POLICY Incentives in Europe

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Agenda

1. **Introduction**
2. Renewable energy support
3. Financing renewable power
4. Experiences renewable power support in Europe
5. Conclusion

1. Introduction

- **Background:** Bahr, Narita, and Rickels (2012) - Kiel Policy Brief 53 (*Kiel Institute for the World Economy)* : “Recent Developments in European Support Systems for Renewable Power”
- EU’s energy and climate policy is to increase the share of renewable electricity (RE) provision
  - RE still needs support in most cases to be viable
  - Optimal support scheme? Attempts to keep the rising costs of the photovoltaic markets in check
- Tendency of market-based support schemes to shift towards tariff-based schemes
- Significance of the investor perspective

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Renewable energy support
General background

- EU Emission Trading Scheme (ETS): cap on CO2
- ➢ Incentive to invest in a carbon-free energy system
- ➢ Additional support for renewable power technologies will not result in further emission reductions

- Long investment cycles in the energy sector and various market imperfections
- ➢ System combining a price for carbon emissions with subsidies for the introduction of renewables might be the better option

- Ex-post efficiency: how to achieve certain given goals at minimum cost

Renewable energy support
General background

- RPS determines the quantity of renewable power provision
- REFIT determines the price of renewable power provision
- ➢ Different implications for cost control of the support
- RPS: usually ensures overall limit of support costs
- REFIT: installations built until marginal cost equals subsidy, overall support costs may be drastic

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Financing renewable power

- *Balance finance:*
  - project remains dependent part of the company
  - company itself is liable for debts and cash-flow payments
  - all assets of the compay used as collateral
  - rating of the company is relevant for its credit rating

- *Project finance:*
  - initiator of the project establishes a special-purpose vehicle (SPV)
  - assets of this SPV are collateral for credit
  - no (or only limited) recourse to the sponsor
  - debt is served exclusively by the project cash-flows
  - amount and stability of the cash-flow is crucial for the credit rating

Financing renewable power

- REFIT systems guarantee a high degree of security with regard to cash-flow.

- RPS are inherently more variable with regard to cash-flows since neither power prices nor certificate prices are stable
  - Developers usually conclude long-term contracts
  - As compensation for risk assumption such long-term prices are usually lower than average long-term prices

- Derivatives can be used to manage the volatility of cash-flows, but are not always available

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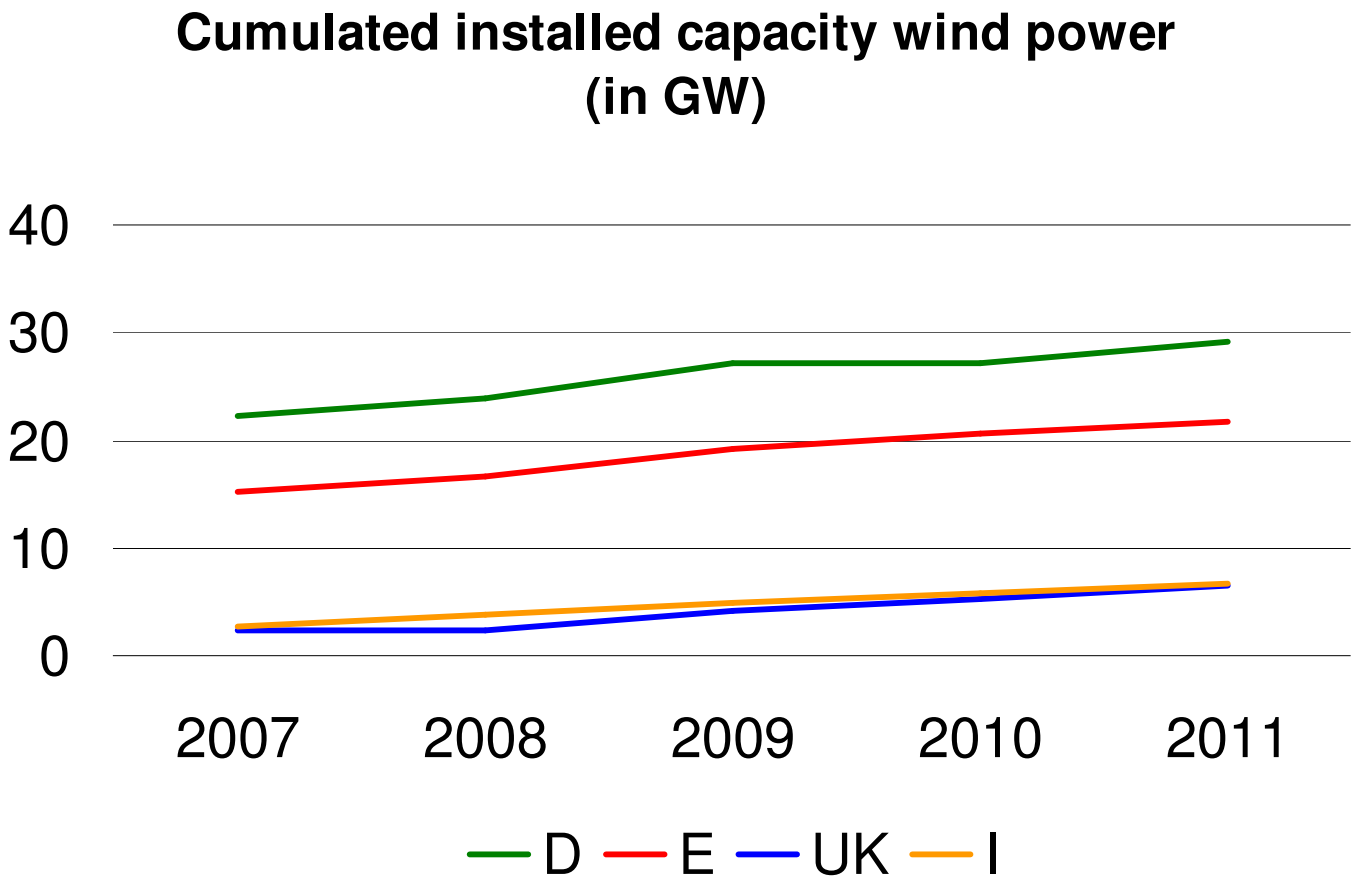
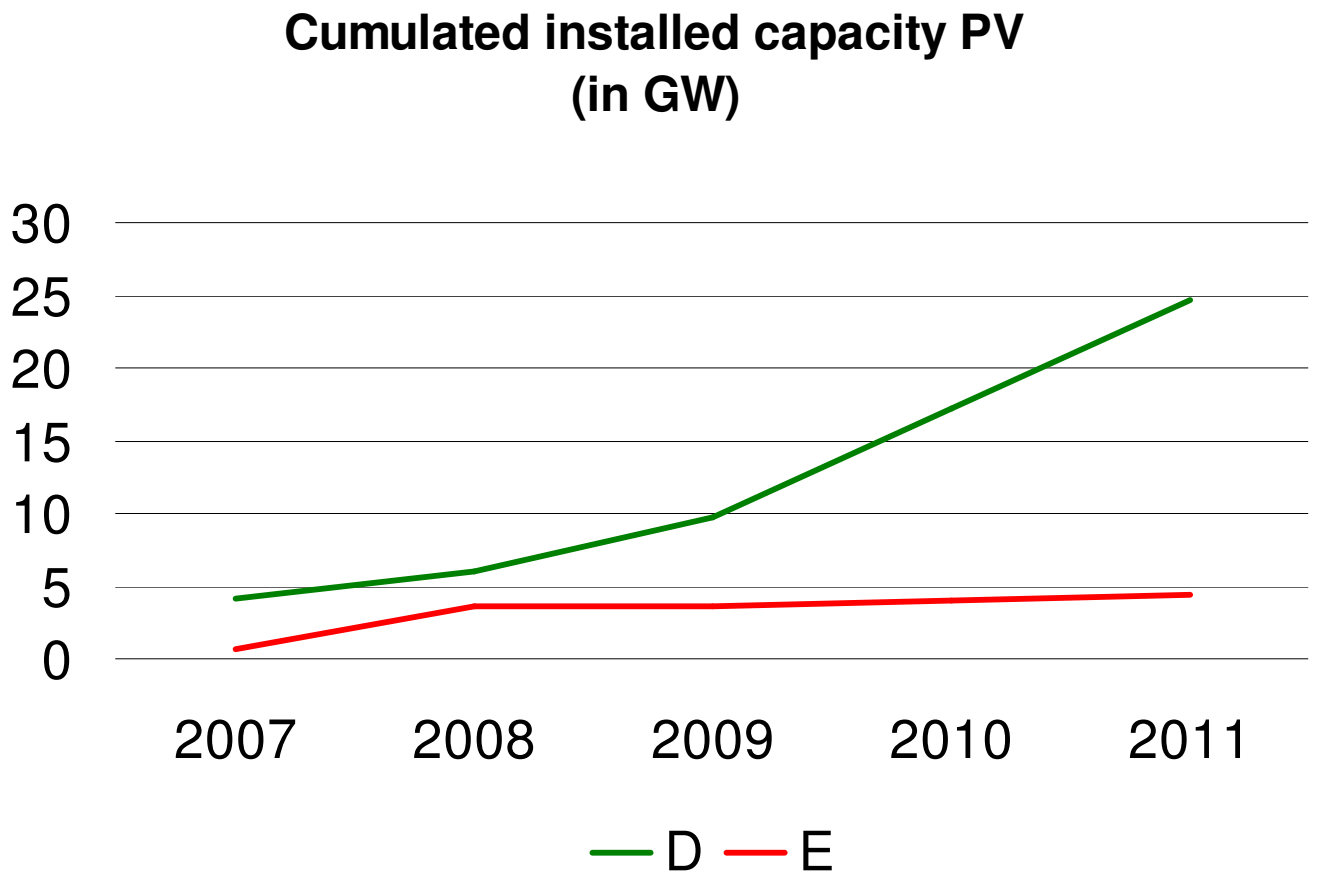
Experiences renewable energy support in Europe

- Higher degree of success in terms of installed capacity for REFITs
- Reduction of risk makes it more attractive to raise capital
- ➢ RPS (e.g. UK, Italy, Belgium) have substantially higher levelized profits than REFIT countries
- ➢ Italy and the UK plan to convert their RPS system to REFIT
  - lower overall support cost required to achieve a specific capacity target
  - failure of RPS to achieve the desired capacity targets
- Surprisingly, these countries have not elected to increase the fine for non-compliance within their existing RPS

Experiences renewable energy support in Europe



Experiences renewable energy support in Europe



Experiences renewable energy support in Europe

Spain

- 2008: 100 kW<P≤10 MW: REFIT of 0.418 EUR per kWh for 25 years, inflation indexed
- From October 2008: cap on installations (166 MW/year groundmounted) and reduction of REFIT, quarterly adjustments
- From 2012: no support for new installations

Germany

- 2008: groundmonted: REFIT of 0.355 EUR per kWh for 20 years, no inflation indexation
- 2008-2011: various adjustments 2008-2011, especially REFIT-adaption according to installations
- Current: 0.13 EUR per kWh for installations above 1 MW, various restrictions for groundmounted systems

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1. Introduction
2. Experimental setup
3. Analysis behavior first generation *A*
4. Analyse behavior second generation *B*
5. **Conclusion**

Conclusion

- Risk plays a crucial role when supporting renewable energy
- However, REFITs do not eliminate risk but transfer it to tax-payers
- Some empirical evidence for wind energy: support costs of REFITs lower than for RPS, however, this does not imply overall efficiency
- Tenders of given capacities for REFITs could combine advantages of REFIT and RPS
- Overall cost efficiency requires equalization of marginal costs over Europe
- ➢ Unified support system would be efficient

Thank you for your attention!