



Overview of Service Quality Regulation in Croatia

Croatian Energy Regulatory Agency

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Quality of Electricity Supply

- General Conditions of Electricity Supply (NN 14/06)
- Grid Code (NN 36/06)
- Rules for voltage standards in low voltage distribution networks and electrical gear (NN 28/00)
- 3rd Benchmarking Report on Quality of Electricity Supply, CEER 2005
- 1st Benchmarking Rport on Quality of Electricity Supply, CEER 2001

Quality of Electricity Supply



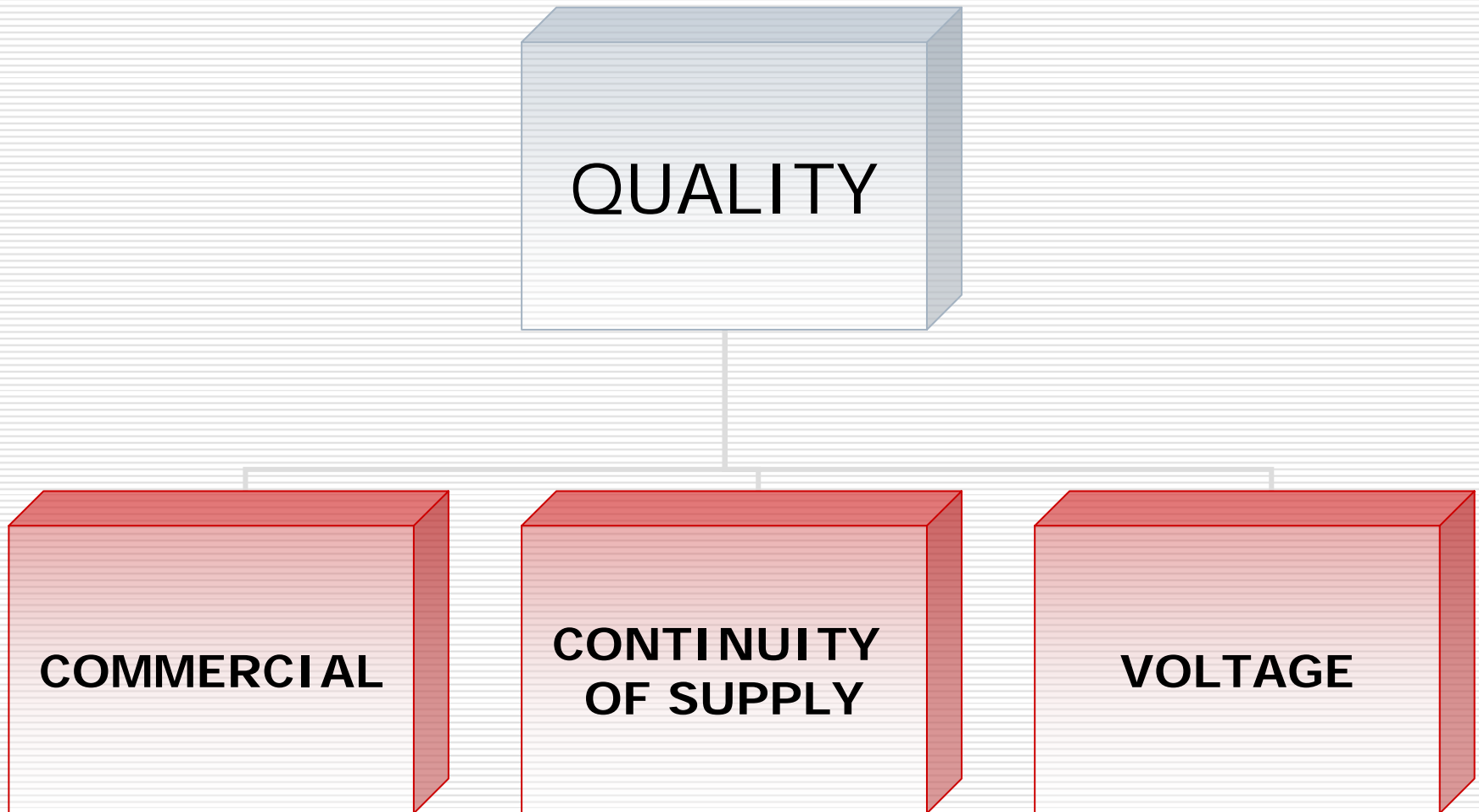
- General Conditions of Electricity Supply (NN 14/06):
 - Commercial Quality Monitoring System, to set up until 01.07.2006. (TSO, DSO, Supplier)
 - Continuity of Supply Monitoring System, to set up until 01.01.2007.
 - Voltage Quality Monitoring System, to set up until 01.01.2007.
 - Written report about quality of electricity supply upon written customer request, obligation from 01.01.2009.
 - TSO and DSO are obliged to suggest standard levels of quality of electricity supply to the concerned minister until 01.01.2008.
 - Minister until 01.07.2008., in accordance with Agency opinion, proposes Government of Croatia standard levels of quality of electricity supply and penalty payments



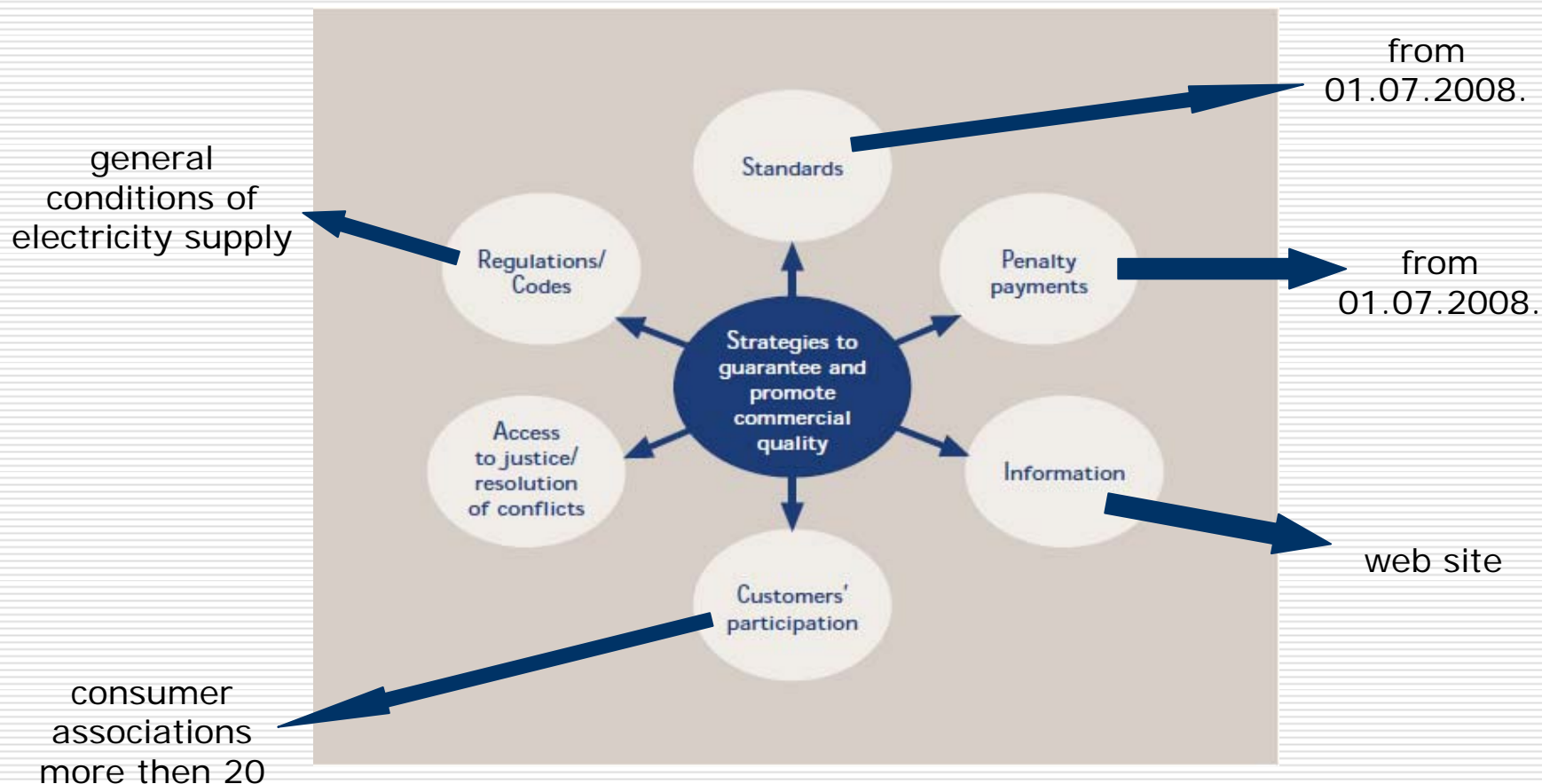
Quality of Electricity Supply

- Commercial Quality
 - Quality of relationship between supplier and customer
 - Service level provided to the customers
- Continuity of Supply
 - Number and duration of interruptions
- Voltage Quality
 - Voltage characteristics under normal operating conditions
 - Frequency, voltage magnitude, voltage variations, voltage dips, temporary or transient overvoltage, harmonic distortion

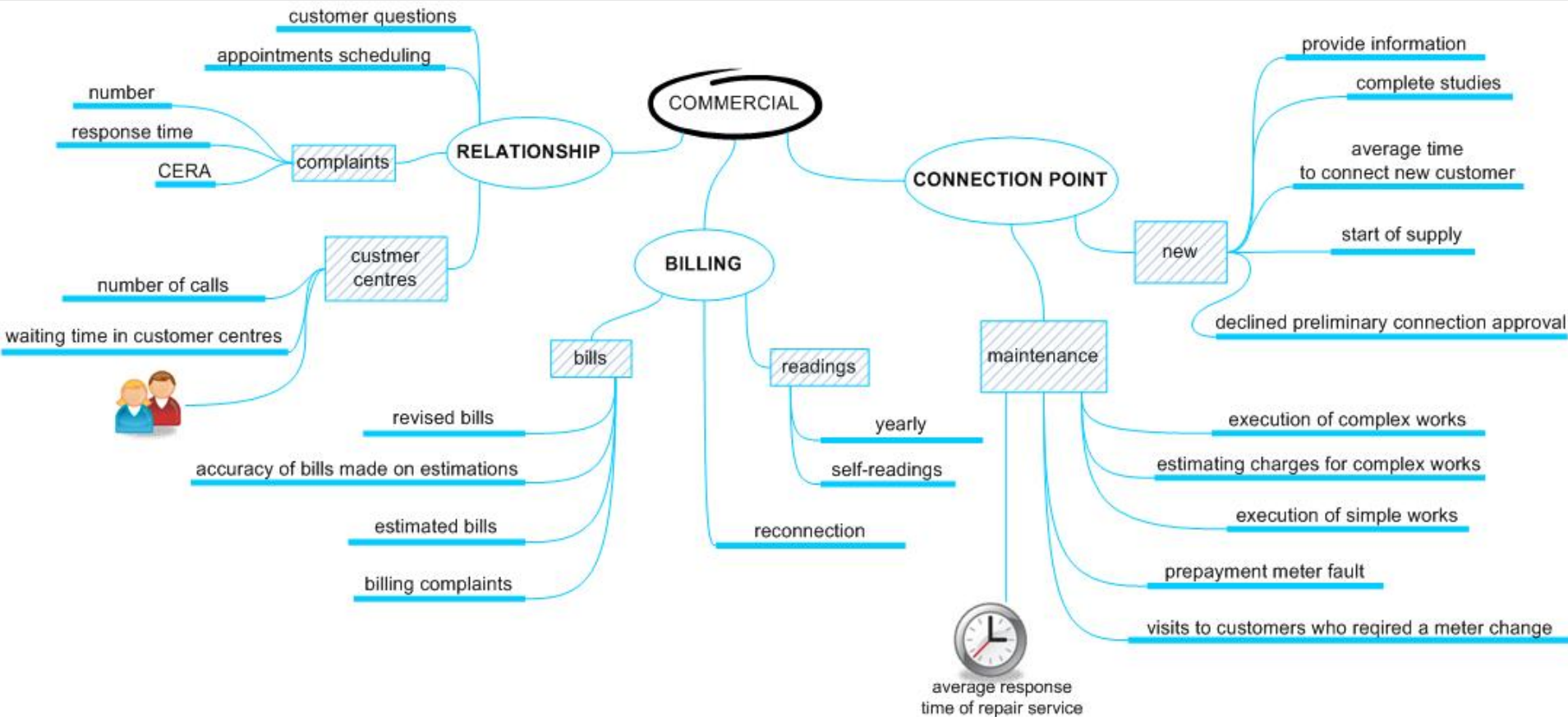
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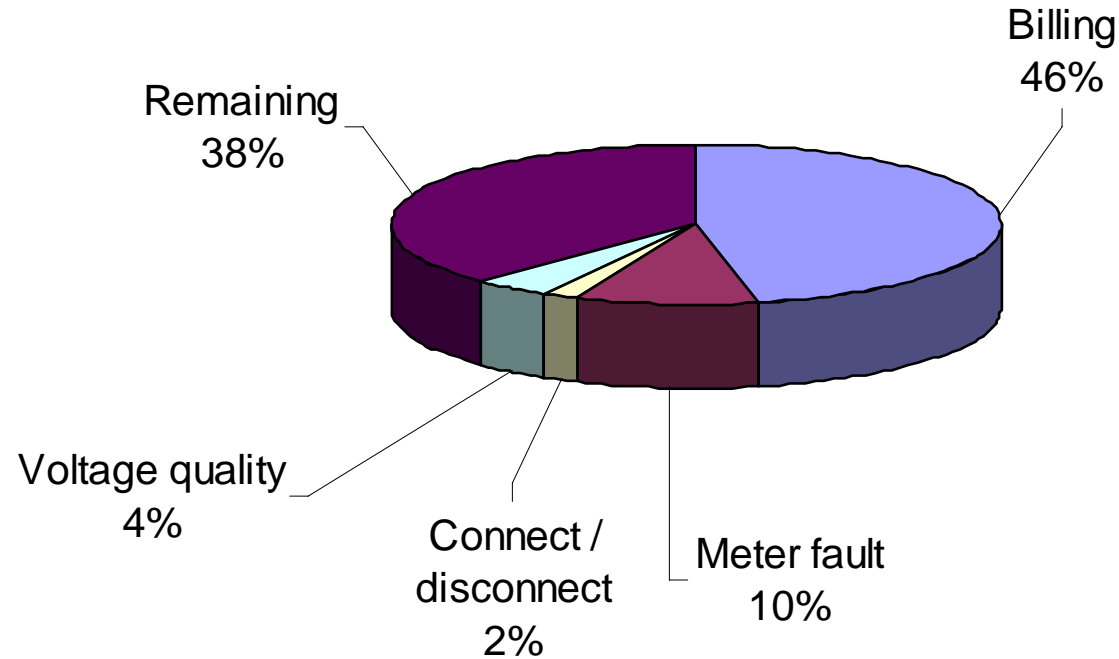
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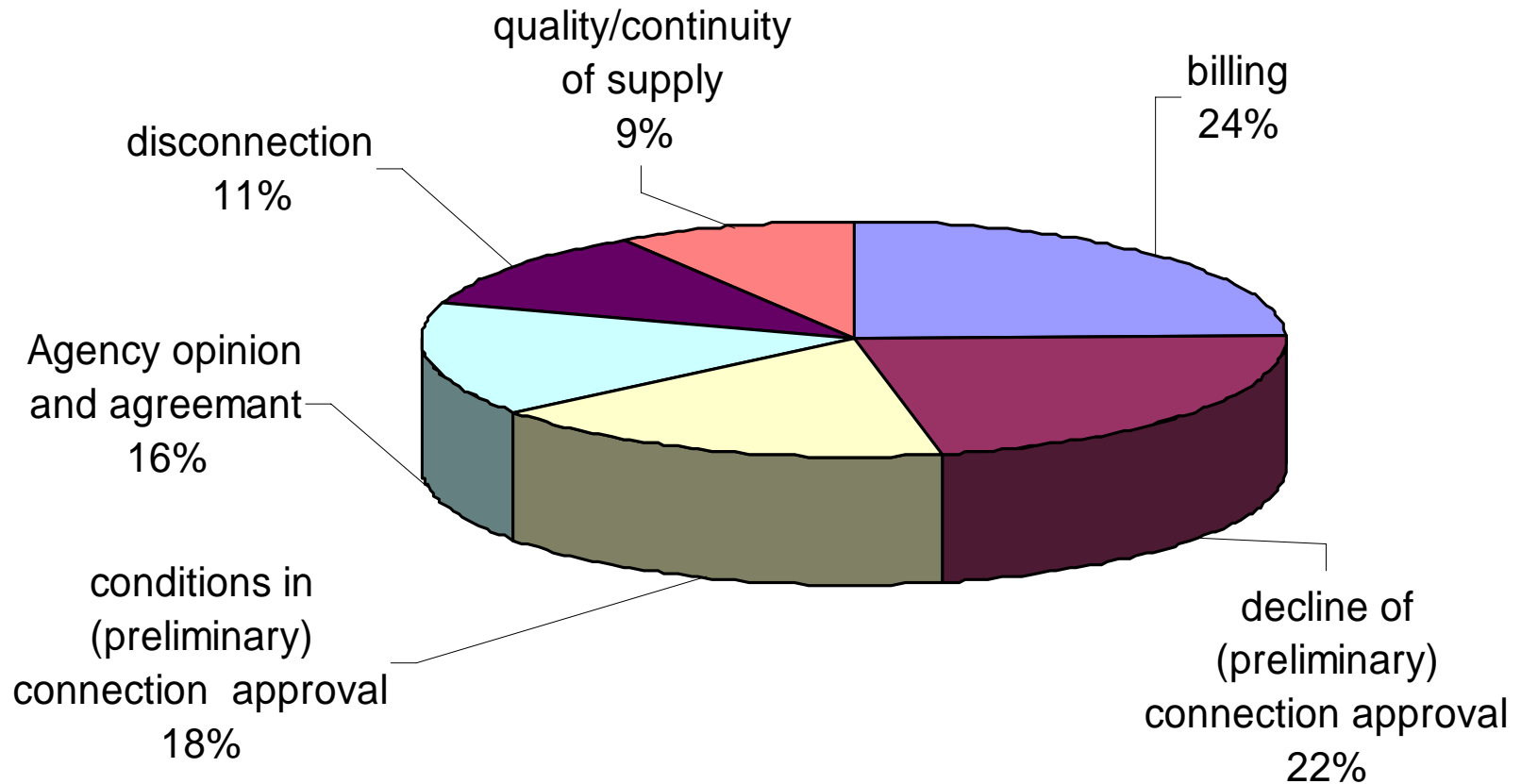
*Subjects of customer complaints resolved in 2006.
by Commission for consumer complaints in HEP-DSO.*



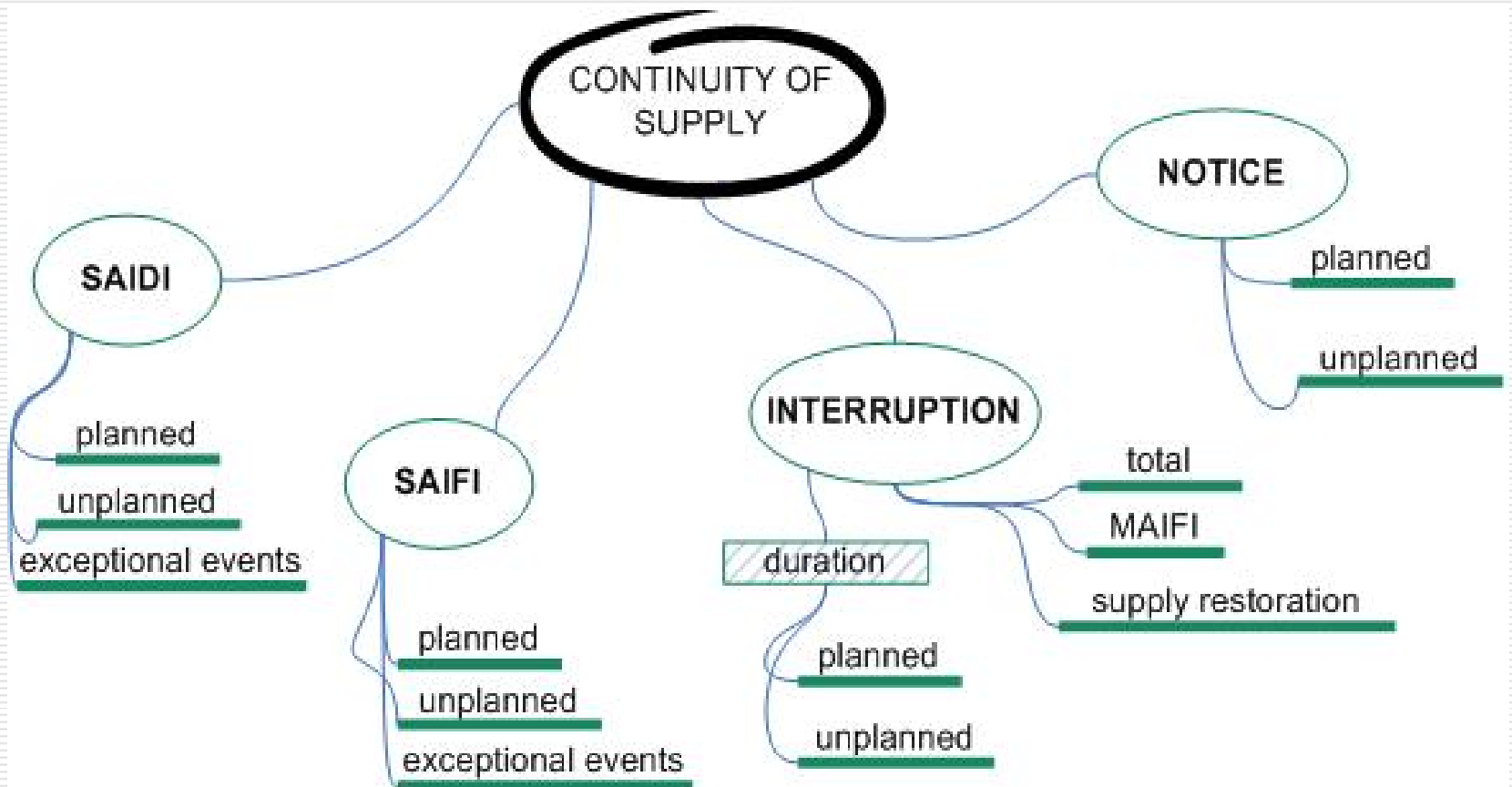
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Complaints structure in Agency for 2006.

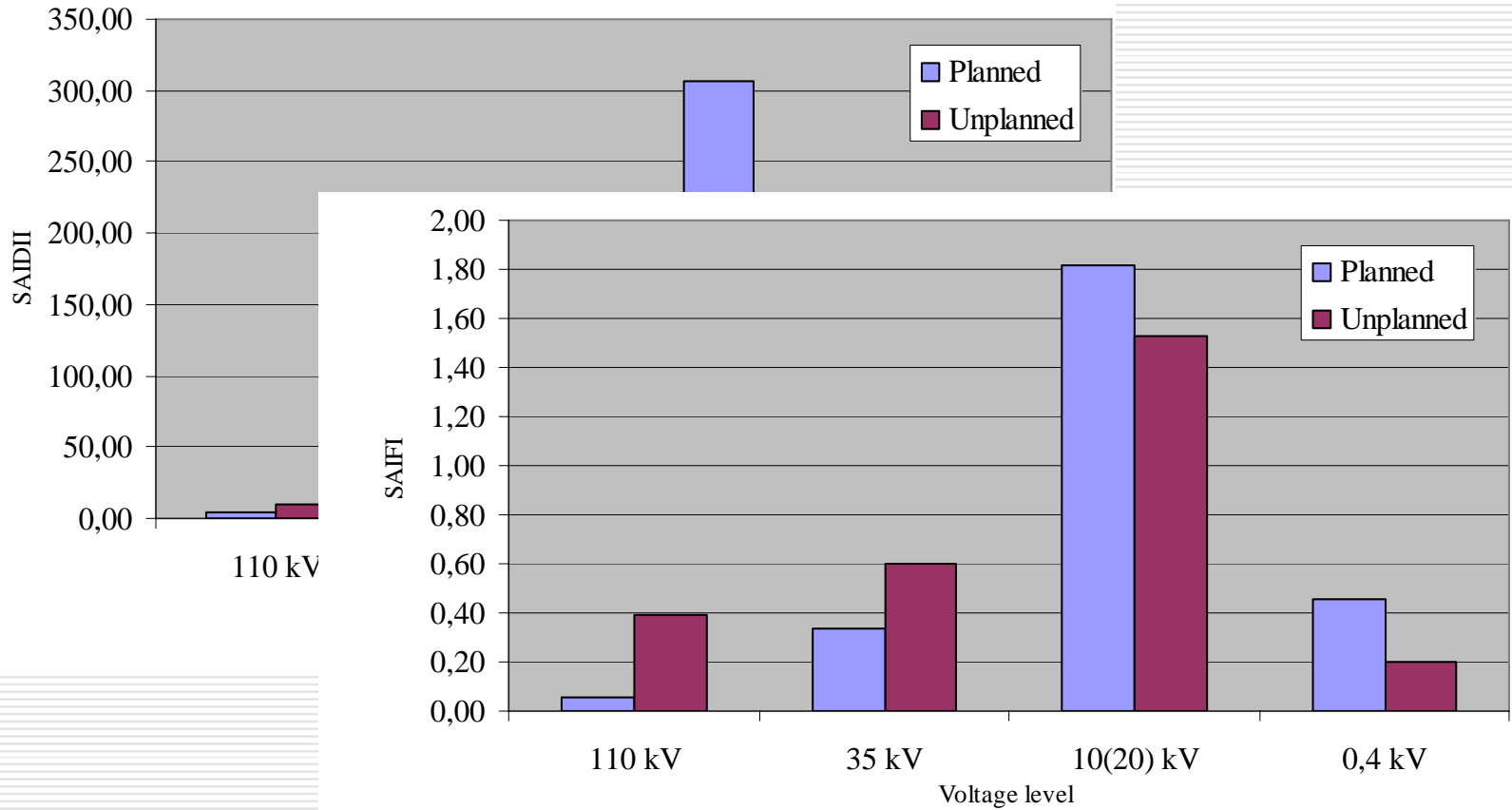


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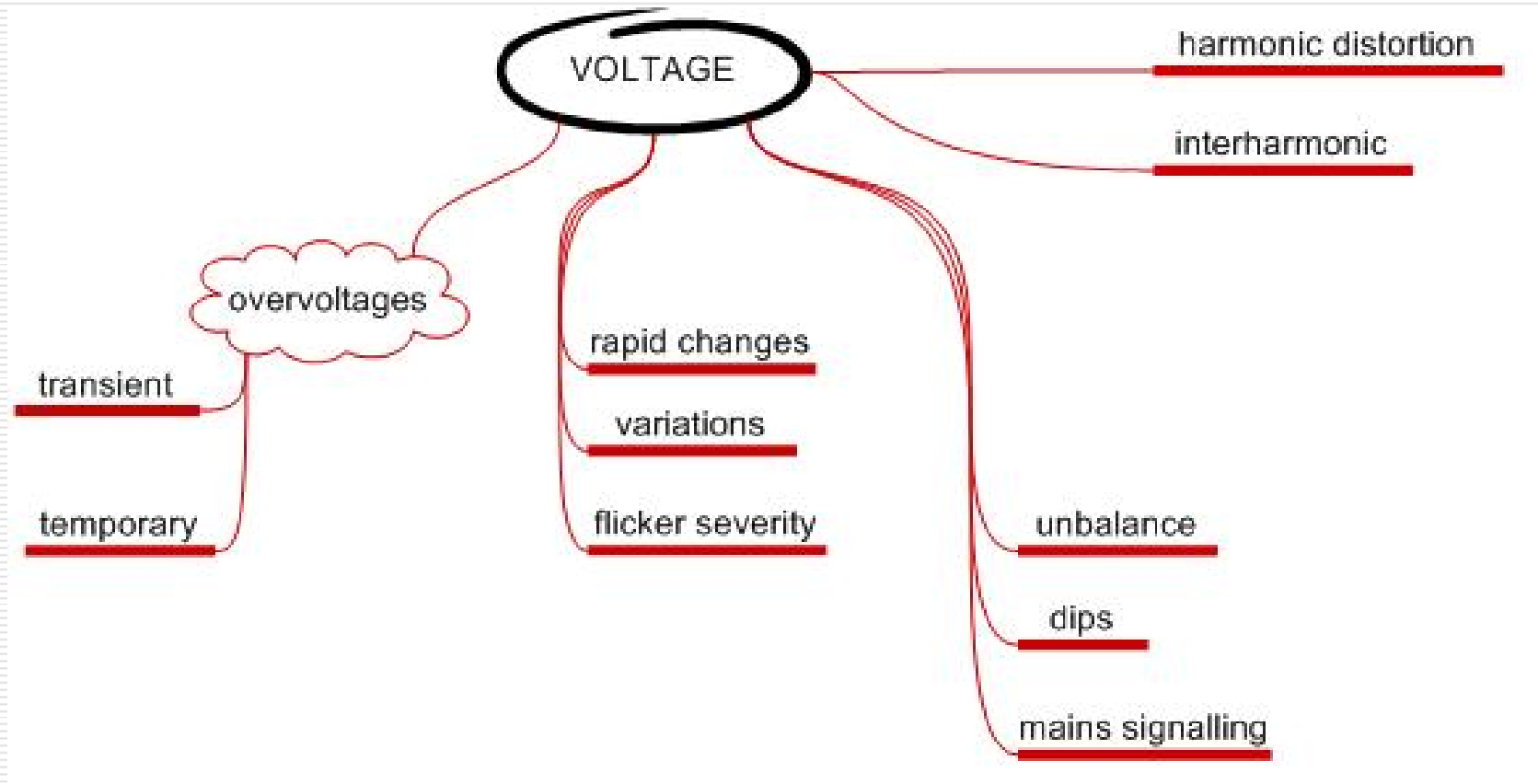




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EN 50160 and regulations for quality of service in electricity supply

- ➡ EN 50160:1999 (CENELEC BTTF 60-6) refers to low and medium voltage networks; does not apply to voltage levels higher than 35 kV
- ➡ **EN 50160** still not accepted in Croatia
- ➡ binding regulations in regard to quality of electricity supply still missing in Croatia
- ➡ supply voltage value covered with the Grid code and the Rules for voltage standards in low voltage distribution networks and electrical gear
- ➡ commercial quality covered with the General conditions of electricity supply



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Rules for voltage standards in low voltage distribution networks and electrical gear

- **Recommends** for supply voltage in LV networks limits of $\pm 10\%U_n$. ($U_n = 230\text{ V}$, 207-253V)
- From 2010. tolerances of $\pm 10\%U_n$ should be achieved



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The Grid Code

- Limits: +6%/-10% (till 2010.) and $\pm 10\%$ (after 2010.),
- Permissible deviation in normal operating conditions:
 - within a week, 95% of 10-minute average effective voltage values should be within $U_n + 6\% / -10\%$ (till 2010.), $U_n \pm 10\%$ (after 2010.).
 - All 10-minute average effective voltage values should be within $U_n + 10\% / -15\%$.



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What if Quality is not satisfactory?

- TSO or DSO shall, at the written request of a network user, submit a written report on the level of quality of electricity supply at his metering point (from 1.1.2009)
- In individual cases of existing network users in remote areas with long lines, deviations of indicators of voltage quality may be greater than those prescribed and the bringing of such indicators to the prescribed level shall be carried out according to the time-limits approved by the Agency if the TSO or the DSO is unable to resolve such a problem in a three-year development and construction plan



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What if Quality is not satisfactory?

- ➡ If the network user submits a written complaint about the level of voltage quality, the TSO or the DSO shall carry out measurements within 20 days, and shall submit a written report on the results of quality measurements at the metering point to the network user within a further 10 day period
- ➡ If the complaint is unfounded, the costs of measurements shall be borne by the network user
- ➡ If the complaint is founded the costs of measurement shall be borne by the responsible network operator
- ➡ If the network user submits a report of an authorized person on the results of the measurements of the quality, the TSO or the DSO may accept the results or measure itself.
- ➡ If the complaint is founded, TSO or DSO is obliged, under by the Agency approved development and construction plan for that part of the network for the next 3 years, to provide standard voltage quality at the metering point
- ➡ Damage compensations are in chapter X in General Conditions of Electricity Supply

Quality of Electricity Supply



Current status:

- ➡ From 1.7.2006. HEP-DSO has the Commercial Quality Monitoring System
- ➡ From 1.1.2006. HEP-DSO has Continuity of Supply Monitoring System, application DISPO
- ➡ Study has been started for to set up Voltage Quality Monitoring System



Thank you for your attention!

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