

Regulating Energy Networks to facilitate the Transition in the Energy Industry

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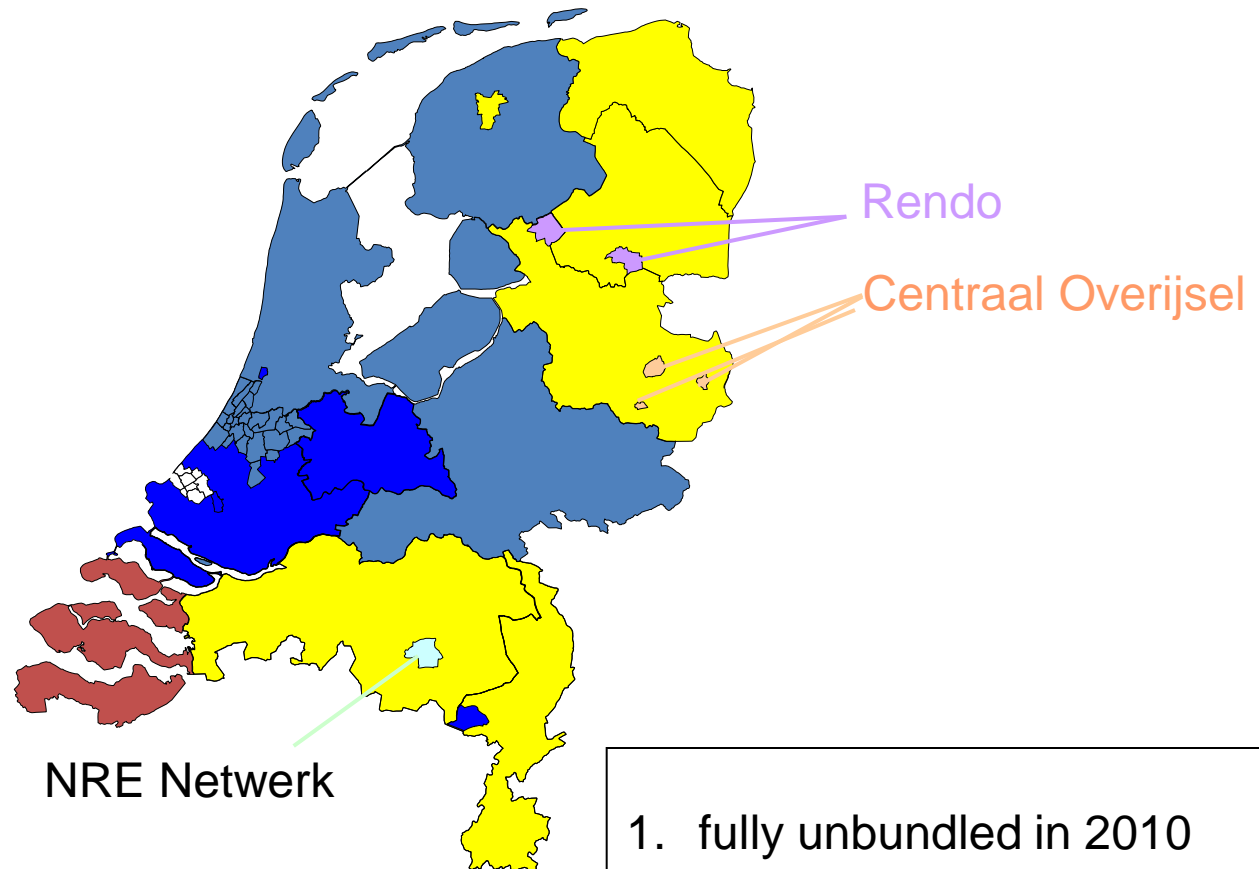
Outline

1. What does energy transition mean for regulation?
2. What are the main characteristics of the Dutch regulatory framework?
3. What has been the performance of regulation?
4. Is there any need to adapt the framework to foster energy transition?

Energy transition and regulation

1. **Energy transition** implies a fundamental change in the way energy is produced: less fossil fuels, more renewable
2. For **network operators**, this might mean they have to adapt and improve their network, in order to facilitate decentralised generation and developments like electric cars
3. However, current **regulatory frameworks** are often seen as too much focussed on short-term efficiency (i.e. tariff reduction)

Regulation of electricity distribution networks in the Netherlands:



1. fully unbundled in 2010
2. shares owned by local or regional authorities (> 51%)

General principles of regulation

1. Output-oriented (intermediate) regulation

- incentives on outcome (total income, quality)
- no intervention in management decisions

2. Directed at entire network management

- no focus on short-term efficiency or long-term efficiency

3. Technology neutral

- regulation does not favour one or another technology

Yard stick regulation of revenues

- a. price-cap regulation plus incentives for efficiency and quality:

$$TI_{i,t} = (1 + cpi_t - x + q) \cdot TI_{i,t-1}$$

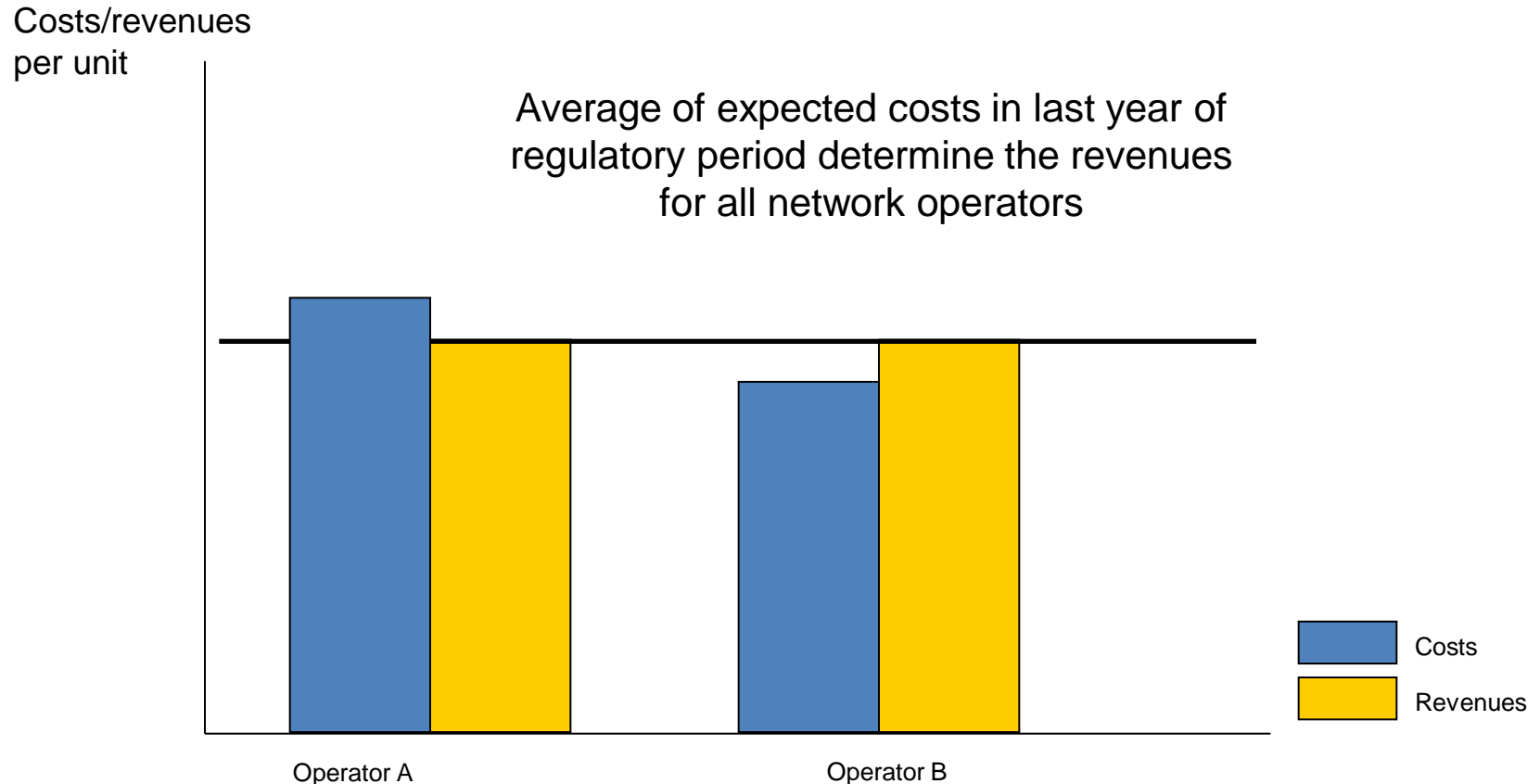
- b. regulation mimics competition (**yard stick**): revenues depend on average costs

- c. besides regulation of revenues, also (light-handed) **regulation of asset management**

Statements about the current regulatory framework

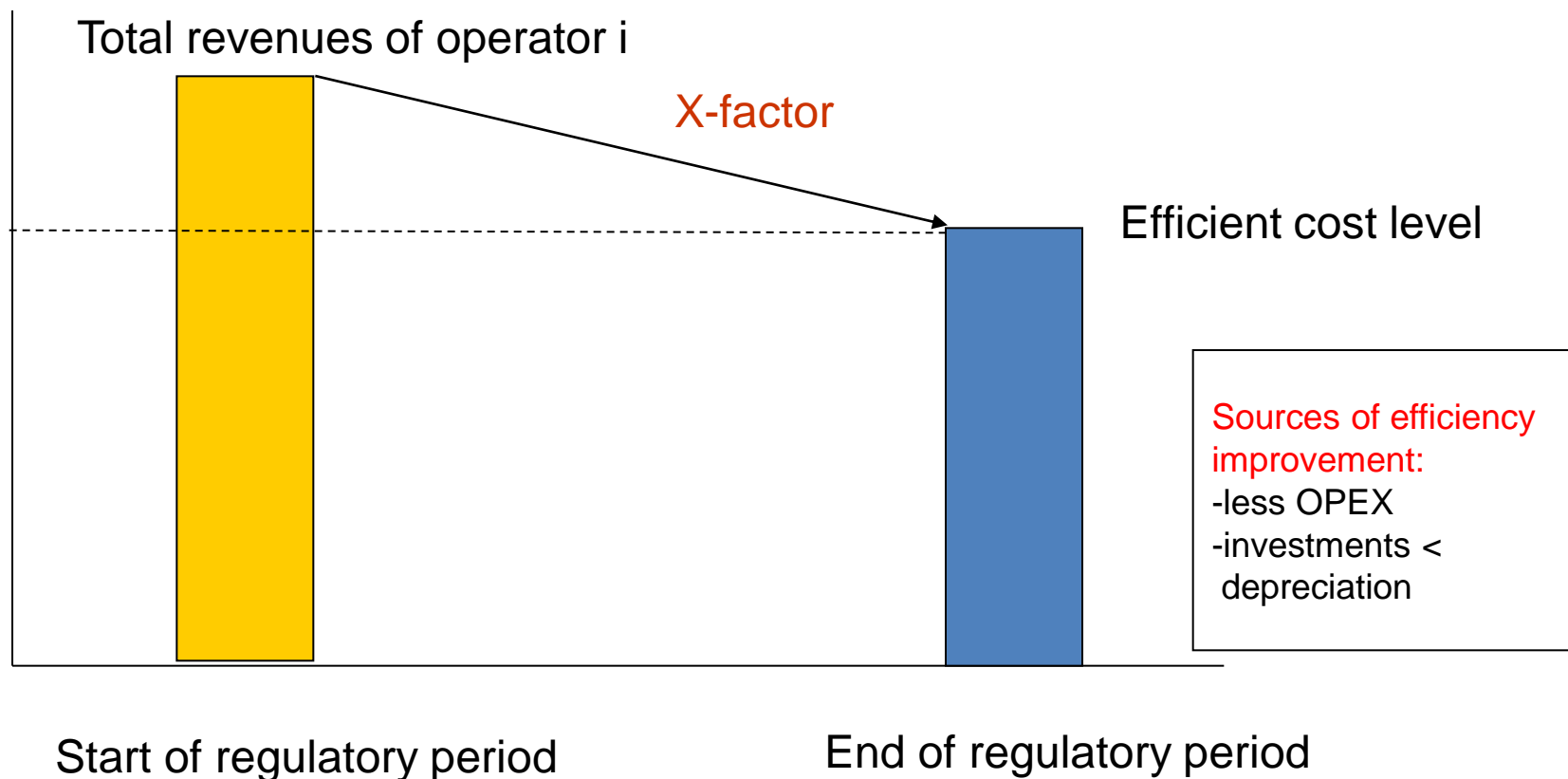
1. “yardstick regulation is an **incentive to wait** on others, i.e. it results in postponing of investments”
2. “incentives for **quality** are too weak, i.e. network operators invest too less in maintenance and replacement”
3. incentive regulation does not give rewards for investments in **innovation and experiments**, i.e. regulation results in too less dynamic efficiency”

Use of yardstick competition to determine efficient level of costs



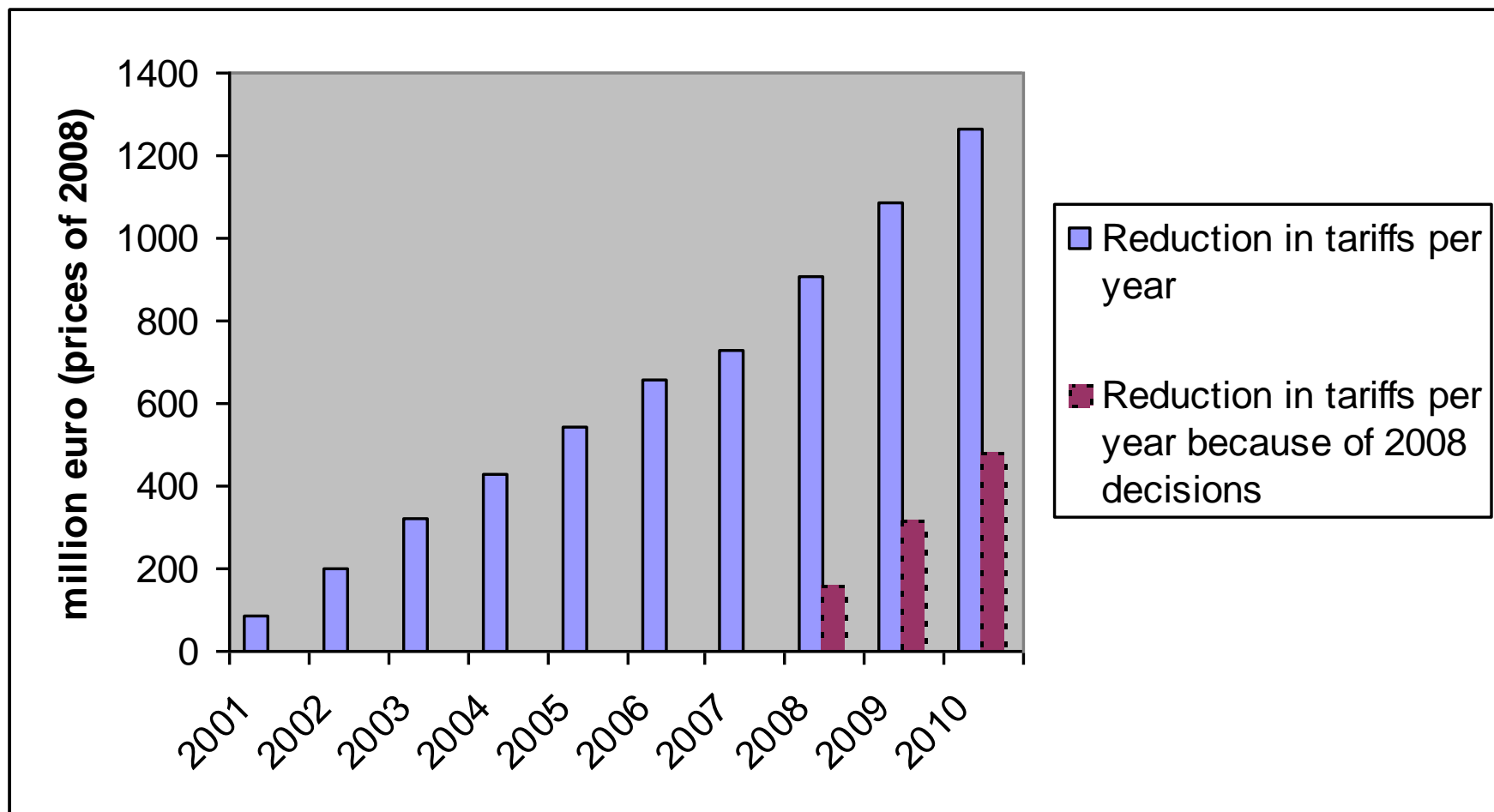
Regulation is directed at total **revenues** of network operators, not at **costs**

X-factor is the factor taking the total revenues to the level of efficient costs at the end of the regulatory period



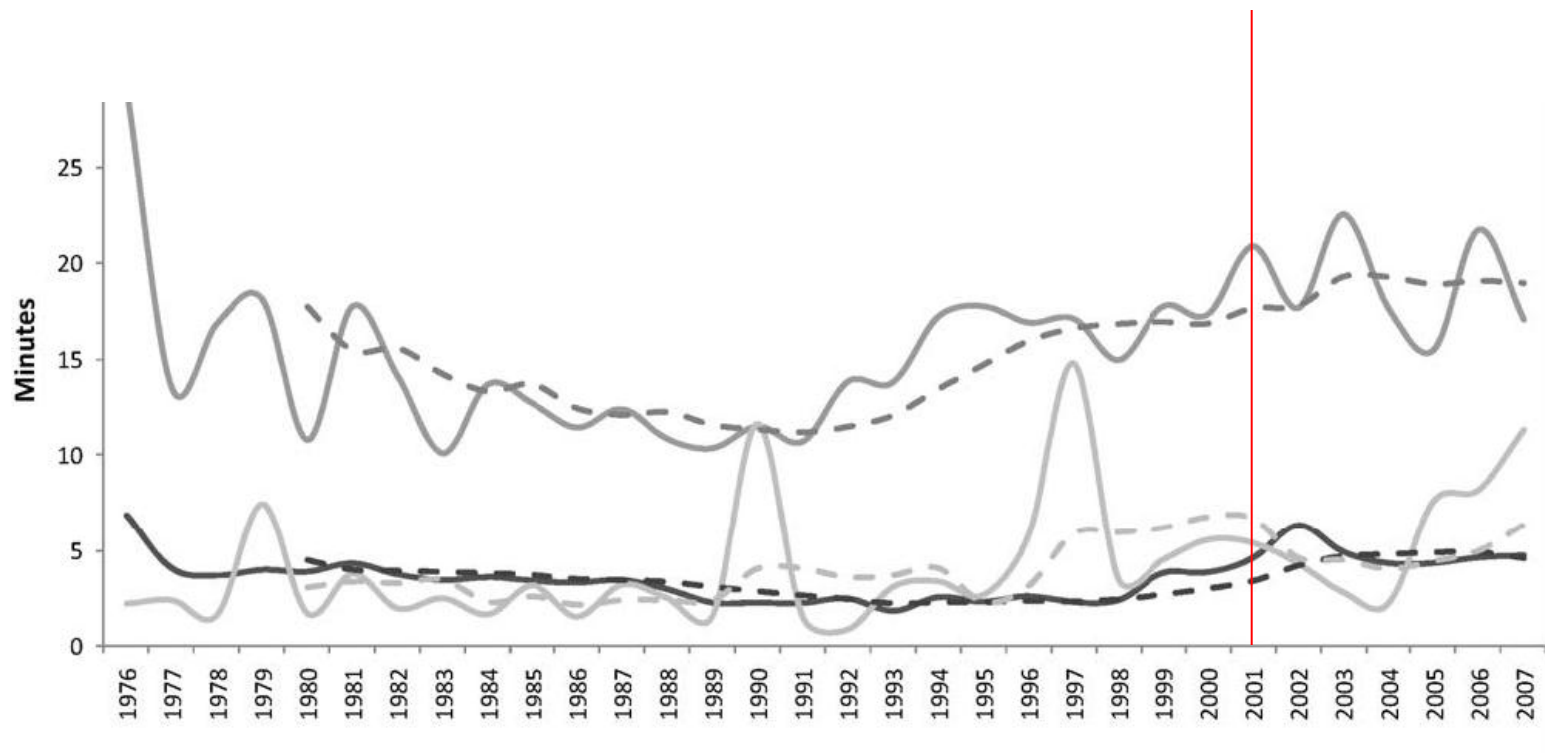
Effects of regulation:

In 2010, users pay about 1 billion less



... while the quality of the network is still high

(length of annual disturbances has not increased since 2000 (except in LV))



Notes:

-black line: low voltage network; grey line: medium voltage network; white line: high voltage network

-dotted lines: 5 years moving average

Conclusion on effects in the past

1. **No evidence** that the current regulatory framework hinders necessary investments in maintaining the quality of the networks
2. Regulation has resulted in **more efficient investments** (timing, size) without deteriorating the quality of the networks (quality is rather constant at high level)

Regulation of investments in energy transition

1. As the yard stick is based on the average cost level, **all costs of all operators are reimbursed** by the regulated revenues
2. But if operators make different decisions (regarding e.g. smart grids), they will have different costs levels, while the revenues are equal
3. This might hamper investments in energy transition, **only** if operators face different structural circumstances
4. In general, yard stick competition enables operators to facilitate energy transition