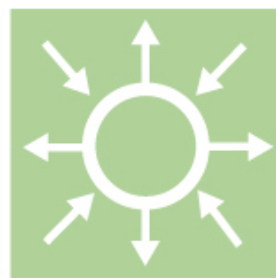




Way Forwards to a Harmonised Nordic Retail Market

Elforsk rapport 09:69



Niclas Damsgaard
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May, 2009

ELFORSK

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Förord

Integrationen av elmarknaderna i de Nordiska länderna är långt gången. Grossistmarknaderna på Nordpool utgör i praktiken en nordisk marknad, och TSO:erna i de olika länderna har kommit relativt långt i integrationen av balansmarknaderna. Den marknad som är minst integrerad är den för sluktunder. Det finns idag en mängd olika hinder för elleverantörer som vill agera på samtliga marknader i Norden.

Att skapa en nordisk sluktundermarknad står högt på den politiska dagordningen men för att nå dit krävs omfattande harmonisering av regelverken i de olika länderna. I denna rapport studeras vad för sorts regelverk som behöver harmoniseras för att en gemensam nordisk sluktundermarknad skall kunna bli verklighet samt vad det skulle kosta att genomföra harmoniseringarna. Dessutom presenterar rapporten olika förslag på hur de nödvändiga harmoniseringarna skulle kunna genomföras i praktiken.

Projektet som redovisas i rapporten har finansierats av Market Design-programmet.

Forskningsprojektet Market Design syftar till att öka kunskapen om hur den avreglerade nordiska elmarknaden fungerar och hur regelverken som omger marknaden kan utvecklas. Programmet är nu inne på sin tredje etapp och verksamheten spänner över hela fältet från produktion och handelsfrågor till nätfrågor. Närliggande frågor som har stor påverkan på elmarknaden så som EU:s handelssystem för utsläppsrätter och miljömärkning av el behandlas också. Market Design-programmet finansieras gemensamt av elföretagen och Energimyndigheten.

Mer information om programmet finns på hemsidan www.marketdesign.se

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Peter Fritz

Programledare Market Design

Sammanfattning

Bakgrund och syfte

Integrationen av den nordiska elmarknaden är en pågående process med en lång historia. Sedan skapandet av Nord Pool har grossistmarknaden gradvis blivit mer och mer integrerad. Även om det fortfarande finns möjligheter till ytterligare integration är den processen redan mycket långt gången. Slutkundmarknaden är dock betydligt mindre integrerad och integration av den marknaden på tvärs av de nordiska länderna är sedan något år tillbaka högt på den politiska dagordningen.

Syftet med den här rapporten är att studera regleringar och kostnader relaterade till en harmoniserad och integrerad nordisk slutkundmarknad för el och att föreslå en möjlig väg framåt.

Mot den bakgrunden har två harmoniseringsscenarier skapats – långtgående och begränsad harmonisering. Scenariot med långtgående harmonisering är ambitiös, medan den begränsade harmoniseringen är en mer praktisk lösning som kan implementeras i närtid.

Under arbetet med projektet har det blivit uppenbart att det är mycket svårt att få kvantitativa estimat av kostnader och nyttor relaterad till marknadsintegration. Trots ansträngningar att skapa tydliga och precisa scenarier, har de flesta marknadsaktörer begränsade insikter såväl i kostnaderna associerade med förändringar som nyttan av en mer harmoniserad marknad – bortom kvalitativa bedömningar. Inom ramen för projektet arrangerades en workshop med marknadsaktörer och andra intressenter. Syftet var att diskutera preliminära resultat från projektet, men också att ge input till den vidare analysen. Även under denna workshop var bedömningarna huvudsakligen av kvalitativ natur.

Slutsatser

Givet svårigheterna att få trovärdiga kvantitativa bedömningar av kostnader och nyttor är de flesta resultaten av kvalitativ natur.

För att uppnå verkliga vinster av en harmoniserad nordisk marknad förefaller det nödvändigt att möjliggöra för elhandlare att arbeta på tvärs av den nordiska marknaden med samma affärsinfrastruktur, t ex IT-system. För att nå det målet krävs en långtgående harmonisering. Därför måste alla delar som krävs för att nå det målet bedömas tillsammans, snarare än att göra individuella kostnads- och nyttoanalyser för varje enskild fråga.

Dock, baserat på detta och andra liknande projekt är det tydligt att det är svårt att få relevanta kostnadsdata när man studerar frågeställningen på ett övergripande plan. Det är också svårt att bedöma nyttorna, särskilt de som huvudsakligen hänförs till bättre marknadsfunktionalitet. Uppenbara nyttor, som minskad marknadsstyrka genom marknadsexpansion verkar också vara begränsade.

Nyckelområden för harmonisering

De viktigaste områdena att harmonisera är de som hindrar elhandlare från att arbeta på tvärs över Norden med samma affärsinfrastruktur. Det innebär att det är nödvändigt att harmonisera åtminstone de centrala affärsprocesserna

om verkliga nyttor ska uppnås. Vi har delat in harmoniseringsfrågorna i fyra områden:

- 1 Informationsutbyte och processer
- 2 Mätning
- 3 Balansavräkning
- 4 Konsumentförtroende

De centrala affärsprocesserna finns huvudsakligen i grupperna 1-3 ovan. För var och en av grupperna föreslår vi:

Informationsutbyte och processer:

- Fullt ut harmoniserade processer, meddelandeformat och innehåll som möjliggöra automatiserad hantering, och
- En nordisk informationshub.

Mätning

- Höga harmoniserade miniminivåer för mätning med gemensamt definierade trösklar:
 - × Miniminivåerna kommer att kräva AMR-system för alla kunder.
- För att undvika de mest kostnadsdrivande elementen föreslås:
 - × Timvis mätning med daglig insamling enbart för stora kunder (t.ex. >63 A)
 - × För mellanstora kunder föreslås timvis mätning med månatlig insamling.
 - × För de minsta kunderna föreslås månatlig mätning och insamling.

Balansavräkning

Viktiga steg för att harmonisera balansavräkningen i Norden har redan tagits. Ytterligare steg rekommenderas med målet att det ska vara lika enkelt att gå in på en annan nordisk marknad som att arbeta i sitt eget hemland:

- Gemensamt balansavtal
- En gemensam balansavräkningsorganisation, för att:
 - × Underlätta implementeringen av ett gemensamt balansavtal
 - × Gemensamma säkerheter för hela den nordiska marknaden
 - × Samma informationsflöde
 - × En faktura för balansansvar.

Konsumentförtroende

Det finns många frågeställningar som är viktiga för en bra utveckling av marknaden, men som inte direkt berör kärnan av affärsprocesser. Harmonisering krävs exempelvis avseende fakturor för att inte skapa onödiga inträdesbarriärer. Många andra aspekter är dock viktiga främst ur ett

konsumentförtroendeperspektiv, men är inte av central betydelse för kärnprocesserna.

Vem ska vara ansvarig?

För att facilitera och driva processen föreslår vi att en nordisk koordinerande enhet utses. Detta skulle exempelvis kunna vara NordREG, som är en redan etablerad organisation för de nordiska regleringsmyndigheterna. En sådan koordineringsenhet skulle dels ha ansvaret för att driva processen framåt, men också fungera som ett rådgivande organ exempelvis vad gäller nationell lagstiftning på området för att bidra till att harmoniseringsprocessen följer planen.

A nordisk informationshub föreslås för att ge alla marknadsaktörer tillgång till samma information/data på ett enkelt sätt.

Som redan nämnts, föreslås också en nordisk balansavräkningsorganisation.

När ska en nordisk marknad införas?

Det kan vara en lång process för att nå en fullt ut harmoniserad marknad, eftersom det inbegriper vissa tämligen komplicerade politiska beslut, men också för att det kräver att nya regleringar införs och nya tekniska system måste också implementeras.

En omedelbar frågeställning är nå enhet kring att starta processen, inklusive att utse en koordinerande enhet.

Andra frågeställningar som påverkar marknadsintegrationen

Det finns många andra frågeställningar som påverkar integrationen av slutkundmarknaden. Två viktiga frågor är stöd till förnybar elproduktion och flaskhalshantering in Norden.

Stöd till förnybart

Stödsystem till förnybar elproduktion är en del av kärnan av den nationella energipolitiken i alla de berörda länderna, och är på så sätt en mycket bredare fråga än integration av slutkundmarknaden. Likafullt är det klart att utformandet av stödsystemen kan påverka hur slutkundmarknaden fungerar.

Detta är mest uppenbart för elcertifikatsystemet som används i Sverige. Inbyggt i systemet är att det involverar elhandlarna och systemet kommer mer eller mindre automatiskt att utgöra en inträdesbarriär för elhandlare från andra länder. Vidare uppstår också frågan om det är möjligt för en elhandlare i ett annat land att ta hand om kvotplikten för svenska kunder. För närvarande skulle det behandlas som direkt import och slutkunden skulle själv behöva ta ansvar för att täcka sin kvotplikt. Detta kräver vidare analys.

Stödsystemen i de andra nordiska länderna berör inte elhandlarna på samma sätt och har därmed mindre betydelse för hur slutkundmarknaden fungerar. Dock, om en stor andel av elen måste köpas via speciella stödmekanismer begränsas drivkrafterna för kunderna att välja andra leverantörer.

Ett gemensamt stödsystem skulle naturligtvis ge fördelar, men det är en betydligt större fråga och ligger utanför denna rapport.

Flaskhalshantering

För närvarande hanteras flaskhalsar antingen genom motköp eller genom marknadsdelning. Sverige och Finland har så här långt inte delat marknaden i flera områden, men det kommer troligtvis att förändras.

Det är viktigt att erkänna att införandet av fler marknadsområden kan skapa svårigheter för elhandlare. Möjligheterna för att prissäkra prisområdesskillnader är begränsade idag. För vissa prisområden i Norden finns det inga finansiella produkter tillgängliga och för andra områden är likviditeten typiskt sett begränsad. Det finns en risk att uppdelning i fler prisområden kan leda till minskad konkurrens i elhandelsledet, eftersom elhandlare kan välja att inte vara verksamma i alla marknadsområden.

Samtidigt så lyfter introduktionen av fler prisområden fram vikten av integration av slutkundmarknaden. Med möjligen mindre prisområden inom ett land är det viktigt att möjligheterna till prisområden på tvärs av landsgränser utnyttjas för att upprätthålla (eller kanske i vissa fall förbättra) den nuvarande konkurrensnivån.

Det är dock också motiverat att fråga sig om det är möjligt att ta ytterligare åtgärder för att förbättra marknadens funktionalitet när fler prisområden införs. En möjlighet som skisseras i rapporten är att TSO:erna fortsätter att ta sitt ansvar för att utveckla marknaden genom att sälja *Financial Transmission Rights* (FTR). Detta innebär i praktiken att TSO:erna säljer flaskhalsintäkterna i förväg baserat på förväntade prisskillnader. Det innebär dock inte någon fysisk allokering av transmissionskapacitet. Införandet av FTR:er skulle ge en ny möjlighet för att prissäkra mellan marknadsområden och skulle åtminstone ge upphov till en primärmarknad för detta.

"Coalition of the willing"

Erfarenheter från denna typ av processer indikerar att det ofta kan fördröja processen väsentligt genom att vänta på att alla ska komma överens. Det kan finnas skillnader i agenda och idéer hur harmonisering ska göras, men också skillnader i den faktiska viljan att harmonisera.

Det är viktigare att processen fortskrider än att vänta på de långsamma. Vi föreslår därför att processen baseras på konceptet *coalition of the willing*, d.v.s. att länder som är intresserade av att gå framåt gör det även om andra länder inte hänger med.

Ytterligare utveckling av marknaden

I det här arbetat har vi utgått ifrån att den nuvarande marknadsmodellen i Norden bibehålls. Det finns dock processer i andra länder som är intressanta. Införandet av *single point of contact* har diskuterats i Norden, d.v.s. att kunderna bara har kontakt med elhandlaren. I Nederländerna införs för närvarande en *supplier centred model* där kunderna bara har kontraktsförhållande med elhandlaren. Elhandlaren köper i sin tur nättjänsterna och inkluderar kostnaden för detta i sin faktura. Det kan jämföras med att tågbiljetten inkluderar även tågforetagets kostnader för att hyra rälsen. Detta är ett intressant koncept, men ligger utanför detta projekts ram.

Summary

Background and purpose

The integration of the Nordic electricity market is an ongoing process. The history of regional cooperation in the Nordic area is long and since the creation of Nord Pool the wholesale market has gradually become more and more integrated. Even though there are still possibilities to integrate the wholesale market, this process is already very advanced. The retail market is however much less integrated. Integration of the retail market in the Nordic area is high on the political agenda.

The purpose of this report is to study the regulations and costs related to a harmonised and integrated Nordic retail market for electricity and to provide a road map for a possible way forward.

Two harmonisation scenarios – extensive and limited harmonisation – were created. The extensive harmonisation scenarios can be characterised as an ambitious and far reaching harmonisation, while the limited harmonisation scenario is more of a practical solution that can be implemented in the near future.

During the project it has become evident that it is very difficult to get quantitative estimates of the cost and benefits. In spite of efforts made to create clear and precise scenarios, most market participants have very limited understanding of the costs associated with the changes as well as the potential benefits of a more harmonised market – beyond a qualitative assessment. Within the project a workshop with market participants and other stakeholders was arranged to discuss the preliminary findings of the project and provide further input to the analysis. Also during this workshop the assessments were mostly of a qualitative nature.

Key findings

Given the difficulties to obtain credible quantitative assessments of the cost and benefits the findings are mostly of a qualitative nature.

In order to achieve real benefits of a harmonised Nordic market it is necessary to enable suppliers to work across the Nordic market using the same business infrastructure, such as IT-systems. In order to reach this goal an extensive harmonisation is needed. Therefore, all the elements required to reach this goal need to be assessed jointly, rather than making individual cost-benefit analysis for each issue.

However, based on this and other similar project it is clear that it is difficult to obtain relevant cost data, while working on a high level. It is also difficult to assess the benefits, since those will mainly be derived from a better functionality of the market. Apparent benefits, such as dilution of market power through market expansion seem to be limited.

Key areas to harmonise

Following from above, the most important aspects to harmonise are those that prevent the suppliers to work across the Nordic area using the same business infrastructure. This means that it is necessary to harmonise the key business processes. We have the harmonisation issues into four areas.

5 Information exchange and process

6 Metering

7 Balance settlement

8 Consumer trust

The key business processes are mainly found in groups 1-3 in the list above. For each of the groups above we propose:

Information exchange and processes:

- Fully harmonised processes, message formats and contents allowing for automatic handling, and
- A Nordic information hub.

Metering

- High harmonised minimum level of metering with common defined thresholds.
 - × The minimum levels will require AMR systems for all customers.
- In order to avoid the most cost driving elements:
 - × Hourly metering with daily collection will only be required for the large customers (e.g. >63A)
 - × For a mid-size range hourly metering with monthly collection is recommended
 - × For the smallest customers monthly metering and collection is recommended.

Balance settlement

Important steps have already been taken to harmonise balance settlement in the Nordic area. Further steps are recommended with the goal that it should be equally easy to access another Nordic country as operating in your own home country:

- Common balance agreement
- One balance settlement organisation, in order to
 - × Facilitate the implementation of one common balance agreement
 - × Common collaterals for the whole Nordic market
 - × Same information flow
 - × One invoice for balance responsibility.

Consumer trust

There are several issues that do not directly affect the key business processes of the suppliers, but are essential for a positive development of the market. Harmonisation is needed e.g. regarding invoices in order to not create obstacles across the Nordic market. Several other aspects are important from a consumer trust perspective, but are not of as immediate concern for the key processes.

Who should be responsible?

In order to facilitate and drive the process we propose that a Nordic coordinating body is appointed. This could for example be NordREG, which is an already established organisation for the Nordic regulators. This coordinating body should have the responsibility of driving the process forward, but also function as a consultative body in relation to national legislation in this area to ensure that the harmonisation process is kept on track.

A Nordic information hub is proposed in order to give all market participants equal and easy access to the key data needed for the business.

As already mentioned above, a Nordic balance settlement organisation is also proposed.

When should a Nordic market be implemented?

To reach a fully harmonised market may be a relatively long process, since it will involve some rather complex political decision making, but also since both new regulations and new technical systems will have to be implemented.

The immediate issue is to reach a political decision to start the process of integration, including appointment of the coordinating body.

Other issues affecting the market integration

There are several other issues affecting the integration of the retail market. Two important ones are support to renewable electricity generation and bottleneck management in the Nordic region.

Support to renewables

Support schemes to renewable electricity generation are core part of the national energy policies, and as such a much broader issue the retail market integration. Nevertheless, the design of support schemes for renewables might affect the functioning of the retail market.

In the Nordic region this is most apparent with the electricity certificate scheme used in Sweden. By design this scheme involves the suppliers and will thus more or less automatically constitute an entry barrier for suppliers from other countries. Furthermore, the issue arises whether it is possible for a supplier in another country to take on the certificate obligation for Swedish customers. Currently this would be regarded as direct import and the final customer would then himself be responsible for covering his certificate obligation. This needs further analysis.

The support schemes in the other Nordic countries do not involve the suppliers in the same way and are thus not of the same relevance for functioning of the retail market. However, if a large share of the electricity has to be bought through a specialised support scheme the incentives for the consumers to switch supplier will diminish.

A joint support scheme would naturally bring benefits, but this is a much larger issue and outside the scope of this report.

Bottleneck management

Currently bottlenecks are handled either through counter-trading or through market splitting. Sweden and Finland has so far not been split into several market areas, but this is likely to change.

It is important to recognise that the introduction of more market areas may create difficulties for suppliers. The possibilities to hedge for price area differences are limited today. For some price areas in the Nordic region there is no financial product available for hedging and for other areas the liquidity is typically rather limited. There is a risk that splitting into more price areas will lead to decreased competition in the supply business, since suppliers may chose not to compete in all market areas.

At the same time, the introduction of more price areas highlights the importance of Nordic retail market integration. With possibly smaller price areas within one country it is important that the possibility of price areas across country borders is utilised in order to maintain (or in some cases even improve) the current level of competition.

However, it is also justified to ask whether it is possible to take measures to improve the market functionality when more price areas are introduced. One possibility outlined in the report is that the TSOs continue taking their responsibility for the market development and issue Financial Transmission Rights (FTRs). FTRs would imply that the TSOs sell the bottleneck revenues in advance, based on expected price differences. FTRs do however not imply any physical allocation of transmission capacities. The introduction of FTRs would provide a new possibility for hedging between different market areas, and at least provide a primary market for this.

Coalition of the willing

Experiences from similar processes suggest that it may be very time consuming to wait for everyone to agree. There might be different agendas and ideas on how harmonisation should be done, as well as differences in the actual willingness to proceed with harmonisation.

Therefore it is more important that the process proceeds rather than waiting for the slow movers. We therefore suggest that the process is based on a concept of a *coalition of the willing*, i.e. that countries that are interested in proceeding with the market integration do that even if some countries lag behind.

Further development of the market

In this work we have basically assumed a continuation of the current market model in the Nordic region. However, there are also developments in other countries that could be considered. The use of a single point of contact has been discussed in the Nordics, i.e. that the customer has only contact with the supplier (or possibly the network company). In the Netherlands a supplier centred model is being introduced, in which the customer only has a contractual relationship with the supplier. The supplier buys the network services and includes the cost for this in its invoice to the customer (in a similar way as the railway ticket also includes the railway company's rent for using the railroad/tracks. This has been considered outside the scope of this report, but is an interesting option that also could be considered for the Nordic region.

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1 Introduction

1.1 Background and purpose

A continued and deepened integration of the Nordic electricity market has been high on the political agenda at least since the Nordic Council of Ministers summit in Akureyri in 2004. Several studies have been made or commissioned by the Electricity Market Group under the Nordic Council of Ministers, NordREG and Nordel on issues such as the possibilities to harmonise system responsibility, harmonisation of balance responsibility, and the costs and benefits of creating a common Nordic retail market.

Within Elforsk Market Design a common Nordic end-user market is one of the current topics. Previous work includes a study on customer benefits of a common market. The study was carried out by Econ Pöyry in 2006-2007 (see Damsgaard, 2007 and Damsgaard and Römpötti, 2007).

The purpose of the current project is to study the regulations and costs related to a Nordic retail market, and to provide a road map for a possible way forward.

In the report two different scenarios for the implementation of a harmonised Nordic retail market are developed.¹ The necessary regulatory and technical changes and the additional costs for operating in more than one national electricity market are discussed.

During this project it has become evident that it is very difficult to get quantitative estimates – with sufficient precision and accuracy – of the costs and benefits of a harmonised Nordic end-user market for electricity. There are two main reasons for this. First of all it is necessary to have very precise definitions of the changes that will take place in order for any market participant to have a reasonable chance of estimating the costs. But, even in that case most companies have difficulties making an assessment of costs and benefits since the internal analysis in most cases has not been made. Most of the cost drivers are linked to investments in ITC systems. In order to assess the costs of those investments it is necessary to make a relatively detailed analysis of each system which needs to be changed.

1.2 An integrated retail market – definitions and important issues

A loose definition of an integrated market is a market where a supplier can sell electricity to a customer located in another Nordic country at reasonable administrative costs. NordREG (2007) defined a fully integrated market as a market where a customer can manage his electricity supply on a Nordic level through one supplier, and a supplier can operate in other Nordic countries through its domestic business unit. In the current regulatory environment it

¹ The Nordic electricity market is the interconnected Nordic power system in Denmark, Finland, Norway and Sweden.

would from a practical stand point not be possible for a supplier to operate in another Nordic retail market through its domestic business unit.

Operating in several Nordic markets from a domestic business unit would require or be facilitated by a number of changes to the regulatory and technical conditions in the national Nordic markets. The study will look into two different scenarios for the implementation of a common Nordic retail market for electricity. Alternative 1 is a scenario which will represent a more extensive approach intended to illustrate a more comprehensive attempt at harmonising the Nordic retail market. Alternative 2 will on the other hand represent a more minimalist approach intended to illustrate a quicker route to a functioning but more limited harmonisation process.

According to NordREG (2006) the areas of great importance for harmonisation are:

- Protocols for exchange of messages
- Ediel messages for customer and consumption data
- Coordination and identification of metering points
- Model and procedures for supplier switching
- Neutrality of DSOs

The work done by NordREG has formed an important part of the basis for the development of the criteria used for developing the two scenarios. For a summary of NordREG studies of issues of particular interest for harmonisation, we refer to the annex. In parallel with this work NordREG has also continued their work on the market design for a common Nordic end-user market and published a report in May 2009 (NordREG, 2009).

1.3 Method and approach

The overall analytical approach has been to first define the scenarios for implementation of a harmonised Nordic retail market. The scenarios are labelled *extensive* and *limited* harmonisation. The scenarios have been discussed internally within the project team and with the project reference group. Initially it was foreseen that three different scenarios would be developed, with also one intermediate scenario. During the work process it was realized that the value of the intermediate scenario was limited and it was decided to focus on only two "extreme" scenarios.

The second phase of the project was to analyse the implications of the scenarios for defined issues, such as:

- Extra costs for a electricity supplier (supplier) in one country to operate in other countries
- Need for harmonisation of the legal framework
- Need for harmonisation of technical systems
- Implications of infrastructure investments and bottlenecks
- Implications of ongoing metering reforms

- Implications of renewable support schemes

As initially expected the definition of the scenarios and the analysis phase became an iterative process, where the scenarios were refined during the work process.

It was expected that underlying data/information regarding the cost implications of the different scenarios could be obtained through questionnaires or interviews with market participants and service providers. However, during the work process it was realized that the possibilities for market participants to provide such information was limited, primarily due to the fact that in general these aspects had not been analyzed within the companies.

Within the project a workshop on a harmonised Nordic end-user market for electricity was arranged with invited contributors from different type of market participants.² In total approximately 35 participants attended the workshop. While also discussing experiences of the Nordic retail market, the workshop focused on identifying the most important aspects of harmonisation and the priorities related to the way forward, mainly from a qualitative perspective.

² In addition to the project team invited representatives of E.ON, YelloStrom, Fjordkraft, GodEl/Zavann and NordREG WG Retail and Distribution provided prepared contributions in the workshop.

2 Defining the scenarios

Experiences from previous in the area of harmonised retail markets highlights the importance of having a well defined model for the harmonised market in order to assess the costs and benefits in a reasonable way. This is driven by the fact that the required changes depend on the details of the new model, and said changes will affect the potential benefits.

With this background we developed two alternative scenarios/models for the harmonisation of the Nordic retail market. The two scenarios are based on "minimum harmonisation" and "extensive harmonisation" respectively.

An intermediate scenario has been discussed, but due to the limited amount of information available regarding the costs associated with the integration process the study focused on two alternatives. The two alternatives were chosen too illustrate two more distinct options for how a harmonised market could be achieved. To create clearly separate options the focus has been on the more extreme options, i.e. minimal and extensive harmonisation. These options could of course also, at least in parts, be seen as sequential steps on the road to harmonisation, which would mean that there could be a number of intermediate scenarios/phases in between the two more extreme ones.

An assessment of the current situation is also needed in order to identify the necessary changes in order to implement the scenarios. In this chapter we provide a brief description of the main differences between the countries. NordREG (2009) provides a detailed comparison of the differences between the Nordic countries.

2.1 Alternative 1: A extensively harmonised market

Alternative 1 can be characterised as an ambitious and far reaching harmonisation. We foresee an extensively harmonised market, implying that most types of regulations which are electricity market specific are harmonised across the Nordic countries. Among other things, this would imply common functionality requirements on meters/metering, and common balance management. It would also mean common rules on reporting including time frames, periodicity and the method for exchanging information. It could also include measures such as a common Nordic information hub. The existing support schemes for renewable electricity generation are taken as a given.

The extensive harmonisation scenario requires political consensus to enable a seamless and consistent market allowing the interaction of all actors regardless of their country of origin. It is also necessary to create a level playing field to enable market players throughout the Nordic countries to react to uniform signals from the market. When discussing the feasibility of extensive harmonisation it is important to carefully consider the time frame

for the implementation. The basis for this scenario is to maximise the expected benefits from harmonisation.

An extensively harmonised market would imply harmonisation of protocols and data formats as well as a harmonised system for metering point identification. It would also require that the regulation is harmonised at least along the lines previously proposed by NordREG.³ This would for example involve unambiguous identification of metering points and the use of the same message format. The data systems also need to be compatible to ensure smooth communications between the suppliers and DSOs in the Nordic countries. It will also be necessary to agree on time limits and the content of the various messages which need to be exchanged between the suppliers and the DSOs, including the messages sent at the start, the end and during a contract period, including when a customer moves. One way of creating efficient information flows would be to create a common Nordic information exchange hub. Different kinds of meters should be handled in the same way across the Nordic market, i.e. the meters should be read in the same way. Ultimately a supplier should be able to supply customers across the Nordic market from one entity based in one of the Nordic markets, being able to use one IT system for their sales across the Nordic market.

In addition, market integration would also be facilitated if the obligations regarding taxes, green certificates and public service were harmonised or handled by the DSOs. To some extent this could be more easily achieved with regard to energy taxes and public service obligations, but support schemes like the green certificates contain even more complicated issues, for example related to the market based pricing of the certificates. However, such regulations are an integral part of policies in the increasingly important climate and environment area. These support schemes has thus been deemed as being outside the scope of this study and the existing schemes are taken as given. However, a discussion on some of the possible impacts of the existing support is found in Chapter 3.5.

An extensively harmonised market would also imply that the rules applicable to the treatment of customers have been clarified, e.g., in terms of customer protection in case of disputes over billing and contracts. Creating an even playing field for the suppliers would mean enabling customers to enter into contracts without significantly increasing their risk and also establishing a common framework for the sellers so that they are obliged to fulfil the same conditions thus competing on equal terms. Some of the issues can be dealt with simply by deferring them to the DSOs, e.g. the obligation to supply, including providing a supplier of last resort. To stimulate competition in a harmonised Nordic retail market there should also be a common approach to the pricing and availability of obligation to supply contract so as not to interfere with the market signals.

³ The important issue here is the harmonisation not that it is done completely according to the NordREG proposal.

2.2 Alternative 2: Limited harmonisation

Alternative 2 outlines an integrated Nordic market with minimal harmonisation. A minimalistic approach should be a practical solution that can be implemented in the near future. The focus is on common procedures for switching suppliers and some basic requirements regarding metering. It could also include measures such as national information hubs. The existing support schemes for renewables are taken as a given.

The implementation of a limited harmonisation scenario would require using considerable fewer resources and should be possible within a shorter timeframe. This scenario is based on a combination of minimizing additional costs from harmonisation, and an evaluation of benefits realisable within a shorter timeframe. The focus is on harmonising the critical aspects of the Nordic retail markets and use the least intrusive ways of implementation.

A harmonised Nordic retail market is based on the customers being able to choose and switch between suppliers, and suppliers encountering no or few obstacles when supplying customers in other Nordic markets. A prerequisite for achieving this is the quick, correct and timely exchange of data between suppliers and DSOs, signifying that these aspects need to be handled efficiently also as part of a minimalist approach to harmonisation.

Even with minimal harmonisation there needs to be at least a common approach on how to handle the differences between the rules in the seller's country vis-à-vis the rules in the buyer's country, as metering data need to be received and delivered at appropriate intervals. Using AMR would make it easier and less costly to transfer data at the appropriate intervals.

As alternative 2 is focused on harmonising a more limited number of aspects, one possible way of achieving this would be through the use of national information exchanges, i.e. EMIX type solutions, which would be used for transferring data between the different countries. This would mean that the individual supplier and DSO only need to be able to communicate with their national information hub, and the systems needed for converting the data could be handled within the information exchanges.

It is also important that the metering point can be uniquely identified to prevent potential mix ups. As EAN codes are used in all Nordic countries except Finland, switching to EAN-codes would require minimal harmonisation and also encompass a system that can be easily extended to other countries in the future.⁴ This would also help facilitate an information exchange based solution minimising the risk for mix-ups.

Both scenarios are based on the same proposal for energy taxes, i.e. these are to be handled by DSOs. They also both take the existing support systems for renewable energy as given. However, the Nordic market would benefit if brokers offering services consisting of assisting electricity customers fulfilling their quota obligations were established. Such services would be of particular

⁴ GSRN is the new name for the EAN system.

interest for small and medium sized customers, which are likely to find handling these obligations a heavier burden comparatively speaking.

2.3 Detailed description of the scenarios and comparison with the current situation

There are a number of regulatory and technical aspects that differ between the four Nordic countries. The main aspects have been divided into 12 separate categories which are described below, along which the scenarios are defined. The defined categories are:

- 9 Supplier switching and moving
- 10 Information exchange
- 11 Identification of metering points and customer ID
- 12 Metering
- 13 Balance settlement
- 14 Invoicing
- 15 Taxes
- 16 Labelling
- 17 Obligation to supply
- 18 Price and product information
- 19 Consumer protection
- 20 Renewable support schemes

The two scenarios have been defined in such a way that they should be possible to realize. The issues necessary to deal with within the scenario based on limited harmonisation will also need to be handled within a scenario based on extensive harmonisation. However, the different scenarios may lead to different ways of resolving the need for harmonisation. One approach is to see limited harmonisation as a first step towards extensive harmonisation, with several intermediate steps possible along the way. The main aspects which need more detailed consideration in the two scenarios include information exchange between market actors, balance settlement, metering, identification, and consumer protection.

2.3.1 Supplier switching and moving

From the suppliers' perspective the major issue when creating a harmonised Nordic retail market is the business processes. If the necessary business processes cannot be handled smoothly and efficiently the prerequisites for a functioning Nordic retail market are not in place either. The business processes are the processes necessary to enable the suppliers to conduct their day to day business including supplier switching and invoicing customers. When defining the scenarios we thus start by discussing supplier switching as

this is one of the fundamental processes in the market, both from a national and an international perspective.

As stated above, the basis for a functioning common Nordic retail market is the option of switching suppliers easily with a minimum of interruptions and problems. The need or wish to switch supplier can arise for a number of different reasons, including when customers move to a new address. As there is a significant amount of moving every year the potential complications need to be evaluated and processes put into place which handle these also in a Nordic market. The process needs to be stable and transparent enough to inspire the required trust from the parties involved in the market. The customer needs to feel comfortable using a supplier in another country, having trust in that they will receive both the product and the accompanying invoices in a timely and correct manner. On the other side, the supplier needs to be comfortable with the processes necessary for gaining customers in other countries and to be sure to get the data needed for both beginning and ending a contract, and maintaining the customer during the contract period. The supplier thus needs to be able to access the required data identifying the customer, metering point and consumption in that metering point.

This implies that reliable AMR solutions contribute to ease of supplier switching as more data can be handled automatically. When creating a common regulation for the harmonised Nordic retail market there is a need for harmonising timing, content and format of data exchange as these are to be seen as prerequisites for efficiently functioning business processes. The extent and method may differ between the two scenarios and is discussed in the categories below.

Both scenarios will encompass common regulation and common simplified procedures as these form the basis for integration. To make the Nordic market an attractive option it is important to avoid implementing new procedures which are too complex and cumbersome to handle efficiently. Ideally, creating common procedures also means creating procedures which are easy to handle for the actors concerned. Simplified procedures might also benefit suppliers choosing to remain in their national market.

However, the extent of the harmonisation and the methods chosen are likely to differ between two scenarios such as these. We therefore specify the timing of supplier switching in the scenario based on extensive harmonisation. In this scenario a customer should be able to switch supplier on any weekday, and it should happen within a specific time limit which could reasonably be set at 14 days.

Ideally there should be no charges for switching, since such charges discourage switching through increasing the costs. The impact is likely to be more negative on switching to suppliers outside the buyer's own national market since such a switch is likely to be perceived as more risky, at least at the outset of a common Nordic retail market. We thus assume that no such switching charges exist in the extensive scenario.

Table 1 Supplier switching and moving – scenarios

Extensive harmonisation	Limited harmonisation
Common regulation Common, simplified procedures Switching possible on any weekday within a given time limit (e.g. 14 days) No fees connected to switching suppliers, including no fees for extra meter readings.	Common regulation Common, simplified procedures

Comparison with the current situation

The currently existing national processes are similar, but a number of aspects such as time limits and procedures differ between the Nordic countries. One example of differences is that in Finland a customer can switch supplier with 14 day notice, whereas in Sweden supplier switching can only be done on the 1st of every month with 30-15 days notice. Another example is that in Finland meter reading related to supplier switching is free of charge once a year. In the other Nordic countries supplier switching is always free of charge.

In both of our scenarios there is a need for a common Nordic regulation on supplier switching defining; notice period, data needed and how to handle contact and contracts with existing supplier.

In the extensive harmonisation scenario supplier switching can be made any weekday with 14 days notice and free of charge every time. This needs to be incorporated in each country's regulation. It will also necessitate new requirements e.g. regarding balance settlement.

It is expected that both scenarios can be implemented without major difficulties.

2.3.2 Information exchange

To enable an efficiently functioning market where customers can switch suppliers and suppliers can invoice their customers correctly, metering data need to be received and delivered at appropriate intervals. The need or wish to switch suppliers arises for a number of reasons, including when customers move to a new address. As there is a significant amount of moving every year the potential complications need to be evaluated and processes put into place to handle these in a Nordic market. The exchange of information need to work efficiently in both scenarios since there at least needs to be an agreement on how to handle the differences between the rules in the seller's country and the rules in the buyer's country even in a more minimalistic scenario.

In the extensive harmonisation scenario we assume that message formats and the contents of messages will be fully harmonised. Having these aspects harmonised will facilitate communications between the various market actors across the Nordic market. It would also make it easier to establish a Nordic

information exchange hub as it would facilitate the communications between the market actors and the hub. It would be reasonable to expect a more efficient solution within the hub with a lower number of differences in the content and format of the messages to be handled. In other words, harmonising the format and content of messages would provide a more efficient solution also when a hub is implemented.

Establishing a Nordic information exchange hub would provide an efficient setting for handling the information flow, particularly in conjunction with harmonised message formats and contents, and a Nordic testing and certification process. An integrated market based on one Nordic hub is thus used for the scenario based on extensive harmonisation. In this scenario we also assume a Nordic testing and certification process for the information exchange in order to achieve a high level of conformity and thus a low level of errors in the exchange of information. As errors often require manual handling and thus are costly to deal with it is important to strive for as low a level of errors as possible.

A Nordic information exchange hub, or even four national information exchange hubs, will however also involve some aspects which need to be considered from a competition perspective. A hub will handle commercially sensitive information, which means that the access to the information needs to be strictly controlled to ensure that only the market actors concerned have access to the relevant information. This aspect is of particular importance when such a hub is owned by market actors or their organisations. If the latter is the case it is important to have clear rules governing who may access particular information.

In a scenario with limited harmonisation we assume a gradual approach to harmonising message formats. When there is a cost to handling differences between the markets, it is important to create transparency at least with regard to the costs involved in acquiring a customer situated outside the supplier's national market. If there are any charges involved in switching suppliers these must be the same and not vary depending on in which country the old or new supplier is located.

Table 2 Information exchange – scenarios

Extensive harmonisation	Limited harmonisation
Fully harmonised message formats & contents covering aspects such as switching suppliers at an existing address, moving, etc.	Gradually harmonised message formats & contents through industry driven standardisation covering aspects such as switching suppliers at an existing address, moving, etc.
Nordic testing and certification process for information exchange	National testing and certification processes in all four countries for information exchange
Nordic information exchange hub with clear regulation and limitations of data access for different actors	Four separate national information exchange hubs with clear regulation and limitations of data access for different actors

Comparison with the current situation

Smoothly functioning communications between DSOs and suppliers depend on the parties' ability to exchange information with each other and other relevant parties. Messages containing relevant data need to be transmitted and understood correctly and efficiently minimizing the risks for disturbances due to differences in protocols and formats (see also next category).

The Ediel-standard is used in all Nordic countries, but different standardised messages are used for different purposes and each country has its own national guideline on how to use the messages. Other differences include the protocols used for sending messages. There are also differences in the time limits for data exchange.

Although the terminology may be similar in some aspects, there are differences in the actual implementation in the respective countries. Even small differences would cause problems in a harmonised market.

Harmonised rules on settlement of different transactions between market actors would mean clarifying which information should be received or sent, how the information will look, and when it should be received sent.

The only country not using SMTP-format for EDIEL messages is Finland. PRODAT is used for communication between DSOs and suppliers in all countries but Denmark.

To include detailed definitions in each country's regulation may not be very practical. A Nordic testing and certification process, as proposed in the extensive harmonisation scenario would promote a Nordic standard, given that the same regulations are used. A Nordic information hub, also proposed in the extensive harmonisation scenario, would develop the harmonisation even further.

2.3.3 Identification of metering points and customer ID

When discussing the identification of metering points, it is worth noting that EAN codes are used in all the Nordic countries except in Finland. EAN codes would thus be a convenient choice for harmonisation in this area. EAN codes are a global system, and would thus be possible to expand for a future widening of a common retail market to include more countries, e.g. the EU common market. EAN codes have changed name to GSRN⁵.

Also for limited harmonisation based on an information exchange it would be important to have a unique identification system for the metering points to prevent potential mix ups. As EAN codes are used in all Nordic countries except Finland, switching to EAN-codes would require limited harmonisation and also encompass a system which can be easily extended to other countries in the future. This would also help facilitate a Nordic information exchange hub minimising the risk for mix-ups.

However, it is not only necessary to be able to identify the metering points correctly. It is also important to be able to identify the consumer responsible for the consumption in a particular metering point. The suppliers both need to know that they are entering into a contract with the correct customer and once delivery has started they need to be able to invoice the correct customer. The suppliers also need to be able to follow up on unpaid bills, and address any follow up measure to the correct party, even when a particular customer has moved from a particular address/metering point.

These aspects would be equally important in both scenarios.

Table 3 Identification of metering points – scenarios

Extensive harmonisation	Limited harmonisation
Unique identification of metering points throughout the area.	Unique identification of metering points throughout the area.
Harmonised rules on identification of customer (person or company)	Harmonised rules on identification of customer (person or company)

Comparison with the current situation

It is important that all metering points are correctly and uniquely identified, minimizing the risk for mix ups within or between the countries concerned. All countries except Finland uses national GSRN based metering point IDs.

Only Sweden uses personal identification numbers to identify a customer.

With our scenarios Finland would have to change the system to a GSRN based metering point and the personal identification numbers would not be the basis for identification of a customer.

2.3.4 Metering

In a scenario with extensive harmonisation the criteria for mandatory hourly metering will be harmonised, based on fuse size or annual consumption, with

⁵ GSRN is the EAN standard Global Service Relation Number.

a harmonised format for profiles for points not metered on an hourly basis. There will be uniform minimum requirements for AMR including any rules about two way communications. The frequency with which meters shall be read and data registered will be uniform.

In a scenario with more modest harmonisation, three different levels of meter readings will be defined; hourly, monthly and yearly metering. There will be national thresholds for the three levels. There will also be a common format for profiles. To be cost efficient, we assume one load profile per DSO.

When looking at the settlement of different transactions between market actors, having harmonised processes will e.g. clarify which information should be forthcoming or sent, how this information can be expected to look and when it should be sent/received.

Table 4 Metering – scenarios

Extensive harmonisation	Limited harmonisation
The minimum frequency of meter reading shall be uniform by commonly defined categories. - Minimum level of data to supplier - Harmonised minimum level for hourly metering (based on fuse size or annual consumption) Common format for profiles - DSO distributes the load curves to suppliers - One load curve per DSO Uniform minimum functional requirements for AMR	Three different levels of meter reading defined (hourly, monthly, yearly). National definitions of thresholds. Common format for profiles - DSO distributes the load curves to suppliers - One load curve per DSO Harmonised rules on identification of customer (person or company)

Comparison with the current situation

Differences in metering between the Nordic countries include different requirements for mandatory hourly metering and different requirements for the frequency of meter reading (especially from 2009 when Sweden requires at least monthly reading). There are also different definitions of the metering point ID. Furthermore, there are no common requirements regarding future meters with regard to AMR functionality. In addition, the rules on how often the metered values need to be sent on to various recipients also vary between countries and customer groups.

There are also fundamental differences in load profile systems. Grid area residual profiles are used in Denmark, Norway and Sweden, while customer segment profiles are used in Finland. There is one profile per DSO in Denmark and Norway, and there will be one profile per grid area in Sweden starting in 2009. The DSOs in Denmark use a special profile for network losses. In Finland, normally three customer segment profiles are used (households with an annual consumption of less than 10,000 kWh, households with an annual

consumption of more than 10,000 kWh, and one for other customers which are not hourly metered).

Since there are substantial differences in regulation today, the current regulations need to be changed. The changes in regulation for each country depend on the chosen solution and how it compare to the current situations.

2.3.5 Balance settlement

Another aspect with the potential for having a significant impact on the suppliers is the balancing issues. All suppliers need to be able to handle the balancing issues for the customers they supply, either on their own or through arranging for someone else to handle it.

The process is already underway to implement the model proposed by NordREG, and the first stage of the implementation is expected to be finalised in the first half of 2009. The current process is based on harmonised guidelines and responsibilities concerning balance settlement, creating a system which will be more similar in the Nordic countries, thus facilitating entry. We assume that this model would be applicable to the scenario with limited harmonisation, i.e. no changes outside this model would need to be undertaken.

For a scenario based on extensive harmonisation one Nordic balance settlement system and organisation is assumed. This would mean that the supplier only needs to have one contract and to handle one process when dealing with balance settlement across the Nordic market. This would simplify the process from the supplier's perspective and make entry into other markets less risky and also less costly since there would be no need to duplicate the processes and the necessary IT functions.

Table 5 Balance settlement – scenarios

Extensive harmonisation	Limited harmonisation
One Nordic balance settlement system and organisation	Harmonised guidelines and responsibilities concerning balance settlement (see NordREG report 3/2008)

Comparison with the current situation

Suppliers need to have a balance agreement with a balance responsible party in the country in question. The BR need to have an agreement with the TSO, i.e. the party responsible for the national balance calculations. All the Nordic countries have implemented the Electricity market directive (Directive 2003/54/EC). Nordel has agreed on harmonisation of balance settlement in the Nordic countries from the beginning of 2009. The harmonised balance settlement includes; harmonised cost allocation, two balances, common fee structure and balance adjustment trading (inter day trading) in all countries.

With one Nordic balance settlement system and organisation, as proposed in the extensive harmonisation scenario, will require changes in each country's

regulation. In the limited harmonisation scenario only minor changes in national regulation is anticipated.

2.3.6 Invoicing

The invoice is an important contact point with the customer and the electricity invoices are known to be regarded as complicated even within a national market. We assume that it will remain the national rules which govern the look and content of invoice, but that there will be common minimum requirements on the information to be included in the invoice in the extensive harmonisation scenario. This information could involve aspects such as fuse size, metering point ID, yearly consumption etc.

It is important not to create standards which in practice create unnecessary barriers for companies wishing to enter another Nordic market. But to facilitate for the suppliers on a common Nordic retail market the content of invoices should be similar. If the same kind of information is required and is to be presented in the same format this would facilitate the development of efficient IT systems for this purpose. As a consequence such IT systems would then also benefit from access to a wider Nordic market.

With regard to the aspect of joint billing of network tariffs and electricity consumption, the EU legislation on VAT and unbundling must be kept in mind. Another aspect of particular importance when discussing billing in a Nordic retail market is that the rules must not favour national or local suppliers over other suppliers in the Nordic market. This aspect is important in both scenarios, but should be given even more emphasis in the scenario based on extensive harmonisation.

During the process of developing the scenarios we have also discussed the need for common guidelines for cross-currency contract conditions in the scenarios. However, this would most likely be of less interest to household customers, the customer group which it is most urgent to protect. Creating such guidelines may thus not be necessary, and may also be counter productive creating an implicit barrier for the offers responding to various market based signals.

Table 6 Invoicing – scenarios

Extensive harmonisation	Limited harmonisation
Network tariffs and electricity use shall be billed separately or at least separated in the invoice. Common minimum requirements on information to be included in household customer invoices.	Network tariffs and electricity use shall be billed separately or at least separated in the invoice.

Comparison with the current situation

The invoice is an important contact point with the customer and the electricity invoices are seen as complicated by the customers even within national markets. They reflect both the rules and regulations in the national electricity

markets, and other more general rules affecting consumers, accounting, taxes etc. One major difference between the countries regarding invoicing is that in Norway households with an annual energy consumption over 8,000 kWh must be invoiced every three months and that Swedish DSO invoices have to contain information about the metering point ID and the network area ID.

For the extensive harmonisation scenario we propose the same minimum requirements on information to be included in household customer invoices.

2.3.7 Taxes

The market players are also under obligation to fulfil a number of other functions in the electricity market. When the responsibilities differ between the national markets it creates a more complex situation for the suppliers wishing to enter the market. As a consequence market integration would be facilitated if the responsibilities for aspects such as taxes, green certificates and public service obligations were harmonised, or moved to the DSOs when possible. Under this category we will discuss taxes, while support schemes for renewable energy and the obligation to supply will be discussed under separate headings.

In the Nordic market energy tax is collected by the DSOs in all countries but one. The easiest way to harmonise would be to move the collection of energy taxes to the DSOs in all the Nordic countries. This would mean that the energy tax will be collected by the market actor with a firm grasp of the local or regional rules, e.g. with regard to geographical differences in tax rates. The extent of the adaptation is such that it would be applicable to both scenarios.

The harmonisation of electricity VAT is not realistically achievable nor is it necessary for retail market integration. However, the European Community works towards harmonisation of energy taxes within the EC.

Table 7 Taxes – scenarios

Extensive harmonisation	Limited harmonisation
The responsibility for energy taxes moved to the DSO.	The responsibility for energy taxes moved to the DSO.

Comparison with the current situation

In Sweden, the energy tax is added on the energy price, and is thus collected by the supplier. In all other Nordic countries the tax is included in the network tariff. Minimum level of energy taxation in EU-countries is set by a directive.

To move the responsibility for energy taxes from the suppliers to DSOs in Sweden will require a change in the Swedish legislation.

2.3.8 Labelling

It is important to design a system that makes electricity products easily comparable from the customers' point of view across the Nordic market. One issue is the labelling of the electricity, i.e. the information how it has been produced. At the moment these rules are being developed on a mainly

national basis. However, to make it easier for the customers to compare the composition of the electricity they consider buying the rules on calculation and presentation of the origin should be harmonised in both scenarios. One important aspect to consider is to have common rules for how the electricity bought via power exchanges or other sellers with mixed production resources should be calculated. As it is important to not create new obstacles in this area, the same harmonisation is proposed for both scenarios.

Table 8 Labeling – scenarios

Extensive harmonisation	Limited harmonisation
Harmonised regulation for labelling.	Harmonised regulation for labelling.

Comparison with the current situation

The Electricity Market Directive requires that suppliers indicate the origin of the electricity sold, i.e. the electricity sold must be labelled with information on how it was produced. This information should be available to the customers. At the moment the guidelines and/or regulations for labelling electricity are national in scope.

The regulations for labelling need to be harmonised. The changes in each country depend on the chosen alternative.

2.3.9 Obligation to supply

As electricity can be considered an essential product for most customers, there are rules to ensure that in principle all customers will have access to a supplier. The obligation to supply is handled differently in the Nordic countries, and the responsibilities of the parties involved vary.

Harmonising the obligation to supply is not one of the most critical aspects of the harmonisation process. In a scenario with limited harmonisation we see it as sufficient that there is legislation in place in each country handling the obligation to supply. However, we foresee that this will continue to happen under the national regulations in this scenario.

However, when we move towards a scenario with extensive harmonisation we foresee a harmonisation of the responsibilities of the parties handling the obligation to supply. We also assume that the DSOs will be responsible for appointing default suppliers. These suppliers should be appointed based on competitive bidding to ensure competitive pricing of this service. Competitive bidding will also ensure that all suppliers will have the opportunity to bid for these contract should they be interested in doing so. In some areas of the Nordic market such contracts have commonly been handled by the incumbent and opening the process up to competition would allow new entrants access.

Table 9 Obligation to supply – scenarios

Extensive harmonisation	Limited harmonisation
DSO responsible for appointing default supplier through competitive procurement Harmonised responsibilities	National regulations

Comparison with the current situation

The obligation to supply ensures that consumers will have access to a supplier. The rules on supply obligations vary between the Nordic countries.

In Denmark the obligation to supply is put on a supplier by Energistyrelsen, typically the dominant supplier in the area is chosen. The price is regulated.

The situation in Finland is similar to Denmark.

In Norway the DSOs have the obligation to supply. The price is regulated for six weeks.

In Sweden the DSOs have the responsibility to appointing a supplier with obligation to supply. The price is not regulated.

In the extensive harmonisation scenario we propose that the DSO is responsible for appointing a default supplier through competitive procurement. The legislation in all countries need to be changed with this proposal.

2.3.10 Price and product information

It is not enough to make switching between suppliers in the Nordic countries possible from a regulatory and technical viewpoint. Search and switching costs are typically the most important barriers to reach a competitive retail market and tools that facilitates search and switching are important for the development of a well-functioning and competitive market.

A user-friendly and consistent availability of information would in all likelihood help an integrated market develop more quickly. User-friendliness includes aspects such as that a household customer easily can determine which offers are available for him/in his geographical area and to compare these offers. Creating a Nordic platform for price information, where the customers can find and compare offers from available suppliers would facilitate comparisons, but would most likely be an unnecessarily cumbersome solution. The important aspect here is to provide mainly the household customers with easy access to information allowing them to compare offers from different suppliers.

An extensively harmonised market would then involve price information based on national solutions. This would involve the official price comparison sites as they exist or are being set up today in each country. The price comparison sites should encompass all suppliers whose products fall under the rules requiring them to participate in the price comparison site. These rules may not create unnecessary barriers for new entrants whether they are new to the

geographical or the product market. The rules and processes used by or applied to the four national price comparison services should also be harmonised across the market, to ensure that the required reporting does not become unduly cumbersome for the suppliers active in more markets. Aspects which should be harmonised include the timing of updates of changes in price and terms which should be within 24 hours of changes in products included in the sites. It also includes which information the sites can require. The discussion here is only pertinent to the one regulated price comparison site per country.

Having current information in the sites will strengthen the trust in the electricity market both on the national and the Nordic level, ensuring that household customers have access to updated information on the products included in these sites.

To ensure a more level playing field in the extensively harmonised market the marketing of electricity should also be harmonised, e.g. with regard to the methods of accessing customers. One example is telemarketing which is not allowed in all countries.

In the limited harmonisation scenario the present national price information and comparison services will remain, on much the same terms as today. However these services should encompass all required suppliers, i.e. all suppliers fulfilling the national terms for being included. It is important that these conditions do not include terms which would create unnecessary barriers for suppliers from other markets. There should also be a time limit implemented for updating changes in price and terms at the national sites. In the same way as for the extensive harmonisation scenario updates should happen within 24 hours of changes in products included in the sites.

Table 10 Price and product information – scenarios

Extensive harmonisation	Limited harmonisation
National price information - Harmonised rules and processes - Up date changes within 24 hours Harmonised responsibilities of marketing of electricity services	National price information - Up date changes within 24 hours

Comparison with the current situation

The rules on price and product information vary between the Nordic countries. There are also different rules regarding the reporting requirements of certain products offered on the market. Some kind of internet based comparison of contracts is available in all four countries.

In the limited harmonisation scenario the price changes should be updated within 24 hours. This needs to be regulated in each country.

In the extensive harmonisation scenario the rules and process should be harmonised between the countries and the marketing of electricity services should be harmonised in regulation.

2.3.11 Consumer protection

There are a number of issues relevant to protect the customers in a common Nordic retail market. The issues mentioned here focus on the protection of household customers. They are seen as warranting a higher degree of protection, since they are likely to be more vulnerable than business customers.

Consumer protection is a valid concern from many points of view, not least from the consumer protection organisations and from a political level. It is also important to ensure that the customers are willing to enter the market. To inspire the required trust in the market, it is important to maintain an adequate level of consumer protection also in a harmonised market in order to make the Nordic retail market a safe alternative for household consumers interested in switching to a "Nordic" supplier.

For extensive harmonisation we expect the same level of consumer protection in all four countries. As changes in the general legislation in this area are outside the scope of this project, we assume that the consumer protection rules of the household customer's country of consumption should apply regardless of where the supplier is situated. But certain conditions should still be harmonised, such as conflict resolution and the regulation and sanctions connected to cancelling a fixed price contract. In the extensive harmonisation scenario, we also assume that the rules on announcing price changes are harmonised. For companies offering certain kinds of products like fixed price contracts these rules may not be a major concern. However, for suppliers which in the future may be interested in offering to supply as default supplier or supplier of last resort these rules would be of more interest.

Table 11 Consumer protection – scenarios

Extensive harmonisation	Limited harmonisation
Same level of consumer protection - The consumer protection rules of the household customers' country of consumption should apply regardless of where the supplier is situated - Harmonised regulation of certain contract conditions, such as: - Conflict resolution - Common regulation and sanctions on cancelling a fixed price contract Rules for announcing price changes to be harmonised	The consumer protection rules of the household customers country of consumption should apply regardless of where the supplier is situated

Comparison with the current situation

Since electricity is seen as essential goods there are a number of rules intended to protect consumers. The rules covering prices has already been

described. EU has defined the minimum criteria of electricity consumer protection. The requirements consist among other things of the right to relevant information on the different suppliers and supply possibilities, the right to a straightforward procedure for changing supplier, and protection against unfair commercial practices and energy poverty for the most vulnerable consumers.

In the extensive harmonisation scenario there should be harmonised regulation of certain contract conditions, such as conflict resolution and sanctions on cancelling a fixed price contract. Rules for announcing price changes should also be harmonised in regulation.

2.3.12 Renewables support scheme

The Nordic countries have separate support schemes for renewable energy, mainly based on feed-in-tariffs or tradable green certificates (TGCs). These support schemes are part of the strategic considerations for energy and climate issues and are as such partly outside the scope of a harmonised Nordic retail market. Nevertheless, the support systems will have effects on both the national and the Nordic market. However, from the point of view of this project we will not develop proposals on how the renewable support schemes could be adjusted in the two scenarios. Both scenarios will assume that no changes will be made to the existing renewable support schemes as part of the integration process.

Table 12 Renewables support schemes – scenarios

Extensive harmonisation	Limited harmonisation
No change – separate national schemes maintained	No change – separate national schemes maintained

Comparison with the current situation

The Nordic countries have separate support schemes for renewable energy. Sweden uses TGCs while feed-in-tariffs are commonly used elsewhere.

No change is proposed in the scenarios and no regulatory changes are thus needed.

3 Additional costs of operating in other Nordic markets

Lack of harmonisation between the national markets will lead to needs for a supplier to replicate/duplicate processes and systems in order to be active in other national markets than the home market. This creates an entry barrier which will prevent at least smaller suppliers from being active in other markets.

As already mentioned, it has become clear that it is very difficult to obtain actual data on the additional costs of operating in other Nordic markets and in general the market players do not know these costs themselves. In order to obtain data it would be necessary to define alternatives in a very precise manner, and the companies would have to invest a fair amount of time and money to develop relevant with cost figures. We have hence not been able to quantify actual cost in money terms. Instead we have listed costs and benefits in the scenarios in terms of impact on Nordic retail market and how difficult it would be to implement the scenarios. Important input to this part of the study has come from a workshop with market participants and other stakeholders held 19th of February 2009.

The different issues for harmonisation could be divided into three main categories:

- Key business processes; Processes that are necessary in order for the supplier to perform its business.
 - × Supplier switching
 - × Information exchange
 - × Metering
 - × Balance settlement
 - × Invoicing
 - × Identification of metering points and customers
- Differences in administrative responsibilities
 - × Responsibilities for tax collection
 - × Energy labelling
 - × Responsibilities for renewable support schemes
- Customer protection and consumer trust
 - × Customer protection rules
 - × Price and product information
 - × Obligation to supply

In the following sections we discuss the implications of the two scenarios. Furthermore, the implications of the ongoing meter reforms in the Nordic countries and of bottlenecks and infrastructure investments are discussed separately.

3.1 Key business processes

The suppliers would like to be able to use the same business process in all countries; such as for supplier switching, moving, metering data and invoicing. A clear message from the participants in the workshop was that the goal must be to implement a model that allows the companies to use the same business processes and systems in all Nordic countries. If there are major differences in the countries, separate organisations and systems need to be implemented for each country in which the supplier has customers. This is costly and creates large barriers for entering a new country for the suppliers.

3.1.1 Supplier switching

In the extensive harmonisation scenario it will be easy to switch between suppliers regardless of where they are located. Market entry will be facilitated. Taken together these aspects will promote competition in the Nordic market allowing suppliers to choose more freely where to operate, and providing customers with a wider range of choices. However, it is likely to involve costly changes to IT systems and procedures which form part of the core business for suppliers and DSOs. However, as the same processes and systems will be applicable across the Nordic market in the end it should be more cost efficient at least for larger suppliers active across the market.

In the scenario with limited harmonisation we assume a less extreme goal, which makes the implementation process somewhat easier even though it is not unlikely that the process can be both long and complex also in this scenario. This scenario will allow the suppliers to be active on other markets, however the extent to which the same systems and processes can be used across the market should be considerably less than for extensive harmonisation.

Table 13. Key implications on the costs for supplier switching

	Impact on the Nordic retail market	Implementation
Extensive harmonisation	+ Switching suppliers becomes easy, promoting competition + Easier and less costly market entry for suppliers as easier to handle switching customers + More even flow of switches across the month	- Implementation process may be long and complex - Changes to IT systems and procedures will incur costs for both DSOs and suppliers

	Impact on the Nordic retail market	Implementation
Limited harmonisation	+ Switching suppliers becomes easy, promoting competition + Easier and less costly market entry for suppliers as easier to handle switching customers	- Implementation process may be long and complex - Changes to IT systems and procedures will incur costs for both DSOs and suppliers.

3.1.2 Information exchange

Several participants in the workshop highlighted the importance of common routines for information exchange in order to facilitating for market participants to be active in several markets.

The technical solutions for information exchange - one or several information hubs, common data base etc. - seem to be of less importance for the market participants, as long as the chosen solution enables the market participants to use one common system internally.

In the scenario with extensive harmonisation it will be possible for a supplier to use same IT-systems and routines for customers in all Nordic countries. The implementation "cost" in this scenario is expected to be substantial, not least the decision process leading to an agreement on the common solution.

In the scenario with limited harmonisation IT-systems and routines will need to be adopted for each country the supplier is active in. The implementation is easier, than in the scenario with extensive harmonisation, as it develops separately in each country and can be built on the already existing structures in each country. At the same time parallel processes in the different countries implies duplication. One clear example would be if information hubs in each country were to be implemented relative to one common hub.

Table 14. Key implications on the costs for information exchange

	Impact on Nordic retail market	Implementation
Extensive harmonisation	+ No duplicated systems + One point-testing ensures Nordic validity + Easier to handle customers on Nordic national markets with Nordic information hub	+ Nordic IT solutions allows more efficient IT development - Standardisation work tends to be time consuming - Market actors need to adopt the new system and formats, which may be costly - Extensive decision process required involving large number of parties - No single decision making body
Limited harmonisation	+ Similar market structures - More complicated communications with four national hubs and formats - Slower development depending on pace of industry driven standardisation	+ Gradual implementation allows for some costs being part of normal upgrading + Facilitates decision making, political and otherwise, as focuses on national decisions - Relies on industry driven standardisation - Implementing four hubs may be difficult and is more costly than implementing one Nordic hub

3.1.3 Metering

The information from the electricity meter is the basis for the suppliers invoicing and risk management. Historical consumption data from the meter is also important input for suppliers in decisions on price offerings to a customer. The customers need metering data for cost estimates and energy efficiency analysis.

In the scenario with extensive harmonisation no duplication of systems or routines will be necessary for suppliers. The cost of implementation is substantial in most countries, as the frequency of meter readings is expected to be at least on the new Swedish level. However, this process is already begun and the most significant problem may be to agree on common requirements for all countries.

The scenario with limited harmonisation is close to today's situation. Different routines and IT-system support will be needed for suppliers having customers in more than one Nordic country. No specific implementation cost as the level may vary between the countries.

Table 15. Key implications on the costs related to metering

	Impact on Nordic retail market	Implementation
Extensive harmonisation	+ Same kind of consumption data and frequency of meter reading for all types of consumers respectively + Future developments facilitated through minimum AMR requirements	- Difficult to agree on requirements - Implementing AMR is a cost, either if new AMR or adaptations to existing are required. Previous investments in AMR can prove liability if new requirements are lower.
Limited harmonisation	+ Three levels of meter readings and one common format for profiles create more uniform conditions - Levels may still differ between countries	+ Allows for national interests

3.1.4 Balance settlement

One system for balance settlement in all Nordic countries will reduce the cost for a supplier acting in more than one country. Same routines and IT-systems can be used for all Nordic countries.

In the scenario with extensive harmonisation there is only one organisation for balance settlement in the Nordic countries, which would be very positive for the Nordic retail market but difficult to implement.

The scenario with limited harmonisation facilitates almost the same advantages for the Nordic retail market, but is much easier to implement. In fact this solution is already under implementation.

Table 16. Key implications on the costs related to balance settlement

	Impact on Nordic retail market	Implementation
Extensive harmonisation	+ Contract with only one organisation and uniform rules for balance settlement across the market + Same kind of information flow between supplier/BR and settlement organisation.	- Political decision making process is complex - Technical implementation presents costs and other challenges

Limited harmonisation	+ Same model for balance settlement will be in place when Nordic market implemented - Different information flows per country	+ Already under implementation
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3.1.5 Invoicing

Having separate bills for network tariffs and electricity consumption as the default option and a clear separation of the respective costs when included in one bill will support competition in the retail market. To enhance competition it is important to separate the cost of the regulated tariff from the cost of the electricity, as the latter is exposed to competition and thus can be influenced by the choices of the consumer.

Both scenarios are based on making sure that the customers can clearly see their price for their electricity consumption in order to provide adequate comparability.

In the scenario with extensive harmonisation invoices should also comply with the same minimum requirements for information. This would enable suppliers both to know which information will be easily available, and also to use the same IT systems in a more cost efficient way.

Table 17. Key implications on the costs related to invoicing

	Impact on Nordic retail market	Implementation
Extensive harmonisation	+ Costs for consumption is exposed to competition, and consumers being able to see costs increases competition between suppliers + Customers more easily accessible for supplier if necessary information for switching easily accessible	+ Agreeing on minimum information requirements on invoices may contain some contentious points but should be relatively straightforward.
Limited harmonisation	+ Costs for consumption is exposed to competition, and seeing costs increases competition between suppliers - Information required for supplier switching differ between countries	+ This is more or less in place in most places in the Nordic market

3.1.6 Identification of metering points and customer ID

The need for secure identification of metering points and customer is closely related to the information exchange. If there is a problem with identification of metering point and/or customer the information exchange will not work.

The suggested solution for both scenarios has a positive impact on the Nordic retail market, as the same solution is used in all countries and risks for errors are reduced. There are implementation costs for DSO's and suppliers in at least one country.

Table 18. Key implications on the costs related to metering points and customer ID

	Impact on Nordic retail market	Implementation
Extensive and limited harmonisation	+ Risk for mix ups limited + Facilitates for Nordic information hub + EAN can easily be extended to countries outside the Nordic market + Identity of customer can be ascertained, e.g. when non paying customers has to be sought out	+ If EAN codes used only one country needs to adapt - Implementation cost for EAN in one country - Implementation cost in at least one country for customer ID

3.2 Differences in administrative responsibilities

3.2.1 Taxes

If the responsibility for collection of energy taxes is allocated to the suppliers, participation in several markets becomes more complicated. This is the case in the Swedish market. However, if tax collection is handled by the DSOs the suppliers should remain largely unaffected by energy taxes.

The scenarios for both extensive and limited harmonisation are the same with regard to this aspect, as this would only involve changes in Sweden all other countries already having implemented the proposed measure. It will however, mean additional work for the Swedish DSOs. During implementation it is also necessary to examine who carries the responsibility for the actual payment of the energy taxes, so that this responsibility will be handled in the same way across the Nordic market.

Table 19. Key implications on the costs related to tax collection

	Impact on Nordic retail market	Implementation
Extensive and limited harmonisation	+ Energy tax collection removed from competitive market	+ No larger difficulties should arise from a technical perspective - Additional work for the DSOs not doing so today

3.2.2 Labelling

It is necessary for the suppliers to provide information on how the electricity they sell is produced. Such rules apply across the Nordic market, and to enhance the functioning of the market these rules should be harmonised in both scenarios. Having a coherent system will allow the customers to compare what is offered thus enhancing fair and equal competition.

However, it is important to note that the harmonisation of these rules in no way should restrict the suppliers' ability design offers based on a particular source.

Table 20. Key implications on the costs related to labelling

	Impact on Nordic retail market	Implementation
Extensive and limited harmonisation	+ Coherent system allows customers to compare products easily	+ No major implementation problems anticipated

3.3 Customer protection

3.3.1 Rules for customer protection

As a common Nordic retail market for electricity includes household customers it is important to ensure that these customers enjoy adequate protection. This is also important from a political perspective as trust in the electricity market needs to be maintained to ensure its functioning.

In both scenarios household customers should be under the protection of their national rules regardless of where the supplier is situated. In the scenario with extensive harmonisation we assume that certain rules are harmonised across the Nordic market such as the rules on conflict resolution, cancellation of fixed price contracts, and rules for announcing price changes. In other words, only aspects with a more specific focus on customer protections should be considered for harmonisation as it is important to maintain the suppliers' freedom to design and differentiate products based on the perceived needs and desires among potential customers.

In the scenario based on limited harmonisation there will be no change from the customer's perspective when buying electricity. However, the suppliers will need to comply with the consumer protection rules as formulated in the Nordic markets where they are active, which means that they may have to duplicate certain aspects within the company.

Table 21. Key implications on the costs related to differences in customer protection rules

	Impact on Nordic retail market	Implementation
Extensive harmonisation	+ Common rules on consumer protection allow small customers to enter market with reasonable low level of risk. + Trust in market necessary for developing the market	+ Decision and implementation process should be reasonably easy + No large costs foreseen
Limited harmonisation	- Consumers may feel uncertain about trying suppliers not located in national markets	+ Decision and implementation process should be reasonably easy + No large costs foreseen

3.3.2 Price and product information

During the study a common Nordic platform for price comparisons has been discussed. However such a solution was not deemed to contribute the necessary added value to motivate implementing such a solution. Having national price information services should provide adequate opportunities for exposing price to competitive pressures.

However, it is important to note that suppliers are expected to compete not only with price, but also through developing products targeted at different groups of customers where it is the differentiation of the terms that are in focus. Aspects that can come into play are e.g. products reflecting various aspects of energy efficiency. Such contracts are not likely to be included neither in a common Nordic comparison service nor in national ones, as these services are more suited to comparing more simple standard offerings basically aimed at household.

In the extensive harmonisation scenario the national price comparison services are still maintained, but the rules are harmonised facilitating the process for the suppliers wishing to promote products encompassed by the price comparison services. An important part of maintaining trust and thus higher utilisation of the services is to make the comparisons relevant in every way possible. One important aspect being to ensure that the prices and products being compared actually are the ones on offer at that point in time and in that particular part of the Nordic market. To ensure this, there should be a common deadline for updating information on price and terms. Having the same rules across the common Nordic market should also facilitate for the suppliers in that the same rules apply across the market, and that the rules they need to comply with are the same. The same goes for having the same rules on marketing across the Nordic market, allowing the suppliers to access customers through the same methods in all markets.

The scenario based on limited harmonisation is to a large extent the same system used today, but with the new requirement that changes in price and terms should be updated within 24 hour. This scenario also assumes that the

existing systems will not exclude new entrants offering the products included in the comparison services.

Table 22. Key implications on the costs related to price and product information rules

	Impact on Nordic retail market	Implementation
Extensive harmonisation	+ Competition promoted if easy to compare offers from eligible suppliers + Same marketing opportunities across the markets create a more level playing field increasing interest in entering new markets - Suppliers may need to be included in more than one national platform	+ Limited implementation necessary - However, it may be time consuming to agree on the common rules and processes
Limited harmonisation	+ Competition promoted if easy to compare offers from eligible suppliers - Suppliers need to be included in more than one national platform	+ No implementation necessary, but some adjustments may be necessary to show new entrants. - Suppliers entering new markets need to know about the national rules for price comparisons

3.3.3 Obligation to supply

The obligation to supply is probably not one of the most essential aspects for harmonisation, but it may still have an impact on the competitive situation in the market.

Nevertheless, it is important to create a common view on what an obligation to supply would involve, and in what way this would differ from the roles of a default supplier or a supplier of last resort.

In the scenario with extensive harmonisation the DSOs will be responsible for appointing a default supplier through competitive procurement. The responsibilities aligned with the obligation to supply should also be harmonised to allow suppliers active in the Nordic market to choose to participate in the procurement process without undue difficulties. This should benefit competition and also allow new entrants access to another part of the market if so desired. Introducing competition in this sector should allow prices to decrease. However, as the obligation to supply includes supplying vulnerable customers, the political process of harmonisation may be complex so as to ensure that the concerns with regard to such customer are adequately addressed in all countries.

In the scenario based on limited harmonisation the national regulations will remain in place as all countries have some rules in place intending to safe guard customers. In this scenario there will be no new openings created with regard to the obligation to supply. However, where competitive tendering already is used we assume that all suppliers fulfilling the basic requirements should be able to offer, and that the requirements do not create unnecessary barriers for the suppliers.

Table 23. Key implications on the costs related to obligation to supply

	Impact on Nordic retail market	Implementation
Extensive harmonisation	+ Same procedure + Competitive procedure invites new entrants, should result in lower prices at least in some markets	- Political process extremely complex - Extended responsibilities for DSOs in some countries
Limited harmonisation	- Less incentive or no possibilities for suppliers to try to gain/win obligation to supply in new market - Risk for maintaining present market barriers both in rules and practices	+ If present national regulations maintained, no implementation necessary

3.4 Implication of metering reforms

Sweden will by 1st of July 2009 have implemented a metering reform, which has resulted in AMR systems for a most of the Swedish electricity customers. Finland has recently, 1st of March 2009, decided on a metering reform. Norway is expected to decide on a metering reform shortly. There are also large investments made in AMR-systems in Norway, Finland and Denmark, without legal requirements. Metering reforms and investments in AMR-systems could be a good base for a Nordic retail market, but they could also be a problem.

In the Swedish metering reform hourly metering is required for customers (installations) with a main fuse >63A and monthly metering for other customers. Almost all Swedish DSOs have already implemented AMR-systems for all their customers. Most of these systems have the capability of collecting hourly metering values. This would require some additional investments in communication infrastructure, data storage and central systems. Some DSOs have invested in AMR-systems that are not capable of collecting hourly metering values. These companies have separate AMR-systems for the large customers requiring hourly metering and for the other customers with monthly metering.

On 1 march 2009 Finland decided to require hourly metering for all customers. A maximum 20% of a DSOs customers can be expempted from hourly metering. Exceptions can only be made for customers with a main

fuse of <25A and yearly energy consumption <5,000 kW. The meter has to be equipped with functionality for remote load control. The Finnish metering reform will be implemented before 31 December 2013.

In Norway hourly metering, and even quarterly metering, is discussed for all customers. If quarterly metering is introduced in Norway and suppliers need to deal with quarterly values, this will cause a threshold for suppliers from other Nordic countries.

We have no information about preparations for a metering reform in Denmark.

Investments in AMR-systems are substantial, especially for small customers if compared with the yearly electricity consumption, and the AMR-systems are expected to have 10-20 years lifetime. A new reform (hourly metering) in Sweden that requires new AMR-investments within the next 10-15 years would most probably not be justified. A reform for medium size customers, for example >25A, could be possible within a shorter timeframe.

Hence, the Finnish decision on metering reform which requires hourly metering for almost all customers, will most likely cause a long period with different levels of metering in the Nordic market. This might also be the case if Denmark or Norway doesn't decide on a metering reform in the near future. The later situation is worse for the Nordic retail market, as correct metering data at fairly frequent intervals are very much desired by customers and suppliers.

There are also more complicated issues concerning metering reforms and AMR-systems. AMR-systems can facilitate other functionalities than metering data, for example remote load reduction, which is required in Finland. If only some suppliers will get access to these kinds of functionalities, this can be an entry barrier for other suppliers. The barrier can be there even if all suppliers will have the same access to the functionality, but if it in practice is not possible for all suppliers to use the functionalities.

One conclusion regarding metering reform is that, even though energy ministers advocate a harmonised Nordic electricity market in general terms, when it comes to metering reforms mainly national considerations are made.

3.5 Support schemes for renewable energy

The national support schemes for renewable energy form an integral part of the larger political considerations around energy and environment. As such they are not included in the scenarios developed for this study, and no assumptions will be made in this regard, differentiated or otherwise.

There are two main types of commonly used support schemes for renewable energy. Feed-in-tariffs (FIT) gives the producer a pre-determined tariff for all electricity that is fed into the system. The level can be determined e.g. by technology or in a public tendering process. There are also systems where the producer receives an extra pre-determined payment on-top of the ordinary electricity price (possibly reduced above a certain price level). Both of these schemes typically do not involve the retail companies and is thus relatively unproblematic for the functionality of a common Nordic retail market.

The other main type of system is the Tradable Green Certificate (TGC) schemes, such as the one currently used in Sweden. By design this will require the involvement by the suppliers.

The obligation to fulfil the quota requirement cannot easily be shifted from the suppliers to the DSOs since it would make it necessary to change the pricing of the certificates (towards customers) from competitive pricing to regulated pricing. In principle it is of course possible to introduce a new element in the network price regulation. If the quota requirement is kept with the supplier, it would imply that a foreign company is obliged to fulfil an obligation put on it by another state though not formally incorporated in that territory. Currently in Sweden direct purchases from a foreign supplier is counted as import, and the individual customer will then become responsible for handling the necessary certificates to fulfil the quota requirement. In practice this will make direct import unattractive for most customers.

Different support schemes involving the suppliers are likely to be a barrier to the creation of a common Nordic retail market and constitute an entry barrier for potential competitors. Currently this primarily relates to Sweden, which has a TGC scheme.

A joint support scheme would facilitate a common Nordic retail market. However, the most important difference is whether the support scheme is administered by the supplier or another party such as the DSO. With different support schemes administered by the supplier entry barriers are created. An ultimate goal could be a joint system, but such a decision is very much dependent on the political situation and outside the scope of this study.

We have assumed that the rules for taxation and TGCs would remain in place in much the same way as today. The compatibility of different mechanisms would have to be examined carefully. The customer's responsibility for acquiring TGCs when importing electricity themselves can act as a barrier for supply contracts from countries with other support schemes. The market would then benefit if brokers offering services consisting of assisting electricity customers fulfilling their quota obligations were established. Such services would be of particular interest for small and medium sized customers, which are likely to find handling these obligations a heavier burden comparatively speaking. However, for the smaller customers it would become clearly more difficult and require entering into one supply contract and one TGC contract. The TGC broker would also need information regarding the volume of certificates that needs to be acquired for the customer.

3.6 Effects of bottlenecks in infrastructure

There are bottlenecks in the transmission grids both between the Nordic countries and within the countries. From an integrated market perspective it the preferred solution is of course that the bottlenecks are removed through investments in transmission capacity. However, investments in transmission capacity are costly and it is unlikely that removing all bottlenecks (in all situations) could be considered justified.

Bottlenecks in transmission grids are treated in two different ways in the Nordic area; counter trading or by market splitting (price areas). With counter

trading the TSO reduces the power flow across the constrained interconnection by buying power from one side of the bottleneck and selling power to the other side. The cost of counter trading is included in the transmission tariff. With market splitting Nord Pool first calculates the system price for the whole Nordic transmission system assuming no bottlenecks, and then makes a second calculation taking bottlenecks into account. The result is a lower price in the area with surplus of power and higher price in the area with deficit.

Between the Nordic countries price area division are used. Norway and Denmark are also using market splitting for major bottlenecks within the country. Sweden and Finland have not been using market splitting within the country. Instead counter trading have been used as the main method for congestion management.⁶

Main arguments for the two alternatives are:

Market splitting:

- The market receives correct price signals and optimises power generation costs, with the limitations in the transmission grid as restrictions.
- Differences in prices reveals bottleneck problems and constitute an input for transmission investments.
- As the Nord Pool system price is the basis for price hedging contracts in the Nordic electricity market, price areas that differ from the system price introduce a risk for market participants that is difficult to hedge. There are contracts to hedge the price area risk, CfD (Contract for Differences), but the trade in these contracts are limited.

Counter trading:

- With one Nordic electricity market there should be one price.
- The TSOs are responsible for investments in the transmission grid and should therefore bear the costs for bottlenecks.
- There can be poor competition in a deficit area causing the cost of counter trade to be higher than if price area division had been used.
- Moving bottlenecks to the country boarder to avoid high counter trading cost discriminates players in other countries.

The Nordic energy ministers have decided that price area division should be used for major bottlenecks within the Nordic grid, regardless if the problem is between countries or within a country. In Sweden, Svenska Kraftnät has been given the assignment by the government to study how price areas should be introduced in Sweden. In Finland, Fingrid has been given a similar assignment by the Finish government. Presently it seems clear that market splitting will be introduced, although the details are not known.

⁶ Nordic countries also use the possibility to move internal bottlenecks to the country boarder.

Pöyry has made a study for Oberoende Elhandlare⁷, (Swedish organisation for independent electricity suppliers), regarding the consequences of price areas and competition. The following conclusions were made in the study:

- The current trade with CfDs is very small and the trade mainly takes place in the OTC-market, which makes the trade difficult to survey and not transparent.
- At Nord Pool the trade with CfD-contracts is not very liquid and the spread is large.
- With an increase numbers of price areas there is a substantial risk that the liquidity will be further decreased.
- With increased risk and cost for suppliers, there is a risk of increased prices for end customers.
- The number of national suppliers in Sweden will most likely be reduced.
- The end customers will find the electricity market as more complicated when different prices within Sweden will be introduced.

In general, the introduction of more price areas was not seen as a positive step for a common Nordic retail market from the point of view of most market participants. However, at the same time the introduction of price/bid areas internally within a country does not automatically imply that the actual price areas will be smaller, but may simply imply that they do not follow the national borders. The possibilities to hedge for price differences is however clearly important, particularly for independent suppliers lacking own generation to make internal hedging.

From the study mentioned above it seems clear that many market participants have concerns regarding the functionality of the market with market splitting. These participants take the view that it might lead to a more fragmented market, while the general trend is towards more market integration. Customers are primarily interested in how they are affected, not how suppliers are affected. But, if the risks for the suppliers of entering into new markets are overly large, the end result may be less competition with fewer suppliers offering their services in any particular price area.

However, it is also important to recognize that the increased use of market splitting may lead to a different market structure, but that this market structure may be as good as (or possibly even better) than the current one. Increased use of market splitting could possibly increase the benefits of a harmonised retail market. With increased use of market splitting internally within one country, the national borders will in many cases not be the relevant market borders. It then becomes even more important that suppliers are able to provide offers across the relevant market area, independent of national borders.

Still, the concerns among some market participants seem at least to some degree be valid. The opportunities to hedge for price area risks are limited. There is a clear risk that more price areas will decrease the liquidity in the financial products used for this purpose (CfDs). At the same time, some price

⁷ Econ Pöyry (2009)

areas may gain from being connected to a larger price area with potentially more market players offering CfDs.⁸

Different measures to improve the functionality of the market should however also be considered. The Nordic TSOs have been instrumental in developing the electricity market in the Nordic area, and could also play a vital role in improving the access to products for hedging price area risks.

Financial Transmission Rights (FTR) are financial contracts that essentially gives the holder the right to (a share of) the revenues on a transmission line. Currently the Nordic TSOs earn congestion rents on congested lines depending on the price differences between the price areas that the line connects. An alternative is that the TSOs instead sell this revenue stream in advance, through issuing FTRs. These would to a large extent serve the same purpose as CfDs. The CfDs is a contract related to the difference between an area price and the system price, while FTRs are contracts related to the difference between two area prices. Both can however be used for hedging area price risks (possibly through a combination of products). If the TSOs issue FTRs this would open a new primary market for a potentially important hedging product that could improve the functionality of the market.

Under normal operational circumstances the risks for the TSOs would be limited. Instead of earning the congestion rent based on actual price differences, they would earn a rent based on expected price differences. The revenues may of course vary over time, but it is difficult to see that this would be a large risk for the TSOs.

However, the significant risk for the TSOs is instead related to unusual operational situations in the transmission grid, e.g., a transmission line being out of operation or a large power plant falling out for a longer time period. The area price differences may then become very large. In the case of the fall-out of a transmission line the issue of the "firmness" of the transmission rights also arises. A fully firm transmission right means that the TSO guarantees the transmission capacity and would then have to pay the holder of the FTR for the area price differences. This would however also provide strong incentives for the TSO to make sure that the transmission capacity is available.

The introduction of FTRs, issued by the TSOs, would have to be analysed in more detail, but seems to be one method for improving the market functionality.

3.7 Costs and benefits of different harmonisation efforts

A common view expressed during the project workshop was that in order for harmonisation efforts to make a significant difference in terms of improving the functionality of the retail market and facilitating a truly integrated Nordic market it is necessary to harmonise to such an extent that it is possible to run the business processes from one common (IT) system independent of

⁸ This has not been analysed in any detail within this project. However, if Southern Sweden and East Denmark (Zealand) becomes one price area this could improve the situation in East Denmark through more competition being introduced in that price area.

country. This would require far reaching harmonisation – approximately along the lines suggested in our extensive harmonisation scenario.

Another lesson learned from earlier projects is that the retail markets in the Nordic countries are not, typically, characterised by significant degrees of market power; or at least that simply enlarging the market is not likely to lead to a significant increase in the competitive pressure in these market. The reason is that the margins are already relatively small (at least for active consumers) and that other factors, e.g. search and switching costs, most likely are more important determinants for the level of competition than simply the number of market participants. This is in clear contrast with the experiences from the Nordic wholesale power market, where market integration has led to important dilution of market power and significantly improved the level of competition (compared to a hypothetical situation with national wholesale power markets).

This means that there are no “easy wins”, i.e., there will be large no gains arising simply from the fact that the market is harmonised. It instead highlights that it is important to:

- 1 Harmonise around the right market model that leads to a better functioning market, and which
- 2 Facilitates the implementation of more efficient business processes.

With this background, it is not possible to assess each harmonisation item in isolation. Instead the main criteria for each harmonisation item is whether they are necessary in order to achieve the goals of a more efficient market. All items that are necessary then needs to be implemented as part of a total package, rather than to be assessed on an item by item basis. If the complete package should be implemented or not would then have to be evaluated based on the expected costs and benefits of the package. This will however require detailed analysis of many different issues and a complete cost benefit analysis may therefore be difficult to conduct before a decision to move ahead is made. Here it is important to recognize that it is unlikely that it will be possible to reach a clear conclusion on the costs and benefits ex ante.

Supplier switching and moving

Both scenarios imply common regulation and common procedures. These are assumed to be harmonised to a sufficient level of detail so that it is possible to run on a common system.

In addition, the extensive harmonisation scenario requires that switching should be possible on any week-day. This would require more far reaching improvements in e.g. balance settlement. The extensive harmonisation scenario also requires no fees for switching suppliers (incl. extra meter readings).

Neither of the two extra requirements in the extensive harmonisation scenario would likely be necessary to achieve the benefit of suppliers being able to use on single system for the whole market. However, both these aspects would imply important benefits for the consumers and increase the transparency and functionality of the market. Without this more extensive harmonisation the suppliers would need to know the different switching rules in the different countries (which is manageable), but more important they

would have to explain to customers why they cannot provide the same offer/service to all customers across the four countries.

The conclusion is thus that the more limited harmonisation scenario could be sufficient for supplier switching, but that also this limited harmonisation implies a relatively far reaching harmonisation in terms of detailed processes, messages etc. The more extensive harmonisation is to be recommended from a customer point of view.

Information exchange

The extensive harmonisation scenario implies fully harmonised message formats and contents covering the information exchange related to all key business processes. In order to achieve an assumed goal of being able to run only one system the more extensive harmonisation is necessary.

In the extensive harmonisation scenario we have also proposed a common Nordic information hub, while there are national solutions in the limited harmonisation scenario.

In order to achieve the benefits of more efficient business processes some kind of information hub solution seems important. Such a solution would allow all market participants access to the same information and should improve the market functionality substantially.

Whether the solution should be one Nordic hub or national solutions⁹ is of less importance and should be evaluated on a more technical level, e.g. regarding the cost effectiveness of the different solutions. The important issue is that the solution enables the market participant to communicate using the same data messages and formats. Our presumption is that with this requirement a Nordic solution is likely to be more cost effective.

Identification of metering points and customer ID

Both scenarios include the same degree of harmonisation and this harmonisation is necessary.

This would most likely require Finland to switch to EAN codes and Sweden to use another customer ID method than personal identification numbers, as this would be the solution requiring the least amount of changes.

Metering

Both the extensive and limited harmonisation scenarios could potentially allow suppliers to run their business operations using one common system. The main difficulty with the limited harmonisation scenario is that it would be difficult for the suppliers to have the same offers across the Nordic market since the available data may differ between the countries.

Depending on how harmonised minimum requirements for metering are defined the costs will differ greatly. For instance if a minimum requirement of hourly metering (and settlement) for all customers was introduced it may require additional investments, but also increased operational costs.

⁹ Including for example the possibility of two countries cooperating on one common hub.

Although it is difficult to acquire data on the costs (and benefits) of different alternatives, we have received indications of the costs for hourly vs. monthly metering from one Swedish DSO. According to this information the investment costs are not significantly affected since most metering equipment installed today can handle both monthly values and hourly values. Collection of hourly data can impose some additional investments in collection infrastructure such as routers, central system, data storage etc. The largest cost difference between metering alternatives is however in operation. Hourly metering increases cost of communication, data storage and handling. Daily collection of quality assured data increases cost of supervision and field work to maintain a very high level of communication. The following cost indications were given:

- Monthly metering, monthly collection SEK 100/installation and year
- Hourly metering, monthly collection SEK 200/installation and year
- Hourly metering, daily collection SEK 300/installation and year

The main motive for hourly metering is to give customers information and prices to promote energy saving measures or changed consumption patterns (decrease in consumption in peak hours). The cost difference between monthly metering and hourly metering with monthly collection is SEK 100, according to the information above.

In a previous Elforsk Market Design study the consumers' reaction to peak prices was studied (Lindskoug, 2005). Household consumers with electric heating were invited to participate in an experiment where they could face high peak prices (3-10 SEK/kWh) for a maximum of 40 hours per year. The consumer was notified the day before (by SMS or e-mail), but no additional technical installations were made. The experiment was constructed so that it was cost neutral even if the consumer didn't react at all. The results from the study showed that the consumers reduced their consumption with on average 50% during the "peak price" hours. The average effect reduction was slightly above 2 kW/house.

Historically we have not seen peak prices of this magnitude in Sweden. Assuming that we in the future will see peak prices of 3 SEK/kWh for 40 hours per year (on average) and the consumer can reduce the consumption by 2 kW during those hours it would imply a saving of 240 SEK/year. With those assumptions it would be motivated to introduce hourly metering with at least monthly collection. It is however not possible to determine even in this case if it is motivated to have daily collection. That would depend on what the additional benefits of moving from monthly to daily collection would be.

The results above indicate that it could be motivated with hourly metering for household customers with electric heating. This is however contingent on the assumptions regarding the frequencies of peaks and the peak prices.

We do however not have any information on whether it is motivated to introduce hourly metering for the even smaller customers. Assuming an average electricity price of 50 öre/kWh the required saving to compensate for an extra cost of 100 SEK would be 200 kWh/year. The energy savings required for different type of consumers are then:

- Apartment, 2,000 kWh/year 10%
- Apartment/small house, 5,000 kWh/year 4%
- Small house, 20,000 kWh/year 1%

If additional investments are needed to achieve the savings this would naturally increase the savings requirements.

There are potentially other benefits than the direct savings of electricity. If the peak load can be reduced by 2 kW/customer they can reduce their fee towards the regional and central grid with perhaps 400 SEK/customer. However, this is also contingent on that this reduction is peak load takes place and it is probably most likely to occur for houses with electric heating.

Hourly metering for houses with electric heating seems to be motivated. However, we can not find substantive evidence that the benefits outweigh the costs for the smaller customers. There is not enough data to precisely define any limit, but at least for small customers with a yearly consumption below 10,000 kWh we question if hourly metering is motivated. The current debate to extend hourly metering to all customers is not built on any cost benefit analysis to our knowledge.

In the next chapter we outline a possible model for harmonised minimum requirements that probably will avoid the most cost driving elements. The details of such requirements should however be analysed in more detail. Furthermore, it should be possible to combine the minimum requirements with requirements which enable the use of existing more detailed data (such as hourly metered data for small customers).

Balance settlement

The extensive harmonisation scenario proposes the implementation of one Nordic balance settlement system and organisation, while the limited harmonisation scenario only proposes harmonised guidelines and responsibilities concerning balance settlement.

The key issue for the market participants is to get harmonised rules for the balance settlement and harmonised pricing of imbalances. The latter is currently being introduced. However, the balance settlement procedures and the allocation of responsibilities are very different in the Nordic countries.

Significant benefits would probably arise from only harmonising the procedures/responsibilities across the Nordic, i.e., a common balance settlement organisation may not add much value to the market if the harmonisation can be achieved anyhow. At the same time a common balance settlement organisation could be a vehicle for implementing this and ensure that common procedures are kept and developed. Furthermore the creation of a common balance settlement organisation would facilitate the introduction of common collaterals (and common invoicing), which would reduce the entry barriers. In Sweden, Svenska Kraftnät requires a basic collateral of minimum SEK 500,000 (or a higher amount determined by Svenska Kraftnät) and additional collateral determined for each balance responsible company by Svenska Kraftnät. Although this is not a very large amount in case, collaterals of a similar amount in several countries constitutes an entry barrier at least for smaller suppliers entering a market on a smaller scale.

As already mentioned, the Nordic TSOs have agreed on common principles for pricing of imbalances which is being implemented (although with some differences between the countries). This is a very important step. The additional steps required for the extensive harmonisation scenario involve organisational issues as well as changes in the procedures for the balance settlement. The harmonisation of the balance settlement procedures involves some rather substantial changes both for the TSO and the individual companies. In addition to these more technical changes, a common balance settlement organisation would also have to be implemented, which from a technical point of view should be quite straight forward.

To implement a common Nordic settlement organisation would require high investments in the short run, but it would be cost efficient in the long run with one organisation and IT-systems instead of four.

Invoicing

Both the extensive and limited harmonisation scenarios prescribe that network tariff and the electricity use shall be billed separately or at least separated in the invoice.¹⁰ This is proposed in order to secure a level playing field for all suppliers.

The extensive harmonisation scenario also prescribes some common minimum requirements on information to be included in household customer invoice. It is reasonable to require that the suppliers adapt to local market conditions (and thus need some type of local interface with their customers). However, different requirements on the invoicing information may lead to a need to establish separate customer management systems.

Changes in the information requirements on invoices may in some make changes in the customer management systems necessary. As a part of the total system harmonisation assumed in the extensive harmonisation scenario these changes are probably not the most significant ones. However, this would depend on the exact requirements.

Taxes

In both scenarios we propose that the responsibility for energy taxes is moved to the DSO. This is a relatively simple change which would only affect Sweden and would simplify for the suppliers.¹¹

Labelling

In both scenarios we propose a common system for labelling electricity (declaring how it has been produced). This should be a simple change that will facilitate for all market participants (including customers).

Obligation to supply

Only in the extensive harmonisation scenario do we propose changes from the current situation. This is probably not one of the most critical aspects of

¹⁰ Please also see the discussion on potential future improvements, section 4.4 for a discussion on single point of contact and the supplier centred model.

¹¹ A move to a single point of contact model would change this. With a supplier centred model the supply companies would have the relationship with the customers and also bill for the network cost.

harmonisation, but is still important in order to ensure a level playing field for all suppliers. A harmonised system to appoint default supplier through competitive procurement (by the DSOs) should not require changes in e.g. IT infrastructure (unless the DSO and incumbent retail operation has not been properly unbundled).

Given the technical simplicity we recommend that harmonised rules for obligation to supply are introduced.

Price and product information

In both scenarios we propose that the national price information services that currently exist are kept. This does not rule out that two or more of these are merged, but this would be a separate process. The most important issue is that all suppliers have access to the different national price comparison services. In the extensive harmonisation scenario we also propose a harmonisation of the rules and processes. This should be relatively easy, but is on the other hand not critical for the functionality of the market. Such harmonisation would not require that the exact same contracts are compared in all countries. It would be relatively easy for suppliers to adapt to different rules in the different price comparisons. Given that there are some differences in which contracts that are most commonly offered in the different markets, it is preferable that different (the most relevant) contracts are included in the different price comparison services.

There are also different rules on marketing of electricity services in the different countries. Although it would be beneficial to have the same rules in all markets, this also involves some general customer protection legislation.

The conclusion is thus that the most important issue here is to provide equal access to price comparison services. It would be beneficial with further harmonisation beyond that. Such further harmonisation would in most cases be simple (at least from a technical point of view), but is probably not a high priority area.

Consumer protection

The limited harmonisation scenario prescribes that the consumer protection rules of the household customer's country of consumption should be applied. The extensive harmonisation scenario implies further harmonisation. Since this also involves general consumer protection rules that differs between the countries it may be difficult to achieve such harmonisation. However, there are some electricity market specific rules and regulations that could be harmonised. From a technical point of view such harmonisation should be easy and would facilitate both for consumers and suppliers.

Renewable support scheme

A common renewable support scheme would be beneficial from a retail market point of view, but this is driven by other factors which should take precedence over the retail market design.

4 The road forward – implementing a harmonised Nordic retail market

In earlier chapters the report has focused on defining two scenarios for the implementation of a harmonised Nordic retail market. We have also discussed how the scenarios will differ when implemented. In section 3.7 we assessed the cost and benefits associated with the different scenarios. In this chapter the study will focus on the way forward towards a harmonised Nordic retail market. In order to exemplify what kind of decision that needs to be taken we have taken the extensive harmonisation scenario and developed some more detailed solutions for the most important areas to be harmonised.

4.1 What are the most important steps?

When discussing the most important steps to a harmonised market it is important to first define what we mean by a harmonised market.

The ultimate goal of the harmonisation process is for suppliers to be able to operate across the Nordic market from one location. There should also be only a limited need to duplicate the necessary processes and functions, allowing suppliers to use the same processes and systems across the Nordic market. When looking at the scenarios in the study this goal more closely resembles the scenario based on extensive harmonisation.

If we look at the implementation of the harmonised market as an ongoing process the scenario based on extensive harmonisation would be the final goal, while the scenario based on limited harmonisation could be seen as an intermediate step, where the processes are similar but not yet fully harmonised.

Based on the study and discussions with market participants it is clear that the priority must be given to harmonising key business processes, i.e. the processes that are at the centre of the day-to-day business of the suppliers, and also the aspects of the DSOs business which provide the necessary input to the suppliers.

We have summarized the most important categories to harmonise into the following four main areas:

1. Information exchange and process
2. Metering
3. Balance settlement
4. Consumer trust

In the two scenarios developed in this study the detailed solutions for each area are not defined. Different solutions can be chosen which will fit into the scenarios. In order to exemplify what kind of decision that needs to be taken detailed solutions for the most important areas to be harmonised have been

developed. The next sections outline the proposed solutions for the most important areas of harmonisation for a Nordic retail market to function well.

4.1.1 Information exchange and processes

The most important aspects to develop in order to realize a Nordic retail market is to have a **standardised information flow between market participants**. This includes:

- Definition of players; who should send information and who should receive information
- What information to send
- When should information be sent
- Format and content of information to send

The definition of players, in this respect, need to be quite detailed with regards to each players responsibility in metering, settlement, invoicing and customer interactions. Players that need to have the same definition in all countries are TSOs, DSOs, Balance responsible and suppliers.

Information sent between players includes; metering data, customer data, changes in structural information, price information, settlement results and invoices.

The time to send each kind of information is very important, since it determines the routines and day-to-day work at suppliers and other market participants.

When sending and receiving information between market participants the format and content in each message needs to be specified clearly and in detail for automatic handling (in IT-systems), without manual work. Different formats and contents requires duplications in IT-systems and manual work, which increases costs for suppliers that enter a new Nordic country.

A Nordic organisation for information exchange is needed to harmonise both the information exchange and the process. The current cooperation in this area is not enough. A common **Nordic information hub** is needed as a Vehicle for this process and potentially also a cost saving tool, when the Nordic retail market is in place. The Nordic information hub will incorporate a Nordic testing and certification process for information exchange.

To summarise, our proposal includes:

- Fully harmonised processes, message formats and contents allowing for automatic handling.
- A Nordic information hub. However, national solutions are also possible if they can deliver the same functionality at a lower cost and the choices needs to be analysed in more detail.

4.1.2 Metering

As the values from the metering are the base source for most information exchange between the market participants and invoices to customers, this is an important area to harmonise. A **high minimum level for metering** is required for a harmonised Nordic retail market. Sweden and Finland have already decided on a relative high minimum level for metering, but the countries have not chosen the same solution. For a common Nordic retail market the same minimum level is required in order to give suppliers the possibility to use the same customer offerings and routines in all countries.

The details, such as thresholds for different metering requirements, would need a separate analysis. However, a possible solution is:

- >63A: Hourly metering, daily collection
- >25A: Hourly metering, monthly collection
- Other: Monthly metering, monthly collection with possibility for daily metering value (for moves and supplier switching)

If data is collected on an hourly basis for smaller customers those data should be made available to all suppliers on fair and equal terms.

This minimum level requires AMR systems for all customers. The reasons behind the above proposed solution are:

- Consumers will get bills based on actual electricity usage
- Larger consumers will get data for energy conservation efforts
- Suppliers will get data for different kind of offerings to customers, same offerings can be given to all consumers in the same category all over the Nordic market
- Hourly metering values drives costs, due to large data volumes and additional cost for communication between meter and central systems. It is thus uncertain whether it is motivated to introduce minimum requirements of hourly metering for all customers (including customer categories that have small possibilities to change electricity usage on an hourly basis).
- Daily metering collection, with high availability requirements, is also a cost driver. A short time for communication and for detection of errors drives costs. The reason for daily metering collection is that the TSO, balance responsible and suppliers needs hourly data to make forecast for the next day/days. The quality of these forecasts is not expected to significantly improve with a larger amount of hourly metering data on a daily basis.

The minimum requirements outlined above can be combined by enabling the use of more of the information that is collected. To the extent that there is hourly metering also for customers for whom it is not required, this data should be accessible for all market participants on a non-discriminatory basis. One possibility is that the information hub provides the possibility for suppliers to download data with e.g. a higher time resolution on a monthly basis. It is also possible to develop sets of standardised time resolutions

(hourly, load blocks etc.) that are accessible to the suppliers.¹² This would enable all market participants to use the data that is already being collected. The information hub should then also include information on the type of data (in addition to the minimum requirements) that are available for different consumers.

This would imply that there are different data available for different consumers (of the same type). It will then not be possible for a supplier to offer products based on the more detailed data on a broad basis to all consumers. But, the supplier could target offerings towards the consumer for which the necessary data is available. This further increases the importance of the suppliers being able to identify the type of data that is available in an easy and cost efficient manner.

4.1.3 Balance settlement

As previously discussed important steps have already been taken in terms of harmonising the principles for imbalance pricing. However, there are still large differences in the balance settlement procedures that have not been harmonised.

Furthermore, before a supplier enters a new country and starts to build a customer base in the country the supplier needs to arrange for the balance settlement in the country. This can be done by entering into a balance agreement with the TSO or through buying the service from a balance responsible party. Both alternatives create a substantial entry barrier. The balance responsible agreement involves responsibilities such as collaterals and daily information flows. To buy the balance responsibility means having contact with potential competitors and revealing market strategy.

Therefore a **common balance settlement organisation** for all Nordic countries is the ultimate solution. This would bring the following cost reducing benefits for the supplier/balance responsible:

- One balance agreement
- Collaterals for the whole Nordic market
- Same information flow
- One invoice for balance responsibility

The goal is that it should not be more difficult, in this respect, for a Norwegian supplier to enter Sweden than to enter a new price area within Norway.

With one balance settlement organisation it is natural and cost efficient to make the balance settlement exactly the same in all countries. All balance settlement issues should also be handled centrally by this organisation to ensure equal treatment in all countries.

¹² In a previous Elforsk project the possibility of "hourly settlement – light" was introduced. With this proposal the principle currently used (in Sweden) for profiled customers is applied, but with the difference that hourly values instead of monthly values are used for the final settlement. Models similar to this could be used. See Badano, Fritz, Göransson and Lindén (2007).

The central balance settlement needs to handle all metering requirements, as described in section 4.1.2.

- Hourly settlement on daily basis, Load profiles based on network profiles for customers $\leq 63A$
- Hourly correction settlement on monthly basis for customers with hourly metering but $\leq 63A$
- Monthly correction settlement for customers $\leq 25A$

The common balance settlement organisation will be a good vehicle for the implementation of a **common balance settlement procedure**.

4.1.4 Consumer trust

In order for consumers to trust suppliers from other countries a number of minimum requirements are needed.

- | | |
|---------------------------------|---|
| • Invoicing | Separate billing for network and electricity, same required information on bills |
| • Taxes | Energy taxes collected by DSOs |
| • Labelling | Harmonised regulation |
| • Obligation to supply | DSO to appoint default supplier through competitive procurement |
| • Price and product information | National price information up dated within 24 hours, harmonised rules and process |
| • Consumer protection | Harmonised rules for conflict resolution, announcing of price changes and sanctions on cancelling fixed price contracts |

Harmonisation in invoicing is important primarily when it comes to the minimum information requirements on the electricity bills. Different requirements may make it difficult to handle the entire Nordic market from one customer IT system. If the modules were to be the same, the same system could more easily be used on a Nordic basis.

Separate billing for network and electricity, as well as the system for default supplier and to some extent the price and product information are important primarily to ensure a level playing field for all suppliers, but not of extreme importance in order for the business processes in a common market to function efficiently.

Other requirements listed above are perhaps not as important for the suppliers to be able to make offerings all over the Nordic market, but they are important to gain confidence from customers all over the Nordic market. As discussed earlier, a certain level of trust is required if a Nordic market is to develop. If no customers are interested in choosing a new supplier (outside of

its home country) nothing much would change, whether or not the suppliers move into new markets.

4.2 Who should be responsible for the process?

Among market actors it has been claimed that the market itself would be the best driver of the integration process. The proponents argue that once the processes have been agreed, suppliers will act in accordance with their own individual incentives and choose whether or not to enter a Nordic market. In this way a Nordic market would develop as part of a more gradual market driven process. However, such a process entails the danger of fragmentation. This would either lead to the disintegration of the common Nordic retail market or to a fragmented Nordic market meaning more costly adaptations than what would be possible with a more unified process as it is not likely that single suppliers would push for a Nordic policy.

The present organisation Nordel is also likely to assume a lesser role as the TSOs in the Nordic countries also become members of ENTSO-E, which will work on a European basis. Thus one possible important driver of the development would be a less viable alternative in the future.

We propose the following organisations that will drive the harmonisation process forward:

- Nordic co-ordinating body
- Nordic information hub
- Nordic balance settlement organisation

As mentioned above, the harmonisation process would benefit from having a **common body driving the process forward** and also steering the process to prevent fragmentation through co-ordinating the timing and content of the process. Such a common body would thus act to co-ordinate the integration process as a whole across the Nordic markets. There is a danger that ongoing changes in the rules and regulation could contribute to the fragmentation. An indication is that at the ministerial level there is agreement that a common Nordic retail market is the desired goal. However at a national level the authorities still may propose and commit to new regulations and procedures which will obstruct or at least not promote integration. One recent example is the Norwegian discussion on metering, where the use of quarter of an hour values have been discussed. This would mean more frequent readings than in other parts of the Nordic market, with the possible exception of parts of Denmark i.e. a fragmentation of the market rules rather than a move towards harmonisation.

To safeguard against such a development the co-ordinating body should also function as a consultative body. By this we mean that proposals for new legislation and processes in the Nordic countries should be sent for consultation to the co-ordinating body before being decided and implemented. However, as it seems unlikely that such a body would receive a mandate from the four states concerned to decide and enforce policy, their comments on consultation will be in the nature of a recommendation. Their comments should however always be made public, and the consultation procedure is

thus intended to prevent inadvertent fragmentation of the harmonisation process in that going against a recommendation will be a conscious decision by the state concerned. They would also be able, but not required to, make proposals on possible ways of co-ordinating or harmonising the Nordic retail market.

We see two already established organisations that could function as this body; NordREG and the electricity market group under the Nordic Council of Ministers. NordREG has proposed that the electricity market group should have a role similar to this one. We believe it is better that NordREG takes this role. The electricity market group consists of representatives of the ministries in each country. We believe that this body should also comment on proposals for legislation etc, for example regarding to how it affects an integrated market. This might be difficult for ministry representatives, as they most likely have been taken part in drafting the proposed legislations. Regulators can in general also act more independently from the national politics.

The co-ordinating body will drive the Nordic harmonisation process forward. On practical level to implement the process a **Nordic information hub** and a **Nordic balance settlement organisation**, as proposed earlier, will drive the process forward.

It is possible that the Nordic information hub and the Nordic balance settlement organisation could be part of the same organisation. This would then most likely be a TSO driven organisation. However, we expect the Nordic TSOs to be much more investment oriented over the next couple of years. It is then uncertain whether the TSOs will have the power to also drive the market development processes in a forceful way.

A Nordic balance settlement organisation could be set up in many different forms. It is natural to expect it to be a TSO driven/owned organisation.

4.3 When should a Nordic retail market be implemented?

When discussing the harmonisation process it is also important to consider the timing of the process and when the harmonised Nordic market should be up and running.

The timing of the process will affect the costs for the markets actors involved in adapting to the changes required. If the coming changes are announced early it will be possible for the companies concerned to include at least some of the changes in their normal maintenance and updating work. This could possibly lower the costs of adaptation through both enabling the companies to spread the financing of adaptation over time, and to assume part of the cost into their normal activities. It could also help spread the demand for new IT solutions over a longer period of time, thus making the IT suppliers less of a bottleneck creating a more competitive environment than would otherwise have been the case.

The process to reach a fully harmonised and integrated Nordic retail market may be long, as it requires both some rather complex political decision making process and also implementation of regulations and technical systems. A possible goal for the more extensive scenario may therefore be as

long as 10 year. This would allow also the more complex political decision making processes to run their course in the respective countries.

However, it is important to have the other goal dates throughout the implementation process. As discussed above it is important to keep the process going, which means that the Nordic co-ordinating body should be up and running within a year to keep the process on track both with regard to timing and content. If a Nordic information hub should be used as part of the integration process such a hub should be possible within a period of 3-5 years, and thus form a step on the way to the final goal.

Figure 1 below shows a tentative time frame for the proposed detailed solution for the scenario with extensive harmonisation is shown. The time line is to a considerable extent dependent on the extent to which the parties included are able to agree, make decisions and move on with the work.

Nordic coordinating body

The overall targets would have to be decided on the political level. As mentioned above we believe that NordREG could function as the coordinating body for the implementation. NordREG is already existing and operational and should be able to fulfil this role virtually without any delay once a decision is taken. This is simple a matter for the Nordic governments (Nordic Council of Ministers) to agree on and allocate the task. The main uncertainty related to having NordREG as a coordinating body is if they can agree and push the development. However, this difficulty probably arises independent of how the coordinating body is appointed. Therefore, it is important that the body is given a clear mandate from the political level that they should drive the coordination process.

The other main alternative, the electricity market group, is also already existing and operational, thus it could also take this role immediately if given the task.

A completely new body could also be set up, including e.g. also market participants. This would however by itself be a process that risks delaying the main process.

Standardized information flows

Standardized information flows include e.g. message formats, but also how the information should flow (between whom). NordREG (2009) proposes that a proposal for harmonised message formats should be developed by end 2011 and a proposal for harmonised minimum content of messages and timeframes for message sending should be developed by mid 2010. The NordREG proposal then suggests that both of these should be in use by end of 2013. It may seem like a relatively long period for analysis and development of a proposal (1-2.5 years from today), but is most likely required in order to reach an agreement. We thus suggest a similar time line for agreeing on and implementing a standardized information flow.

Nordic information hub

The most difficult issues related to a Nordic information hub are probably to agree to establish it and then to decide on how it should be designed, what

information it should contain, whether it should be a data base or only a hub similar to the EMIX solution.

To some extent the Nordic information hub and the standardized information flows are linked and we suggest that these two are developed in the parallel and communicating processes with the same time schedule.

Minimum levels for metering

It is important to quickly reach a common understanding on the minimum levels for metering. Substantial investments in e.g. metering equipment and IT solutions will be needed and will depend on the requirements decided. We therefore propose that an agreement is reached already during 2010. The implementation period has to be relatively long to allow for the investments to be made.

Nordic balance settlement organisation

To establish a Nordic balance settlement organisation will take some time since it requires both political decisions in all Nordic countries as well as decisions on location, organisation, IT-systems etc.

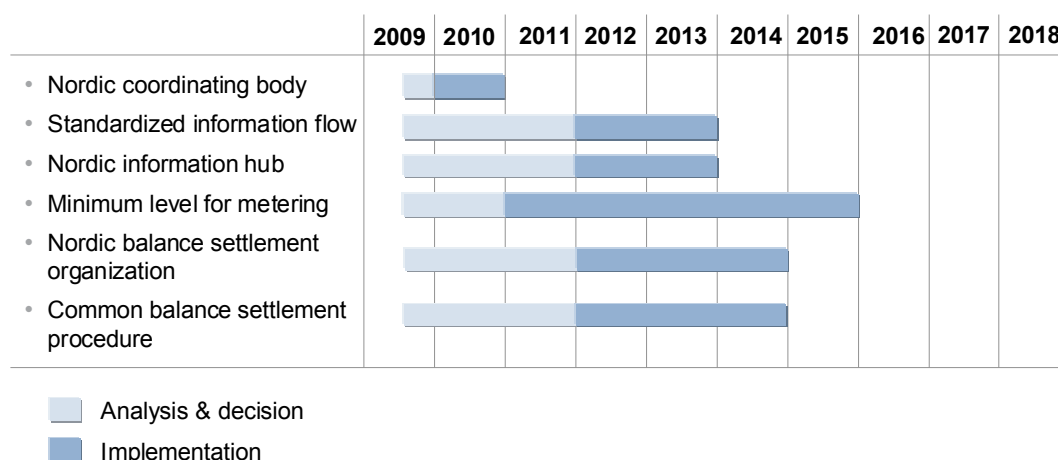
In its initial phase it may not function as a balance settlement organisation, but rather drive the processes related to the implementation of a common balance settlement agreement and procedures.

We suggest that the analysis and decision to establish a Nordic balance settlement organisation is finalized before the end of 2011. The implementation phase will be stretched out over a couple of years, with the initial period focusing on establishing common rules and procedures.

Common balance settlement procedures

The principles for pricing imbalances have already been harmonised, but the procedures differ substantially between the countries. We expect that this will require some thorough analysis of the alternatives, but that agreeing on common procedures will also be difficult.

Figure 1. Time line for implementation of a harmonised Nordic end-user market for electricity



Source: Econ Pöyry

4.4 A coalition of the willing

There are naturally uncertainties around the actual political and organisational commitments to implement a harmonised common Nordic end-user market for electricity. The Nordic wholesale market was not developed by waiting for everyone to agree. Norway and Sweden started out with forming a common power exchange – built on the already existing Norwegian exchange. Finland and Denmark later joined Nord Pool.

We believe that a similar approach should be taken also for the retail market, if agreement cannot be reached among the four countries concerned. It is, of course, preferable if a common market for all of the Nordic market countries could be created at once. But, if some country is unwilling to proceed or significantly slows down the process, the others should proceed based on a concept of a coalition of the willing. Even if only two countries agree to proceed it is a positive development, and the remaining country/countries could join at a later stage. Over time a harmonised market could be extended also outside the Nordic countries, e.g. to the Baltic states and Northern Europe.

4.5 Single point of contact – supplier centred model

The proposals in this report is based on a market model that essentially follows the market models already established in the Nordic region, i.e., where the end-users have a contract with a supplier and with a distribution company.

There is also a broader debate whether this market model is the preferred one. For instance there is a discussion of introducing a system with a **single point of contact** for the customer. This would greatly simplify the electricity market from the customer point of view.

With a so called supplier centred model the individual may not have any contractual relationship at all with the distribution company, but only with the supplier. The supplier then “buys” the “transport services” of its good to the customer and the DSO invoices the supplier for this.

The customer would then get one bill including all electricity charges. The split between different bills for the product/service and for the infrastructure/transportation is rarely found in other industries. Apart from simplifying for the customer it would also save money through the reduction of the number of bills sent.

The single point of contact concept would not mean that the customer never should have contact with the DSO. Technical issues such as power failures and connection questions would probably still need to be directed to the DSO.

The details of such a model may of course differ. The Netherlands are currently implementing a supplier centred model, which also includes a central database where all market participants can collect the necessary information.

We see some clear merits in such a scheme and it carries a potential to improve the functionality of the market. However, we have regarded this as being out of scope of the present study. Thus, no deeper analysis of such a fundamental change in the market model has been included

4.6 Closing remarks

The main purpose of the market is to allow the customers more choice when choosing suppliers, and to ensure that the customers’ options will remain open. At the same time it is meant to create an improved arena for competition. It is thus important to maintain the options for competition so that suppliers will be able to negotiate, differentiate and develop different products, and the suppliers will be able to develop products also with focus on other aspects than price.

Earlier studies have showed that one should perhaps not expect large decrease in the electricity price due to an integrated retail market. Although retail market competition varies between the countries this market is relatively competitive and the retail margins are typically quite small.

This also highlights that it is important that an integrated market is introduced in the right way – the gains from harmonisation are unlikely to outweigh potentially negative effects of a bad market design.

We would, once again, like to stress that in order to make progress harmonisation of the market should be based on a principle of “the coalition of the willing”, i.e., we should not allow the unwilling to delay or stop the process. It is far better that the process begins with perhaps only two countries initially rather than waiting for the slow ones. Others – both Nordic and other neighbouring countries – could join later.

The willingness on the political level is high when it comes to the main objective with one common Nordic retail market, but national decisions are being taken on market details that in sometimes obstruct the main objective. There is a need to take the objective of a common Nordic retail market into consideration when detail market decisions are taken in each country.

Based on this and other similar studies it seems clear to us that it is difficult to assess the overall cost and benefits in high level studies. More in-depth knowledge of the costs involved will probably not be reached until the process is initiated with a clear view on the future market design and analysis of different detailed alternatives is made.

References

Badano, Fritz, Göransson and Lindén (2007), "Timmätning för alla. Nyttä, regelverk och ekonomi", Elforsk rapport 07:62

Damsgaard (2007), "Customer benefits of an integrated Nordic end-user market for electricity. A discussion memo", Elforsk report 07:48

Damsgaard and Fritz (2006), "Affärsmodeller för ökad efterfrågerespons på elmarknaden", Elforsk rapport 06:10

Damsgaard and Römpötti (2007), "Retail margins and the effects of an integrated Nordic end-user market for electricity", Elforsk report 07:49

Econ Pöyry (2009), "Prisområden och konkurrens, version 2"

Lindskoug (2005), "Demonstraktionsprojekt. Effektstyrning på användarsidan vid effektbristsituationer", Elforsk rapport 05:31

NordREG (2006), "The Integrated Nordic End-User Electricity Market – Feasibility and identified obstacles", NordREG report 2/2006

NordREG (2007), "Cost and Benefits of Nordic Retail Market Integration", NordREG Report 5/2007

NordREG (2008), "Harmonised supplier switching model", NordREG Report 2/2008

NordREG (2009), "Market Design. Common Nordic end-user market", NordREG Report 3/2009