ABSTRACT
Purchasing services has become more common in organizing business processes among Finnish distribution companies. This study is one part of a research project that is an update to the services purchasing currently and evaluate the future development. Mainly purchasing services have been satisfying and benefits are clear. Also risks exist and distribution companies seem to identify them.

INTRODUCTION
Electricity distribution business in Finland is changing towards networked business model [1]. This paper deals with a project studying purchasing of services in the Finnish electricity distribution currently. The project was divided to subtasks, from which web questionnaire for distribution companies and service providers were one. This paper focuses on the results of the questionnaires. The aim of the whole project is to find out following issues:

- What business processes are purchased as service
- The main reasons for purchasing
- Ratio of in-house and service business processes now and in future
- Expected benefits and risks in service purchasing
- Experiences of service purchasing
- Activities and steps in successful the process
- Prerequisites and barriers of successful outsourcing
- Best practices in the market
- New innovative service business concepts

The project has been ordered by Finnish Energy Utilities Association (Energiateollisuus ry) and carried out by Technical Research Centre of Finland (VTT), Lappeenranta University of Technology, and Tampere University of Technology. Project was carried out mainly during year 2008.

SURVEY STRUCTURE AND RESPONSES
Survey’s questions were divided into functions under network planning, network construction, network operation and maintenance, measurements and customer service. Individual business processes are presented in Table 1.

Questionnaire was sent to 81 companies. Results from 30 companies were received from which 25 fulfilled the extent for conducting analysis. When looking at the network length or number of customers the answers present very well the DNO’s in Finland. According to network length coverage of the study is 72 % and according to number of customer’s coverage is 68%. Results have also been divided into 3 groups as large, medium and small companies according to their number of customers. Large companies have over 50.000 customers, medium 50.000-10.000 and small less than 10.000. The percentage from large companies answers cover 78 % of companies in this size. In medium size companies coverage is 25 % and in small 15 %

In network length medium size companies present 41 % of companies.

According to answers business processes can be organized in following ways:

- Processes are done in-house in the distribution companies.
- Processes are purchased partly or entirely from company that has ownership relation to the distribution company.
- Processes are purchased partly or entirely from company that is independent from the distribution company. This model can also bee called as actual service acquisition.
- Processes are organized in combination of alternatives above.

In the next chapter results from the utility questionnaire are presented. Results are correlated with company size or type of organizing the processes as described above.

START-UP OF THE SERVICE PURCHASING

The service purchasing begins with finding out the possibilities to purchase service. Second phase is to ask for tender from service providers and if the decision is to purchase service make an agreement with selected service provider. The portion of each process and their level of involvement in each phase have been presented in Table 1.
Looking at Table 1 it can be seen that according to results medium size companies are using more services than the large utilities. The number from small utilities is not presented as the number of answers was so small.

When comparing the portion in each step it can be seen that in many cases the portion of tender request is smallest. This may be due to utility already knowing the partner providing the service.

The year that service purchasing started among the utilities answering this questionnaire has been presented in the Figure 1.

Table 1. Number of processes by utility size that they have A) made research of possibility to purchase service B) put processes out to tender C) Purchase service.

<table>
<thead>
<tr>
<th>Category</th>
<th>Large</th>
<th>Medium size</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
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<td></td>
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</tbody>
</table>

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Figure 1. Number of distribution companies service purchasing beginnings annually since 1990.

Year 1995 is the highest peak in number of business process service start ups. Looking at individual results one company made 7 process service starts but still it is a highest number annually. Finnish electricity market was liberalized in 1995 which may have increased the number in that year. Also the change of the century is another high rate of service start ups. No clear reason for this was found based on the questionnaire results. The years include both full and additional service acquisitions. More detailed analysis of the start-up phase of the service purchasing is presented in [2].

SERVICE PURCHASING AND FUTURE TRENDS

Utilities can select strategy for approaching their processes in terms of whether to purchase services or do them in-house. Each process can be decided separately or the companies can make general decision on whether to favour in-house or to start using services in large scale of the processes.

When looking at results 14 utilities gave totally covering answers on all or almost all of the processes. This is 17 % of the total number of companies receiving the questionnaire and x % of companies answering the questionnaire. In-house processes were dominant in 3 utilities and also 3 utilities were favouring full scale service purchasing. Other companies were having both in-house and services in their process organization.

Table 2 is presenting the main type of organizing business processes in utilities currently. In addition it presents the change in percentage in that by the year 2015. Table is divided into mainly in-house, mainly service purchasing from ownership level service provider or from independent service provider.

Table 2. Comparison of process organizing now and change compared to year 2015.

Looking at Table 2 the change from today’s process organization is that the number of mainly in-house processes is decreasing by 40%. Independent service purchase is increasing it’s share by 67% and ownership relations services 22%.

Most typical in-house processes for Finnish utilities are general and network planning now and also in 2015. Also most of the network construction processes have high in-
house rate excluding 110 kV network. Other processes purchased extensively from independent service providers are substation projecting and balance settling. One of the biggest changes is taking place in measurement processes. AMR service process will be purchased most extensively from independent service provider in 2015. The change is from 45 % in-house to 18 % in year 2015. Table 3 presents the additional purchase of services according to type of partner with future trend.

**Table 3.** Portion of additional services purchased by the utilities and change by the year 2015.

<table>
<thead>
<tr>
<th>Category</th>
<th>Additional purchase / Independent</th>
<th>Additional purchase / Ownership</th>
</tr>
</thead>
<tbody>
<tr>
<td>Network planning</td>
<td></td>
<td></td>
</tr>
<tr>
<td>General planning</td>
<td>7 %</td>
<td>0 %</td>
</tr>
<tr>
<td>Network planning</td>
<td>36 %</td>
<td>+11 %</td>
</tr>
<tr>
<td>Field planning</td>
<td>57 %</td>
<td>+10 %</td>
</tr>
<tr>
<td>Structure planning</td>
<td>50 %</td>
<td>+19 %</td>
</tr>
<tr>
<td>110kV</td>
<td>23 %</td>
<td>-8 %</td>
</tr>
<tr>
<td>Cable network</td>
<td>45 %</td>
<td>0 %</td>
</tr>
<tr>
<td>Overhead lines</td>
<td>47 %</td>
<td>-5 %</td>
</tr>
<tr>
<td>Substation</td>
<td>24 %</td>
<td>-5 %</td>
</tr>
<tr>
<td>Warehouse/logistics</td>
<td>25 %</td>
<td>0 %</td>
</tr>
<tr>
<td>Network operating</td>
<td>14 %</td>
<td>+14 %</td>
</tr>
<tr>
<td>Fault repairing</td>
<td>36 %</td>
<td>-7 %</td>
</tr>
<tr>
<td>Condition inspect</td>
<td>50 %</td>
<td>0 %</td>
</tr>
<tr>
<td>AMR service</td>
<td>18 %</td>
<td>+9 %</td>
</tr>
<tr>
<td>Mass meter replace</td>
<td>57 %</td>
<td>0 %</td>
</tr>
<tr>
<td>Balance settling</td>
<td>0 %</td>
<td>0 %</td>
</tr>
<tr>
<td>Condition monitor</td>
<td>50 %</td>
<td>-33 %</td>
</tr>
<tr>
<td>Commercial</td>
<td>20 %</td>
<td>+20 %</td>
</tr>
<tr>
<td>Technical</td>
<td>0 %</td>
<td>0 %</td>
</tr>
</tbody>
</table>

From Table 3 the result is that the number of additional service processes purchased from ownership level partners is increasing by 72 %. The number of service processes purchased from independent service providers is increasing totally around 10 %. This may due to many answers covering 2015 included the option of purchasing also from ownership level partner in addition to independent service provider. This may indicate uncertainty of future strategies of purchasing.

Network planning functions are increasing the portion of additional services purchased and especially from independent service providers by the year 2015. Condition monitoring is decreasing the number of additional services and increasing the total service purchasing from ownership and independent service providers.

Tables 2 and 3 indicate that currently if utility has ownership with the service provider it is most likely that the process is fully purchased as service. If the service provider is independent and agreement is based on competition the level of cooperation is not so deep. Excluding balance settling, 110 kV network construction and substation projecting in-house processes combined with serviced purchased from ownership level partner form majority share of total number of agreements. Looking to year 2015 this seems to be changing as stated in Table 2 that the number of mainly purchased services from independent service provider is increasing by 67 %.

**BENEFITS AND RISK OF SERVICES**

Risks identified by utilities that were common to all of the processes were in order of importance:

1. The number of service providers is too small for truly functioning market of services
2. Targeted costs savings doesn’t realize
3. IT systems cannot support service purchasing
4. Service purchaser’s and service providers relationship doesn’t meet the expectations
5. Lose of know-how in organization of service purchasing utility

Correspondingly benefits from service purchasing were identified in order of importance:

1. Getting additional resources becomes more easier
2. Possibility for the utility to concentrate on the core business
3. Cost savings
4. Access to the best practices
5. Better costs awareness

Risks and benefits varied a little in case of each process although those presented above cover the majority of those. Benefits from the service purchasing seem to out rule the risks as satisfaction to services purchased was high.

**THE ROLE OF IT SYSTEMS**

Information systems have a significant role in creating the services in the current utility environment. As stated in previous chapter the IT systems were seen as one of the most crucial risks. The risk is that they cannot support service purchasing. Following processes and their IT risk was discovered:

1. Condition inspections (most significant risk)
2. Balance settling (most significant risk)
3. Structure planning (2nd most significant risk)
4. Field planning (2nd most significant risk)
5. Warehousing and logistics (2nd most significant risk)
6. Meter mass replacing (2nd most significant risk)
7. Network planning (3rd most significant risk)
8. AMR measurements and database (3rd most significant risk)

In discussions with the utilities the risk was identified as integration problem. Meaning that transferring data from systems to another and allowing service providers download and update information was not possible or was very difficult. From service providers questionnaire this risk appeared on the list at number 11 as minor risk.

Compared to other IT related studies findings are identical.
In reference [3] following problems with IT systems were found:
1. System interface problems (integration)
2. Technical problems (inoperability)
3. Lack of user skills (cannot fully benefit from systems)
4. Program errors

These problems influence on service purchasing. Efforts on developing IT systems should be increased. The pressure from increasing service purchasing also requires this.

**UTILITIES OPINIONS OF THE SERVICES**

Important factor on service purchasing process is setting goals for the service. These can be quantitative and also qualitative. Types of goals set for services were not asked on this study. How ever the time that goals were met was asked. Table 4 presents them according to company size.

Table 4. Goals set for purchased services were met according to company size.

<table>
<thead>
<tr>
<th>Reaching goals</th>
<th>Large</th>
<th>Medium size</th>
</tr>
</thead>
<tbody>
<tr>
<td>During first year</td>
<td>52 %</td>
<td>64 %</td>
</tr>
<tr>
<td>During first 3 years</td>
<td>40 %</td>
<td>32 %</td>
</tr>
<tr>
<td>Not reached</td>
<td>8 %</td>
<td>4 %</td>
</tr>
</tbody>
</table>

Medium size companies are little bit more active on purchasing services. They also seem to meet goals set for purchasing services faster than large utilities. Also meeting goals in some phase along the agreement period with service provider is higher among medium size utilities.

Qualitative results from services were collected by asking utilities level of satisfaction to the purchased services. Results for this according to company size have been presented in Table 5.

Table 5. Utilities opinions from the services purchased on general level.

<table>
<thead>
<tr>
<th>Experiences from services</th>
<th>Large</th>
<th>Medium size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very satisfied</td>
<td>6 %</td>
<td>19 %</td>
</tr>
<tr>
<td>satisfied</td>
<td>72 %</td>
<td>51 %</td>
</tr>
<tr>
<td>Neutral</td>
<td>17 %</td>
<td>20 %</td>
</tr>
<tr>
<td>Unsatisfied</td>
<td>4 %</td>
<td>7 %</td>
</tr>
<tr>
<td>Very unsatisfied</td>
<td>1 %</td>
<td>3 %</td>
</tr>
</tbody>
</table>

**DISCUSSION**

The usage of services is increasing in the future among the Finnish distribution companies. The main reasons are concentration to core business, need for additional resources, access for best practices and cost awareness and saving.

Service purchasing itself is not something to promote. Results indicate that if managed well it can have positive outcome and it may help to solve problems related to in-house operations.

Utilities seem to be satisfied with services that they have purchased and in most cases the goals set have been achieved.

The effect of the company size does not seem to make big difference on how much of the processes companies purchase as service. Interesting factor is that many distribution companies have service company with ownership relationship. These regional companies are mainly outsourced from the distribution company and take care of network construction and fault repairing.

Results show that in future the trend is towards purchasing services from independent service providers.

The role of IT systems is significant in service purchasing and according to this study they also cause significant risk and actual barrier limiting usage of services. Utilities should take effort on actively finding solutions to these problems and invest on systems supporting service purchasing. Case studies made also reveal that best practice is to benefit IT also in tender and order phases. Some companies say this is obligatory for managing services purchased.

Changing from in-house business processes towards networked business model requires also changes inside the distribution companies. Previously know-how has been on work management but in service purchasing it must be on defining what is being purchased, what are the key performance indexes (KPI’s) to measure quality of service, what kind of legal agreements are set, how are the information systems following service purchasing and how to support service markets. The risks utilities see related to service purchasing can be controlled.

This is not easy task and seems to take several purchasing rounds to practice it. From distribution companies’ management this change in the business model should be taken into close consideration. Success in management makes this transformation a lot easier in long term.

**REFERENCES**

