more Nordic interconnectors than load. As such the legitimacy depends on the overall tariff design. However, investment contributions between TSOs may reduce the imbalances that arise from the general tariff system. As described above a Nordic tariff collected from customers separately from the national TSOs may not be in line with art 37(6) of the Electricity Directive.
4. *Feasibility.* The level of feasibility may vary between countries. Investment in other countries would normally not be included in the regulated cost base. For Nordic tariffs it will be necessary to decide on tariffication principles and a practical solution for collecting the tariffs. These feasibility issues are not impossible to solve, however. In Norway, for instance, it is possible to apply for a special solution for a limited time if an investment in another Nordic country is beneficial for the national power system. The Norwegian part of such an investment can then be covered through the national tariffs even if the asset is not included in the cost base. Other solutions may also be possible

### **2.2.1.3 The role of investment contributions in a financing model based on tariffs**

As mentioned above, possible instrument for balancing costs and benefits between the Nordic countries is investment contributions between TSOs.<sup>10</sup> A simple example can illustrate the working of such a system:

- A common Nordic investment, for instance an interconnector between two countries A and B, costs 1000 to build. It yields expected benefits of 2000, i.e. a net benefit of 1000. (We disregard operating costs for simplicity.)
- Country A will pay 700 of the investment cost and country B 300 of the cost according to the proportions of the line and corresponding costs located in each country. The cost is financed through the ordinary national tariffs. Hence, grid users in A pay 700 and grid users in B 300.

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<sup>10</sup> The case of Nea-Järpströmmen, where Statnett paid Svenska Kraftnät a compensation for part of the cost on the Swedish side of the new transmission line, is a practical example of such investment contributions between TSOs.

- The gross benefits are distributed as follows: 500 in country A and 1500 in country B.
- The TSO in country B pays an investment contribution of 450 to country A, again financed through the tariffs. The net benefit for country A is now  $500 + 450 - 700 = 250$ . For country B the net benefit is  $1500 - 300 - 450 = 750$ .
- In this manner, country A and B share costs proportionally to the benefits. A is left with 1/4 of the net benefit of the project, and B with 3/4 (of course, a number of possible solutions exist which give each country a positive net benefit after costs per country are deducted).

In the case of Nordic tariffs, the same logic can be applied, but the baseline for calculating the investment contribution should be the proportion of Nordic tariffs paid by grid users in each country rather than the cost paid by the respective TSOs for the investment.

With more than two countries involved, and several Nordic investments, this gets rather more complex. However, the example above shows the principle of using investment contributions to achieve a fair distribution of costs and benefits.

Obviously, the use of investment contributions requires a practical method for estimating costs and benefits of Nordic transmission investments and some form of consensus. That is, it is necessary for TSOs and regulators to agree on a how to divide the costs and benefits between the different countries. There is agreement on several such principles between the Nordic TSOs and regulators on this issue already.<sup>11</sup> However, there is still the issue of the practical implementation of the method. For instance, even if there is agreement on the main principles for estimating costs and benefits, the various TSOs still have to arrive at a solution through negotiation if the financing is based on voluntary agreements (see below for further discussion on organizational models).

#### 2.2.1.4 Congestion income

1. *Incentives to invest.* Congestion income arises due to differences in prices between two adjacent market areas due to insufficient transmission capacity between the areas. The revenues collected from this will vary from year to year depending on many factors (temperatures, inflows to the hydro system, economic downturns etc.), and the level is highly uncertain. This uncertainty may obviously create disincentives for investments, unless the expected level is sufficiently high to compensate for the risks. There is anyway no necessary link between the level of revenues and the costs of Nordic investments, which in itself may be problematic for the incentives. Of course, it is possible to accumulate congestion income in a fund which is then paid out over time to finance Nordic transmission investments. This may reduce the risk as seen from the investor's perspective, but there is no guarantee that it will be sufficient to finance the desired investments. Another complicating issue is that a grid investment may well remove the area price difference/congestion income ex post. As the aim of Nordic investments will often be to relieve congestion, this makes it highly problematic to rely on congestion income to finance investments (at least as the only source of financing).

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<sup>11</sup> See for instance the Nordel report *Priority Cross-sections. Joint Nordic Analyses of Important Cross-sections in the Nordel System*. 11 June 2004.

2. *Market consequences.* Congestion in the grid can be handled by using price areas or counter-trade. The economic principle behind price areas is to give efficient localization price signals to producers and load both in the short and the long term. Price areas are arguably the best way to handle congestion based on economic theory, but may have weaknesses in practice. One example is if the characteristics of a price area lead to local market power for generators. TSOs relying on congestion income for income may also have incentives to increase congestion through their operational decisions, including the setting of available transmission capacities. This problem may be mitigated by regulation, however. On the whole, it should be possible to use congestion income for investment financing without compromising market efficiency.
3. *Legitimacy.* Congestion income arise due to lack of sufficient interconnection capacity and as such it should seem fair to use these revenues in projects that increase capacity. However it is not certain that there will be a fair division of cost and benefit, either between countries or between generators and consumers. In annex 1 to the new EU regulation on cross-border exchanges there is a comment that congestion income preferably should be assigned to specific predefined projects which contribute to relieving the existing associated congestion. This might alleviate the subject of legitimacy. There is of course a need to define a method for sharing the income from congestion between the countries they belong to, which could be more or less fair. Investment contributions may be used to balance the benefits and costs, in the same manner as described for tariffs above (although the baseline for the investment contributions will now be congestion income and not tariffs). The costs of the investment contributions will probably have to be recovered through the national tariffs.
4. *Feasibility.* The new EU Regulation on cross-border exchanges specifically asks for congestion income to be used for guaranteeing availability of allocated capacity of interconnectors or maintaining or increasing interconnection capacities through network investments. Only if the revenues can not be efficiently used for those purposes may they subject to approval be used for reducing tariffs. With respect to feasibility, congestion income may therefore some seem more like a requirement than a question of possibility. The subject of using congestion income has also been a topic in previous discussions within Nordel.

The concept of using congestion income is closely related to Financial Transmission Rights or FTRs.<sup>12</sup> An FTR gives the holder the right to collect the congestion income on a specified interconnector. FTRs may serve several purposes, including investment financing, for instance through auctioning of FTRs or issuing of FTRs to an investor in Nordic transmission capacity. However, the value of FTRs is closely related to the value of congestion income. The willingness to pay for an FTR will depend on the expected congestion income *after* an investment in increased transmission capacity is made. This may be significantly lower than the observed congestion income today. Hence, the characteristics of FTRs will largely be equivalent to using congestion income for financing purposes.

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<sup>12</sup> A more detailed definition and discussion of the FTR concept can be found in Econ Pöyry Memo 2009-011 *Financial Transmission Rights on NorNed*.

### 2.2.1.5 Nordic trading fee

1. *Incentives to invest.* A Nordic trading fee can be a stable source of *revenue* depending on the level set and the basis for the fee. However, the level of revenue would not be directly linked to the costs of Nordic transmission investments financed under a common scheme. Hence, the fee will not necessarily provide a stable *profit* for investors. Some sort of intermediary fund may of course reduce this problem of matching revenues and costs.
2. *Market consequences.* The possible distortionary effects of introducing a common Nordic fee depend on the design and base of the fee. A fee per kWh trading in the financial or spot market would give incentives to move trade from the electricity exchange and as such have distortionary effects. However, a fee payable by all balance responsible entities for their annual production and sales to final consumers would be applicable to all (independent of how trade is undertaken) and as such not have any direct distortionary effects. It will, however, lead to an increase in the price for electricity of end-users and function as a general tax on electricity consumption (in addition to existing taxes). Although the trading fee is not a network tariff as such, it will in practice be quite similar to a per kWh Nordic tariff for network customers. The comments given above about Nordic tariffs and possible compliance with EU regulation are also relevant to a Nordic trading fee.
3. *Legitimacy.* There will be no relation between fee payments and benefits. One would expect the countries with the highest electricity consumption to pay the highest share of the total cost of the fee, but the distribution of benefits may be different. Again, investment contributions may be used to balance the benefits and costs, but probably requires that the costs of the investment contributions may be recovered through the national tariffs (see the discussion under tariffs above).
4. *Feasibility.* Introducing a Nordic fee raises a number of legal and regulatory questions. In principle, it will probably not be very complicated to implement, although this may depend on the design. For instance, a fee with severe distortionary effects is likely to meet opposition.

### 2.2.1.6 Summary of financing sources

The following table summarizes the evaluation of the different sources of financing.

**Table 1.1 Summary of evaluation of the different sources of financing**

Source/score	Incentives	Market consequences	Legitimacy	Feasibility
<b>Tariffs – national or Nordic</b>	Good	Depending on design	Poor	Good
<b>Congestion income</b>	Poor	Good	Depending on use	Good
<b>Nordic fee</b>	Medium	Depending on design	Poor	Medium/Poor

As can be seen, all sources may be problematic with regard to legitimacy or fairness. It should be emphasised that none of the sources provides a simple solution to this issue. A supplementary instrument seems necessary regardless of the chosen solution. One option could be to use one-off investment contributions between the TSOs to better reflect the distribution of costs and benefits at the national level. This obviously requires some form of Nordic consensus on the definition and calculation of costs and benefits. We elaborate on the role of investment contributions below.

Legitimacy aside, tariffs have several desirable qualities which make them suitable as a basis for Nordic financing models. Tariffs are clearly the best option with regard to incentives for the investors, although there is of course a need for supplementary regulation in order to avoid incentives for over- or underinvestment. Tariff financing is also fairly easy to implement in practice compared to some of the other alternatives.

Whether the Nordic transmission assets are included in the cost bases of the national TSOs or a virtual asset base for Nordic investments with a corresponding Nordic network tariff, will to some degree depend on the organization of ownership. However, a Nordic tariff with a separate structure along the lines of existing national tariff systems, adds another layer of complexity. As mentioned in chapter 2.2.1, the possible compatibility of a Nordic tariff with EU regulations has to be elaborated further if this model is to be followed. The possible compatibility of such a model with the national models of economic regulation is also something that must be looked into.

Congestion income could be used in addition to tariff financing – according to the Annex 1 to the Regulation, it is more or less presumed that congestion income shall be used for concrete projects. These revenues could be organized to be used on a year-to-year basis or used to build up a fund from which to use later, and the remaining need for financing covered through the tariffs.

## **2.2.2 Organization**

### **2.2.2.1 Models**

As we will not assess models designed for further harmonization such as a common Nordic TSO or ISO – those options have been looked into and not found to contribute to the solution of the problem or include the possibility of private investors, we are left with two relevant dimensions for possible models of organization: Decision power for investment and ownership of infrastructure. These can be either national or supranational/Nordic. We have identified three main models which combine different aspects of these two dimensions:

- *Bilateral or multilateral voluntary cooperation* with national decision-making and national ownership to the infrastructure. This is to a large degree the current Nordic model. This alternative could also include a joint planning committee without decision-making powers or ownership of transmission assets, which would constitute a slightly deeper integration than the current system.
- *Joint Nordic decision committee* with delegated power to identify and decide on investment but with national ownership to the infrastructure.

- *Joint Nordic Investment Company* with delegated power to identify, decide and own the infrastructure.

It is possible to imagine a fourth alternative with national decision-making and joint Nordic asset ownership. This cannot be considered a very practical solution, however. It is also possible to finance new interconnectors through the establishment of joint ventures organizing the assets as merchant cables, that is, investments outside of the regulated grid. Such joint ventures could be between TSOs, TSOs and private investors or only private investors. EU regulation allows for such investment based on certain assumptions. One criterion is that the level of risk attached to the investment is such that the investment would not take place unless an exemption is granted. Such projects may, subject to application, be given exemptions to EU rules regulating use of revenues, third-party access, tariff principles and congestion management for a limited period of time. The framework is mainly intended for new direct current interconnectors, but may in exceptional cases apply to alternating current interconnectors. In a Nordic setting merchant cables seem less relevant (interconnectors to countries outside the Nordic region is another matter).

Hence, we are left with three main options with regard to organizations models. We use the following evaluation criteria:

- Efficiency of decision-making, that is the ability to actually decide upon and carry out Nordic transmission investments with as short a time lag as possible, without compromising the transparency and legitimacy of the decision processes.
- Feasibility or possible barriers to implementation due to regulation, national legislation or other issues.

#### **2.2.2.2 Evaluation**

It is likely that the efficiency of decision-making will be higher in the models based on a joint Nordic solution compared to the voluntary cooperation model. From experience, the more obvious or simple investment cases are undertaken in the voluntary model, particularly those cases which primarily involve two parties. In more complex cases with several involved parties and an uneven distribution of costs and benefits, external effects etc., there is a need for some kind of authority to bind all the affected countries. Otherwise, there is a real risk of some parties seeking to free-ride on the investments of other countries or no investment being made at all. In particular, it may be difficult to arrive at voluntary agreements on investment contributions and other financing issues.

A necessary condition for the joint Nordic models with common decision making is based on

- 1) a clear definition of what is to be defined as common Nordic grid investments and
- 2) the possibility to agree on the main principles of estimating costs and benefits.

Without a common view on these issues, it is hard to foresee political will to establish a common Nordic organization or that the solution will have long-term durability. These conditions are of course quite similar to the conditions for investment contributions to function as an instrument for balancing costs and benefits in the overall financing system.

With regards to which of the two is the better option, there might be difference with respect to the efficiency of decision-making. Depending on the set up of the principles of governance, the efficiency of decision-making in both models could be fairly similar. A joint company can be seen as more committing, making it more difficult for any party to withdraw due to differences of opinion on for example shares of costs and benefits in a given case. However, with respect to feasibility there is reason to believe that a joint committee is more likely to be accepted politically because it is less comprehensive. A voluntary model has a high level of feasibility.

In both (all) cases it is important to design a transparent and structured decision-making process, along with a suitable model for regulation (including, but not restricted to, investment approval and decisions on financing).

### **2.2.2.3 The impact of EU regulations on Nordic organizational models**

The voluntary investment cooperation between the Nordic countries has so far been carried out within the Nordel framework. For instance, through a process of evaluation of Nordic costs and benefits of different projects, a selection of common projects has been identified.<sup>13</sup> In the future, the new EU Electricity Directive and Regulation for cross-border exchanges will probably be a more important frame of reference for the development of Nordic cooperation. The EU will not impose restrictions as such, but rather strengthen the concept of voluntary regional cooperation and develop a framework for it.

The new Directive requires that Member States as well as regulatory authorities shall cooperate with each other for the purpose of integrating national markets at one or more regional levels. In addition the new Regulation states that TSOs shall establish regional cooperation within the ENTSO-E. The latter shall be reflected through a regional investment plan every two years even though it is not binding. However, cooperation is now mandatory. The geographic boundaries of such cooperation should still allow for a Nordic solution, but may also imply a wider region or cooperation in more than one region. There will also be EU-wide cooperation through the bodies ACER and ENTSO-E.

Another important change in the Directive is that the relevant authorities in each Member State should now apply wider criteria than only the national perspective when authorizing interconnectors or reinforcement of adjacent national networks.

The new Directive and Regulation provides for three levels of investment plans in the future: A national, regional and EU level. National authorities will have the power to impose actions on their respective TSOs.<sup>14</sup> The regional and EU level plans (the latter through ENTSO-E) shall be based on the national plans, but does not entail any binding decisions or obligations on the national TSOs with regard to actual investments. However, ACER will have powers to make recommendations if there is any

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<sup>13</sup> See the Nordel report *Priority Cross-sections. Joint Nordic Analyses of Important Cross-sections in the Nordel System*. 11 June 2004.

<sup>14</sup> Such actions are defined in Article 15, which states that "The regulatory authorities where Member States have so provided or Member States shall require transmission system operators to comply with minimum standards for the maintenance and development of the transmission system, including interconnection capacity.

inconsistency between national and EU-level plans and shall make a comment on both the national development plans and the EU-level plans.

Also, the new Directive gives national regulatory authorities the right to enter into cooperative agreements with each other to foster regulatory cooperation.

The EU developments should help facilitate a multilateral cooperation that will still be based on national decision-making and ownership, but with a higher level of commitment to cooperate. In this context, increased Nordic cooperation through a joint planning committee, or at some stage a joint decision-making process on transmission investments, may be a natural step.

### 2.2.3 Complete models

Models combining possible sources of financing and organization alternatives have been suggested earlier and in particular by Nordel.<sup>15</sup> Many of the basic concepts they suggested are still relevant. As such, we suggest two possible models which to a large extent correspond to two of the Nordel models:

- *Multilateral voluntary cooperation within the new EU framework.* Cooperation structure based on the new EU framework with a common planning process but with national decisions and ownership. Financing by use of national tariffs and congestion income, combined with voluntary investment contributions between TSOs to achieve a better match of costs and benefits at the national level.

*Joint Nordic decision committee.* Formalized cooperation through joint committee responsible for a common planning process but in addition making binding investment decisions. Financing by use of national tariffs and congestion income, combined with investment contributions between TSOs to achieve a better match of costs and benefits at the national level. The decision committee will need the authority to make decisions on financing, including the obligation to use investment contributions to balance costs and benefits.

The first model can be seen as a natural evolution of the Nordel cooperation, while the second would be a greater step towards a more formalized structure. Of course, the two models are not mutually exclusive, but could be seen as steps along the path towards deeper integration.

A third model for financing investments of common Nordic interest, which is closely related to the two above, could be defined using the ITC system as a basis. An ITC-like model may conceivably be developed in the Nordic region and function alongside the European ITC arrangement. The components of such a model would be the following:

- A general system where network assets (or a proportion of network assets) in a TSO area which perform a common Nordic function are identified as Nordic investments.

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<sup>15</sup> See Nordel: *Report on Financing and Organisation of Investments in Prioritized Cross-sections. A background report prepared by the Nordel Market Committee in the Nordel project on Enhancing efficient functioning of the Nordic electricity market.* 28 February 2005.

- A supporting model which is used to calculate how the costs of these assets (capital and operational) can be attributed to TSOs (more specifically, the customers of the TSOs) located in other areas.

A general model of calculating costs and compensations between customers located in different TSO/tariff areas will need to be quite similar to a model for calculating investment contributions between countries. Hence, the “ITC model” will not necessarily be very different in practice from either of the other two complete models described, depending on the practical implementation and detailed design.

## **2.2.4 Regulatory implications**

Any move towards closer cooperation with regard to Nordic transmission investments will require a corresponding development of the national regulatory systems towards increased cooperation. The need for regulatory changes to respond to the different levels of cooperation will depend on the extent of decision authority and ownership mandate which is delegated to a supranational body and the choice of financing model:

- In the case of the voluntary cooperation model, the impact on regulation will be relatively small, but it may be desirable to introduce some clear guidelines at the national level regarding payments between TSOs (i.e. allow for national cost recovery in the case of payments or investment contributions across borders). If a joint planning committee is established, the Nordic regulators should perform some supervisory function, i.e. ensure that the committee adheres to certain principles and reporting requirements, and if necessary ensure that the costs of the committee are covered through the national network tariffs.
- In the case of a transfer of decision-making authority or ownership to a Nordic entity, there will be a need for a corresponding transfer of regulatory authority, with the establishment of a regulatory cooperation unit or a Nordic regulator for Nordic issues. These bodies will need to have the right to control and authorize the investment decisions made by the joint investment committee or joint investment company. They will also need to have the right to authorize the system for tariffs in the case of a Nordic tariff, the distribution of costs through national tariffs in the case of national tariff financing, and of course any decisions on mandatory investment contributions between countries.

# Appendix 1 - Relevant legislation on the regulation of the Nordic TSOs

Relevant legislation on the regulation of the Nordic TSOs is found in the following national laws, regulations and administrates:

## Norway:

- The Energy Act lov 29. juni 1990 nr. 50. (EA)
- Regulations to the Energy Act (REA)
- Regulations of the System Operator (RSO)
- Regulations concerning Energy Planning (EP)
- Regulations concerning Metering and Settlement (RMS)
- Regulations concerning Economic Regulation and Tariffs (RET)
- Regulations concerning Energy Rationing (RER)
- Regulations concerning Contingency Planning (RCP)
- Regulations concerning Power Quality (RPQ)
- License for System Operation
- License for International Connections
- License for Balancing Responsibility
- License for Trade of Electricity

## Sweden:

- The Electricity Act (EA), the Act, SFS 1997:857 of November 20, 1997, as amended by SFS 2006:926,
- Instruction from the Government (SvK-I), Regulation (1991:2013),
- Annual instruction from the Government,
- Regulation on system responsibility (SAF) (1994:1806), and
- Act on Power Reserve (EfRL) (valid until 29 February 2008).

**Finland:**

- The Electricity Market Act (EMA), 17.3.1995/386, as amended by 21.12.2004/1172,
- The Government Decree on Electricity Market, 7.4.1995/518, as amended by 21.12.2004/1174,
- The Decree of the Ministry of Trade and Industry on Unbundling of Electricity Businesses, 4.12.2005
- The Energy Market Authority's Regulation on Publication of the Key Figures of Network Operations, 2.12.2005
- Act on Securing Usability of Power Reserves, 8.12.2006/1082, valid until 28 February 2011,
- The Act on Verification and Notification of Origin of Electricity, 19.12.2003/1129,
- The Government Decree on Notification of Origin of Electricity, 30.12.2003/1357,
- Licence for network operation (including system responsibility)

**Denmark:**

- The Electricity Act (EA), the Act, lovbk. 1115 November 8, 2006
- The act on Energinet.dk (ENDKA), L 1384 of December 20, 2004
- The executive order on system responsibility (OSR), Bkg. 1463 of December 19, 2005, and
- The executive order on economic regulation of Energinet.dk (OER), Bkg. 965 of September 21, 2006
- The executive order on compliance programmes, among others Energinet.dk (OCP), Bkg. 965 of September 21, 2006







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