EXPERIENCE OF CONNECTION FEES MODELS IN FINLAND AND SWEDEN RELATED TO EFFICIENCY AND REGULATION POLICIES

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ABSTRACT

This paper reviews the different models for connection fees in Finland and Sweden and the experience of their application in the Vattenfall electricity distribution companies. The design of the connection fees model has considerable impact on customer satisfaction and what's more the efficiency in the connection process in the distribution company. The paper describes the possibilities opened as a result of launching the connection fee zone-model based on fixed price in each zone for each connection size. The great importance of the regulator's confirmation of the model and its application is discussed on the basis of experience in Finland and Sweden.

INTRODUCTION

Traditionally individual cost methods for connection fees have been used in both Finland and Sweden. The traditional method in Sweden is described in a recommendation from Swedenergy [1] and in a publication from the Swedish regulator [2].

From a theoretical point of view an individual cost based method should work well as every new connected customer is supposed to pay the calculated cost caused by the connection. However practical circumstances often lead to difficulties with a cost based model for the network company as well as the customers.

CONNECTION FEES MODELS IN FINLAND AND SWEDEN

Finland

In Finland the drawbacks with a cost based method resulted in a cooperation between the Finnish regulator and the association of the Finnish electricity distribution companies. In 2005 this resulted in a new national zone method for connection fees in Finland. The new Finnish method is described in [3].

Zone method in Vattenfall Finland
The zone method consists of three different price zones which all have a fixed price for the connection size (fuse or demand related). The connection fee is based on the average network constructing costs per connection in each price zone.

Zone 1 in city planned areas. (All connection fees are fixed)

Zone 2 outside city planned areas, within 400 m from an existing sub station. (Fixed fees up till 3x63A)

Zone 3 outside city planned areas, between 400-600 m from an existing sub station. (Fixed fees up till 3x35A)

Outside zone 3 the price is based on an area pricing method where the connection fee is determined for a specific geographical area. The area-price calculation takes into consideration all the potential connections in that specific area.

Sweden

In Sweden discussion about a new model has been going on for some years. A pioneering work in zone pricing was described in a report from a working group in the 6 city group [4].

The introduction of a new national model is however delayed because of a large number of complaints concerning pricing with the existing method regarding the connection of telecommunication pylons. In order to facilitate the handling of these complaints the Swedish regulator simplified the calculation of the individual cost by using standard costs, which is described in [5].

In Sweden a proposal for a new legislation from 2012 demands a zone method for connection fees [6]. Although there is yet no national method in Sweden two of the largest network companies, EON and Vattenfall, have introduced zone methods in 2008. A likely outcome is that experiences from zone methods in Finland and Sweden will result in a Swedish national model.

Zone method in Vattenfall Sweden
The connection fees are based on average costs and have a fixed price for each connection size (fuse or demand related) in four different zones.

Zone 1 in city planned areas. (All connection fees are fixed)

Zone 2 outside city planned areas, within 400 m from an existing sub station. (Fixed fees up till 3x63A)

Zone 3 outside city planned areas, between 400-600 m from an existing sub station. (Fixed fees up till 3x63A)

Zone 4 outside city planned areas, between 600-1000 m from an existing sub station. (Fixed fees up till 3x63A)

The zone model in Vattenfall Sweden is illustrated in figure 1 and table 1.

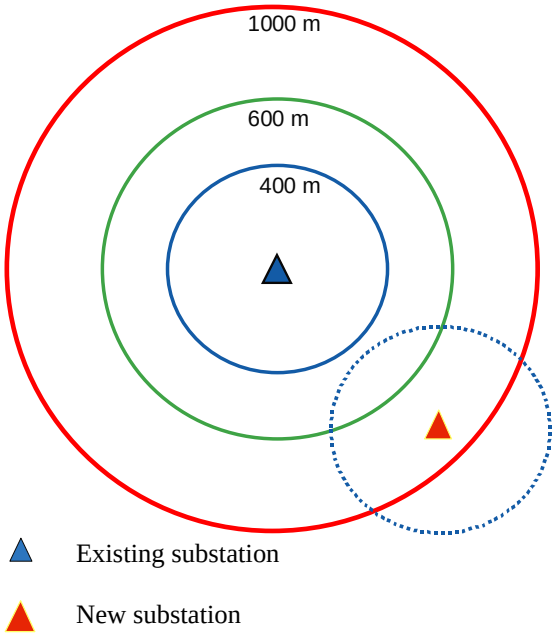

Figure 1. Illustration of the zone model used by Vattenfall Sweden

A connection in zone 4 demands of technical reasons that a new sub station must be built. The fee is calculated as a reasonable fee for the first customer taking into account that additional customers normally pay a fee according to zone 2 or zone 3. The fee for a connection outside zone 4 is the fee in zone 4 with addition of a fee for the distance exceeding 1000 m from the sub station.

Table 1. Zone model definitions

Zone 1	City planned area or the area within 400 m from sub station with 10 or more connections
Zone 2	The area within 400 m from a sub station
Zone 3	The area within 400 and 600 m from a sub station
Zone 4	The area within 600 and 1000 m from a sub station

Zone 1 is in city-planned areas. Zone 1 also includes small villages etc in the countryside with the definition that it should be ten or more existing connections within 400 m from an existing sub station. Zone 2 is within 400 m from an existing sub station with fewer than ten existing connections. Zone 3 is between 400 and 600 m from an existing sub station. Zone 4 is between 600 and 1000 m from an existing sub station. Within these zones there is a fixed connection fee, depending only on the size of the connection (fuse or demand related).

Customers in Zone 2 and 3 may normally get their connection to the low voltage network. A new substation is not needed in these zones. Figure 2 give an example on rural area connections in Zone 2 and 3.

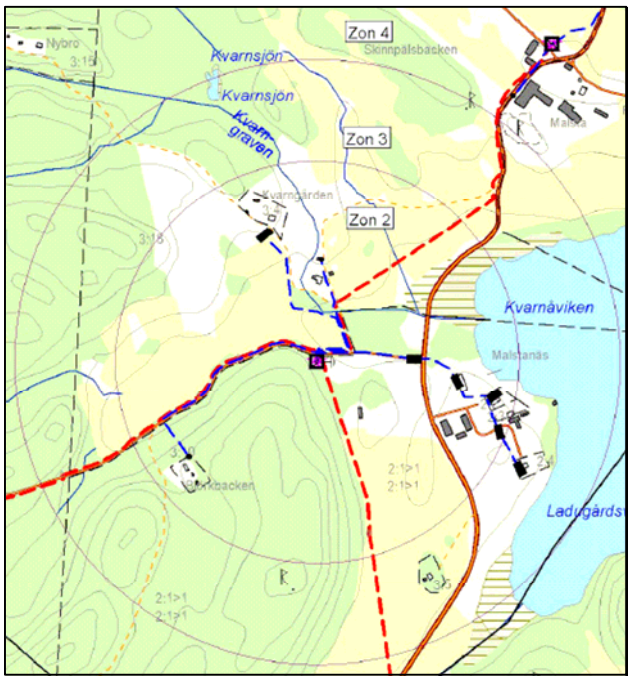

Figure 2. Customer connections in Zone 2 and 3. The LV network is draw with blue broken lines.

The connection fees based on average costs in each zone means that costs associated with new connections must be divided between existing and future connection that will benefit from the investment. This cost division is necessary to avoid paying back to existing customers and is the most important questions in developing a zone model. Table 2 shows the average cable lengths for each customer (m/customer) and the number of customers on each sub station (customer/sub station).

Table 2. Cost division in the different zones

	Division of costs			
		Zone 2	Zone 3	Zone 4
LV cable	m/cust	100	250	150
Sub station	cust/sub st	6	6	3
MV cable	m/cust			800/9

A very important objective for launching a zone model is to cover as many customers as possible in rural areas within the zones and thereby get fixed prices to most of the customers. Figure 3 gives an example of the zone model's grade of covering the total area.

Figure 3. Circles indicating Zone 4 outer boundaries with 1000 m radius from substations. The figure illustrates the zone model's grade of covering the total area.

Comparison of Vattenfall zone models in Finland and Sweden

The zone models used in Vattenfall Finland and in Vattenfall Sweden are very similar. They are both based on average costs with price zones and the rules of the price zones are almost the same. Some country specific differences appear and will probably also appear in the future. The difference is mainly outside zone 3 were Finland have an area pricing method, while Sweden have an averaged price for all new sub stations within a distance of 1000 m from an existing sub station and a special rule for longer distances.

BENEFITS AND DRAWBACKS WITH DIFFERENT MODELS

The benefit of an individual cost based method is that every new connection is supposed to pay a fee corresponding to the real cost of the connection.

However it is often difficulty to decide how big part of the cost that really is necessary for the new connection and if a part of the cost is in favour for the common network. There is also difficulty to decide if the cost shall be divided with existing and future connections that may benefit from the connection. If a reasonable cost division is not made there will most likely be pay back in the future when new customers are connected. The pay back is difficult to explain to customers and also leads to a difficult administration. But the most serious drawback with the individual cost based method is probably the lack of fairness between customers. The fee may differ essential between customers in the same area depending on coincidences which the customers can't influence like the location of the network as well as the order in which customers are connected.

A benefit with the zone model is that it is a simple and understandable model. The fee is the same in a certain area for the same kind of customers. Experiences from both Finland and Sweden show that customers are mainly satisfied with the zone model. Another advantage is that the fee for a certain connection is not depending on the measures taken in the network in relation to that specific connection. The expansion of the network may hence be made in accordance with a more long term view which may facilitate the design of more optimal networks.

It is obvious that the model is well accepted by customers with connections with costs over the average cost. A drawback with a zone model could be that the model also has to be accepted by customers with connections with costs below the average cost. This acceptance from all kind of customers is consequently very important as the fees are calculated as the average cost in each zone.

CUSTOMER SATISFACTION AND FAIR PRICING TO THE CUSTOMERS

The customer satisfaction and a fair pricing to the customers are depending on the design of the connection fees model and related application roles.

The most essential driving force for launching a zone model is to get fair pricing for the customers and not least important fairness between customers and neighbours. The connection fee is not depending in which order the connections in a zone are carried out. The first customer on a location must not pay a very high fee and then have to see the neighbour later on get a very low fee. Even if the first customer in the old cost based model could be paid back, when using roles in a payback system, this principle gave a very uncertain situation for the customer. With the zone model all the customers at a location within the same zone pay the same fee, which provide safe and predictable conditions to the customer.

The tender process and the other administration works in the electricity distribution company are also faster and easier with the zone model compared with the traditional model which is also appreciated by the customer.

In Finland customer satisfaction towards the price setting of connections has increased after the zone method has been implemented. Experiences from Sweden with fixed prices for many years in city planned areas also show that customers are mainly satisfied with the zone model. The zone model is simple, fair and easy to explain to the customer.

MODEL IMPACT ON NETWORK QUALITY

The connection fees model has to be designed with centre of attention on the customer requirements. Nevertheless the connection fees model also has an impact on the distribution network and the quality of supply.

With the prior Vattenfall model, which still is applied by most of the Swedish distribution companies, the connection fee was settled from cost calculation on each individual connection. This resulted in many cases in much too long low voltage lines that in the future could lead to problems with voltage quality. This very close depending of network extension to the connection fees in many cases led to inefficient network structure and in the long term higher cost.

With application of a zone model the planning of the network structure and extension of the network are separated from the pricing of connections which have a very positive effect on network performance and the quality of supply.

REGULATION POLICIES

The electricity markets in Finland and Sweden were fully deregulated in 1995-1996. Network tariffs and connection fees for the customers have been open and published since then. The network tariff is common for all customers in the same category and is supervised by the regulating authority. A traditional individual calculated connection fee can be complained by every customer. Normally this is not a problem but if the number of complaints is very big, like in Sweden, it really is a problem for both the network companies and the regulator. To solve problems like this it is essential with cooperation between the regulator and the electricity distribution companies.

A good example of a fruitful cooperation is the common work with a new model in Finland between the regulator and the electricity distribution companies. The regulator established and published the new model which was then implemented by the network companies. Since then the number of individual complaints concerning connection fees from customers have been very few.

In Sweden the big number of complaints on connection fees based on the traditional model partly depends on the difficulties in the old model and partly depends on the different views of the cost level between the regulator and the electricity distribution companies. The major parts of the complaints arise from 3g telecom operators. In 2008 the regulator has taken an initiative to solve these problems by starting a project to work out a new model in cooperation with customer representatives and Swedenergy.

EFFICIENCY IN DISTRIBUTION COMPANIES

The zone model compared with the traditional model opens up for the possibility to streamline the business from an administrative perspective. With the traditional model every connection needs to be priced individually which drives a lot of resources. By implementing the zone model the need for designing and dimensioning the connection before confirmed order is not longer needed for standard connections. The company can therefore secure that a minimum of resources and efforts are needed before the customer actually places the order.

The design of the zone model also gives the necessary prerequisites to standardize the process. Since all connections in a specific zone have the same requirements towards the customers the activities can be conducted in a standardized way. This drives for efficiency, secured quality and decreases the leadtime towards the customer. With a standardized way of working the company can use their resources in a more optimal way and fewer competences are needed through out the process. Standardization of processes are at the same time a prerequisite for IT-solutions supporting the business in a constructive way and opens up for possibilities like on line services on the Internet as well as pricing “over the phone”.

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