

The investment and innovation dilemma in regulation: Theory and international experiences

Christine Müller
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- Project background: IRIN
- The investment and innovation dilemma in regulation
 - Analysis
 - International experiences
 - Conclusion
- Basis: two SASE conference papers
 - „Regulation, efficiency and the incentive dilemma with smart grid investments“
 - „Advancing regulation with respect to smart grids: a revision of international best practices“

Project background: IRIN

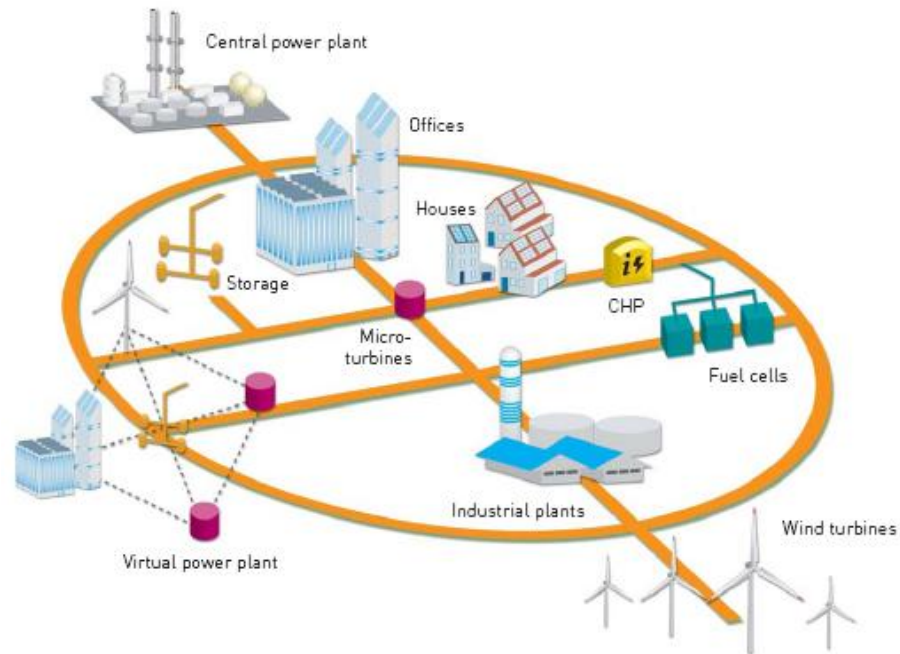
- The research project IRIN - Innovative Regulation for Intelligent Networks - deals with the design of an adequate institutional framework that supports efficient and effective network development towards smart grids.
- Central research questions are:
 - Advancing incentive regulation with respect to smart grids?
 - Which network pricing system sends effective signals for efficient coordination of network, generation and load installations?
 - Which advancements should be made to incentive regulation to adequately account for network innovation and transformation?
 - Are changes required to the current legal framework?

Ambitious decarbonisation and sustainability targets

- Consequences
 - Generation (renewables): Distributed, intermittent, offshore
 - Networks: Connection of new energy, bi-directional energy flows
 - Retail/new services: new business models
 - Demand-side management/prosumer
- Paradigm shift leads to
 - New generation/consumption patterns
 - New forms of communication
 - New market participants and role definitions

Key technology: Smart Grids

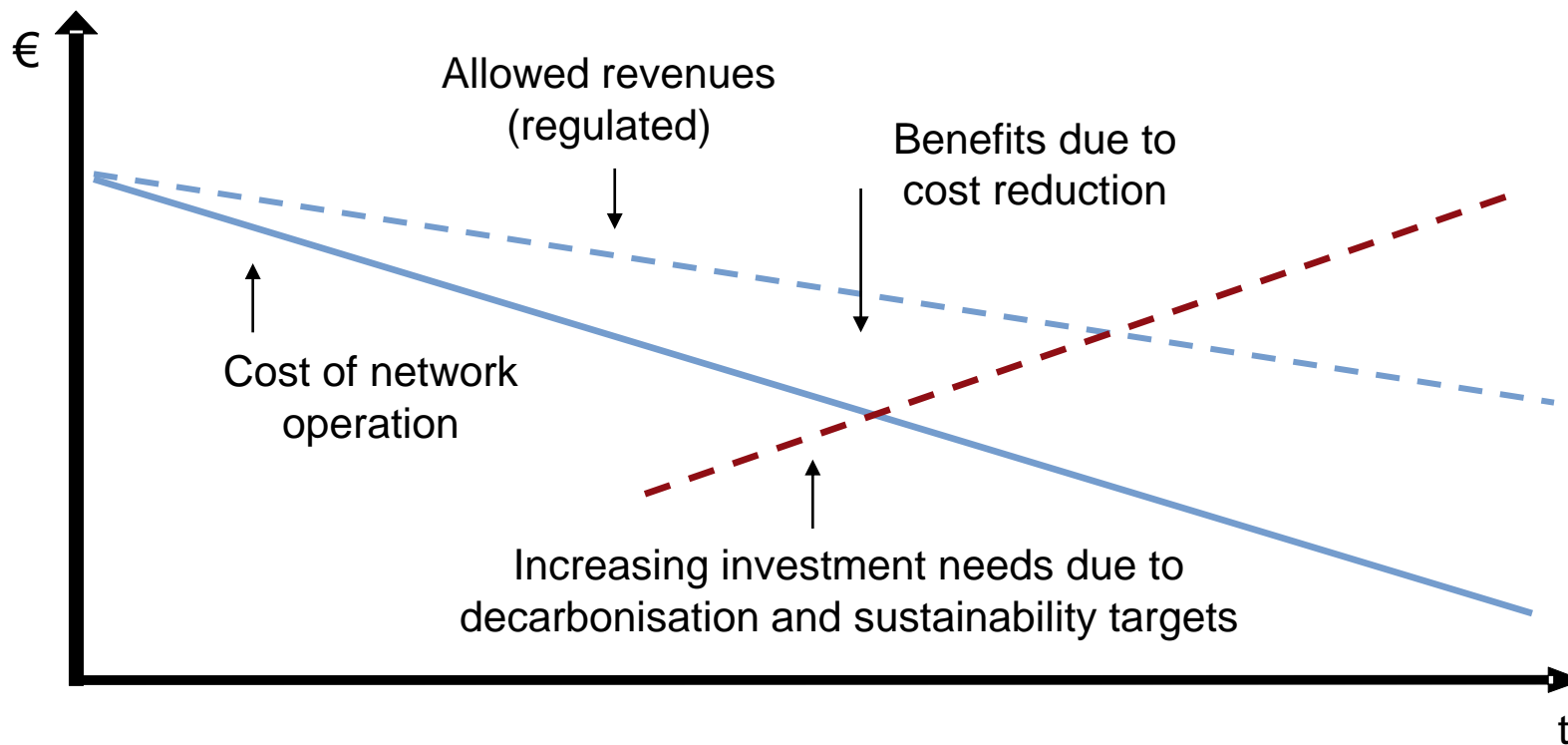
Smart grids are considered as the key technology to tackle these challenges.

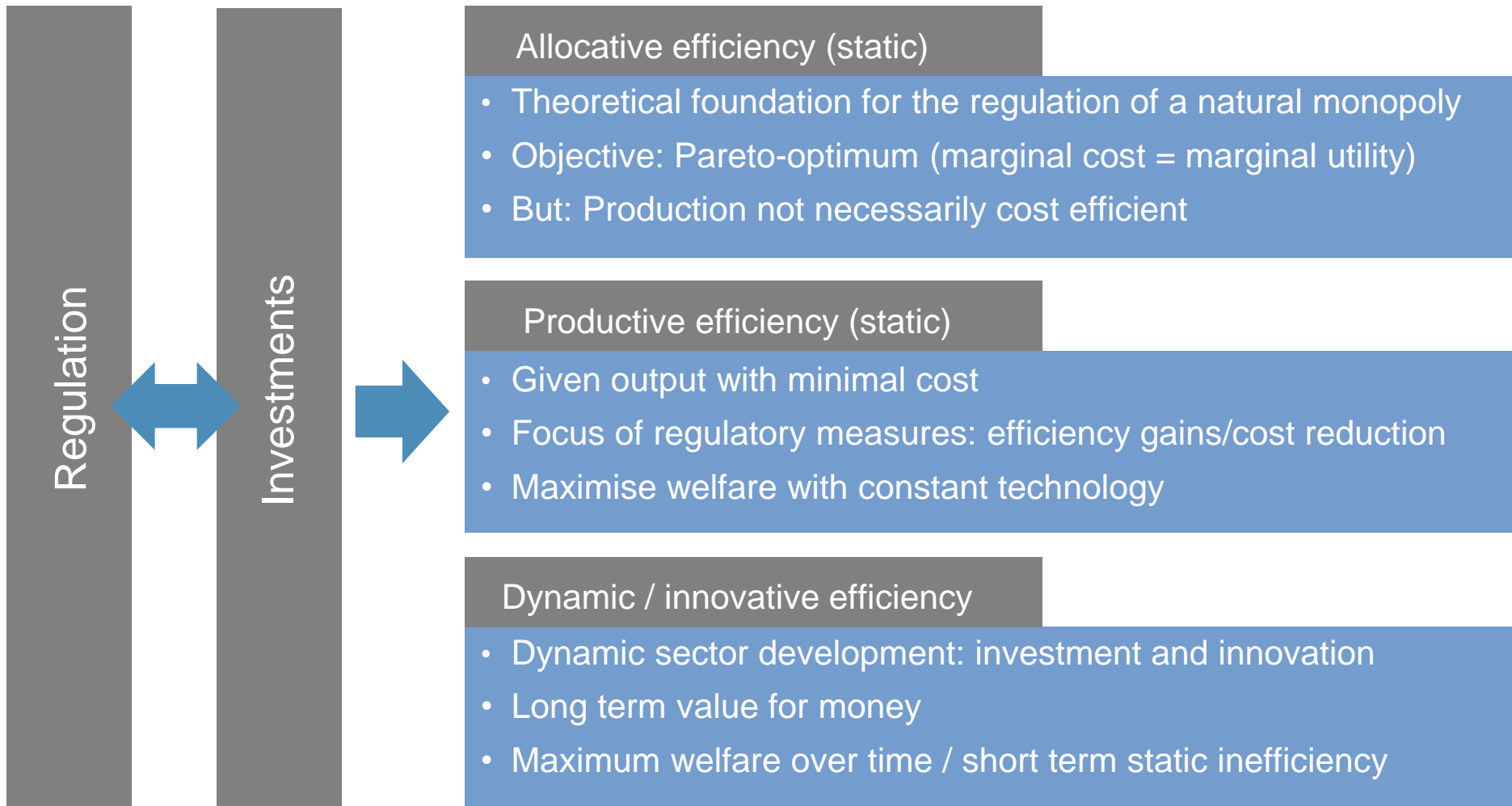


This requires investments and the right (regulatory) incentives.

Regulatory dilemma?

Do current forms of incentive regulation provide the right incentives or do we face a regulatory dilemma with respect to investments and innovation in a smart grids context?





Results (1)

Efficiency measure	Cost-based regulation	Incentive-based regulation
Allocative efficiency	+	+
Productive efficiency	-	+
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Dynamic efficiency		
Process innovation (OPEX)	-	+
(Asset-) innovation (CAPEX)	-	Regulatory dilemma

Investment categories and their incentivisation*

Type of investment	Replacement investment	Expansion investment	(Asset)-innovation
Objective	Adequate level of continuity of supply	Capacity (Integration EEG-/CHP- /Offshore plants)	Smart grids
Instrument	Q-Element** Bonus/Malus	Investment budgets (TSO) E-Factor (DSO)	Regulatory vacuum
Mechanism	Cost internalisation	Cost-based regulation	

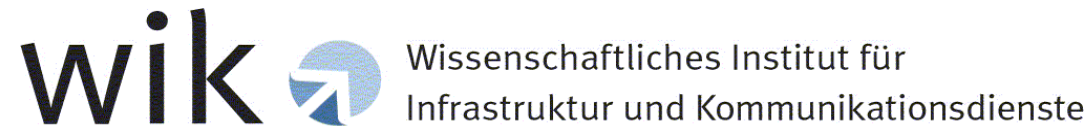
* On the basis of the German regulatory framework

** Planned for 2012

- Currently: design of a new regulatory framework: “RIIO-Model”
- Objective: make energy networks „fit for purpose“ in a low carbon energy sector
- Basis: RPI-X with new regulatory features
 - Aptitude to efficiently deliver outputs (review of business plans, revenues set upfront for 8 years, mid-term review and adjustment if necessary)
 - Holistic, forward looking, long-term value for money perspective in order to stimulate dynamic efficient investments (balance flexibility vs. uncertainty)
 - Explicit stimuli for innovation (LCN for demonstration projects)
- Pro: Regulatory framework mirrors sustainable policy targets and provides for a dynamic efficient sector development
- Con: Regulatory complexity increases; dynamic efficiency is “heavy handed”

- Incentive regulation since 2000
- OPEX benchmarking (X-factor only applies to OPEX)
- Seperate treatment of CAPEX
 - Investment update with a two years time-lag
 - Increased rate-of return for specific investments (DSO and TSO level)
 - Efficiency indicators to measure the benefits expansion investments bring to the system (DSO and TSO level)
- R&D component in the network tariff / increased WACC for awarded demonstration projects
- Pro: Pragmatic approach
- Con: Risk of demarcation problems

- Dynamic efficient investments are the essential catalyst to facilitate smart grids to tackle the overarching sustainability and decarbonisation targets.
- Incentive regulation does not stimulate dynamic efficiency in the sense of explicit regulatory stimuli for asset innovation leading to a dynamically efficient CAPEX allocation (in a smart grid context).
- Complex trade-offs to adjust the right incentives (regulatory dilemma)
- Internationally: first approaches towards a more investment/smart grid friendly regulatory framework. Pioneer: UK, “long-term value for money”
- Challenge:
 - Transform sustainability targets in regulatory functionalities
 - „Live“ dynamic efficiency



WIK Wissenschaftliches Institut für Infrastruktur
und Kommunikationsdienste GmbH

Christine Müller

Postfach 2000

53588 Bad Honnef

Germany

Tel.: +49 2224-9225-85

Fax: +49 2224-9225-68

E-Mail: c.mueller@wik.org

www.wik.org

Innovation		
Process innovation	Product innovation	System innovation
OPEX	Asset-investment* (CAPEX)	Smart market place**
Network operator	Network operator Third parties?	?
Regulated	Regulatory classification?	

* e.g. intelligent network control on DSO level such as intelligent substations

** e.g. demonstration projects such as the E-Energy Modell regions in Germany