Foundations of a Sustainable Society

World Future Council

Creating markets for renewables – Best practise design of feed-in tariffs

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- Activities of the WFC
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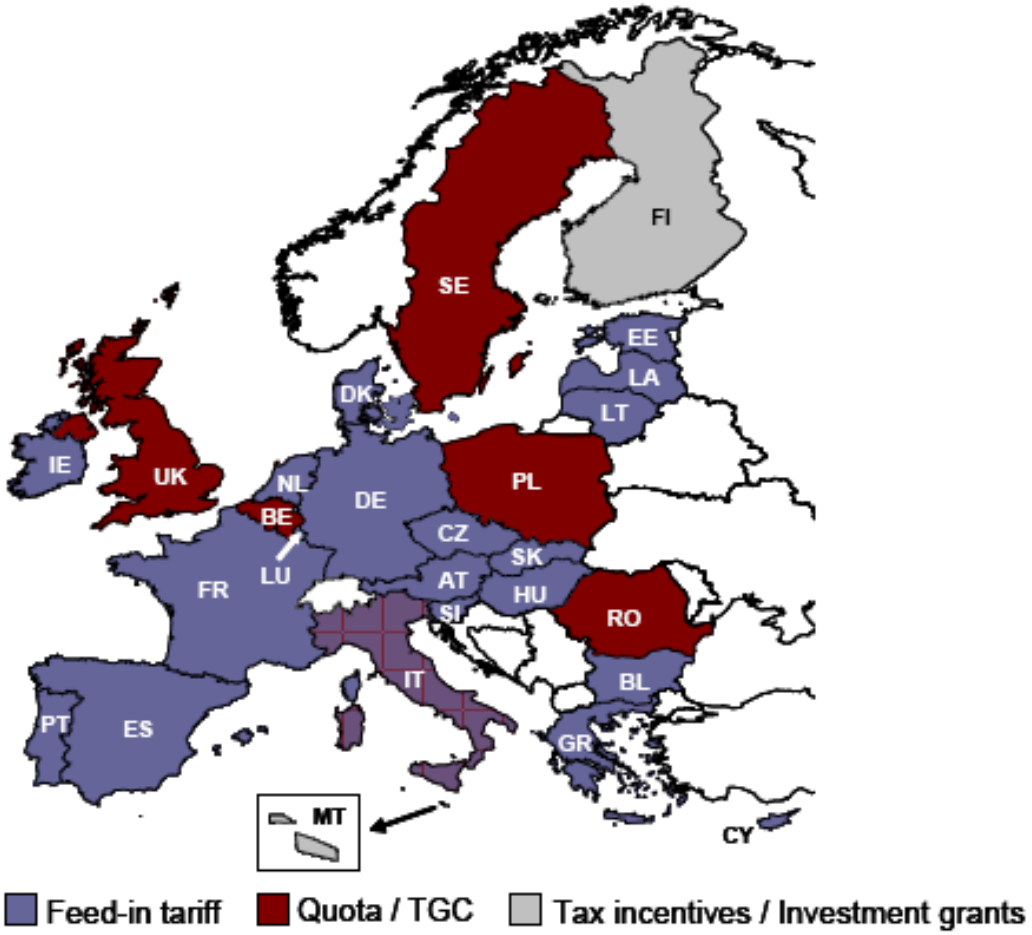
FITs in the European Union



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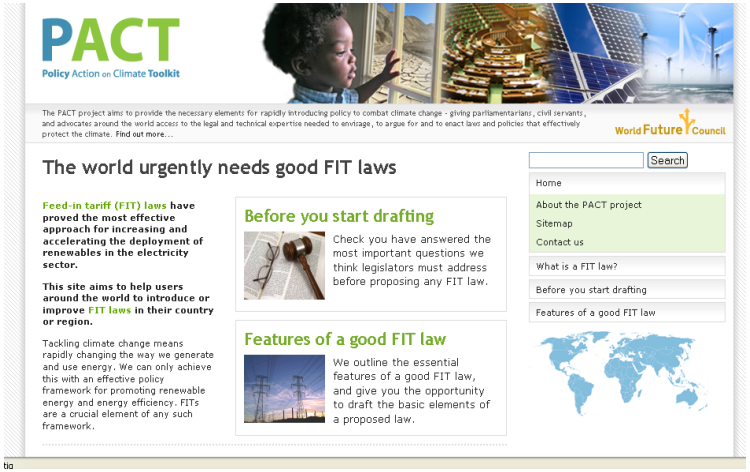
FITs world-wide

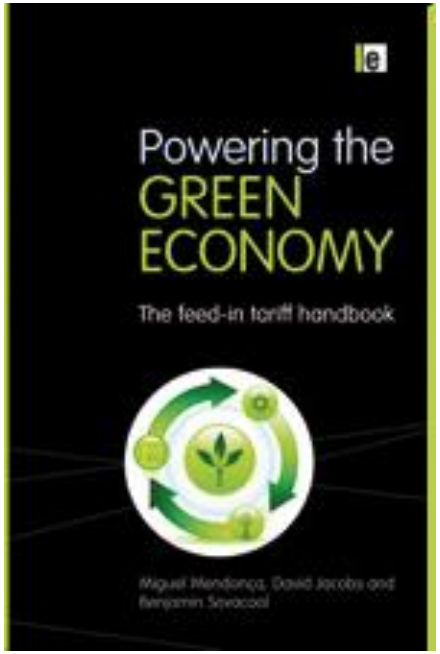
Africa	Americas	Asia	Australasia
Algeria Kenya Mauritius (Nigeria) South Africa Uganda	Argentina Brazil Canada* Ecuador Nicaragua United States*	China India* Indonesia Korea (South) Pakistan Philippines Sri Lanka Thailand Taiwan Israel Mongolia	Australia

FIT activities of the WFC

- Research and evaluation of best practise
- Publication of books and brochures in order to inform policy makers
- Presentation at international conferences
- Parliamentary hearings
- Strategy workshops
- Creating of networks
- Study trips
- Feasibility studies

FIT activities of the WFC





Online policy advice:

Make your own FIT law

www.onlinepact.org

The feed-in tariff handbook:

http://www.earthscan.co.uk/?tabid=92822

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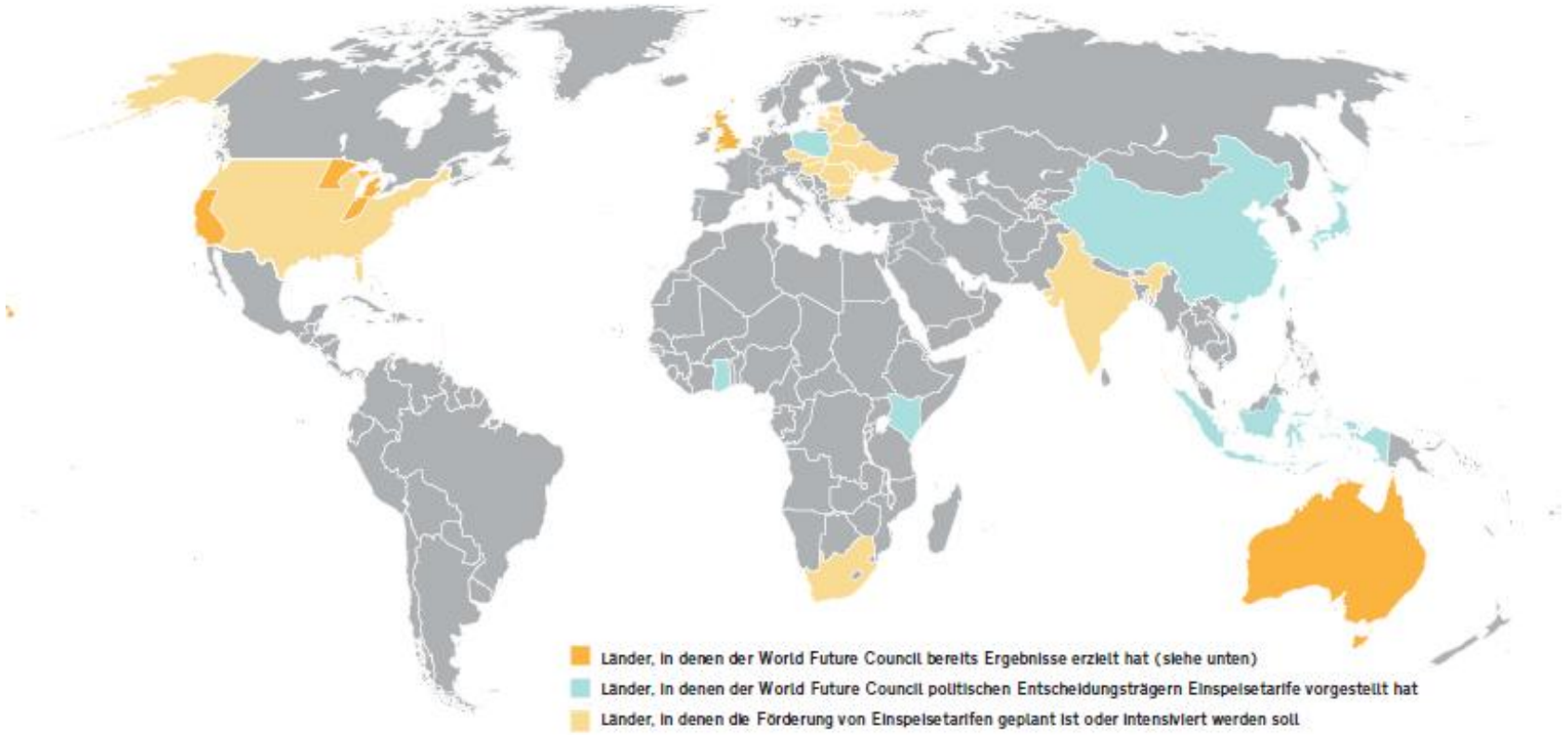
FIT activities of the WFC



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Defining feed-in tariffs

Basic feed-in tariff components

- Purchase obligation
  - Independent of electricity demand
- Guaranteed tariff payment
  - Fixed payment of a pre-defined tariff based on generation costs
- Payment over a long period of time
  - Reflecting the average lifetime of power plants

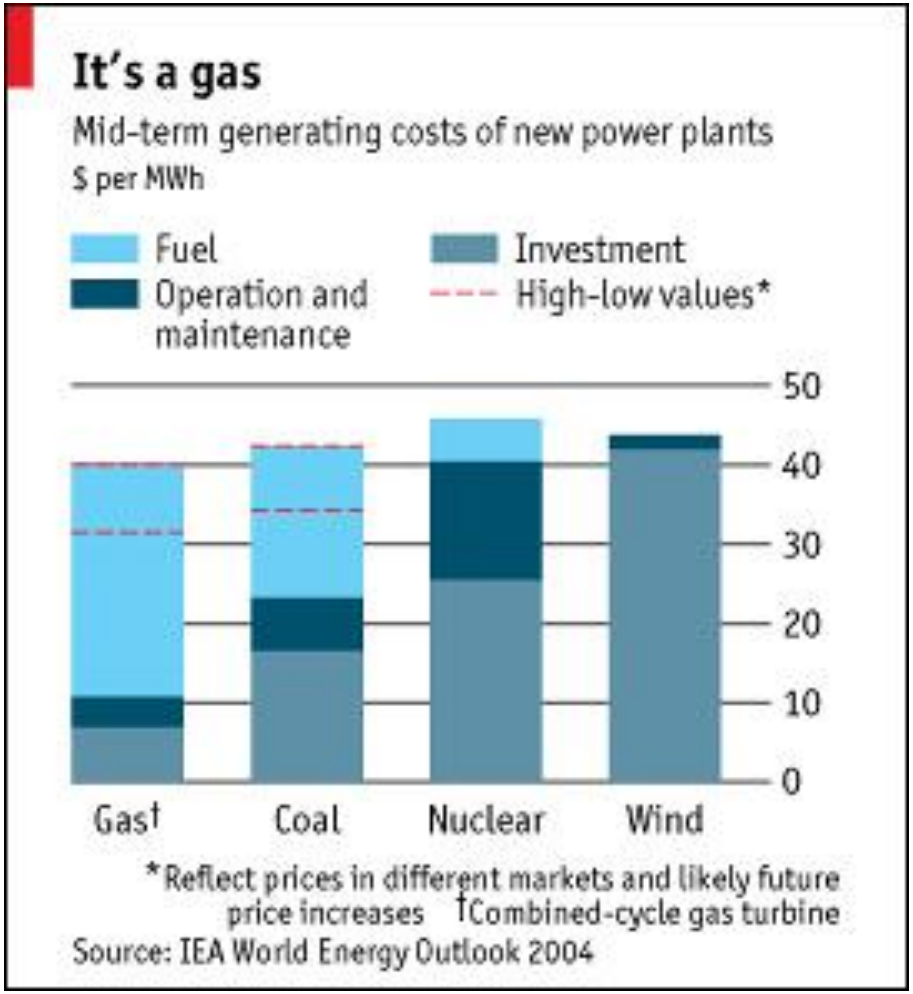
  (e.g. 20 years)

Tariff calculation methodology

- Tariff calculation based on technology specific generation costs + “reasonable” rates of return
- Don’t use “avoided costs” as point of reference
- Cost factors:
  - Investment costs (material and capital costs)
  - Grid-related and administrative costs (including grid connection, costs for licensing procedure
  - Operation and maintenance costs
  - Fuels costs (biomass and biogas)
  - Decommissioning costs (where applicable)

Tariff payment duration

- Formerly: short periods (logic of conventional electricity sector)
- Nowadays: long payment durations (usually 20 years ~ lifetime of power plant)
- Necessary because of special investment structure

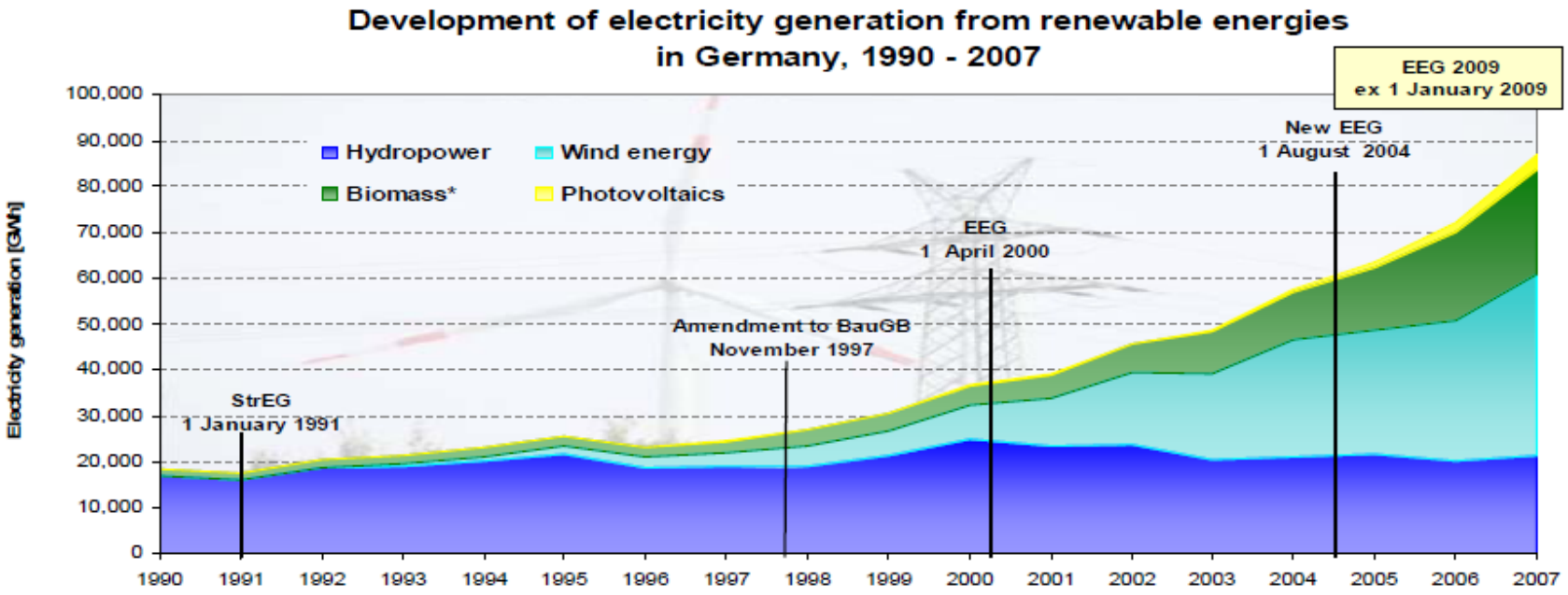


Effects of feed-in tariffs

- Increases investment security
  - Fixed tariff over a predictable period of time
- Reduces price risk and therefore costs
  - Even small and medium sized actors get cheap loans
  - Risk reduction reduced additional costs for final consumer
- Replaces long negotiations between RES-e producers and utilities/monopolists
  - Short track for PPAs
  - Fast growth of renewable energy sector in a "protected" market

→ Creating markets for renewables!

RES-e development in Germany (1990-2007)



Source: BMU 2009

Additional design options

Basic FIT design options

- Financing mechanism
- Targets and progress report

Design options for tariff differentiation and adjustment

- Technology, size and location specific tariffs
- Tariff degression
- Inflation indexation

Conclusion:
Feed-in tariffs manage to incentivise investment into renewable energy sources at an early stage of market development.

Question:
Can feed-in tariffs help to incorporate an increasing share of renewable electricity?

Share of renewable electricity in EU countries (excluding hydro, 2004)

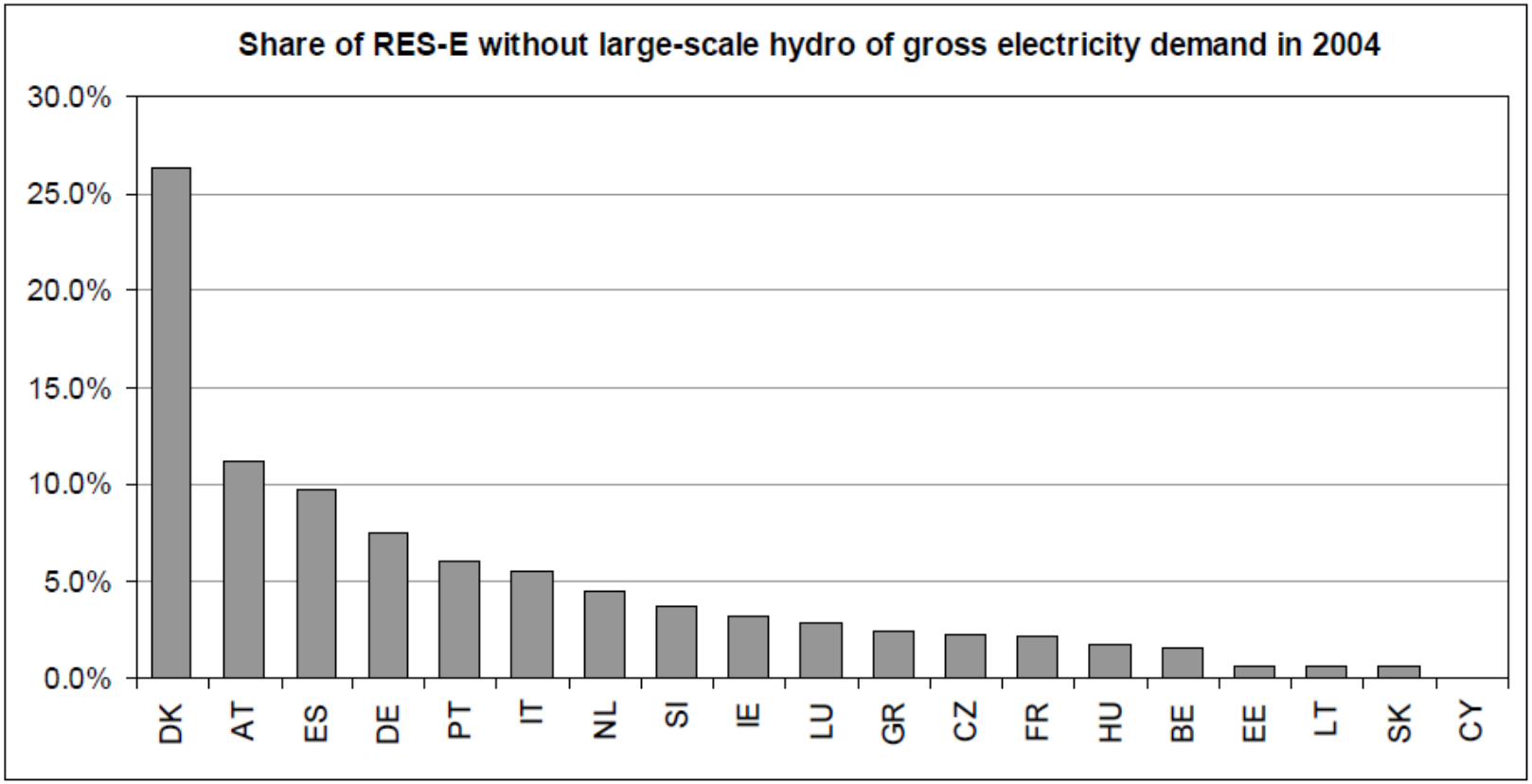


Figure 4.1: Share of electricity from renewable energy sources of gross electricity consumption excluding large-scale hydro power in 2004

Source: [OPTRES 2006]

Design options for market integration

Alternative sales options

- Market sales
- Premium feed-in tariffs
- Auto-consumption (solar PV)

Tariff payment for improved system integration

- Auxiliary grid services (reactive power, voltage dips)
- Demand-oriented tariff payment
- Tariff payment for steady electricity supply

Regulations for controlling power output

- Forecast obligation
- Remote-controlled power output

Outlook and questions

With an increasing share of RES-e the debate has to move from from designing support mechanisms to the design of electricity markets:

- Fixing tariffs vs. market sales
- Which kind of actors do we want in the power generation business?
- How to cope with merit-order effect?
- Establish capacity markets?

…the end…

Thank you for your attention!

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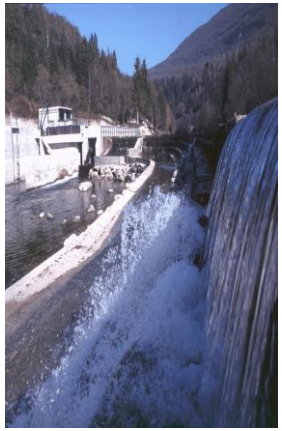

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