The electricity distribution tariff

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The Gävle Energi Group

Gävle kommun (Municipality)

Gävle Stadshus AB (Holding company)

Gävle Energi AB (Parent company)

Per Laurell, CEO

Subsidiary companies

Gävle Energisystem AB
(Sales electricity)
100 %

Gävle Kraftvärme AB
(Heating and electricity producer)
100 %

AB Sätraåsen
(For the future)
100 %

Bionär Närvärme AB
(Local district heating)
55 % Gävle Energi AB
45 % Ockelbo Kommun
Business areas

Electricity supply
Network 163 Mkr

Sales electricity
251 Mkr

Broadband Network
55 Mkr

Energy services
4 Mkr

Heating
366 Mkr

Local district
Heating 57 Mkr

Production
298 Mkr

Cooling
1,2 Mkr
Profit after financial income (MSEK)

MSEK

2000 2001 2002 2003 2004 2005 2006 2007

38 65 52 101 95 105 93 = 109 MZAR
If we had built our cables and pipes in one row, we could had ended up nearly to your hometown
The electricity industry

- generation
- transmission
- distribution
- sales

Monopoly structure

Open market
National transmission, regional and local distribution

- Kärnkraft 45%
- Ca 5% övrig elproduktion
- Vattenkraft 50%
- Stamnät 220-400kV
- Regionnät 70-130kV
- Lokalnät >20kV

Hushåll och mindre industri får sin el från lokalnätet
Stora industrier får sin el direkt från regionnätet
The structure of the electricity Market

Producer

National grid
Region net
Local net

Consumer

The power market
- Power balance
- Sales

Nord Pool
2020 - 30TWh wind energy
6000 wind turbines

2008 – 1.4TWh wind energy
900 wind turbines
The Network Performance Assessment Model (NPAM)

1. Data collection
2. Configuration of the fictional network
3. Calculation of the fictional network expenditure
4. Quality judgment

\[
\text{Debiting rate} = \frac{\text{Year's revenue}}{\text{NPAM's revenue} - \text{quality judgment}}
\]
• The new requirements of the law:

  – Monthly measuring of the customers’ energy consumption.
  – Annual risk and vulnerability analysis and action plans
  – Compensation for loss to the electricity connection from 12h.
  – No interruption longer than 24 h.
  – Annual report off interruptions from 100 millisecond.
From meter to invoice
AMR solution

System
Kamstrup heat and electricity meters
Kamstrup EMS10, Acquiring metering data system
Powel MDMS Meter database
Kaskad, Customer information system

Meters with radio, GSM or PLC communications
Concentrator with radio, GSM or cable modem
Acquiring system
Meter database
Customer information system

AMR

GÄVLE ENERGI
• Economical: pleased owner afford to investment.

• Technological: decrease electricity usage during high demand.

• Administrative: decrease the administrative management of billing.

• Customers: customer will only be charged for the actual usage.

• Regulator: income below the regulator’s requirement.
The current tariff

- **High level voltage (10kV)**
  - Demand tariff

- **Low level voltage (0.4kV)**
  - Demand tariff (from 80A)
  - Demand tariff 63A
  - Fuse tariff 16-50A
– Demand tariff
  – Fixed fee SEK/year
  – Peak demand capacity fee SEK/kW/month
  – Off peak demand capacity fee SEK/kW/month
  – Reactive power SEK/kVAR/month
  – Energy fee Ct/kWh

– Demand tariff 63A
  – Fixed fee SEK/year
  – Peak demand capacity fee SEK/kW/month
  – Off peak demand capacity fee SEK/kW/month
  – Energy fee Ct/kWh
- 50A
- 35A
- 25A
- 20A
- 16A
- Apartment (16A)

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<tr>
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<th>Fixed fee</th>
<th>SEK/year</th>
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<td>Energy fee</td>
<td>Ct/kWh</td>
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The calculation of the tariff

- Investment/reinvestment
- Maintenance
- Power loss
- Administration
- Subscription to regional grid
- Financial cost
PRINCIPLE OF NETWORK

4 Main Substations
7,8 Km 70 kV Overhead lines
54 70 kV Poles
23 Km 70 kV Underground cables
16 Transformers
9 MV/LV Substations
7 Hydro Power stations
501 Km 10 kV Underground cables
196 Km 10 kV Overhead lines
2480 10 kV Poles

62 MV Subscribers
711 MV/LV Substations (of which)
119 Pole Substations
774 Transformers

4171 0,4 kV Poles
189 Km 0,4 kV Overhead lines
1437 Km 0,4 kV Underground cables
487 km Signal Cables
605 km Opto fibre cables

22561 Streetlights
886 Km Cable for street lighting
The calculation of the tariff

INVESTMENT of the year

Investment HV Equipments
- HV tariff

Investment MV Equipments
- MV tariff

Investment LV Equipments
- LV tariff
The calculation of the tariff

Low Voltage expenditure

- LV demand tariff (≥80A)
- LV demand tariff (63A)
- Fuse tariff (≤50A)
Electricity consumption

Appatments' energy consumption, kWh/year

Houses without electrical heating - 16A, kWh/year

Energy consumption by the same fuse
• **Future tariff – a more reasonable tariff**

• The new law - monthly measuring.
• The demand tariff for small fuse based on the actual usage of power
• Decrease the power peaks.
• Decrease the reinvestment
• Reduce the subscription cost to the regional transmission grid.
• The challenge – to teach our customer:
  – The difference between energy (kWh) and power (kW).
  – The way to manage their energy consumption effectively.