Bundesnetzagentur

Quality Regulation

Stefan Arent

Quality Regulation

Why Quality Regulation?

- § 4 Abs. 1 ARegV introduces efficiency-based revenue caps
- Resulting from this
  - Incentives to increase efficiency
  - With additional return on investment opportunity for network operators
  - Relief for customers through lower user network fees
- Risk on the quality of supply when focusing only on reducing the costs
- Therefore the ARegV introduces Quality Regulation
- The beginning of the Quality Regulation: 1 January 2012

AREgV guidelines regarding the reliability of the network (§ § 18-20 AREgV)

- Bonus/Malus on the revenue cap if there is a deviation on reference values
- Permissible KPIs to build reference values
  - Duration
  - Frequency of interruptions of supply

- Reference values
  - Should be calculated with data provided by network operators nationwide
  - Should be calculated as weighted averages of all network operators
  - Territorial structural differences should be considered

Key points of Quality Regulation

- Persuant to § 20 Abs. 1 ARegV: Permissible KPIs to assess the network reliability
  - Duration of interruptions in energy supply
    - Low voltage → SAIDI (System Average Interruption Duration Index)

$$\text{SAIDI} = \frac{\sum(\text{duration x interrupted LV})}{\text{LV total}}$$

    - Middle voltage → ASIDI (Average System Interruption Duration Index)

$$\text{ASIDI} = \frac{\sum(\text{duration x inst. apparent assessment of the interrupted ONT and LVT})}{\text{installed apparent assessment of all ONT and LVT}}$$

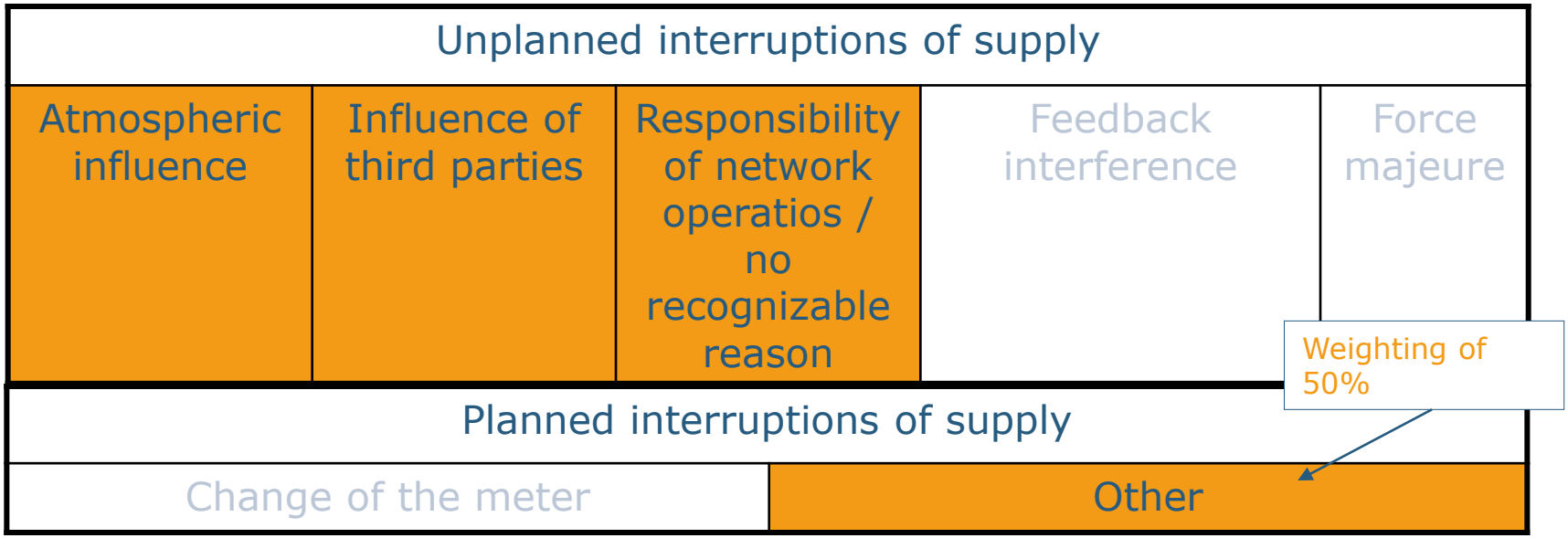
Key points of Quality Regulation (basic version)

- Data basis
  - Reporting obligation persuant to § 52 EnWG regarding interruptions of supply (VU) >3 minutes

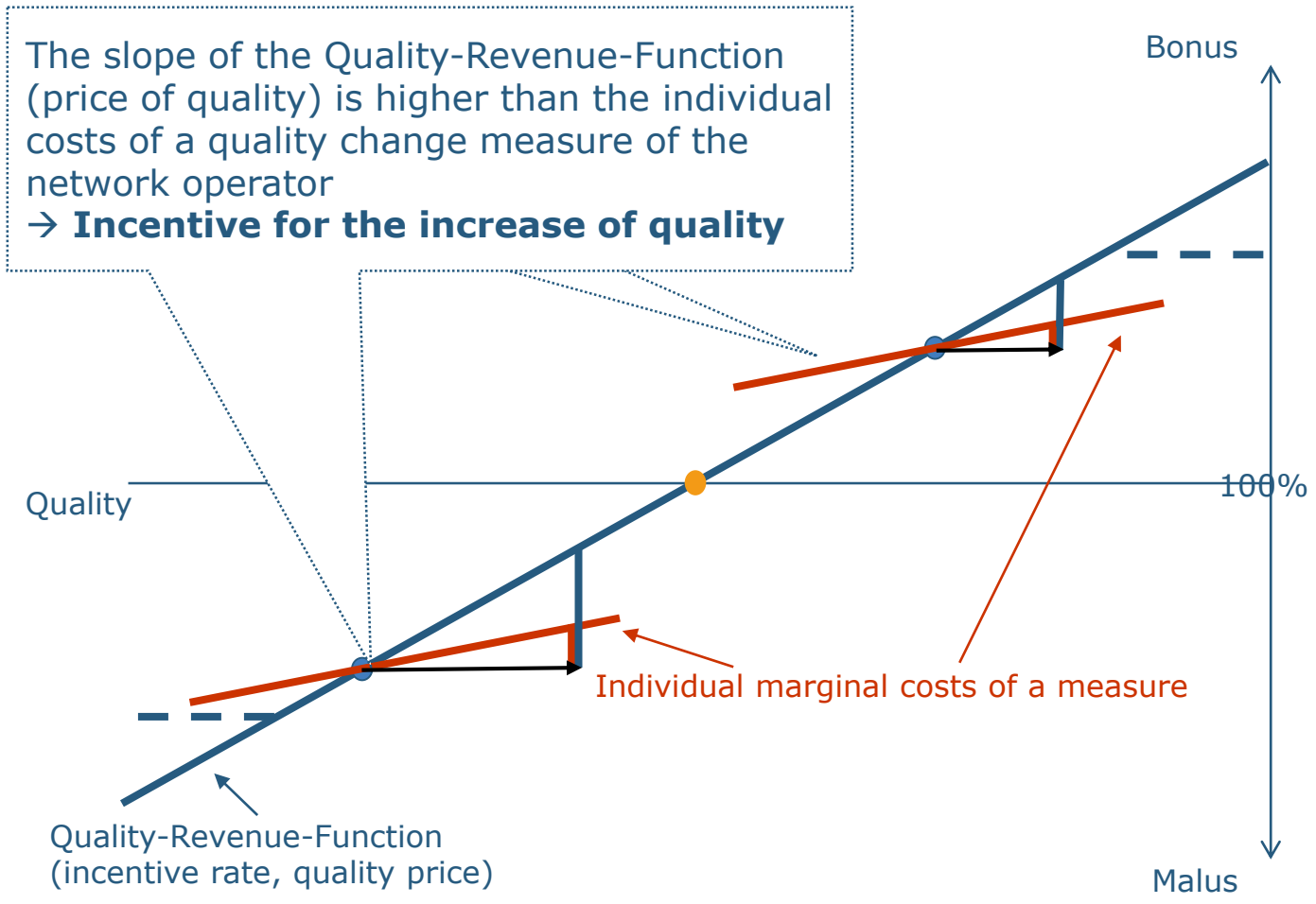
Unplanned interruptions of supply				
Atmospheric influence	Influence of third parties	Responsibility of network operatios / no recognizable reason	Feedback interference	Force majeure
Planned interruptions of supply				
Change of the meter		other		

Key points of Quality Regulation (basic version)

- Data basis
  - Calculation of KPIs taking into account the following interruptions of supply



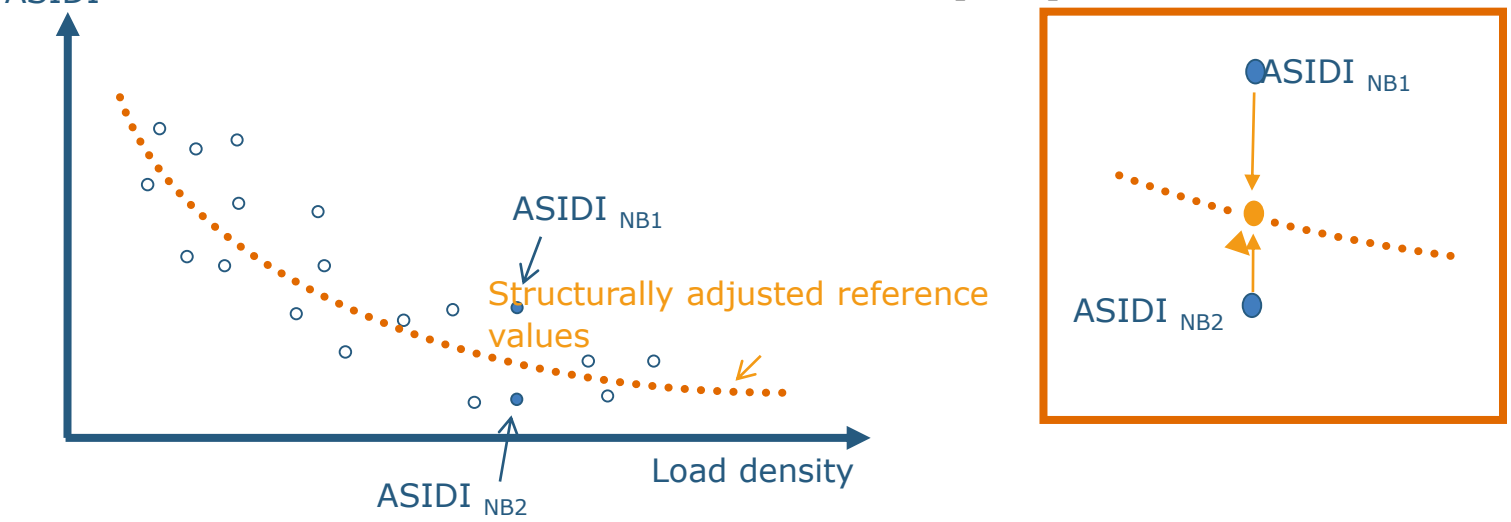
Key points of Quality Regulation (basic version)



Determination of the quality element

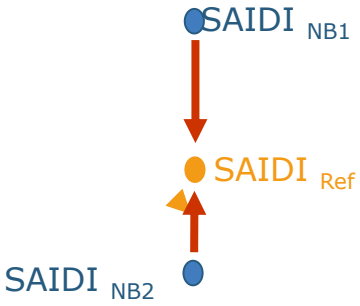
- Consideration of territorial structural differences
  - E.g. in the middle voltage level taking into account a functional context between the exogen structural parameters load density and the non-availability (ASIDI)

$$\text{Load density} = \frac{annual\ peak\ load\ \ [kW]}{supplied\ area\ [km^2]}$$

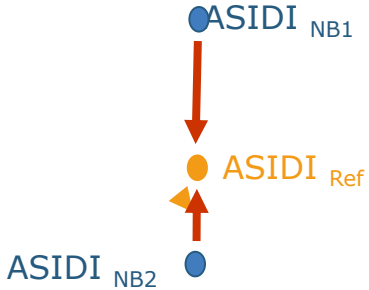


Determination of the quality element

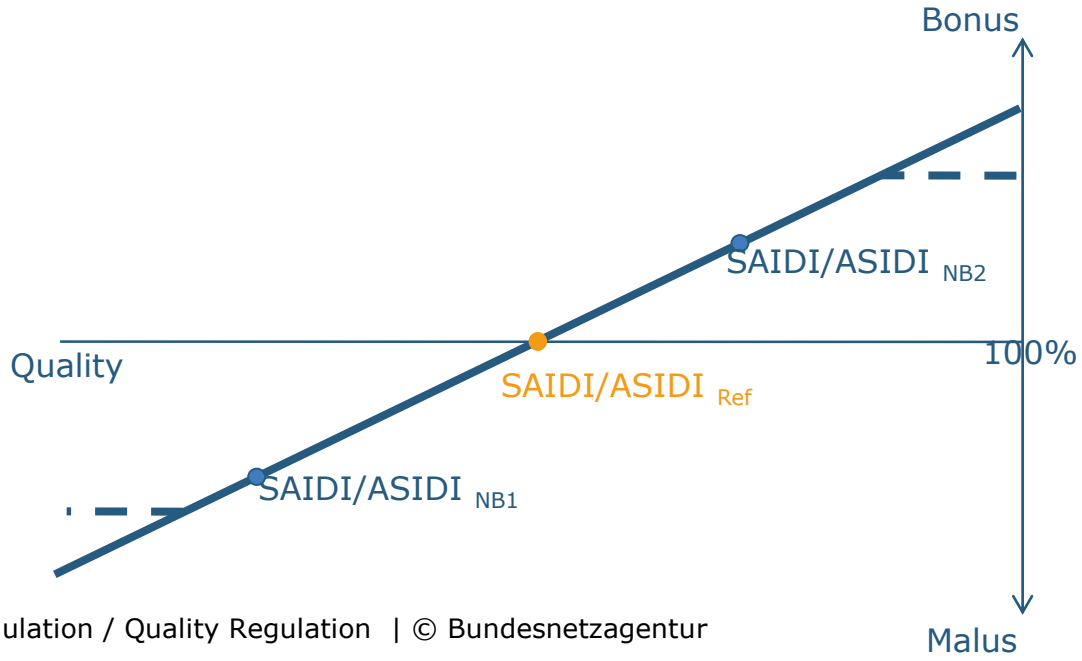
Low volatage level:



Middle voltage level:



Bonus/Malus = $(Q_{Ref} - Q_i)$ * final consumer$_i$ * quality price in €/min/customer/a



Methods of monetisation

- Proven method: customer survey (internationally very common), but
  - in Germany not yet carried out
  - Expensive and a good preparation and post processing necessary
  - Acceptance of the method?

- Analytical methods in § 20 (3) ARegV as equal alternative provided
  - Using a macroeconomic approach as a basic variant

Key points of Quality Regulation

- Self-regulating system, that menas cost-benefit analysis of the network operators are crucial for the development of the quality level
  - **No Guidelines on target values or development paths**
  - That means, development of the quality level is not fixed
- Worsening of the quality level in the short or in the middel-term is rather unlikely, because
  - Cheap measures often influence the quality improvement
  - The obligation to publish the quality KPIs persuant to § 31 ARegV has a motivating effect on network operators

Monetisation – macroeconomic approach

- Less effort to collect data by using easily available statistical data
- Understandable for everyone
- But based on simplifying assumptions:
  - Industry: value of a kWh results from the ration of added value to total electricity consumption (linear production function)
  - Household: linear ration between the value of the free time and the electricity consumtion (= every interrupted hour is equivalent to one hour of free time)
  - Further assumptions regarding work, free time, wages, etc.

Formal procedure

- Three decisions necessary:
  - Determination of the data query by BNetzA
    - BNetzA conducts a data query of network operators
    - Only that way persuant to § 20 (4) ARegV information can be providedü to LRegB
  - Determination of the basic variant of the quality element by BNetzA und LRegB
  - Individual decisions for quality element regarding the adjustment of the revenue cap by BNetzA and LRegB

Determination of the quality element

- Transmision of the questionnaire to BNetzA
- SAIDI/ASIDI$_{2010}$
- SAIDI/ASIDI$_{2011}$
- SAIDI/ASIDI$_{2012}$

SAIDI/ASIDI$_{NB}$

Middle value over three years to minimize stochastic fluctuations

- Annual peak load
- Geographic area

For the calculation of the load density

- Number of load densities
- …

Determination of the quality element

- Plausibiliy check through data comparison

  Values reported by network operators via questionnaires ⟺ In the past collected values by BNetzA persuant to § 52 EnWG

- Using other sources for plausibility checks
- Cross comparisons
- Consultation with network operators