



# **Pathways towards a 100% renewable electricity system**

## **Reform Grid Regulation**

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- 100% renewable electricity: climate-friendly, reliable, affordable

### **IT'S POSSIBLE** (8 Scenarios)

- Transition to a fully renewable energy supply necessitates political leadership and a mix of wide ranging policies
  - SRU Report Chapter 6: EU energy and climate policy
  - Chapter 7: Energy efficiency
  - Chapter 8: Reform of renewable energy act (EEG)
  - ***Chapter 9: Electricity grids***

- Large-scale expansion of domestic and international transmission capacity is a prerequisite for 100% renewables
- Investments are currently insufficient
- Complex set of actors with diverging interests
- Obstacles to investment are located differently

## Reasons for delayed grid investments

**Insufficient  
incentives arising  
from grid  
regulation**

**Protracted planning  
and approval  
procedures**

**Public acceptance  
issues**

**Focus of today's  
presentation**

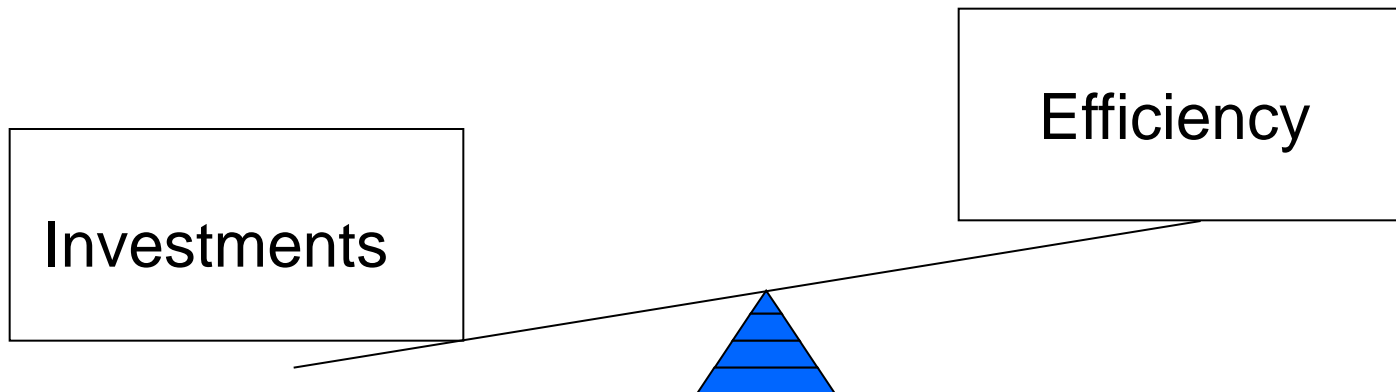


## Regulatory triangle

- **Legal investment obligations**
  - Specific: e. g. § 9 EEG
  - Systemic: §§11, 12 EnWG
  - BUT: Difficult to oblige TSOs to build specific connections which might be regarded necessary for achieving certain energy policy goals
  
- **Investment planning obligations**
  - Third legislative package on EU Electricity & Gas markets
  - ENTSO-E Ten Year Network Development Plan
  - BUT: no state planning of needs; focus on private industry interest
  
- **Incentive based regulation (ARegV)**

## Conflict between investments and efficiency

- ARegV establishes cap on revenues from network charges
- Establishes incentive to reduce network costs
- But also incentive to reduce expenditures
- Conflict of goals



Are the investment incentives strong enough?

- Investment budgets introduced to overcome conflict of goals and to guarantee investment security
- Granted by Federal Network Agency (BNetzA) for capital expenditure on extension and restructuring investments
- If budget is granted, then cost of capital and debt will be added on top of revenue cap and are not subject to efficiency criteria

Are the investment incentives strong enough?

- High initial investments that pay relatively constant and secure dividends
- 9,29% return on equity

BUT

- Deductions from this rate are made in the approval process of investment budgets
  - Expected return risks to be substantially lower
- Financial risks increase, grid investment becomes less attractive and might turn unprofitable



## Deductions in the approval process

- Deductions for avoiding double accreditation of investment costs within the revenue cap and the investment budgets
- Indirect deductions as a result of the limited cost of debt that is approved
  - BNetzA approves only cost of debt that are equivalent to the net yield of low-risk fixed-interest securities; reference is not the market for loanable funds
  - If cost of debt are greater, return on equity decreases
  - Problem is heightened for unbundled TSOs
- Lower return as a result of limited running time of investment budgets

## What to take from this

- If financial incentives are the chosen policy tool, then they have to be set at an adequate level
- What is a sufficient return on equity?
- Change approval practice?
- KfW loan program as a quick fix for high borrowing costs
- Investment budgets likely the wrong system for encouraging investments in high voltage direct current power lines

- Tendering contracts with a required minimum capacity for specific transmission lines
- Bidder that offers to build a certain line in conjunction with the lowest grid charges over a 20-year period is awarded the public contract
- Basis of tenders is a federal grid plan that defines the relevant needs for transmission lines and their routes and allows a public debate concerning alternative routes
- Process could be divided into tenders for project development and construction plus operation
- Milestones and penalties can guarantee construction

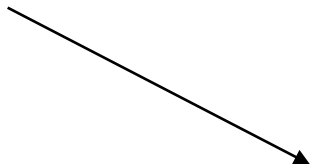
## Advantages

- Adequate rate of return on such an investment must not be predefined but becomes transparent in bidding process
- Enables co-ordinated transformation/expansion of the electricity grid based on needs
- Competition between bidders secures cost-efficiency

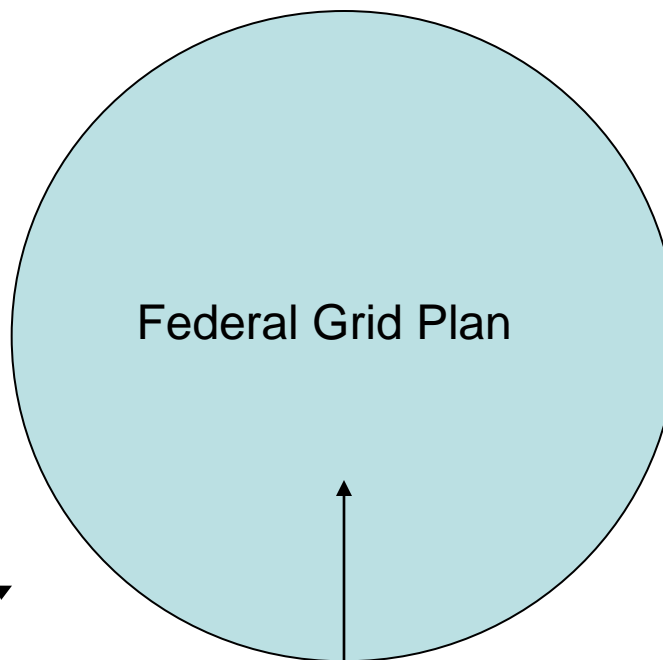
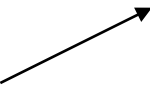
ENTSO-E TYNDP



Investment plans of  
German TSOs



TEN-E guidelines



Grid expansion  
model BNetzA



Public oversight  
over what lines are  
needed for  
transformation  
towards a 100%  
renewable  
electricity system

Thank you very much!

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