



# New Energy Services: Barriers and Solutions

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## Background

The energy field is changing to mitigate climate change. The goal is to decrease emissions and increase energy security. The change will be pushed forward with digitalisation, technological leaps, and distributed solutions. Finnish Energy's vision on customers era (2018) discusses that the change will servitise the sector and overall radically change it. The goal of this summer project was to get an overview of the development of sector-integration projects in Finland and the offering of energy services to customers. Two other aspects were to gather information of obstacles for further development and examples of new offerings.

This analysis is based on interviews with specialists in the energy field. These concentrates on sector-integration and new services. Services are one way of implementing sector-integration, but not all services are sector-integration. This ongoing transition brings companies new possibilities to offer services and products, and customers more chances to affect their choices. This will increase customer satisfaction, bring improved services, better optimised system and give companies savings.

## Methods and purpose

The goal of the interviews was to understand the situation of sector-integration in companies in the Finnish market and to get an overview of offered energy related services, especially new ones. In this case, services covered everything, except only traditional energy (electricity, heat or gas contracts) sales. However, product bundling of electricity, gas, or heat with a service are included. The interviews concentrated on both the companies' perspective, views, and opinions, but also customer feedback. The final material should help in Finnish Energy's advocacy work and used as examples in education for employees in the energy field. This chapter concentrates on the planning of the interviews and does not discuss the findings from the interviews.

The interviews were divided into two parts, first sector-integration related matters and then services. However, the two topics are strongly interconnected, and the separation was not clearly visible in all the interviews. In addition, the interviews concentrated either on the company's view on the general picture or on specific services or divisions in a company. The chosen path was mostly dependent on the area of responsibility of the interviewee. Both gave important input to barriers for working towards sector-integration and the launching of new energy services.

The interview questions were planned beforehand into a questionnaire template, shown in the appendix, which were then modified to fit the individual interviews better. Questions were also modified on the go if the interviewee mentioned something interesting. This method may not fulfil the requirements for an academic research, but it gave insights into the barriers in the Finnish energy markets. For this purpose, it worked. However, this was a very laborious way to get insights, but simultaneously the interviewees liked talking and gave long answers to well formulated questions.

The goal was to interview a heterogeneous group of companies and company representatives. However, the timing of the interviews just before and after the summer holiday period in Finland may have affected who answered the interview requests and who took the time to schedule an interview. In the end, I had eleven (11) interviews, with ten (10) companies listed in *Table 1*. These included one researcher from a Finnish University, one advocacy organisation representative, one larger company representative working with demand response, one in forestry, one new entrant to the Finnish electricity market and four municipality owned company representatives. District heating was represented by the largest number of interviewees, which may have affected the results and emphasised certain areas. Others were also asked, but the summer holiday period probably made the timing non-optimal for interviews.

Table 1. The interviewees and related background information.

No.	Organisation	Name	Title	Comment
1	Paikallisvoima	Jari Nykänen	Advocacy Manager	Represents smaller energy companies in Finland
2	LUT	Salla Annala	Researcher	Researches demand response
3	Fortum Spring	Jani Leirimaa	Business Development Manager	Works with Spring
4	Lahti Energia	Jarmo Virtanen	Sales Manager	Also, IoT & Energy Solutions
5	Helen	Jussi Uitto	Business Development Manager	
6	Helen	Jussi Ylinen	Innovator	
7	Metsä Group	Pirita Mikkonen	Vice President, Energy	
8	Pori Energia	Tiia Niemi	Customer Relations Manager	
9	Enefit	Ville Pentti	CEO in Finland	
10	Fingrid	Niko Korhonen & Jussi Matilainen	Specialist & R&D Manager	
11	Gasgrid	Anni Sarvaranta & Sara Kärki	Senior Vice President, Strategy and Market Development, Development Manager, Business Development and RD&I	

## Analysis

The interviews clearly concentrated on new projects and services, and related barriers and restricting legislation. Questions about success stories were also asked, but more focus was clearly put on the obstacles for further development. Therefore, many projects and services that have an established position on the Finnish market were not discussed. As a result, the findings may be skewed and show a more problematic

market compared to reality. However, the tone was overall positive for the Finnish market and its liberal regulation, but still problems were pinpointed.

The discussion often ranged around solar power, e-mobility, demand response, energy efficiency, efficient resource usage and district heating. The role of gas, on the other hand, is still adapting. Research activities are increasing and further development is upcoming. LUT (2020) is researching in the area and for example Neste (Lane, 2020) and SSAB (2020) have pilot projects. Out of the services entering the market, solar power has made the furthest progress. The problems for most of these seemed to be housing companies making decisions and buying these products and services. The decision-making process is slow, as it requires official meeting and the majority of votes. An interviewee hoped that the decision process would get smoother in the future when products and services get more common. However, a board meeting decision will probably be sufficient in the near future. Other customer segments, for example, companies and consumers, are targeted too, but the selling process is easier and therefore not discussed as much in the interviews.

The findings can be divided into 11 themes, each with further detailed findings. Here, the findings will be discussed anonymously, backed up with claims from the interviews and analysed. These themes are: poor knowledge about terminology (sector-integration, sector-coupling), favourable Finnish regulation and that it has created a positive competitive position for Finnish companies, different perspectives between companies and politicians, importance of efficient resource use, changing understanding of energy, difficulties understanding the importance of energy networks, cooperation between companies becomes more common, costumers are brought to the centre, new services has to add value, Finnish Energy's customers' era vision and district heating's market position.

The first theme was the poor knowledge of the term sector-integration and the definition of a service. Sector-integration was defined by some as the integration of gas and electricity, others saw it as a very wide concept including all different energy forms and sources. Some said they googled it before the interview to get a better picture of the term. In addition, sector-coupling and -integration were mixed up or the difference was not understood. The terms are new and therefore, it is understandable that the definition is not widespread. In addition, even EU bodies have used the terms sector-integration and sector-coupling interchangeably. Finnish Energy could keep up a public discussion on the topic and simultaneously increase the knowledge in the area. Furthermore, sector-integration is far developed in the industry, but they are unaware of the term. This interview showed that sector-integration is also a large communicational issue both around the topic, but also between different industries. On the other hand, the term is not important for companies in their everyday business. It is used in politics, societal discussions, and advocacy work. The different views of companies and politicians are further discussed later.

The second finding is that Finnish legislation is in general open for new types of integration and services and the market is favourable and enabling. However, it was still the most discussed topic in the interviews. This clearly shows that regulation is an ongoing process. The job of fitting business and regulation never stops. To begin with, regulation should allow the entry of new innovations and technology. This allows the market to decide what is profitable and succeeds, and also to meet customers' needs. One of the interviews brought up that business emerge to solve problems. In the end, legislation and regulations will, to a wide extent, determine how the future develops.

Continuing with the same topic, interviewees discussed that energy systems are optimised only over a smaller part of the whole. This is because companies optimise from their own perspective over parts of the energy system which they operate in, and which they can monitor themselves. Therefore, the setting the goals for whole system integration and providing tools and incentives for the whole system is the responsibility of politicians, not companies. Politicians are responsible for introducing legislation that allow companies to share their profit of cooperation. For example, incentives could be in place. This is then connected to the question of resources and their usage. For example, the requirements for substitutes for

plastic are increasing, but new biomass-based materials are often away from energy production. The same applies for waste and division between burning and recycling. On the other hand, legislation for chemical recycling is underdeveloped. One important discussion will be the distribution of these resources.

Regulations require implementation to understand their impact, especially on new technology and innovations. The new solutions bring up barriers that could not have been noticed with older technology. Therefore, the requirements often arise suddenly and then the need to change is urgent. On the other hand, also new regulations can have some unsuitable details and then change should also be rapid. Unfortunately, these rapid changes lead to an unfavourable investment market. One interesting development for the future is the implementation of energy community legislation in Finland. The goals are largely known and defined in the final report by the Smart Grid working group (2018). Only time will tell what kind of services this will bring to the market.

The liberal Finnish market has given Finnish companies great opportunities to develop their business models towards a greener future. This gives companies a head start when entering other markets in terms of knowledge and expertise. However, legislation differs remarkably between EU countries. This increases the barriers to enter a new market. Also, it is important to remember that only businesses can move abroad. The Finnish companies already have the expertise at this point, which should be their advantage. The markets are tied to specific countries.

The progress of sector-integration has two sides, the business and political ones. The first answers to changes in the market and the second plans how to change the market. The low understanding of the term sector-integration probably stems from this point. The politicians create the strategies with the new terms and then businesses adapt to the changes. Politicians are responsible for the whole picture, whereas companies look at society from their point of view. Larger companies more often have the resources to create demand and push new products to the market. However, also the larger companies say that they mostly react to pull factors from the market. Here, the demand can also come from new legislation that forces to, for example, recycle more.

The understanding and interest of energy questions is changing. The society is electrified, customers ask more about production, non-monetary key performance indicators (KPI's) emerge, and the youth have protested for more action to mitigate climate change. Electrification makes energy visible in a different way than before and therefore, customers also have interest in production and sources of energy. Non-monetary KPI's become a part of decision-making processes, even if all business still must be profitable. Also, the protests arise interest in their effect on the future and on the demand when the protesters start making their own decisions.

Energy is seldomly produced at the same location as demand. Therefore, energy needs networks. This improves the opportunity to produce the energy where it is the most efficient. In addition, efficient networks increase security. However, this connection is often dismissed by customers. Further development in demand response or investments in batteries can decrease the required investments in networks and further use of gas could improve long-term storage. This is a win-win situation, but according to the smart grid working group (2018), electricity network companies are only allowed to own network. Therefore, the batteries must be bought from a market-based company. One interviewee brought up that public discussion concentrates on the high increases in prices but does not discuss the reason behind them or the high investment requirements arising from regulation. Also, politicians take part in the discussion, but the requirements come from their decisions.

As a part of sector-integration, cooperation between companies increases in energy questions. This includes both cooperation between energy companies and across sector lines. Energy companies can for example help data centres to save money in their energy bills through demand response. However, the knowledge of energy questions is low outside the field. Energy related problems are not prioritised or then no one realises all the possibilities. Increasing the understanding of energy takes time and the transition to including

customers in energy related questions is new. In addition, district heating companies were used to competing in the market in peace and finding synergies between companies. In district heating, networks are separate and does not compete, but competitors are other sources of heat. The competition may change when, for example google, Facebook or other new entrants come to the field with comfort monitoring or other energy related services. In the electricity market, the price competition is getting tighter. Therefore, smaller energy companies outsource this part of their business. Marginals are so small that economies of scale are needed. This is the goal with new companies and the reason behind the recent consolidation trend in the electricity markets in Finland. The transition can be compared to the change in the teleoperator market in Finland a few years ago.

Businesses are bringing customers to the centre. Customers are targeted as a part of the solution to cut emissions. However, this applies mostly for electricity and related services. For example, solar power on roofs is getting common in Finland and electric vehicles are increasing in number together with charging stations. However, especially regarding heat, the interviews gave the feeling, that new services are not targeting consumers. The main customers for new heating related services are mostly housing companies<sup>1</sup>, and consumers then final users. On the other hand, the interviews highlighted that demand of new services has not grown in the same pace as public discussion has become livelier.

Another arising service is demand response. There, the largest loads are in industry, but in absolute numbers the largest possibilities are consumers. The interviews discussed that companies often make reasonable decisions based on predefined KPI's, but consumers can base the decision on a feeling or fulfilment of values. For both, selling has to include a feeling of increased value, but its communication especially to consumers can be difficult. In the industry, the available load available for demand response is large and adds enough value alone. Among business customers, the progress has gone further. Demand response has also been a good way to show companies that sector-integration does not harm business. The interviews gave the impression that the understanding of demand response has to be increased both among business customers and consumers.

One discussed aspect was the customers' era vision collected by Finnish Energy in 2018. I asked directly in four interviews about their view and comments on the vision. All of these said that it is still current and that parts are getting implemented now. In the other interviews, I did not ask about the vision directly, but the discussed topics were in line with the vision. Four of the five development areas mentioned in the vision were discussed widely in the interviews. The comfort monitoring services are a part of the first change with housing and lifestyle becoming more diverse. The second discusses Finland developing into a service economy, which is particularly visible with the wide offering of energy services. The third is improving the involvement of the manufacturing industry to the energy market, which is possible, for example, through the discussed demand response possibilities. The fourth revolves around a smart transport system, which is shown through electric mobility, charging point. The fifth discusses business opportunities in rural areas increasing the need for services around distributed microgeneration. Rural areas specifically were not in the scope of the interviews, but services around microgeneration were discussed and seems to enter the market in the near future. However, many of its aspects are still only used by pioneers. In addition, all aspects are not progressing in the same pace. For example, solar power has progressed more than e-mobility and demand response. One suggestion was to integrate the bills of electricity and distribution to one bill. This could for example help in communicating the importance of electricity grids.

District heating companies commented that they are only one of the choices to heat a house. The competition is increasing, and heat pumps are getting more common. To tackle this and answer to the competition district heating is becoming more of a service-based product. In addition, district heating is integrated with comfort monitoring services<sup>2</sup>, optimising for example temperature, air quality etc. In

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<sup>1</sup> Suomeksi taloyhtiö, haastattelut eivät erotelleet asunto- tai kiinteistösaakeyhtiöitä

<sup>2</sup> Suomeksi olosuhdepalvelu

addition, the measurements can provide data for more accurate decisions. Simultaneously, transparency increases and allows customers understanding the process better.

## Discussion

Overall, the interviews gave a positive overview of the Finnish energy field. The interviews gave a feeling of companies accepting the transition toward a more environmentally friendly world and using the arising opportunities. The changes include barriers and some trial and error, but Finnish companies seem to handle the pressure well. The companies seemed to be progressing in a similar direction stated in the Customers era vision by Finnish Energy. Most stated that strategies have shifted to put customers in the centre. In addition, the interviewees seemed to like their job and saw it as purposeful.

As already often mentioned, sector-integration as a target is new, so are the terms and the released strategies and regulations. The change will take time and requires communication. The process gets faster by upkeeping a discussion about the topic. This is a task for the Commission, third sector, universities, larger companies and so on. This will make selling new products and services easier. The message of the upsides of sector-integration must reach new sectors and players to really create an allowing market for new sector-integration projects. Simultaneously, the energy field must understand the differences between other sectors and the best starting point for cooperation.

Finnish regulation is permissive and market-based and mostly barriers are elsewhere. The interviews also gave the impression that Finland is doing better than many other EU countries. However, this also shows that there is a lot to do to unify EU legislation in energy questions. Interviews clearly concentrated on new challenges and new legislation. The focus was clearly on the future. Therefore some, for example solar power for individual houses and energy efficiency were mostly not mentioned. Solar power has already established its market in Finland and now it is mostly selling and competing of new customers and market share. Housing companies' solar power, on the other hand, requires implementation of energy community legislation for most benefit to residents.

The interviews emphasised problems with selling to housing companies. However, in reality the barriers are improbably concentrated to these players only. Reasons for the image may come from the high number of district heating players interviewed. For example, district heating companies are developing comfort monitoring services to housing companies in particular and also, solar power available for all housing company residents requires implementation of energy community regulation.

The interviews discussed that sector-integration is viewed differently, or from different perspectives, in companies and politics. As discussed earlier, politicians regulate and plan the whole picture, whereas companies concentrate on their own perspective. However, the different perspectives affect the discussion. I feel that both sides have to remember to adapt their way of discussing when talking with each other. This requires defining the terms used similarly to at least have a common starting point.

Lastly, the transition is slow. Energy related investments are large and therefore, need time for implementation. Also, new investments have a larger risk. Furthermore, including customers in the energy system is a new view. The energy companies have understood the benefit, but now it has to be communicated over to other sectors. However, awakening the interest and understanding is slow and has to be given time.



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## Appendix

### Interview questionnaire template

#### Sektori-integraatio

Miten määrittelet termin sektori-integraatio?

- Mitä mahdollisuuksia se tarjoaa yrityksellenne?
- Entä haasteita?

Minkälaisia esimerkkejä sektori-integraatiosta yrityksenne edistää jo?

Mitä toiveita sinulla on päättäjille?

- Miten lainsäädäntö voi mielestäsi auttaa?
- Entä haitata?

Voisiko ET auttaa sektori-integraatiossa?

Mittaatteko edistymistä?

- Myös molempiin aiheisiin viittaava kysymys
- Tarvitsee jotain taustotusta
  - o Kannattava liiketoiminta – rahallinen
  - o Onko muita kuin rahallisia mittareita?

*Pyydä usein konkreettisia esimerkkejä*

- *Näistä saa eniten irti*
- *Varsinkin haasteista – Mistä ne johtuvat? Säätelystä? Vai jostain muusta?*
  - o *Esim miksei asiakkaita kiinnosta?*
  - o *älä päästä haastateltavaa helpolla*

#### Palvelut

Mitä strategisia tavoitteita teillä on asiakkuuksien osalta?

- *Johdattelee vähän*
- *Tähän liittyen edistymisen mittaamisesta kysymys*
- Riippuvatko ne asiakasryhmästä?
  - o *Kuluttaja vs yritys*
    - *Esim kaukolämpö on pääasiassa isommille asiakkaille*

Oletko tutustunut ETn asiakkaan aika visioon?

- Oletteko jo jollain osa-alueella aktiivisia?
- Lähetä asiakkaan aika visio etukäteismateriaalina

Mitä ~~uusia~~ palveluita tarjoatte?

- *Mikä on uusi palvelu? Pitäisikö vain kysyä palveluista*
- *Palvelut ovat kaikki muu paitsi energian myynti*

Missä olette vahvoja?

- Millä perusteella tiedätte tämän?
- Millä mittareilla?

Missä haette kehitystä?

- Missä olette kokenut haasteita? Tai esteitä?
  - o *Minkälaisia esteitä? Sääntely? Kaupallinen? Tekninen?*
- *Kysy konkreettisia esimerkkejä – tästä voi olla oikeasti hyötyä ja saada edistettäviä esimerkkejä*

Miten asiakkaat ovat vastaanottaneet ~~uudet~~ palvelut?

- *Asiakaspalaute*
- *Menekki myös kertoo palvelun onnistumisesta*

Viitaten keskusteltuihin aiheisiin, mitkä on teidän prioriteetit?

- *Voisi kysyä liittyen uusiin palveluihin ja sektori-integraatioon yleisesti*

Onko lisättävää? yms