

# REGULATION OF ELECTRICITY SUPPLY QUALITY

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# Definitions

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- Transmission (Fingrid)
  - 400 kV **3700 km**
  - 220 kV **2500 km    13900 km**
  - 110 kV (meshed lines) **7700 km**
- Regional network (12 + 66 companies)
  - 110 kV (radial lines) **7500 km**
- Distribution (106 companies)
  - 20 kV **128.000 km**
  - 0.4 kV **212.000 km**

# Number of Substations

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- **Fingrid**
  - 400 kV      **28**
  - 220 kV      **18**
  - 110 kV      **53**
- **Regional network**
  - 110/20 kV   **520**
- **Distribution**
  - 20/0.4 kV   **122.000**

# Energy Market Authority

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- established on 1 June 1995
- subordinate to the Ministry of Trade and Industry (the Department of Energy)
- independent in decision-making
- decisions can be appealed to the Supreme Administrative Court
- ca. 90% of the expenses are financed through fees collected from the network firms, the remaining part from the State budget

# The Main Tasks of the EMA

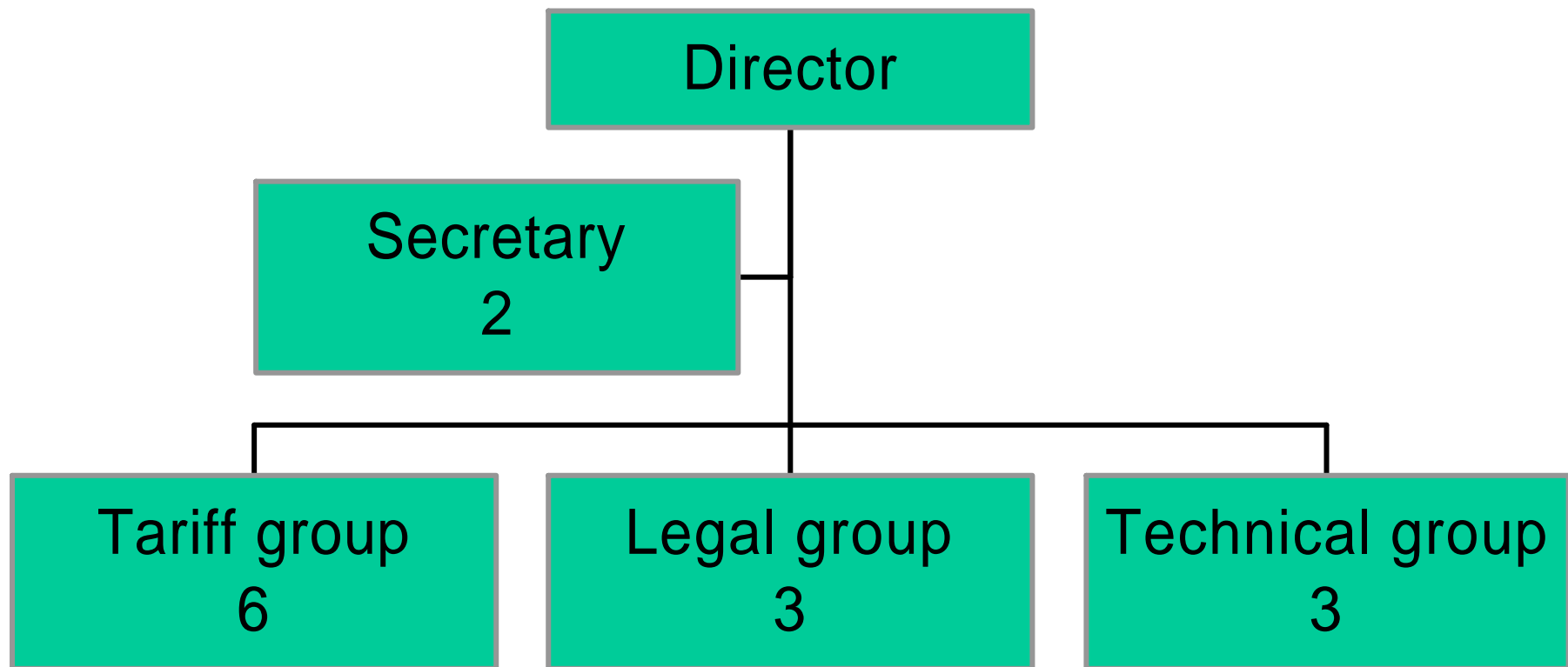
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**Mission: To promote sound and well-functioning competition in the electricity market**

- controls monopoly activities
  - network pricing
  - pricing of electricity to captive customers
  - terms of sales of network services
- issues licences for network operations
- collects and publishes price information

# The Organisation of The EMA (15)

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# Tariff group

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- monitors and investigates network prices in distribution and regional networks
- controls energy prices of captive customers
- collects and analyses price data, accounting information and key economic and financial indicators
- supervises unbundling

# Legal group

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- participates in developing electricity market legislation (working groups, committees, proposals to the Ministry)
- legal surveillance of contract terms
- monitors retail and wholesale market competition
- issues network licences
- handles consumer protection issues



# Technical group

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- monitors and analyses transmission prices set by the national grid company (Fingrid)
- develops and analyses key technical figures of network operation
- controls system reliability, load balancing and balance settlements
- monitors network maintenance and expansion
- issues network building licences
- handles metering and **quality** issues

# The Finnish Regulatory Framework

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- light-handed regulation model
- no ongoing price regulation
- case-by-case ex post price control
- an investigation of pricing may start through a complaint or on the initiative of the EMA
- extensive publicity of price and accounting data → intra-branch benchmarking
- close co-operation between the regulator and the competition authority

# The Finnish Approach

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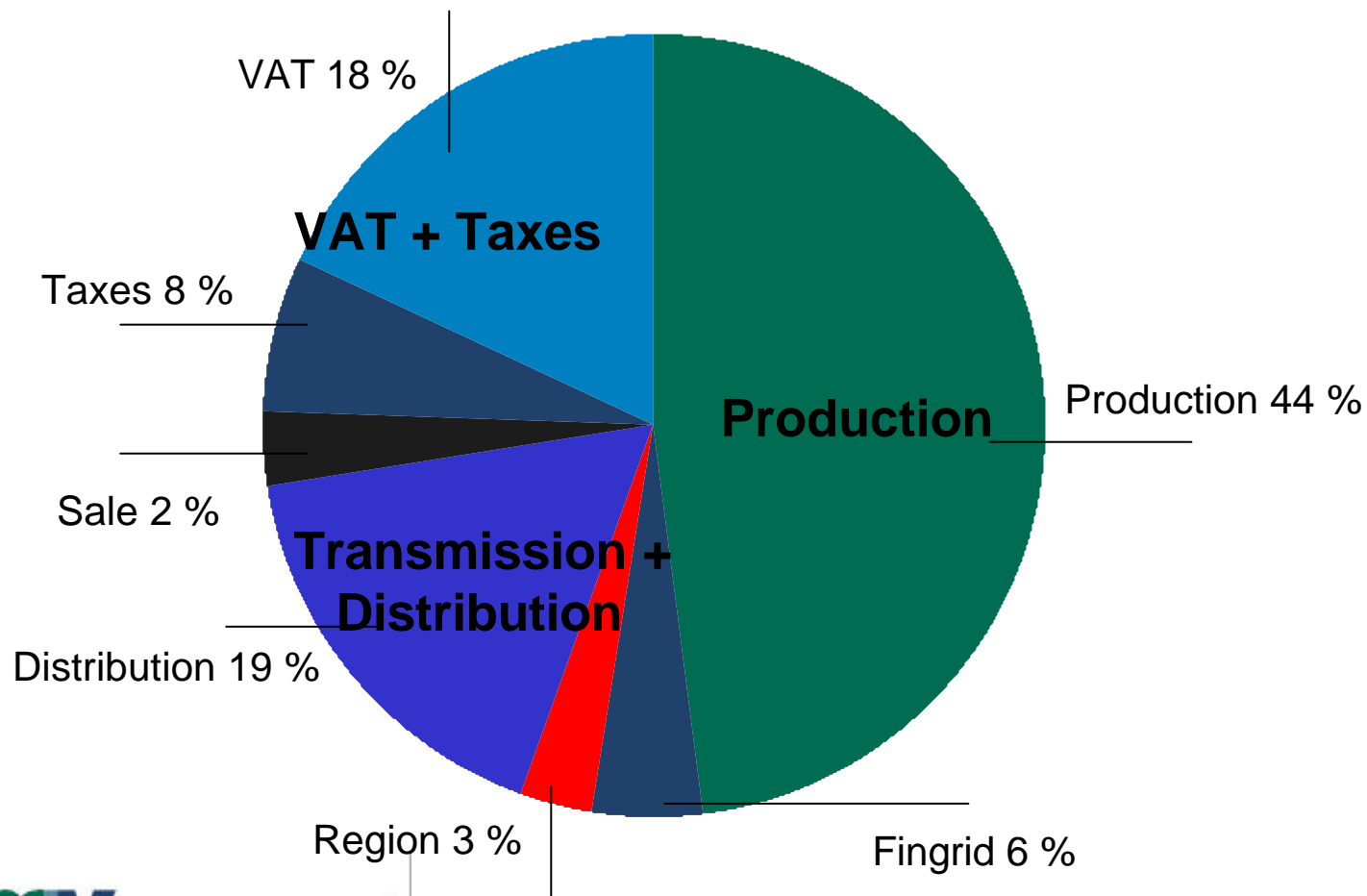
**The competition is more effective than the most effective authority**



**to minimize those activities where the competition is prohibited**

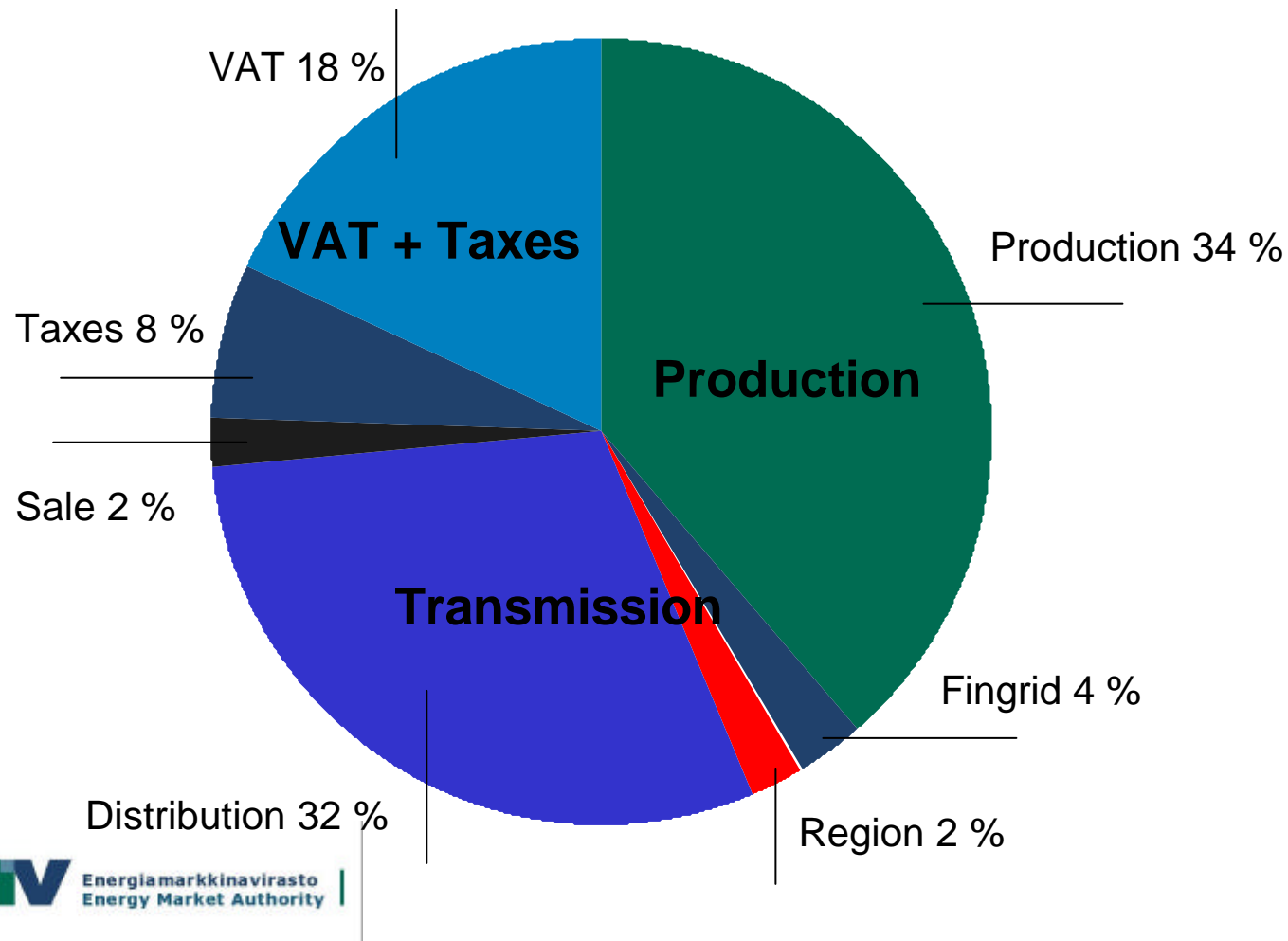
# Price Consistence

Small industry ca 30 p/kWh (5 Euro cents/kWh)



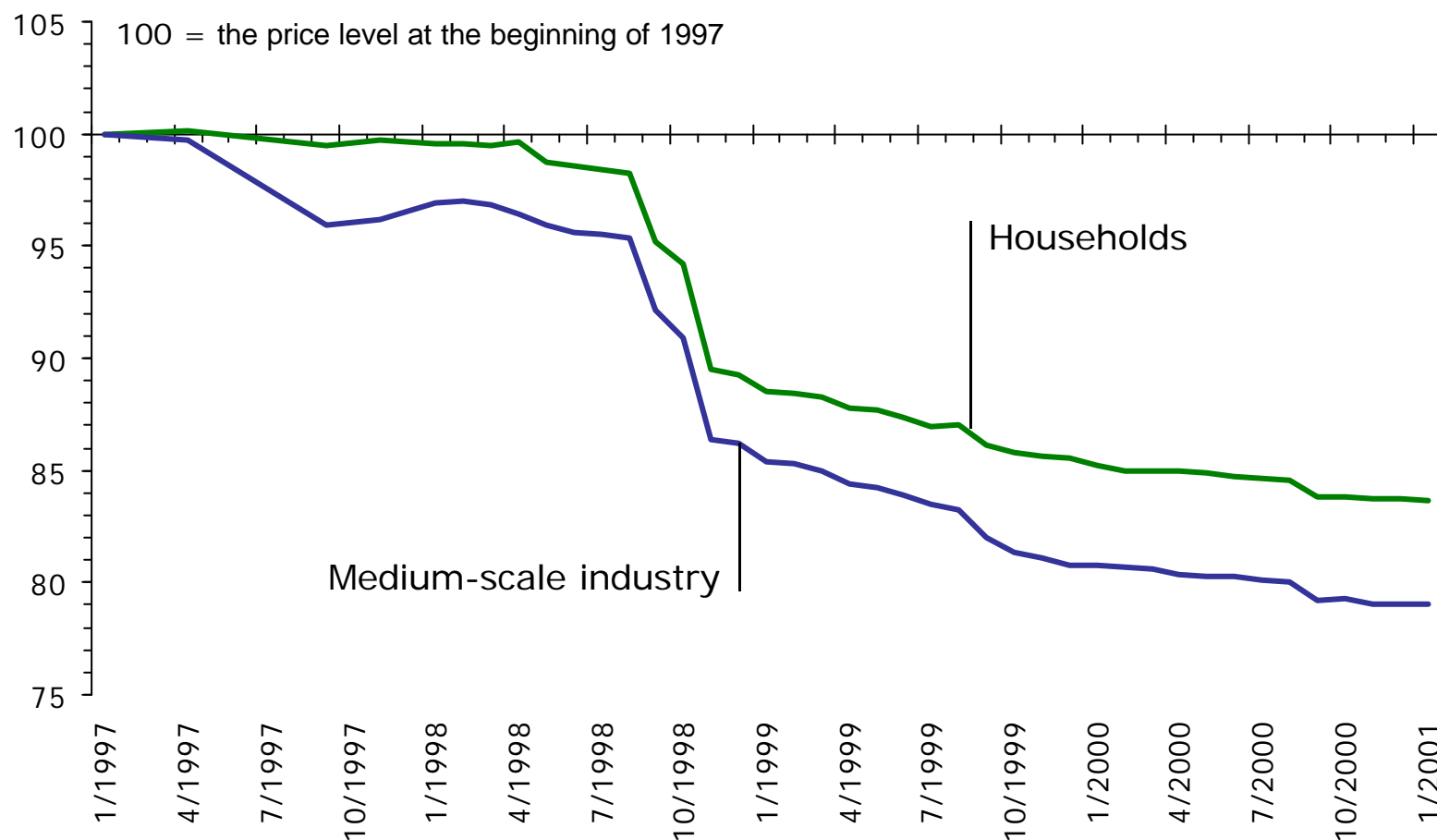
# Price Consistence

Household customers ca 50 p/kWh  
(8 Euro cents/kWh)



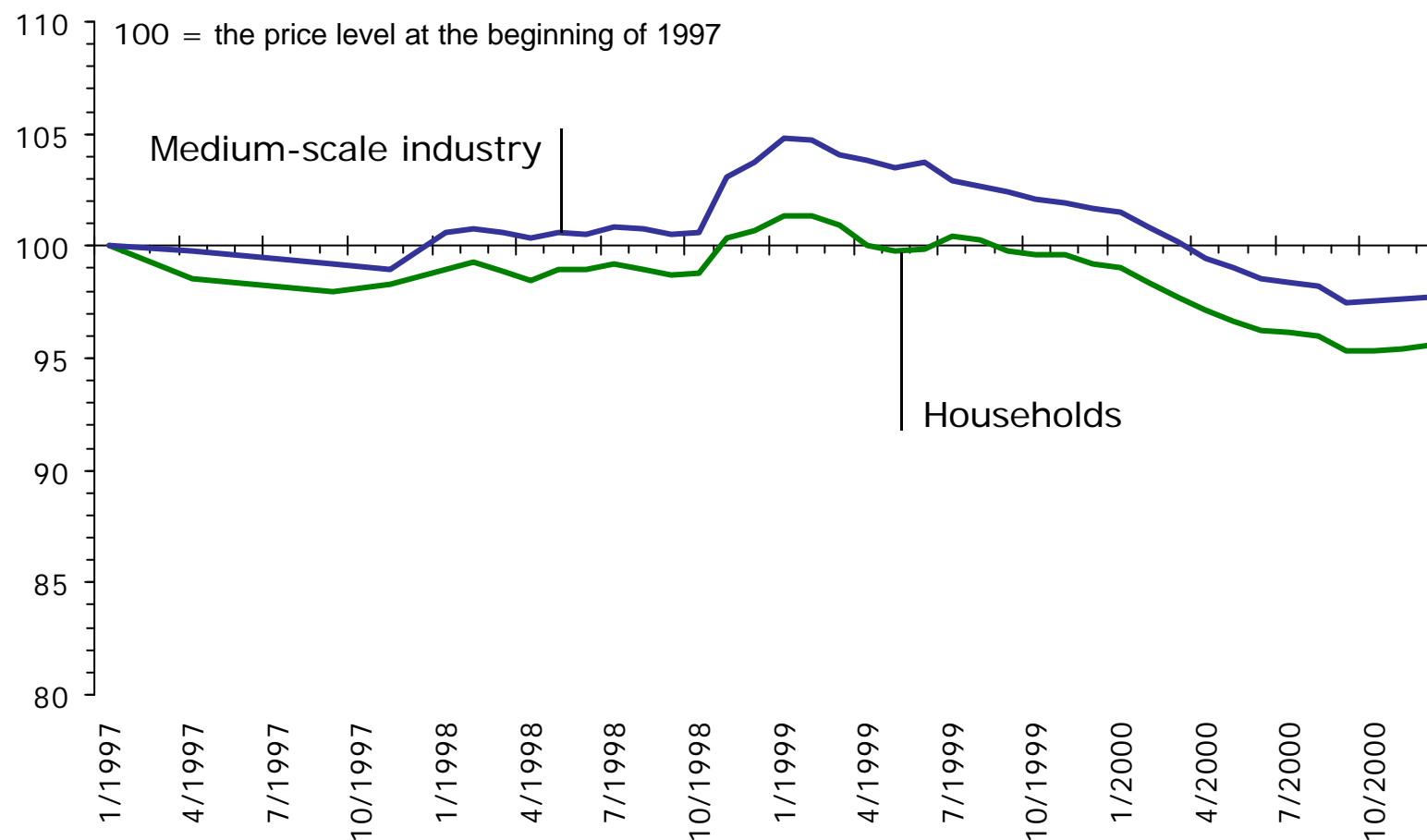
# The Real Price of Electric Energy

(public prices, adjusted with the Consumer Price Index)

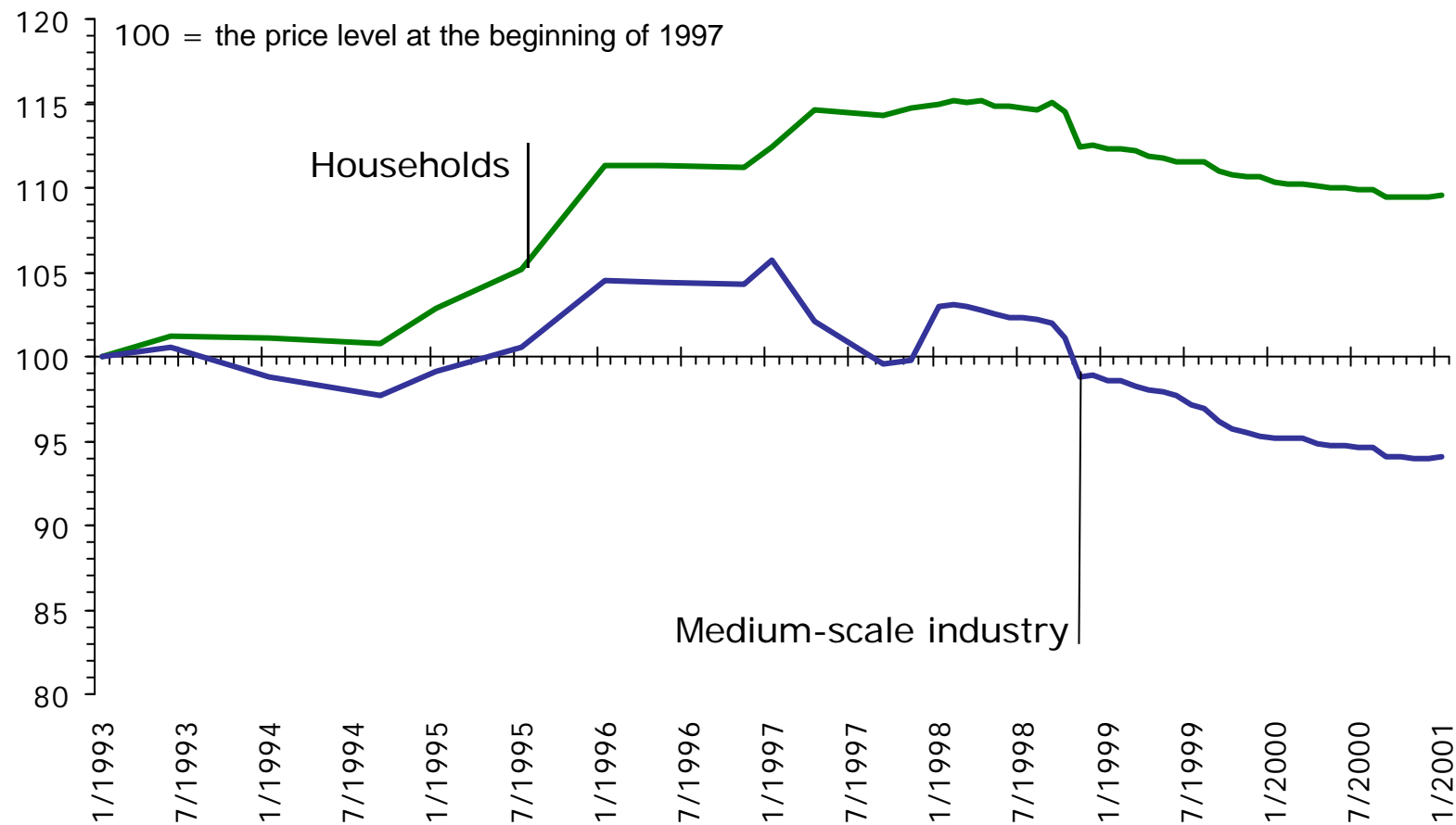


# The Real Price of Distrib. of Electricity

(excl taxes, adjusted with the Consumer Price Index)



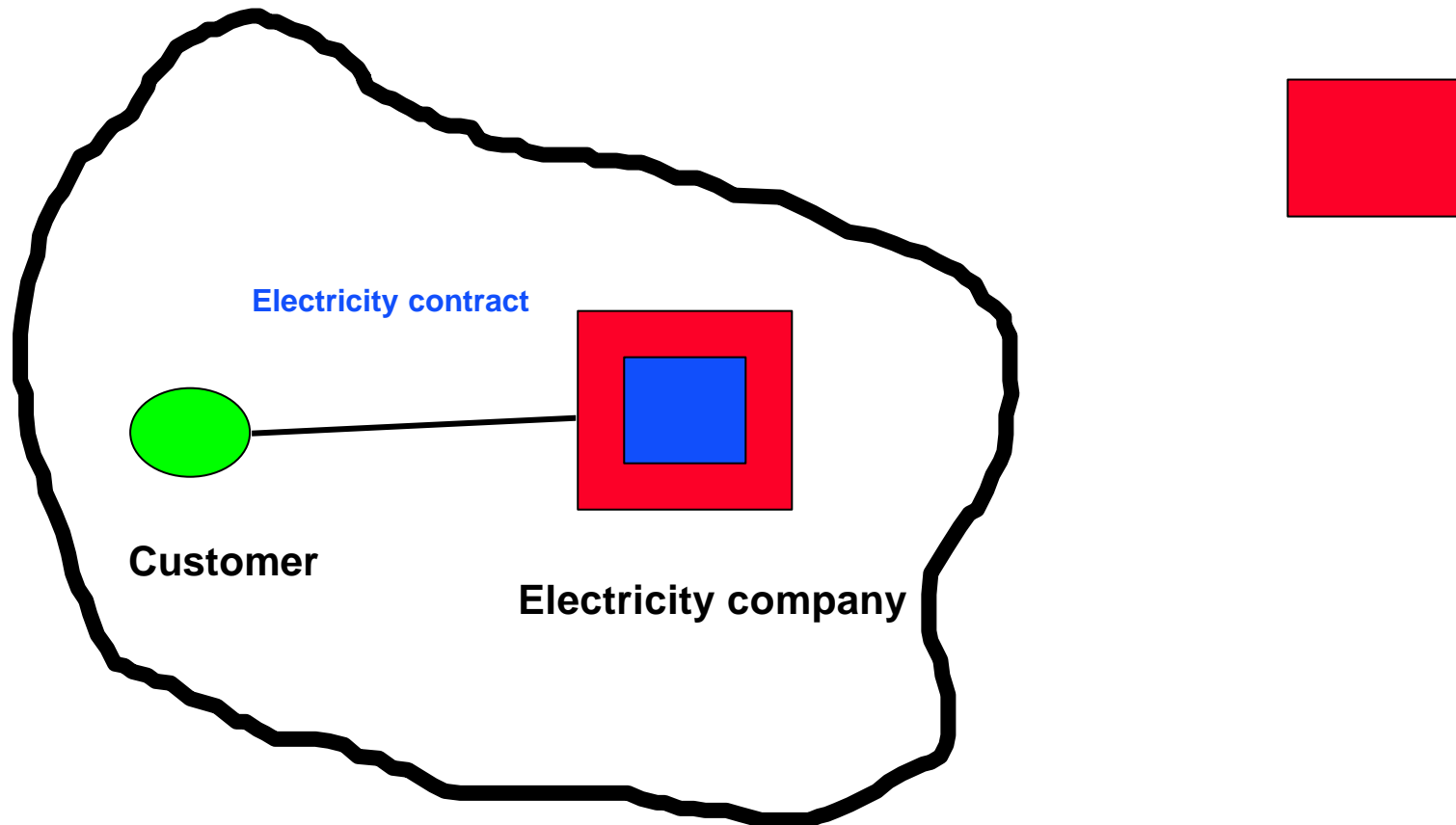
# The total price of energy (incl. distribution)





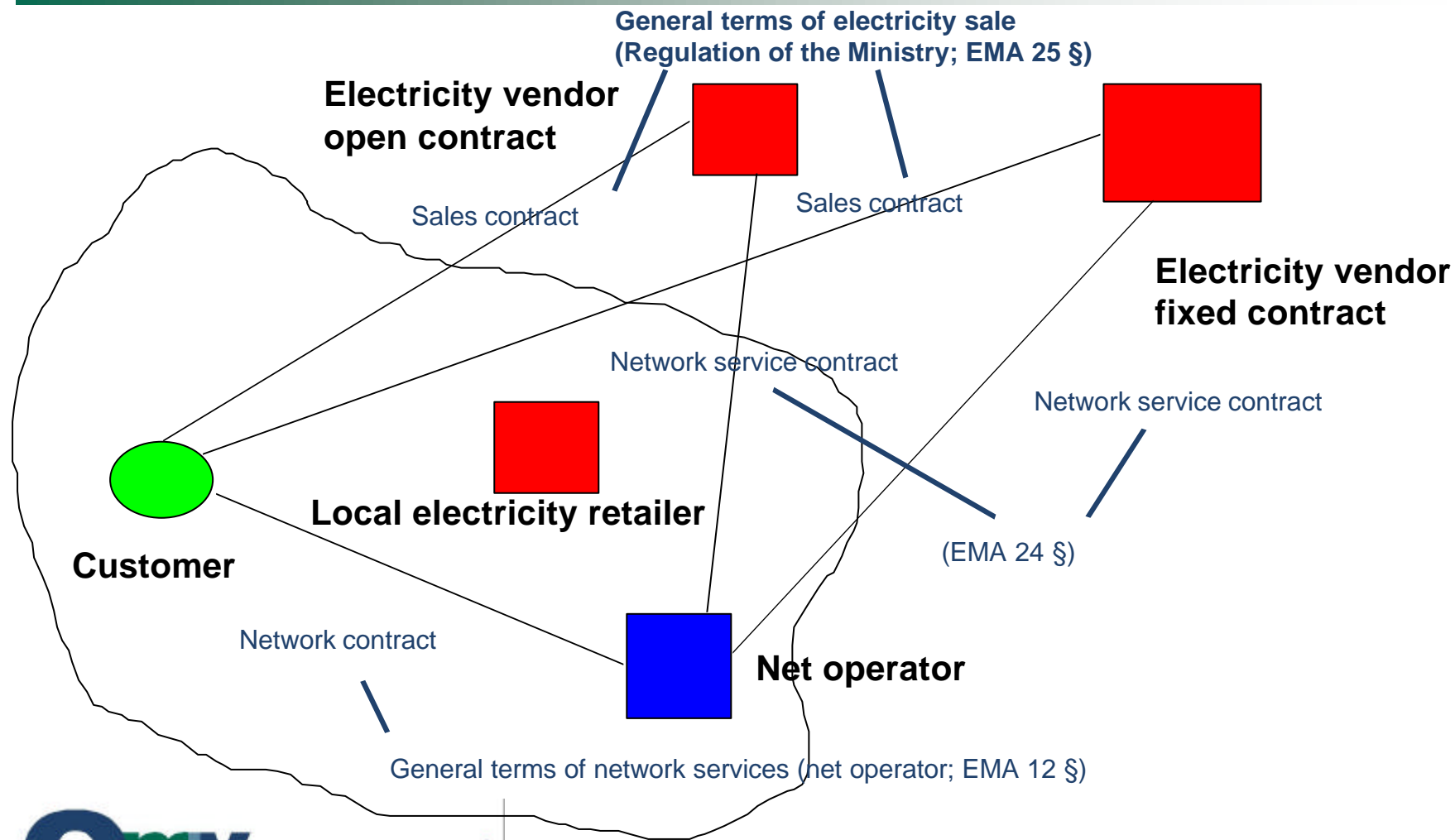
# Contracts in Electricity Purchase

(Before Electricity Market Act 1995)



# Contracts in Electricity Purchase

(According to Electricity Market Act)



# Legal Principles of Electricity Quality

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## General obligations of network operation Section 9

- The net operator shall maintain, operate and develop his power network and the connections to other networks in accordance with his customers' reasonable needs, and to secure, for his part, the supply of **sufficiently high-standard electricity** to his customers (*obligation to develop power network*).

# Legal Principles of Electricity Quality

(Continued...)

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## Section 27 c

### *Fault*

- The supply of electricity is faulty if the quality of electricity or the manner of supply does not correspond to what can be considered to be agreed upon. Unless otherwise agreed, the supply of electricity is faulty if the quality of the electricity **does not correspond to the standards adhered to in Finland** or **if there have been continuous or repeated interruptions** in the supply of electricity, and these interruptions cannot be considered minor when taking into account their reason and circumstances.

# Legal Principles of Electricity Quality

(Continued...)

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## Section 27 d

### *Price reduction*

- On the basis of a fault, the user of electricity is entitled to a **price reduction** proportionate to the fault. If the fault is based on interruption of electricity supply, the price reduction is at least the sum that corresponds to two weeks' share of the annual network service fee.

# Legal Principles of Electricity Quality

(Continued...)

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## Section 27 e

### *Compensation because of a fault*

- The user of electricity is entitled to **compensation for damage suffered because of a fault**. The retailer or distribution net operator referred to below in Section 27 f is then required to compensate for the indirect damage referred to in Section 27 b, paragraph 3, only if the fault or damage is caused by negligence on his part.

# Legal Principles of Electricity Quality

(Continued...)

## Section 27 f *Responsible bodies*

- The user of electricity is always entitled to present his claims based on a fault to the distribution net operator. The claims must be presented within a reasonable period after the user of electricity has noticed, or should have noticed, the fault and has had the data on the distribution net operator needed for presenting the claims.
- The distribution net operator is responsible for faults to consumers, unless the distribution net operator, within a reasonable period after having been informed of the claim, informs the consumer of a retailer who is responsible for the fault and assumes liability for the compensation or price reduction derived from the fault.

# Problems or difficulties

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- **European standard EN 50160:1994** (Voltage characteristics of electricity supplied by public distribution systems) **is not sufficient, Sener has its own recommendations**
- **Standard quality is not good enough for normal electric devices**
- **To prove a fault afterwards is often difficult**
- **Quality meters are expensive**
- **Auto-reclosings cause troubles**
- **Atmospheric phenomena (lightning) – quality or safety matter?**
- **Expertise and knowledge must be increased (net operator plus customer)**



# Conclusions

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- **Significance of quality matters is increasing**
- **Knowledge and requirements among customers are increasing**
- **Electric devices become more and more sensitive**
- **Amount of complaints will increase dramatically**
- **Compensation process must be automatised**
- **Definition of quality must be clarified**
- **Standard must be specified or supplemented by national recommendations**
- **Standard for electric devices and quality must be synchronised**
- **Energy Market Authority will start a quality project**