NVE

Marketing Report

Margins in the Power Market 1997
The Household Market 1998

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SUMMARY

The survey's main objective is to find margins and prices for the various end users based on the energy utilities' reporting of accounts to NVE (the Norwegian Water Resources and Energy Administration) in 1997. This report also includes results from NVE's change of supplier surveys for 1998.

This survey shows that there are still inequalities between the prices that are charged to industrial and household customers. The margin for the sale of power is still greatest for the sale of power to households and lowest for the sale of power to industry and the service sector. The price trend in 1996-1997 seems to indicate that there is a certain sluggishness in the market with respect to changing the price to households in accordance with the electricity spot price, and that the market reacts more quickly with respect to the price to industry.
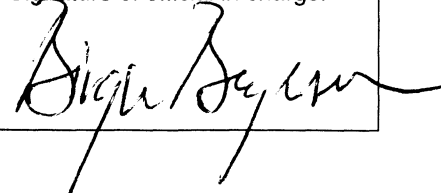
The number of household customers who change supplier is increasing. As of 5 July 1998, the number of household customers who have a supplier other than the one that dominates the grid, i.e. the traditional supplier, has risen to about 65,300.

In addition, some of the results from Gallup's Energy Barometer for the 2nd quarter of 1998 have been included in this report.

Key words: Power market, prices, margins, the end-user market, the wholesale market, households, change of supplier	Signature of official in charge:

CONTENTS

1.   Background

The Norwegian Water Resources and Energy Administration's (NVE) power market surveys are an important part of NVE's supervision of the power market. Big margins[1], a large range of prices or big differences between different customer categories may mean that the market is not functioning as intended. These are important signals in the authorities' attempt to facilitate the market-based sale of power.

Pursuant to the regulations in section 4-4 of the Energy Act, the energy utilities are supposed to submit accounts to the Norwegian Water Resources and Energy Administration (NVE). Business related to activities relating to the sale and transmission of power are to be reported. This power market survey has been conducted on the basis of submitted economic data concerning the sale of power in 1997.

1.1   Changes from Previous Surveys

This survey is based on prices attained and the volume of power sold on the wholesale and end-user markets in 1997. Previous surveys have been based on expected prices and volumes or prices given at a particular point in time.

The market survey has the following objectives:
1. Find margins and prices for various end users
2. Look at the trend in margins
3. Compare the prices in the wholesale and end-user markets

In addition, there is a separate chapter with results from NVE's change of supplier survey conducted in 1998. NVE wants to follow the trend among household customers and see to what extent they avail themselves of the opportunities provided by the power market to change suppliers.

Gallup's Energy Barometer (an analysis of the Norwegians' attitudes and behaviour in a competitive energy market) is an nation-wide survey that is conducted each quarter. Some of the results from Gallup's Energy Barometer for the 2nd quarter of 1998 have been included in this report.

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[1] In the power market, **margin** can be defined as the difference between the purchase price (or perhaps the production cost) and the sales price.

2.   Data and Methodology

The Norwegian Water Resources and Energy Administration gathers yearly data on the energy utilities' activities through the electric utilities' reporting of accounts to NVE. This survey is based on reported data pertaining to the sale of power in 1996 and 1997. Submitted accounting data that is associated with this activity must be handled confidentially by NVE. It must not be possible to trace any information to the individual companies. The data in this survey are therefore presented at the aggregate level.

Relevant forms for this survey are shown in an appendix.

The consumption tax was 5.75 øre/kWh in 1998. In 1997, it amounted to 5.62 øre/kWh. The value-added tax remains unchanged and currently amounts to 23 percent. We note that consumption in northern Troms county and Finnmark county is exempted from the consumption tax and that households in Nordland, Troms and Finnmark counties are exempted from the value-added tax. All manufacturing, mining and quarrying and likewise the greenhouse industry are also exempt from the consumption tax. The excise tax of 1.88 øre/kWh is included.

If nothing else has been stated, the prices presented in this report do not include the transmission price, the consumption tax and VAT.

The reason why taxes have not been included is that this survey focuses on the margins in the companies. Since the consumption tax is only paid by final users, it becomes methodically difficult to deal with taxes in a value-chain perspective. Furthermore, the taxes for end users vary with geographical location, further complicating the picture. **Taxes are therefore excluded from the general analysis, but are included in the presentation of prices to households in chapter 6.**

The following also apply:
- All contract types, both tariff customers and contract customers, are included in the survey.
- Income and/or costs and volume have been reported by the companies themselves and are listed excluding transmission costs, consumption tax and value-added tax. Average prices have been calculated on this basis.

The survey includes a total of 229 companies.

3. Purchase of Power/The Wholesale Market

In order to determine the power suppliers' margins and to compare the prices in the wholesale market and the end-user market, it is first necessary to look at the purchasing costs.

We have distinguished between the purchased power cost and the price on the wholesale market. The purchased power cost has been calculated on the basis of the power purchase portfolio of sales companies with sales to end-users and include internal purchases from their own production. The purchased power cost thus serves as an expression for the price at which suppliers in the end-user market have obtained the power. In the calculation of margins in sales to various final users, this is the price that is used.

Price on the wholesale market does not include purchases from own production (internal deliveries) and energy purchases in connection with partial ownership because the price that is given will often be different from the price that another company had to pay for the power. The wholesale price thereby gives a picture of the average price for purchased power on the market in the accounting year, including both formerly negotiated and new contracts plus purchases in the electricity spot market. The calculation of average price in the wholesale market includes all participants who purchase power in the wholesale market with the intention of reselling it on the wholesale and/or end-user markets.

3.1 Data Base

The Norwegian Water Resources and Energy Administration gathers yearly data on the energy utilities' operations through the electricity utilities' reporting of accounts to NVE. The form that is used in the survey for filling in the data is shown in an appendix.

In the calculation of the purchased power cost, data from the form in appendix 1: "Note 10.1, power sales; energy purchases" has been utilised.

In the calculation of average price in the wholesale market, data for the energy producer's purchases in the wholesale market are also included. Forms for filling in data are shown in appendix 2: Note 10.2, "production; energy purchases".

3.2 Purchased Power Cost

The actual purchased power cost is the average price for a portfolio based on the actual composition of the portfolio.

In the calculation the purchase of regulating power is not included, since this is only employed to adjust the companies' actual output and/or production of power to its reported output and/or production.

Prices and margins for 1997 that are cited in the survey are before trading with financial instruments has been taken into consideration. In 1997 all financial contracts were supposed to be excluded when filling in the notes on power purchases in the reporting of accounts to NVE. Some companies have reported financial contracts. In the cases where this is discovered, they have been deleted. *The actual cost is thus not necessarily in agreement with the cost that has been calculated here, since trading with financial contracts can greatly alter this picture.* Hence, the actual economic picture for the electricity utilities can differ from the picture given by the survey.

The purchase of power has been divided into four categories: Internal purchases from own production, bilateral contracts (domestic), purchases from Nord Pool's Electricity spot market, and other purchases including purchases from abroad. The average purchased power cost is 15.16 øre/kWh.

Category	TWh	Avg. price øre/kWh
Own production	76.4	13.33
Bilateral contracts	80.0	16.91
Purchases in the electricity spot market	28.2	14.75
Other power purchases	4.3	17.66
Total	188.9	15.16

Table 1: Purchased power by category

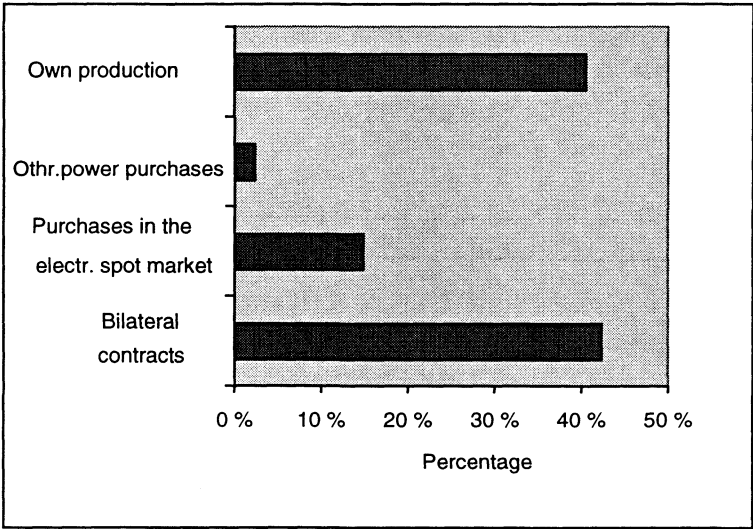The composition of all purchased power is illustrated in the figure below:

Figure 1: Physical purchases of power by category

3.2.1 Internal Purchases from Own Production

Internal purchases from own production are the sales departments's purchases of their own power production. The electricity utilities' assessment of the value of their own production can vary with different organisational structures. The price that is given for this power will vary from actual costs associated with producing power to the market price.

3.2.2 Bilateral Contracts

Energy purchases should be specified in bilateral contracts depending on the contract's duration. Includes both fixed-price contracts and contracts linked to the electricity spot market.

3.2.3 Purchases on the Electricity Spot Market

Purchases on the electricity spot market are reported in this category. Purchases in the electricity spot market will usually be covered in the financial futures market. Thus, the exposure to the electricity spot market will not necessarily be as great as the 15% that is reported in this survey.

3.2.4 Other Power Purchases

Power purchases that have been difficult to categorise and/or are not covered by the other categories are included here.

Among other things, this category includes power purchases from one's own production company.
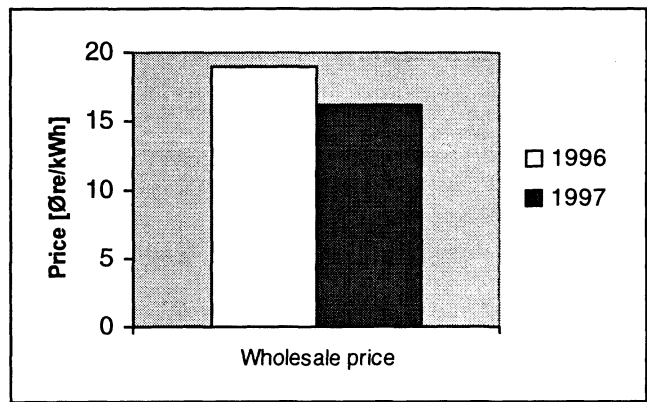
3.3 Price in The Wholesale Market

229 companies are included in the data base, which includes companies only involved in production, companies only involved in sales and companies involved in both production and sales. Thus, it is not just the final sale of wholesale power that is included. The total available volume in the wholesale market is sold several times.

In the calculation of the average price in the wholesale market, purchases of regulating power are excluded, since they are only employed to adjust the companies' actual output and/or production to their reported output and/or production.

Bilateral contracts, purchases in Nord Pool's Electricity Spot Market, purchases from abroad and other power purchases are included in the calculation of the average price in the wholesale market. These different categories are described above. Purchases from own production (internal deliveries) and energy purchases in connection with partial ownership have not been included because the price that is reported will often be different from the price that another company had to pay for the power.

As previously mentioned, prices and margins for 1997 that are cited in the survey are before trading with financial instruments has been taken into consideration. In 1997 all financial contracts were supposed to be excluded when filling in the notes on power purchases in the reporting of accounts to NVE. Some companies have reported financial contracts. In the cases where this has been discovered, they have been deleted. The actual cost is thus not necessarily in agreement with the cost that has been calculated here, since trading with financial contracts can greatly alter this picture. Hence, the actual economic picture for the electricity utilities can differ from the picture given by the survey.

The material includes a volume of 121.4 TWh. The calculated average price in the wholesale market for 1997 is 16.22 øre/kWh.

Figure 2: The trend in the wholesale price

4. The End-user Market

Sales to end-users mean all contracts that have been entered into with either households (incl. agriculture) or business customers. The market has been divided into two sub-markets: the market for households and the market for business customers. Business customers are divided into industrial customers and service-sector customers. The power intensive industry and the pulp and paper industry have not been included in this survey because a large share of the deliveries to these customers are long-term industrial contracts with prices set by the *Storting* (the Norwegian parliament).

4.1 Data Base

The Norwegian Water Resources and Energy Administration gathers yearly data on the energy utilities' activities through the electricity utilities' reporting of accounts to NVE. The form that is used in the survey for filling in data is shown in an appendix.

Appendix 3: "Note 1.1, Power Sales, Sale of Power to End-users" is used when calculating average prices to end-users.

The survey includes 200 companies that sell power to end-users.

4.2 Sales to End-users

The table below has been prepared on the basis of the reporting to NVE for 1997 and shows physical sales to end users, average prices and standard deviations. The calculated price is the actual average price for the customer group. A possible source of error is that some companies may have incorrectly reported parts of a sale to industry, where the power is received from a higher level of the grid (e.g. directly from the regional as opposed to the local grid) and/or from separate power lines as a wholesale sale, and not reported this as a sale to end-users.

In the group "households" the following items from appendix 1 are included: "Note 1.1, Power sales, sale of power to end-users": households, agriculture, forestry and fishing, greenhouses, cabins and recreational homes and other usage.

The "service sector" group includes the items trade in goods, hotel and restaurant business, banking and insurance activities, public administration, education, health and social services, other services, postal services and telecommunications, railways and suburban railways, ancillary activities for the transport sector, and street and highway lighting.

The "industry" group includes mining and quarrying and oil production, other industry, district heating plants and building and construction activities.

As previously mentioned, the power intensive industry and the pulp and paper industry are not included in this report.

	Households	Service Sector	Industry
Volume TWh	35.2	20.6	10.7
Weighted sales price (øre/kWh)	20.91	19.88	17.99
Standard Deviation	4.01	3.32	3.53

Table 2: Average prices to end-users in 1997

The standard deviation shows the variation in the electricity utilities' prices.

The graph below shows the percentage of the volume that has been sold at various prices:
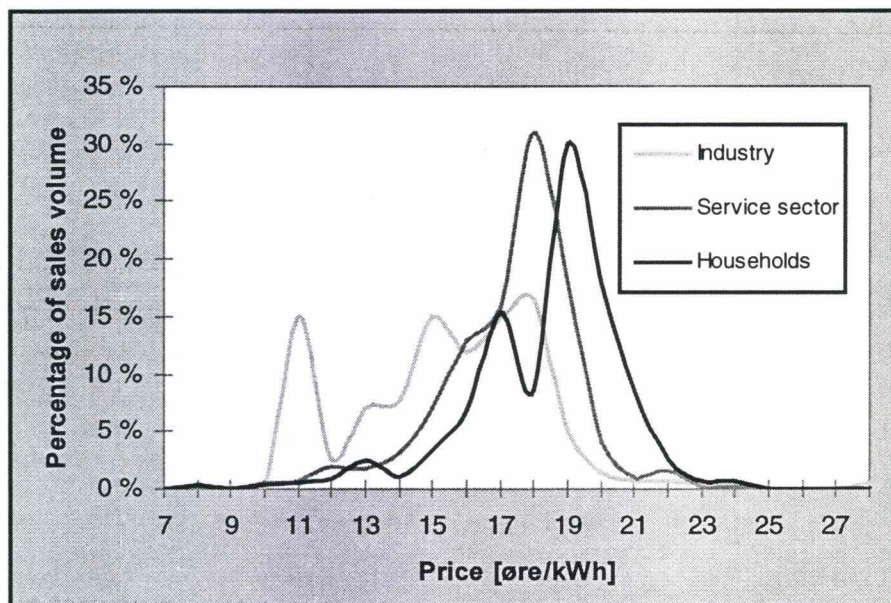
Figure 3: Price spread for different customer groups, 1997

The survey shows that there are still inequalities between the prices that are charged to industrial as opposed to household customers. In the form for the specification of sales to final users to be used in the reporting, there is no specification of sales divided by contract type. Thus, we cannot determine whether the inequalities are due to different compositions in the portfolios or differences in the prices specified in the contracts to the different categories. One reason may be that industry has a more favourable profile of power purchases and is better able to adapt its consumption to price changes that occur over days or years. The curves' appearance seems to indicate that the industry still has contracts with low prices. These *may* be older contracts, and the inequalities may therefore even out somewhat with time.

4.3 Price Trend

Average prices to various customer groups in 1997 are compared with the corresponding prices in 1996:

	Households	Service Sector	Industry
Sales price 1996 (øre/kWh)	19.56	17.49	18.09
Sales price 1997 (øre/kWh)	20.91	19.88	17.99

Table 3: Prices to end-users in 1996 and 1997

The price to households in 1997 was 1.35 øre/kWh higher than the price in 1996. Likewise, the price to the service sector in 1997 was 2.39 øre/kWh higher than the price in 1996. The price to industry in 1997 was marginally lower than the price in 1996.
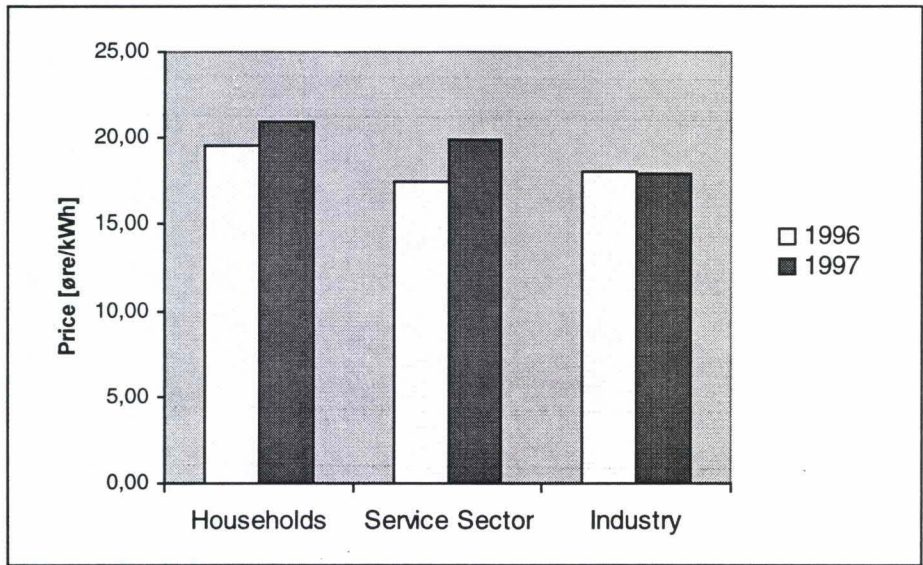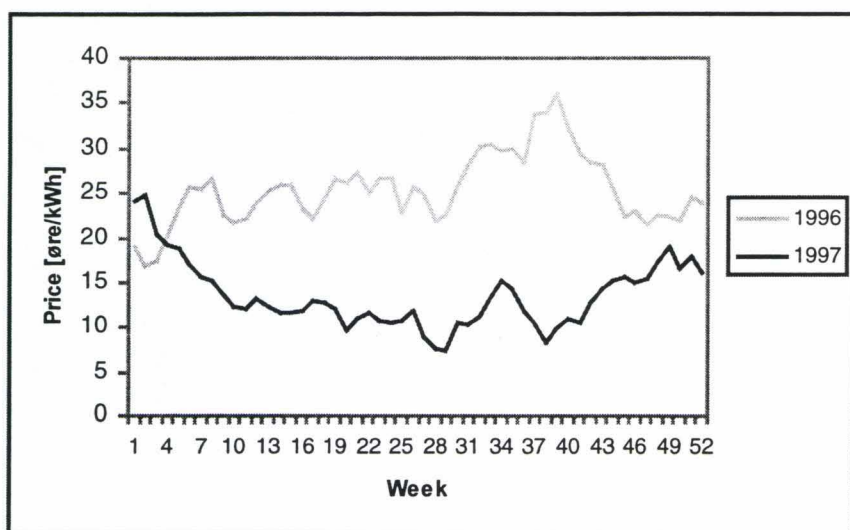

Figure 4: Prices by business sector - 1996 and 1997

The average electricity spot price was low in 1997 compared with 1996. The trend in the spot price is illustrated in figure 4. The average spot price was 13.5 øre/kWh in 1997 and 25.7 øre/kWh in 1996:

Figure 5: Spot price trend in 1996 and 1997

As previously mentioned, sales to end-users have not been divided according to type of contract. In August 1997, however, NVE conducted a market survey for 1997 based on expected prices and volumes for the whole year (NVE-publication no. 18, 1997: The Market Survey, 1997). The results of this survey showed that the percentage of contracts tied to the electricity spot price is higher for industry than for households and the service sector. However, a large percentage of households have variable price contracts.

The trend in the prices seems to indicate that a certain amount of time must pass before changes in the spot price are reflected in the prices to final users, and that there was a certain sluggishness in the market before the price to households and businesses was increased in the autumn of 1996 and decreased in the spring of 1997. It appears as if the market responds more quickly with respect to prices to industry. The figure below shows the spot price trend compared with variable power prices to households:
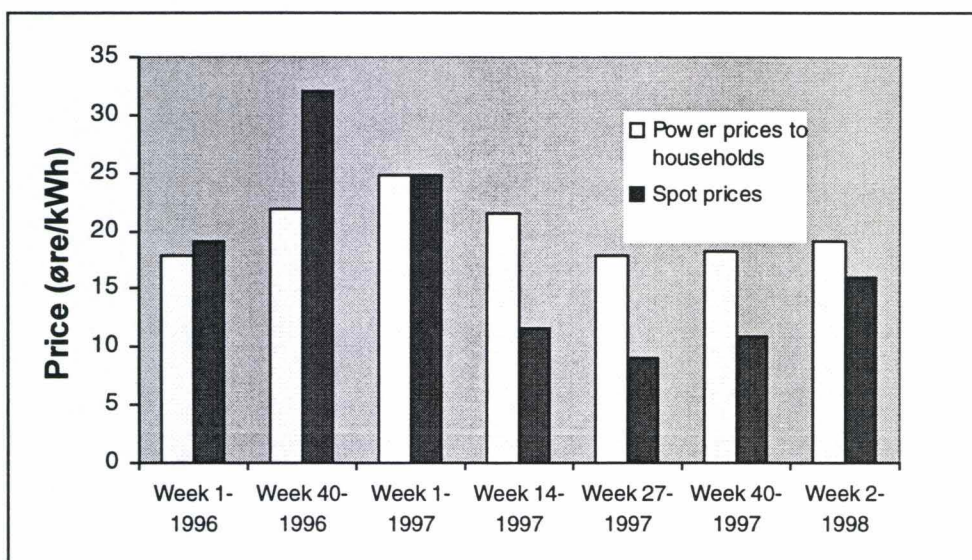
Figure 6: Variable power prices to households compared with the trend in the spot price

5.   Margins

In a well-functioning market the participants only retain a "normal" gross profit, or margin, which should cover fixed costs and other operating costs, e.g. costs associated with marketing, customer services, administration, etc. The gross profit should be related to the risk that is found in the market. If the gross profit is higher than normal, this may indicate that the market is not functioning and that the participants are exercising market power. In the power market, the gross profit can be defined as the difference between the purchase price (or perhaps the production cost) and the sales price for the power.

The profit is the difference between the gross profit and the remaining costs. Sources in the industry argue that an effective salesman can transact purchases and sales of power at a cost of 1- 1 ½ øre/kWh. This profit can be related to the capital values in the industry in order to compare the power industry with other industries. Nevertheless, it is difficult to say whether the profits are extraordinary or not, because the market is still characterised by great uncertainty. The risk associated with conducting power trading seems to indicate higher operating margins than in other business sectors.

Depending on the prices that the calculations are based on, we can talk about two different margins: an actual margin and a market margin. The actual margin shows the size of a power supplier's gross profit, given the suppliers actual power purchase portfolio. This margin shows what the existing suppliers can earn on the basis of historical market coverage strategies and contracts that have been signed.

On the other hand, a market margin will tell something about the margin a supplier could have had by covering himself 100 % in the market on a given date. If a supplier has a mean purchased power cost of 20 øre, while the market price is 16 øre, this indicates that the market assesses the power at a lower price than the one for which the supplier has been able to purchase it. Thus, a new supplier can get established, purchase cheaper power and sell it on the market. If the first-mentioned supplier sold the power at an average price of 23 øre, the actual margin would be 3 øre/kWh. On the other hand, a new supplier could purchase power for 16 øre, which would give a margin of 7 øre assuming that the prices were not driven down. The market margin is therefore 7 øre/kWh in this case.

The reason for employing these two concepts is that if the market margin in the long run is higher than the actual margin in the short run, new participants ought to be able to get established in the market and sell power more cheaply than the established companies so that the competition thereby drives down the prices to the end-user. This kind of situation arose in the first years after the deregulation of the electricity market in 1991, thereby facilitating competition. In the long run, the market margin and the actual margin will converge.

Contracts that are included in the power purchase portfolio for a given period can be entered into at many different points in time. The same applies to contracts that are included in the sales portfolio. The times for building up a power purchase portfolio and a sales portfolio will also be different. A sales contract that is assessed as having a high market margin at the point in time when the contract is signed can contribute to a low margin in the contract period. This applies to both the spot price and the power purchase portfolio for the same period. If for each purchase contract the supplier enters into a sales contract of equal duration, the margin at the time when the contract is signed will be equal to the margin in the contract period.

The margins that are calculated here do not take into consideration the margin at the time when the contract was signed, and thus only give a picture of the average margin in the accounting year[2].

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[2] Cf. NVE publication no. 18, 1997: The Market Survey, 1997, chapter 2.2, which gives a description of margins based on the premises on which the market survey in 1997 was based.

5.1 Actual Margin

The calculated margin is the average margin achieved for 1997. *All* contracts in the power purchase portfolio are included and likewise contracts signed prior to 1997.
A comparison of purchase costs and sales prices show the margins that are obtained for the different customer groups:

	Households	Service Sector	Industry
Purchased power cost	15.16	15.16	15.16
Sales price	20.91	19.88	17.99
Actual margin	5.75	4.72	2.83

Table 4: Actual margins in 1997

The margin for the sale of power is biggest for the sale of power to households and lowest for the sale of power to industry. This can be explained by differences in the volume of power being drawn and in the consumption profiles of the different groups, but also by different degrees of subsidising of local industry.

5.2 Market Margin

Market margin means the margin between market price and actual sales price. In the calculation of the market price, it is necessary to make certain assumptions about the customers' consumption profile. It is assumed here that industry has had flat consumption for the year, whereas the service sector and households have had a normal consumption profile. The calculation of the average market price for 1997 for the service sector and households employs hourly values in the electricity spot market weighted with Viken Energinett's adjusted input profile. The average market price for industry has been set equal to the average hourly value in the electricity spot market.

The market margin is calculated here in *retrospect* based on the market's pricing of power hour by hour, and it gives a picture of the average margin that the power supplier would have achieved through coverage in the electricity spot market.

	Households	Service Sector	Industry
Sales price	20.91	19.88	17.99
Market price	14.69	14.69	13.50
Market margin	6.22	5.19	4.49

Table 5: Market margins in 1997

The table shows that the average market margin in 1997 lay consistently above the actual margin. The difference between the market margin and the actual margin is greater for industry than for households and the service sector.

5.3 The Long-term Trend in The Margin

Trend in The Actual Margin
The procedure for filling in the economic and technical reporting to NVE has been changed somewhat from 1996 to 1997 with regard to the reporting of energy purchases. In the 1996 reporting the original value of bilateral contracts was supposed to be corrected for profits or losses on the security of bilateral contracts. In the 1997 reporting *all* financial contracts were supposed to be excluded. Likewise, in 1997 individual companies have reported their financial agreements. In the cases where this has been discovered, they have been subtracted.

Prices and margins in 1997 that are cited in the survey are before trading with financial instruments has been taken into account. In 1996 prices and margins have been corrected for profits or losses on the security of bilateral contracts.
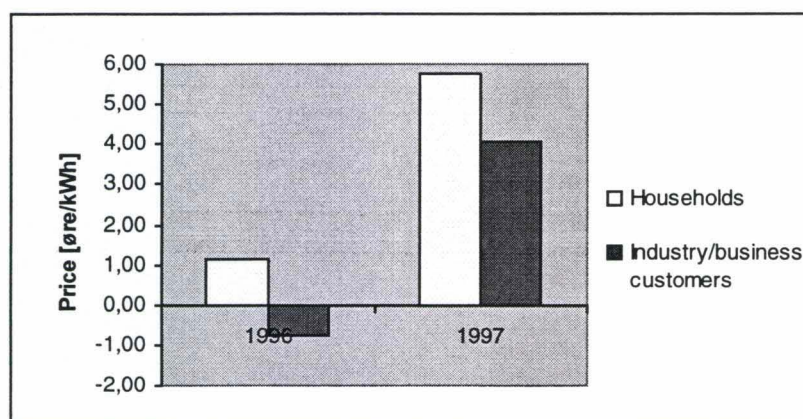

Figure 7: Margins - 1996 and 1997

In 1996 the margin for deliveries to industry and the service sector was negative, while the corresponding margin for deliveries to households was positive.

In 1997 we see that both margins were positive, but the margin for the sale to households was still greater than the margin to the service sector and industry. This seems to indicate that household customers subsidise business customers. The difference between the margins for deliveries to industry and deliveries to households has been reduced from 1.87 øre/kWh in 1996 to 1.68 øre/kWh in 1997.

That the margin for industrial and business customers is still lower than the margin for household customers can be explained by the differences in profiles and volumes of power that they drew.

A second reason why margins were lower for sales to industry and/or business customers than for sales to households in 1997 and why the margin for sales to industry and business customers was negative in 1996, may be that industry still has contracts that are priced quite low. These *may* be older contracts.

The low margin for sales to households and the negative margin for sales to industry in 1996 compared with the relatively high margins in 1997, seem to indicate that it takes a certain amount of time before changes in the spot price are reflected in the prices to end-users.

5.4 Comparison of The Prices in The Wholesale Market and the End-user Market

The average price in the wholesale market is calculated at 16.22 øre/kWh for 1997, cf. chapter 3.3. The price in the wholesale market does not include purchases from own production (internal

deliveries), and energy purchases in connection with partial ownership have not been included. The corresponding price for 1996 was 18.98 øre/kWh. The average price in the end-user market was 20.91 øre/kWh for household customers and 19.23 øre/kWh for industry and the service sector in 1997. The corresponding prices for 1996 were 19.56 øre/kWh and 17.69 øre/kWh respectively.
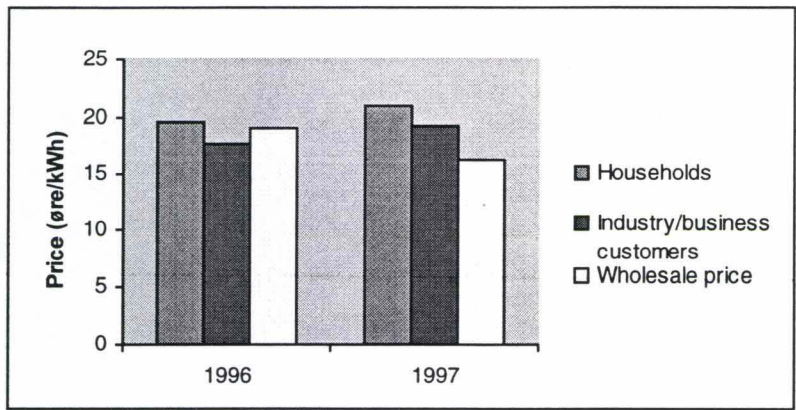
Figure 8: Prices in the Wholesale and End-user Markets

The price to business customers lay beneath the wholesale price in 1996. The way things were in 1996, the electricity utilities did not earn money from selling power to business customers. The figure also shows that the margin between the wholesale price and the price to business customers was positive in 1997.

6. Changes of Supplier, July 1998

Each quarter NVE conducts surveys focusing on end-user mobility. In July, forty of the biggest distribution network owners were contacted with questions about the number of customers who had changed power supplier, the total number of customers in the grid and the percentage of customers served by the dominant power supplier. Dominant power supplier is defined as the supplier in the grid with the biggest market share. This participant is consistently the same as, or has ownership and contractual ties to, the traditional supplier in an area. Thus, Oslo Energi AS would be the dominant participant in the grid that is owned and operated by Viken Energinett AS. Power prices from the Norwegian Competition Authority's price summary that are in effect for household customers in the suppliers' local grid area have been employed in this survey.

The survey covers about 72 % of the household customers in Norway. The key figures from the survey have therefore been scaled up by a factor of 1.4 in order to represent the whole country.

6.1 Results

6.1.1 Number of Changes of Supplier

In the period from 6 April to 5 July, 10,250 changes of supplier were registered. This corresponds to a decline of 48% from the previous quarter: in the period from 5 January to 6 April, 21,288 changes of supplier were registered.

The number of customers who have a power supplier other than the dominant one in the grid (i.e. the traditional supplier) increased to about. 65,300. Altogether there are about 2 million household customers in Norway. The figure below shows the trend since 1996.
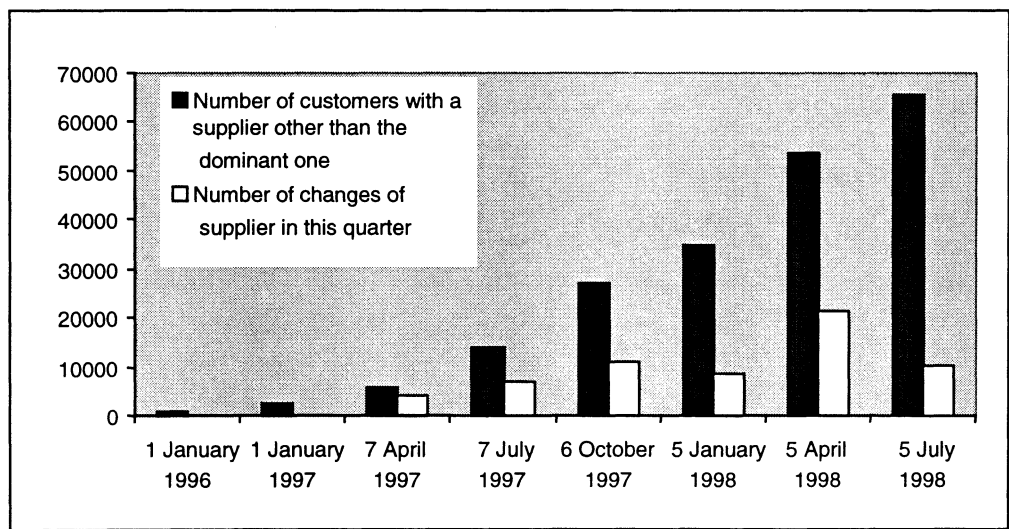

Figure 9: Trend in the number of customers with a power supplier other than the dominant one in the grid

### 6.1.2 Price Spread in The Household Market

The number of changes of supplier must be compared with the power prices in general and with the spread of power prices in particular. In order to get a picture of the price spread, we show two different graphs. The first graph shows the price spread at two dates, 30 March and 29 June.
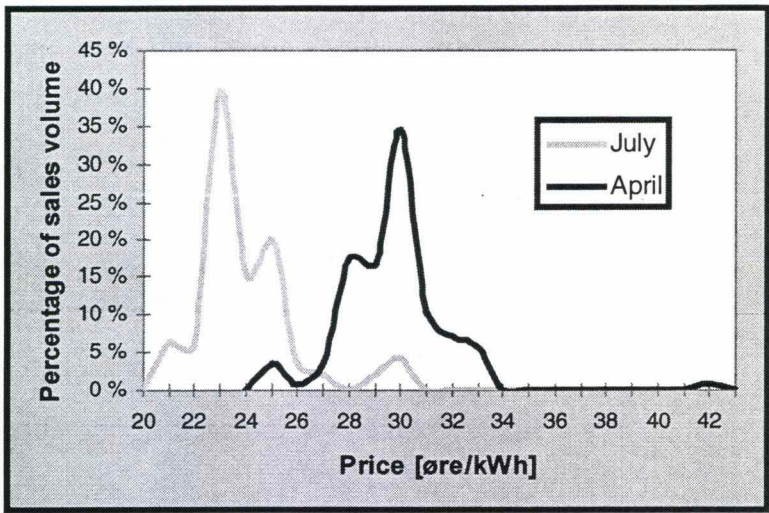
Figure 10: Comparison of prices and price spread in April and July

The second graph shows the spread of the average prices during the whole period from April to July.
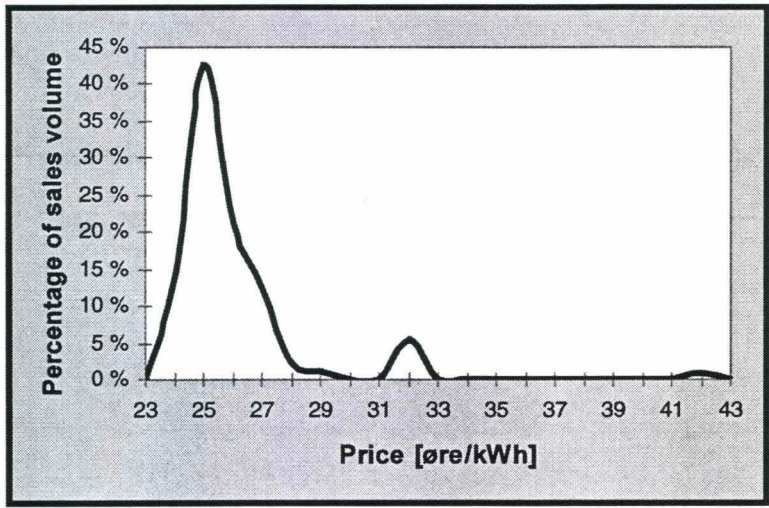
Figure 11: The spread of average prices from April to July

Both of these graphs show how large a share of the volume has been sold at a particular price, e.g. we see from the first graph that 34 % was sold at a price of about 30 øre/kWh in April. In July we see that this percentage has sunk to 5 %, while the percentage of the volume sold at 23 øre/kWh has increased from 0 % in April to 40 % in July. This fluctuation has contributed to lowering the average price.

In April the average price was 30.25 øre/kWh (including the consumption tax and VAT). In July the average price had sunk to 24,82 øre/kWh.

The average price for this period was 26.57 øre/kWh.

The graph below shows the trend in the volume-weighted power price compared with the spot price from January to October. We see that there is agreement between the volume-weighted power price to households and the spot price, but the fluctuation in the price to households is small, and there is some sluggishness in the market when it comes to changing prices:
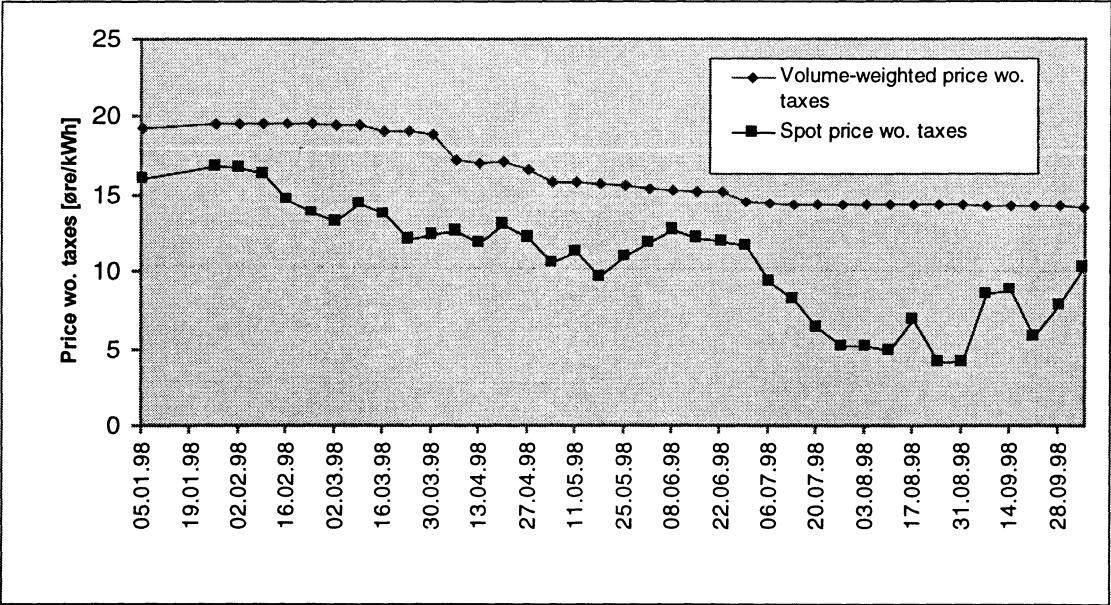
Figure 12: Trend in volume-weighted price excluding taxes compared with the trend in spot prices excluding taxes

In order to determine the magnitude of the spread of power prices, we can look at the standard deviation. The greater the standard deviation, the greater the spread.

Here we present two different standard deviations. The standard deviation of the prices weighted by sales volume, and the standard deviation of the prices charged on the market.

The standard deviation of the prices weighted by sales volumes indicates the size of the price spread for the power that is actually sold to households. This standard deviation also describes the variation in the households' power costs.

The standard deviation of the prices charged on the market indicates the size of the difference in the prices that are charged on the market, cf. appendix 4 for a more detailed description of the way in which these standard deviations were calculated.

The Standard Deviation of The Prices Weighted by Sales Volume

The standard deviation of the prices weighted by sales volume in April was 2.09. We see from the graph, however, that a small volume will be sold at 42 øre/kWh, which is the price charged by one of the suppliers. This price lies disproportionately much higher than the other prices. If we ignore this price, the standard deviation is 1.69.

For the period from January to April the standard deviation for the prices weighted by sales volume was 2.47. If we ignore the highest price charged, the standard deviation is 1.87.

The standard deviation for the prices weighted by sales volume in July was 2.65. When the highest price charged is ignored, the standard deviation is 1.94.

We see that the spread of the households' power costs has risen somewhat since April. This is probably related to the relative stability of the prices during the period from January to April. In this period the average price fluctuated between 31.5 øre/kWh and 30.2 øre/kWh. In the period from April to July the prices have fallen from 28.2 to 24.8. The fluctuations in the prices have consequently been 2.5 times greater. This has given rise to a greater spread of prices.

The Standard Deviation of The Prices Charged on The Market

The standard deviation of the prices charged by the 40 biggest suppliers of power was 3.36 in April. When the highest price charged is ignored, the standard deviation is 2.53.

The standard deviation of the prices charged by the 40 biggest suppliers of power was 3.04 in July. When the highest price charged is ignored, the standard deviation is 1.82.

6.1.3 Sub-markets and Market Shares

The Norwegian power market for households actually consists of over 200 sub-markets because each distribution grid is metered and billed separately. NVE is trying to open these sub-markets and make the different grids as transparent as possible so that the market develops into a national market. Since the total market is the sum of all of the sub-markets, it is interesting to take a look at the market concentration that we find in the various sub-markets. By subtracting the number of customers who have a supplier other than the largest one from the total mass of customers, we find the average market share of the dominant participant.

Due to uncertain data, NVE is unable to determine the trend in market shares in the different grid areas from April to July.

Data from NVE's survey conducted in April showed that the average market share has been reduced from 98.2% on 5 January to 97.3% on 6 April. The market share in these sub-markets is much higher than in other business sectors, and it is difficult to believe that this kind of high market share will be able to last for any great length of time, *given that the price differences and margins are large*. As long as the variations in price are small, however, the market shares will probably remain high, because the price is the most important reason for changing supplier, cf. chapter 7.3. The variations among the individual sub-markets are large. One participant still has a 100% market share in a grid. Half of the participants covered in the survey have market shares of greater than 98%. In four of the grid areas, the dominant power supplier's market share is less than 95%. The gap from the next lowest to the lowest market share for the dominant participant is large: 76.8% to 86.8%.
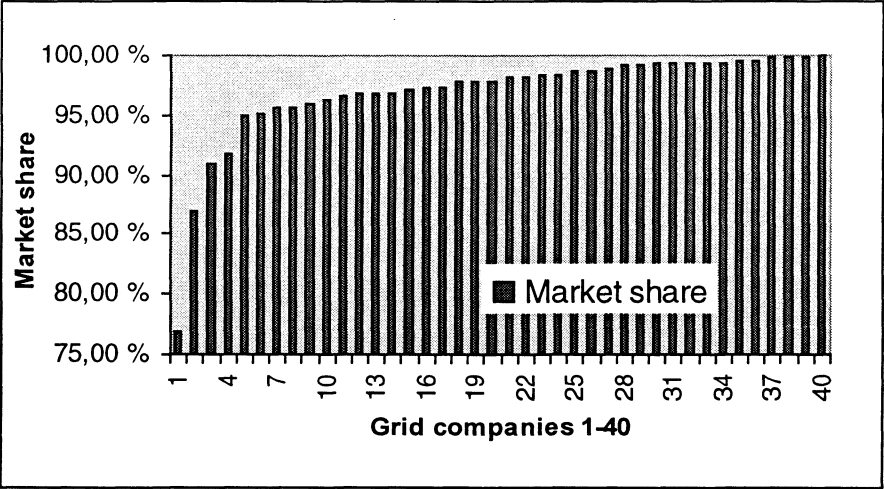
Figure 13: Market shares on April 1998

7.   Attitudes to The Power Market – Results from Gallup's Energy Barometer

Gallup's Energy Barometer is a nation-wide survey that is conducted each quarter. This survey addresses the person in the household who is responsible for and/or receives the electricity bill. Gallup submits inquiries to a representative sample of about 1000 people. The Energy Barometer was conducted for the first time in December 1997. These results are from Gallup's Energy Barometer for the 2nd quarter of 1998.

7.1 The Energy Act and The Power Market

The sample was asked the following question to survey the households' knowledge about the Energy Act: "Norway passed a new Energy Act in 1991. This act has resulted in significant changes for you as an electricity customer. Do you know what the most important of those changes are?".

Fifty per cent of those questioned answered that the most important change is that consumers can freely choose the power supplier from which they want to purchase power. Twelve per cent responded that the most important change is the transition to unrestricted competition. Thus, 62% are familiar with the most important change that the Energy Act brought about for the consumers.

The figure below shows how the sample responded. The question was not accompanied by any multiple-choice answers.
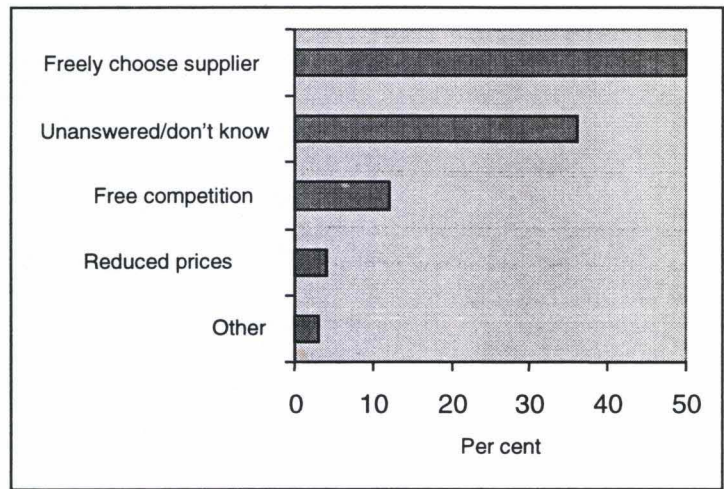

Figure 14: Most important change as a result of the Energy Act

In addition, the sample was asked what effect the transition to the deregulated power market has had on power prices. The question was posed as follows: "Are you of the opinion that the deregulated power market has resulted in reduced or increased power prices?" The question was not accompanied by any multiple-choice answers.

Fifty four per cent of those questioned are of the opinion that the deregulated power market has resulted in reduced power prices. This indicates that the majority of Norwegian households think that the market is functioning.

The figure below shows how the sample responded.
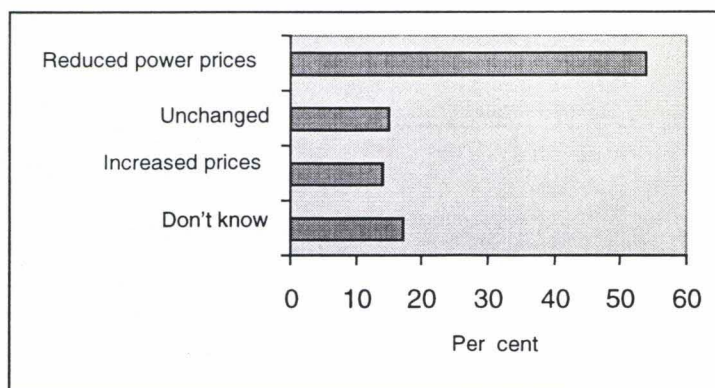
Figure 15: The Deregulated Power Market's Effect on Prices

To survey knowledge about the electricity bill, the sample was asked the following question: "Today's electricity bill consists of two itemised expenditures. One of them concerns the consumption of power. Do you know what the other is?".

The figure below shows how the sample responded. The question was not accompanied by any multiple-choice answers.
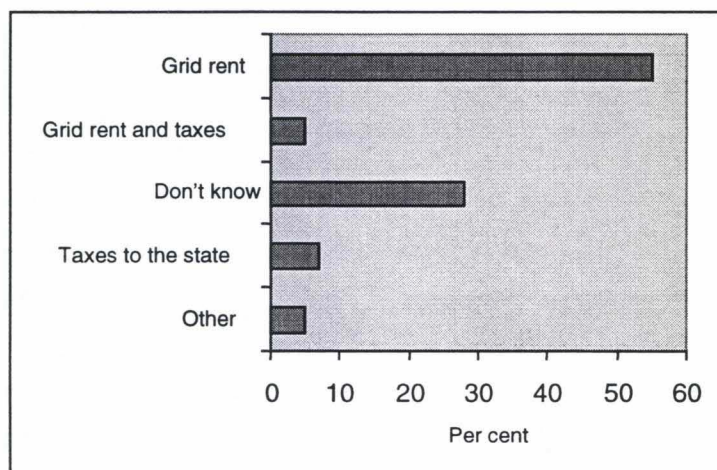
Figure 16: Knowledge about the electricity bill

The answers show that 60% of the sample knows the distinction between grid rent and power.

The results of NVE's evaluation indicate that Norwegian households are well aware of the changes that the Energy Act has brought about in the power market. That as many as 60% know the distinction between grid and power shows that the households have a good understanding of how the power market now operates.

7.2   Awareness of The Possibility of Changing Current Supplier

Figures from Gallup's Energy Barometer for the 2nd quarter of 1998 show that 95% of the households are aware of the possibility of changing supplier. These figures indicate that this awareness is increasing; during the last six months the percentage of those who know that they can change suppliers has increased by eight per cent.

The percentage of those who did not mention the possibility of freely choosing their supplier as the most important change resulting from the Energy Act, were made aware of it here by posing the

question in the following way: "One of the most important changes in the new Energy Act is that you can freely choose your supplier of electrical power. Are you aware of, or have you already taken advantage of this opportunity?"

NVE considers it a very positive development that as many as 95% of all households are aware of the possibility of changing supplier.

7.3 Reasons for Change of Supplier

The power market is price sensitive: in Gallup's Energy Barometer over 90 per cent of those who have got a new supplier state price as the most important reason for making the change. This contrasts with other business sectors where factors such as quality and service are also important reasons for change.

The data from the survey also suggests that some households change because of brand names.

For the households that are aware of the possibility, but elect not to change, the most important reason for this is that they regard the potential savings as low. Other important reasons are that they are satisfied with their current supplier or that it is too much bother to change supplier.

7.4 Electricity Costs Are Prominent in People's Awareness

Thirty per cent of the sample state "electricity costs" in response to the question of what expenses they would primarily cut down if the household's cost budget had to be reduced. Fully 22% mention this as the first expense that they would cut. This indicates that the electricity costs have a very prominent place in people's awareness.

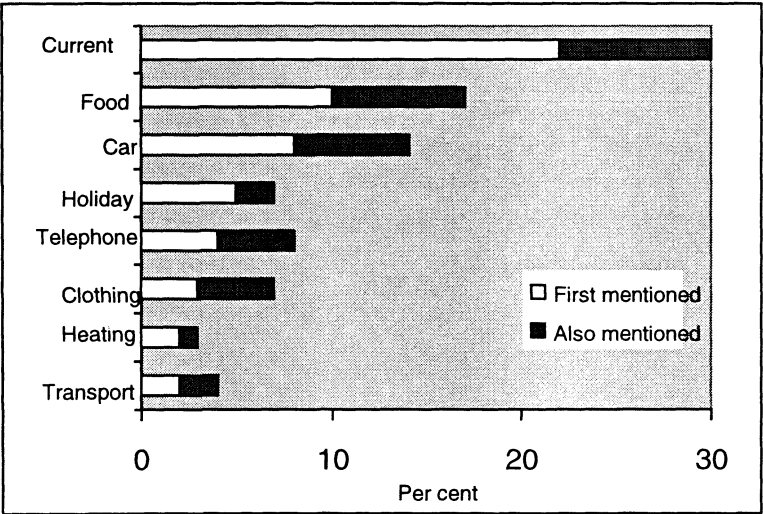The figure below shows the distribution of various expenses:

Figure 17: Expenses that the sample wants to cut if the household's cost budget has to be reduced.

Appendix 1

Note 10.1, Power sales

Energi purchases Contract		Cost	Volume	Avg. price øre/kWh
Bilateral Contracts				
Contracts	< 1 year			
Contracts	1 - 5 years			
Contracts	> 5 years			
Purchases				
Regulating power				
Electricity Spot Market				
Other Power Purchases				
Purchases from abroad				
Other purchases				
Internal Purchases from own Production				
Internal Purchases from own Production				
Total				

Appendix 2

Note 10.2, Production

Energi purchases Contract		Cost	Volume	Avg. price øre/kWh
Bilateral Contracts				
Contracts	< 1 year			
Contracts	1 - 5 years			
Contracts	> 5 years			
Purchases				
Regulating power				
Electricity Spot Market				
Other Power Purchases				
Purchases from abroad				
Other purchases				
Energy purchased in connection with partial ownership				
Total				

Appendix 3

Note 1.1, Power Sales

Sale of Power to End-users	Income	Volume	Avg. price øre/kWh
Pulp and paper industry			
Power intensive industry			
Other Economic activity			
Mining and quarrying and oil production			
Other industry			
District heating plants			
Building and construction activities			
Trade in goods			
Hotel and restaurant business			
Banking and insurance activities			
Public administration			
Education			
Health and social services			
Other services			
Transport and communications			
Postal services and telecommunications			
Railways and suburban railways			
Ancillary activities for the transport sector			
Other End-users			
Agriculture, forestry and fishing			
Greenhouses			
Households			
Cabins and recreational homes			
Street and highway lighting			
Other usage			
Total			

Appendix 4

Calculation of Standard Deviation

The standard deviation of a distribution is derived from the variance. The variance of a distribution is calculated with the following formula:

$$VAR = \sum_{i=1}^{n} \left(x_g - x_i\right)^2 /(n-1)$$

Where X_g is the mean value of the distribution, X_i is a single observed value and n is the number of observations.

The expression in parentheses thus expresses the magnitude of the deviation between each individual observed value and the mean value of the distribution. The parentheses are squared in order to make the deviations positive. Finally the squares of each deviation are added for all of the observed values.

Thus, the variance indicates the spread of a distribution, but it is not intuitively understandable because the variance is a squared quantity. Therefore, the standard deviation is generally used in order to describe the spread of a distribution. The standard deviation is derived by taking the square root of the variance:

$$Std.Dev. = \sigma = \sqrt{VAR}$$

Standard Deviation for The Prices Weighted by Volume

We have presented the sales volume as a function of the prices. This has been done by comparing each individual supplier's prices with their yearly volume sold to households. In this way we find the magnitude of the volume sold at each individual price. This gives a good picture of the price spread of the sales volume.

In order to find a standard deviation, we have to create a distribution that resembles the one that is pictured. From the graph on the previous page, we see that about 40% of the power to households was sold in July at a price of 23 øre/kWh. Therefore, we have created 40 observations (Xs) with the value of 23 øre/kWh. This can also be described as follows:

$X_1 ... X_{40} = 23$

We also find that about 5% of the volume was sold in July for 22 øre. Therefore, five observations are set equal to 22 øre:

$X_{40} ... X_{45} = 22$

In this way 100 observations have been created. We have taken the standard deviation of these observations.

The Standard Deviation of The Prices on The Market

Here we have simply let each individual price charged be an observation and calculated the standard deviation of the prices reported by the Norwegian Competition Authority. Thus, this standard deviation only indicates the magnitude of the spread in the prices charged without taking into consideration the quantities offered or the quantities sold.