
Can cheap talk coordinate unbundled generation and network investment decisions?

This relies on joint work with Gert Brunekreeft

Agenda



- introduction
- the third package and unbundling
- coordination of network and generation
- information exchange: cheap talk
- concluding remarks

Introduction

unbundling in network industries

- common approach
 - assure non-discrimination
 - enable fair competition

- eliminates firm-internal coordination
- decentralized investment decisions may be suboptimal (lack of coordination)

- can simple information exchange solve coordination problem?

The third legislative package – Main Objectives



regulatory framework for fully effective market opening /
single market

→ achieving the lowest possible energy prices and better security

sustainability

→ stimulating energy efficiency

→ guaranteeing access for small companies, (esp. renewables)

competitive market

→ improving conditions for investment in power plants, transmission

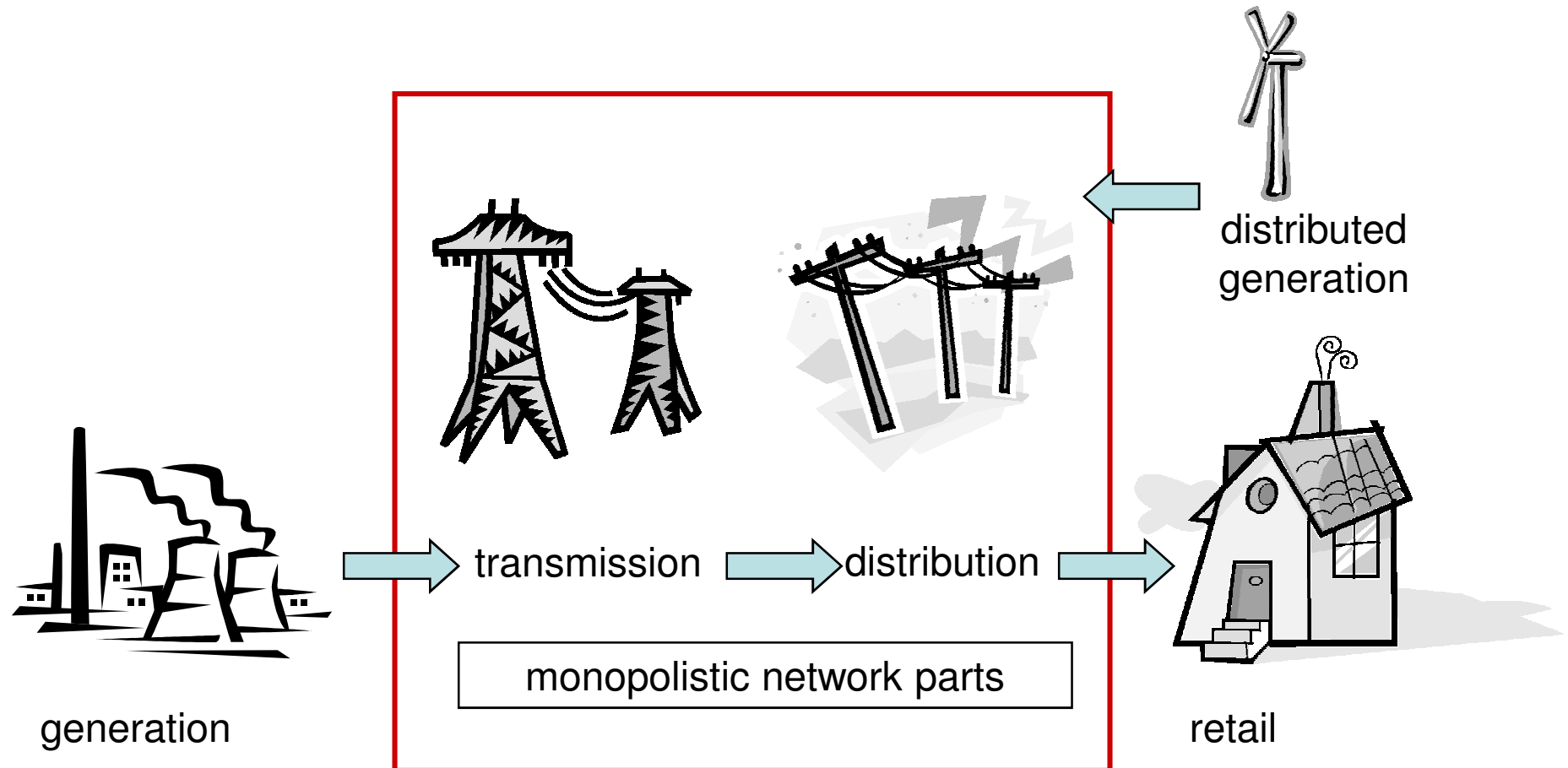
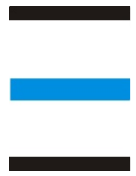
→ greater security of supply

The third legislative package – Unbundling as one key element



- level playing field by separating effectively production and sale from transmission of energy.
 - eliminate conflict of interests,
 - promote network investment and
 - prevent any discriminatory behaviour/ abuse of privileged position of integrated firms.

Structure of electricity supply



Coordination



short run: system operation, dispatch, reliability

long run: coordinated investment strategy

- long-run least cost supply, joint optimization of network and generation, system adequacy

transmission:

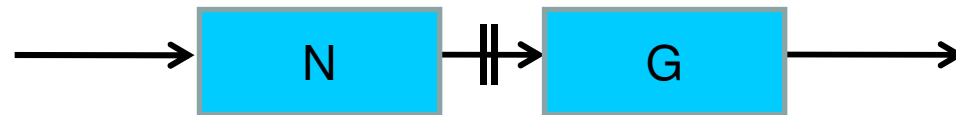
- large power plants, high-voltage long-distance transmission
- relatively few players

distribution level:

- decentralized generation, load, smart grids
- smaller players, high transaction costs

Coordination of network and generation

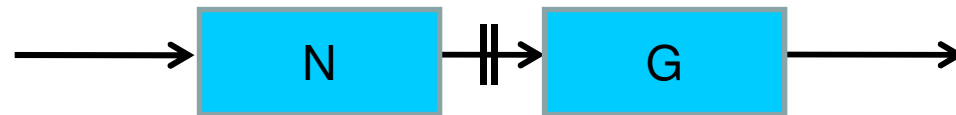
- network and generation as complementary stages



- separation of generation and network eliminates firm internal coordination and information flow

Coordination of network and generation

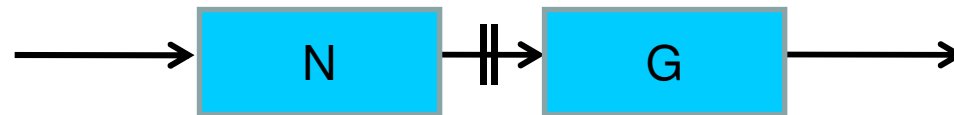
- network and generation as complementary stages



- separation of generation and network eliminates firm internal coordination and information flow
- argument against unbundling?

Coordination of network and generation

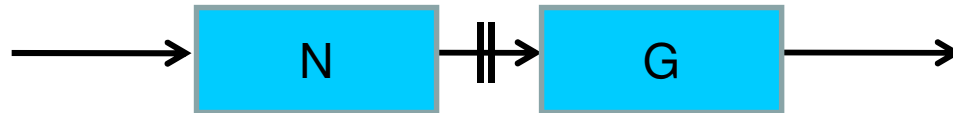
- network and generation as complementary stages



- separation of generation and network eliminates firm internal coordination and information flow
- argument against unbundling?
 - not necessarily

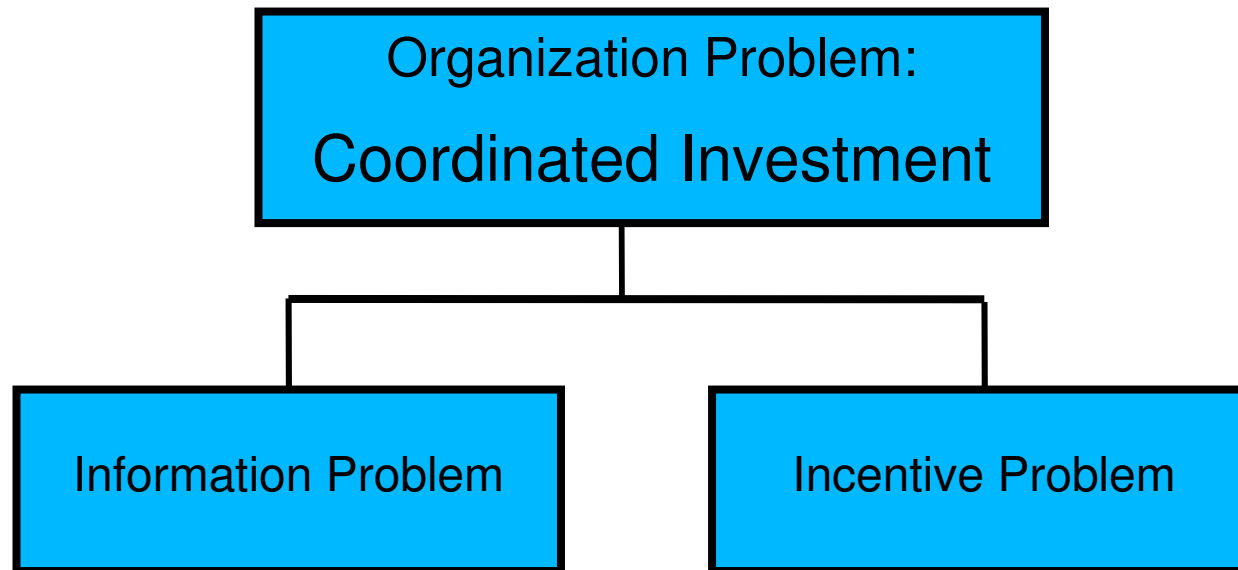
Coordination of network and generation

- network and generation as complementary stages



- separation of generation and network eliminates firm internal coordination and information flow
- argument against unbundling?
 - not necessarily
- market coordination (e.g. deep/shallow connection charging)
- inter-firm coordination by exchange of information

Information vs. incentive problem



Investment decisions – A coordination problem



- network and generation as complementary
- single-sided investment has no use
- future demand is uncertain

	G-low	G-high
N-low	coordinated	divergent
N-high	divergent	coordinated

G: Generation
N: Network

- coordination needs information exchange
- information problem \neq incentive problem

Information exchange: cheap talk



cheap talk:

- costless communication in contrast to e.g. signalling
- no commitment to act according to their statement
- cheap talk need not be truthful

how does it work:

- cheap talk by one party
- second party evaluates credibility and acts accordingly

when does it work:

- no incentive to misrepresent (self-signalling)
- believe that signal is believed → truthful action (self-committing)

Farell & Rabin 1996

A model: Does cheap Talk work?

formal game-theoretical model relying on

- principal-agent theory
- information exchange via cheap talk

actors: generator G, network N

actions: cheap talk (G), irreversible investment (G,N)

set-up:

- generators announce capacity investment high or low
- network evaluates credibility and invests accordingly
- generators realize investment



Model setup and conditions

conditions:

- profit maximization of G, N given the respective capacity
→ case distinction in 2x2 matrix

	G-low	G-high
N-low	π_N, π_G	π_N, π_G
N-high	π_N, π_G	π_N, π_G

π_A, π_B : respective expected profits

- relation of G and N via network access charge (paid per unit)
- integration of cost increasing effect for G from low network capacity

Cheap talk coordination



in many cases:

- no incentive problems
- simple coordination problem, lack of information
- cheap talk is credible

	G-low	G-high
N-low	3/2	1/1
N-high	1/1	4/3

→ coordination via cheap talk possible

No coordination inspite of cheap talk



general interest of G in a big network

(no matter whether G plans high or low capacity),

Low network capacity \rightarrow cost increase for generator

	G-low	G-high
N-low	3/2	1/1
N-high	1/4	4/3

- usage charge paid per unit, not for capacity
- incentives to misrepresent: state always high
- signal „*high*“ not informative: cheap talk not credible

\rightarrow coordination via cheap talk not possible

Other problems for coordination



uncertainty for network

- time lag between signal and investment of generator
- updated information on future demand can be included in generator decision
- no commitment to signal possible

Concluding remarks



coordination of network and generation

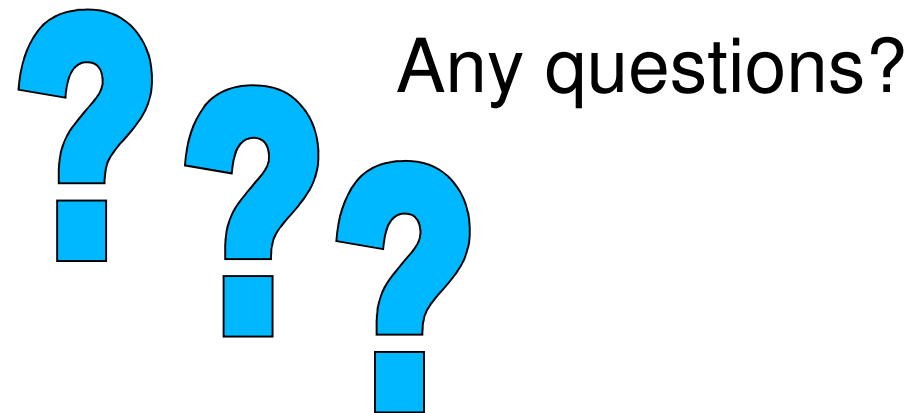
- simple information exchange will often do
 - however, cases exist where it does not.
 - details depend on the effects of diverging capacity choices for network and generator, parameter values of cost function, demand uncertainty
- can cause failure in many cases

central point: incentive structure

- G does not pay for network capacity → incentive to misrepresent
- a (shallow) charge could change structure/ correct incentives
- makes information exchange credible



Thank you for your attention.



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