Support Schemes for Renewables in EU

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EWEC Pre-Conference Seminar:

Wind Energy – The Facts

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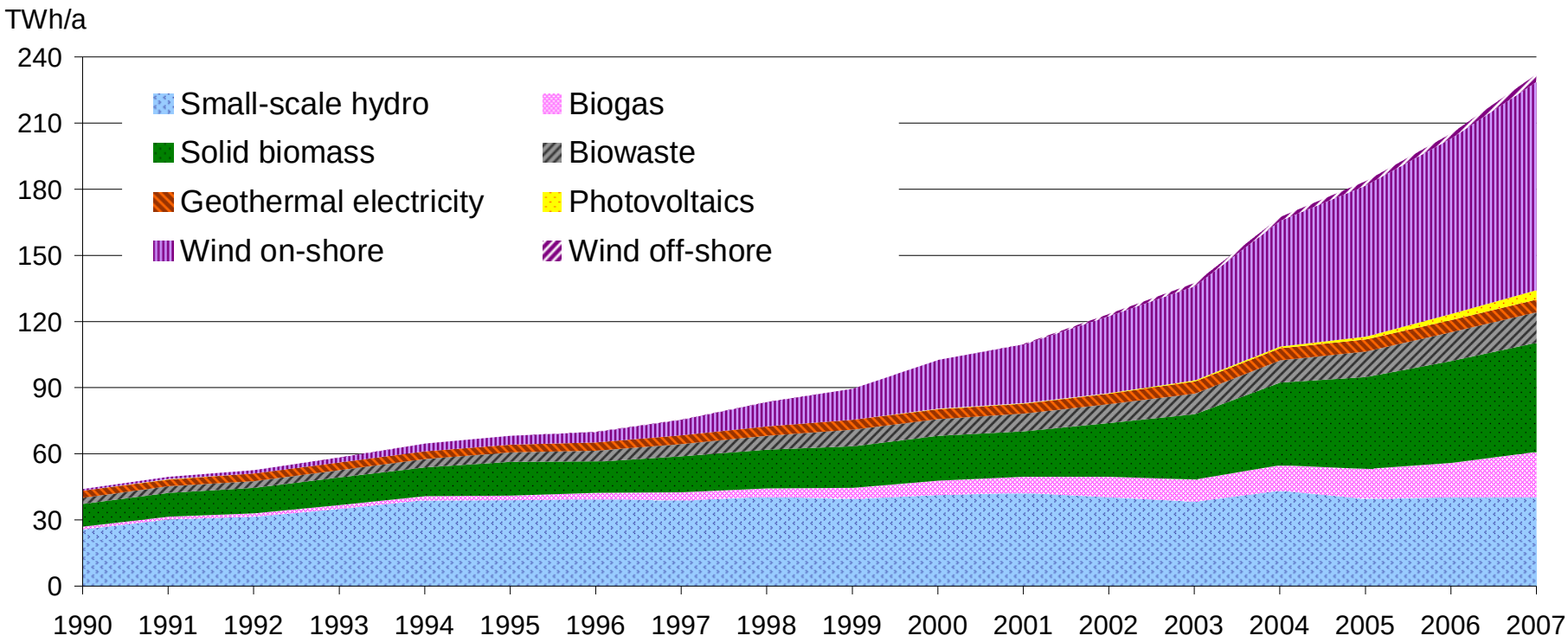
Agenda

1. Historical development
2. New EU Renewable Energy Directive
3. Support Schemes for RES-E
   - Feed-in tariff for wind energy in Germany
   - Quota with TGCs in the United Kingdom
4. Effectiveness and efficiency evaluation
5. Conclusions

Historical development

RES-E penetration in the EU-27 (excl. large-scale hydro)



Source: Eurostat

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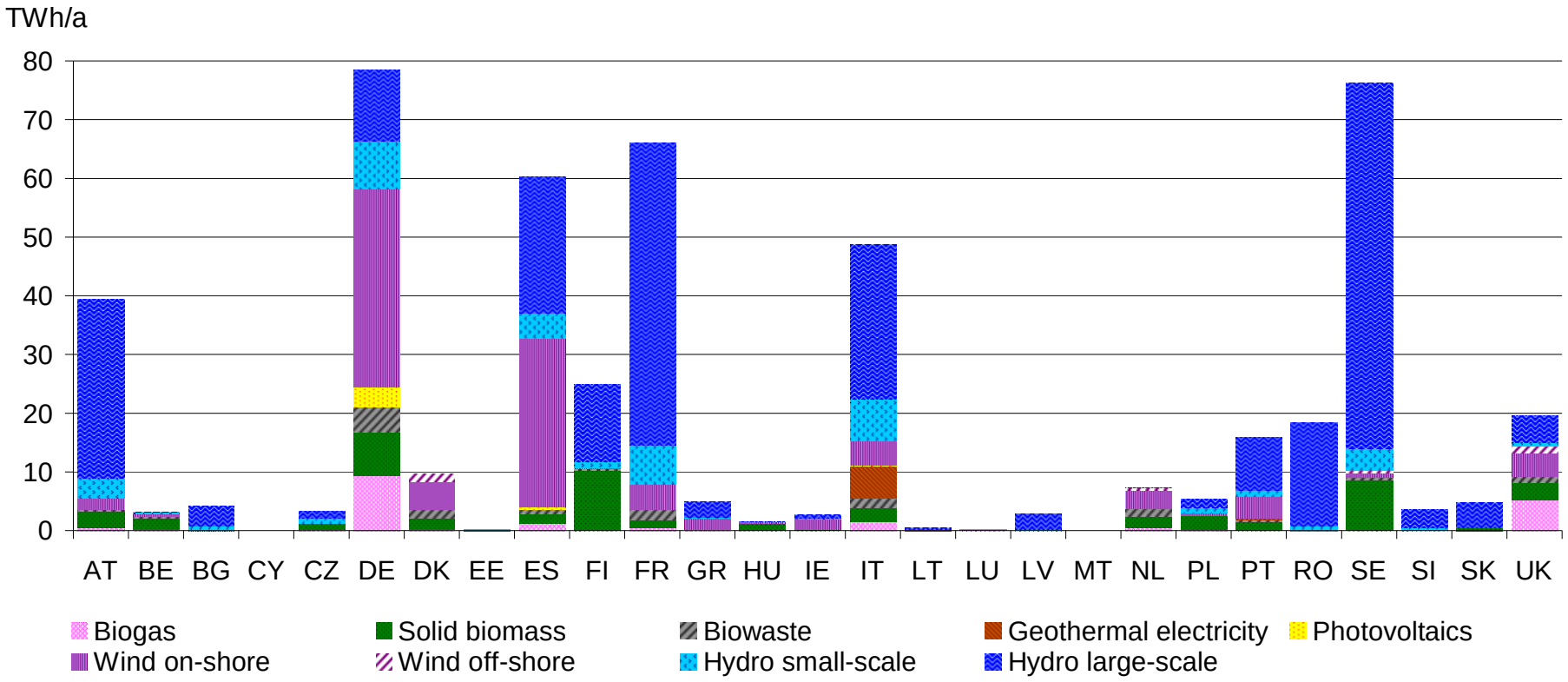
Historical development

Electricity generation [TWh/year] in 2007



Source: Eurostat

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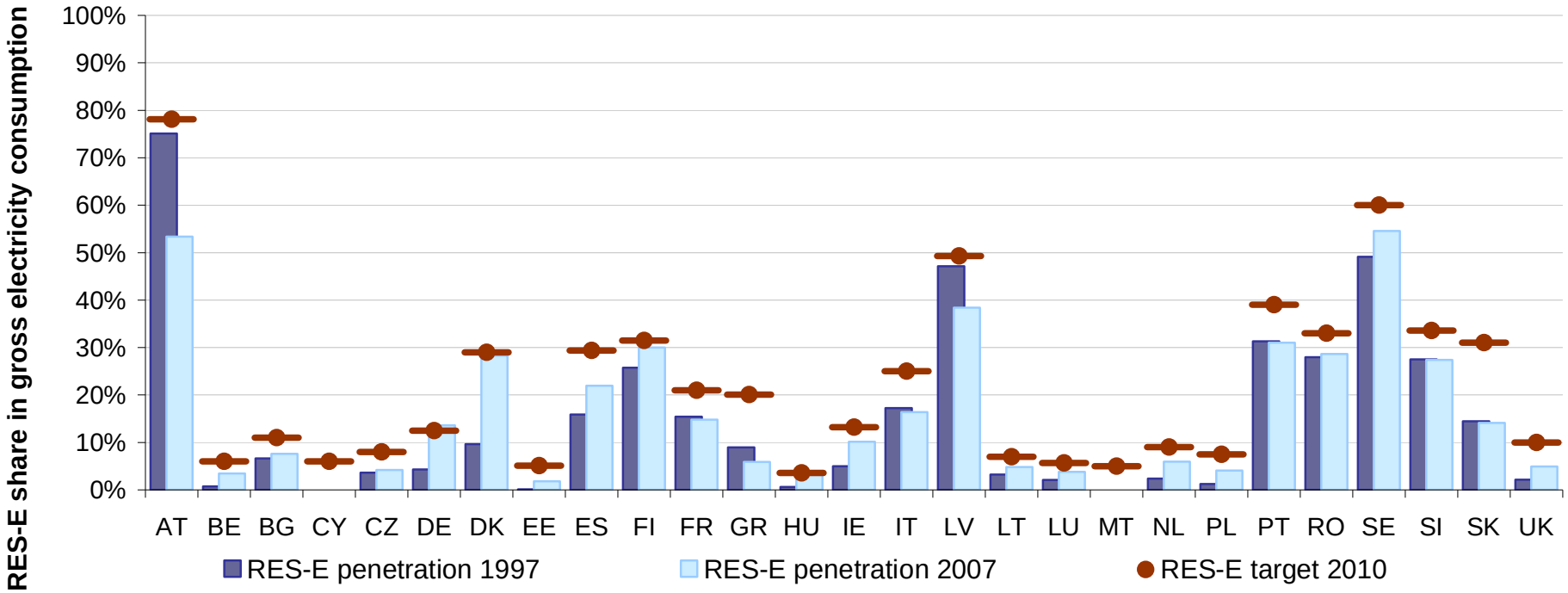
EU Renewable Energy Directive - Main contents

- Targets for 2020:
  - 20 % renewable energy in final energy consumption
  - Binding targets for Member States
- National support schemes will remain the cornerstones of the deployment of renewables in Europe
- Flexibility mechanisms
  - Statistical transfer
  - Joint projects between Member States
  - Joint support schemes
- Measures to reduce non-economic barriers (e.g. easier grid connection)

New EU Renewable Energy Directive

Target fulfillment status:

RES-E share in gross electricity consumption in the EU-27 Member States



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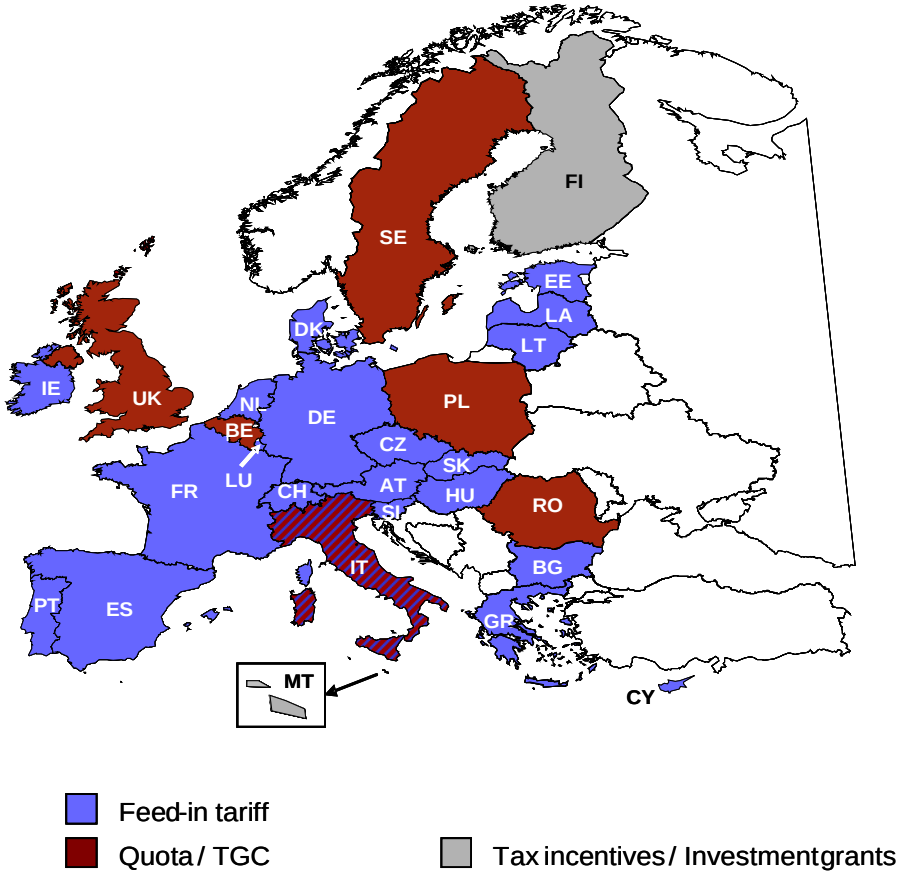
Support schemes for RES-E

National support schemes

- Each Member State can choose its own support scheme
- Strong tendency towards:
  - Feed-in tariffs
  - Quota obligations with tradable green certificates



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Support schemes for RES-E

1. Feed-in tariffs (FIT)

- Renewable electricity can be fed into the grid at a guaranteed tariff for a determined period of time
- The electricity output depends on the support level à price-based
- FITs may also consist of premium tariffs paid in addition to the market price (e.g. in Spain) à stronger market orientation

2. Quota obligation with tradable green certificates (TGC)

- Determination of a quota target, gradually increasing over time
- Renewable electricity is sold at the market price
- Additional revenue from selling TGCs
- Certificate price depends on predefined quota target and is determined on the market à quantity-based

Support schemes for RES-E

3. Tender procedures

- A predefined target of additional capacity or generation is set
- In a bidding round projects with the lowest generation costs can obtain financial support i.e. in form of long-term feed-in tariffs à quantity-based

4. Fiscal incentives / investment grants

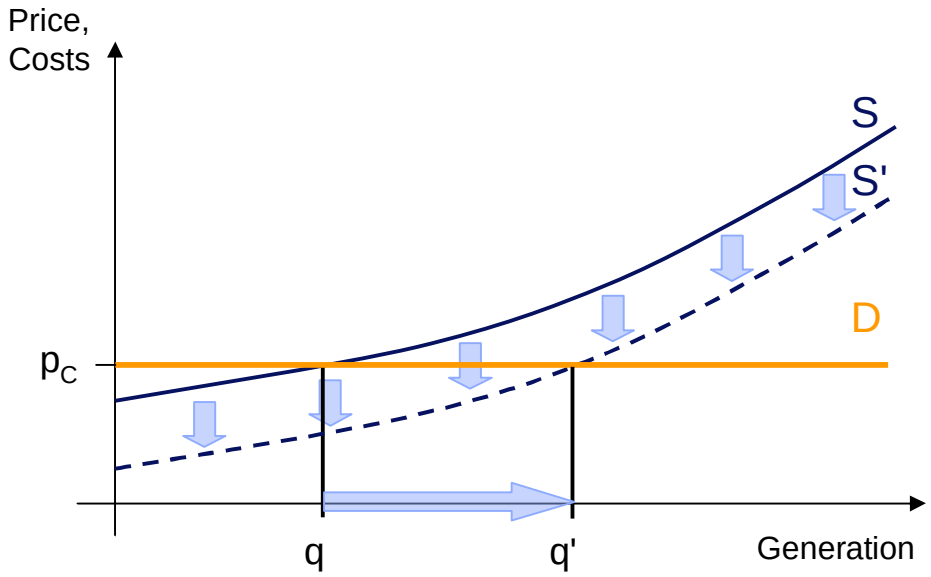
- Tax incentives: Reduction or exemption of tax payment à price-based
- Investment grants: Reduction of capital costs à price-based

Price-based mechanisms	Quantity-based mechanisms
• Feed-in tariffs • Fiscal incentives • Investment grants	• Quota/TGCs • Tender schemes

Support schemes for RES-E

Price-based mechanisms

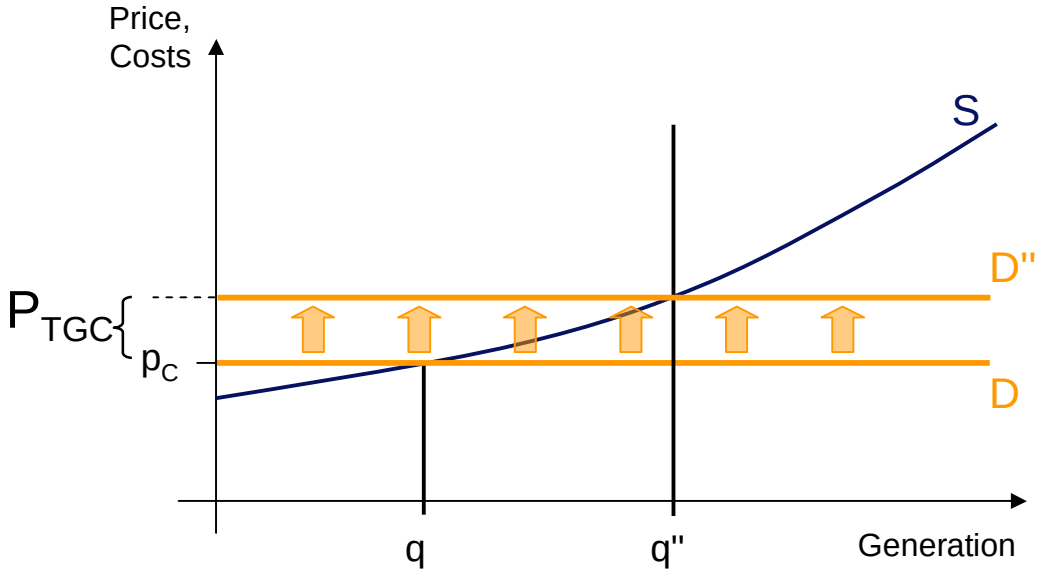
- Supply curve S and demand D lead to an RES-E production of q.
- Price-based instruments (e.g. feed-in tariffs or investment subsidies) "push" the supply curve down (S').
- In consequence the production increases from q to q'



Support schemes for RES-E

Quantity-based mechanisms

- Supply curve S and demand D lead to an RES-E production of q.
- Quantity-based mechanisms create an obligatory demand (quota) for quantity q''.
- To cover this quantity, market actors are then forced to acquire TGCs. The certificate price p_{TGC} is determined by the marginal RES-E generator.



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Support schemes for RES-E

Example: German Feed-in tariff: "Erneuerbare-Energien-Gesetz" (EEG)

- Wind onshore generators receive a fixed tariff for every kWh fed into the grid
  - Initial fee: 9.2 €ct/kWh for at least 5 years (depending on yield of turbine)
  - Final fee: 5.02 €ct/kWh
  - System service bonus: Where new technical requirements for facilities are fulfilled, initial fee rises by 0.50 €ct/kWh
  - Degression: Tariffs decrease by 1% per year, but are fixed once the turbine is built
- Alternatively: Direct selling allowed on a monthly basis
- Priority-grid-access
- Costs for the support of renewable electricity under the EEG are borne by all electricity consumers.

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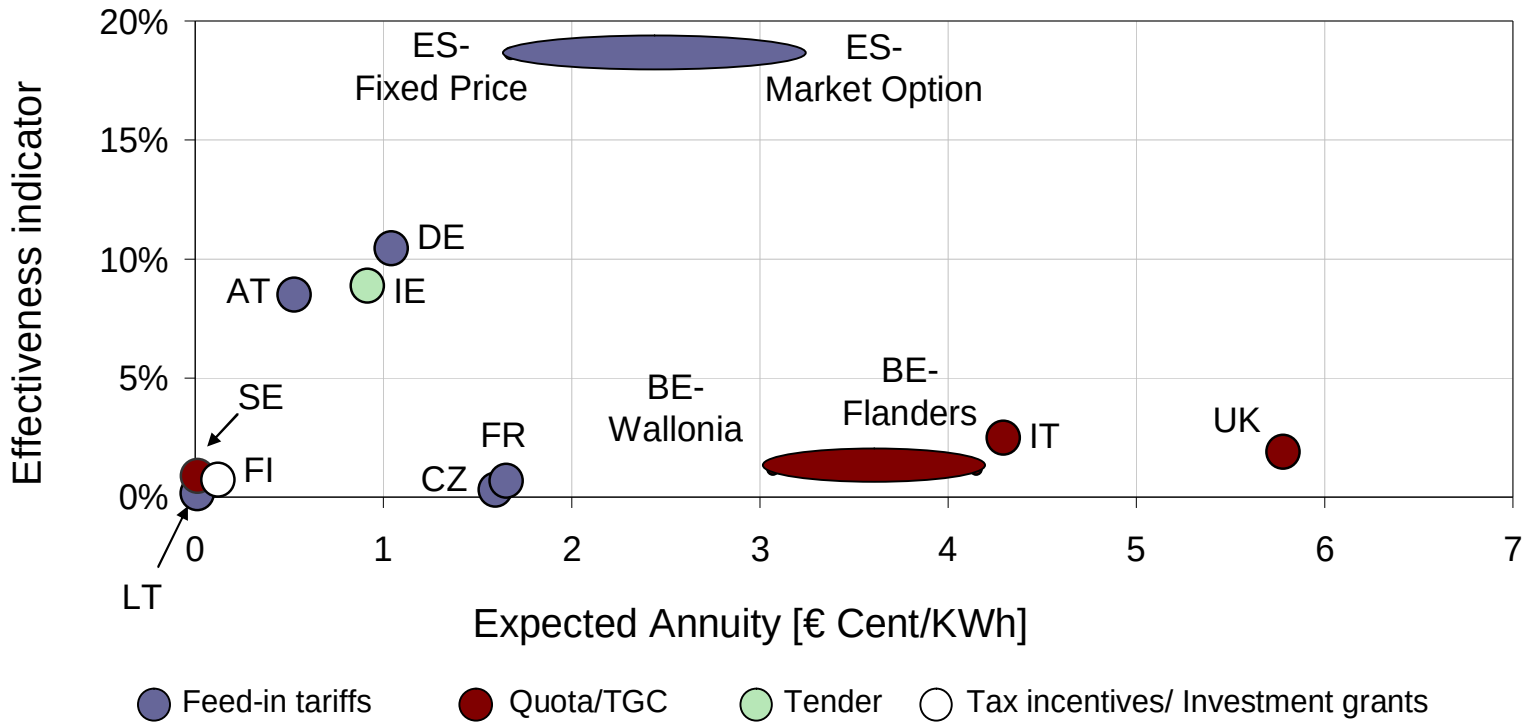
Support schemes for RES-E

Example: Quota with TGCs in the United Kingdom: "Renewables Obligation" (RO)

- Electricity suppliers have to show certificates for a share of their electricity. The quota is:
  - 9.7 % in 2009
  - 10.4 % in 2010
  - afterwards increasing by 1 percentage point per year, reaching 15.4 % in 2015
- Renewable Obligation Certificates (ROCs) are traded in an online exchange
  - Prices: Currently approx. 52 £/MWh (~ 6.1 €ct/kWh)
- New Energy Bill (2008)
  - Number of certificates depends on the technology (1 ROC for Wind onshore, 1.5 ROCs for offshore)
  - Possible introduction of FITs for small RES-E plants

Effectiveness and Efficiency evaluation

Comparison of wind energy support scheme's effectiveness and efficiency for 2004



Source: OPTRES - Final Report (2007)

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Conclusions

- The new Renewable Energy Directive sets binding targets for countries to achieve 20 % renewables in 2020.
- The conditions and support schemes for renewable energies differ among Member States.
- The main support mechanisms used today are FITs and TGC systems.
- There is no perfect support scheme, tailor-made solutions are necessary.
- Until now, good FITs have performed better in terms of effectiveness and efficiency than TGC systems.

Thank you for your attention.

Further literature:

OPTRES - Final Report (2007)

International Energy Agency – Deploying Renewables (2008)

Questions to:

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