Competitiveness of RES Generation – Current Status and Success Factors

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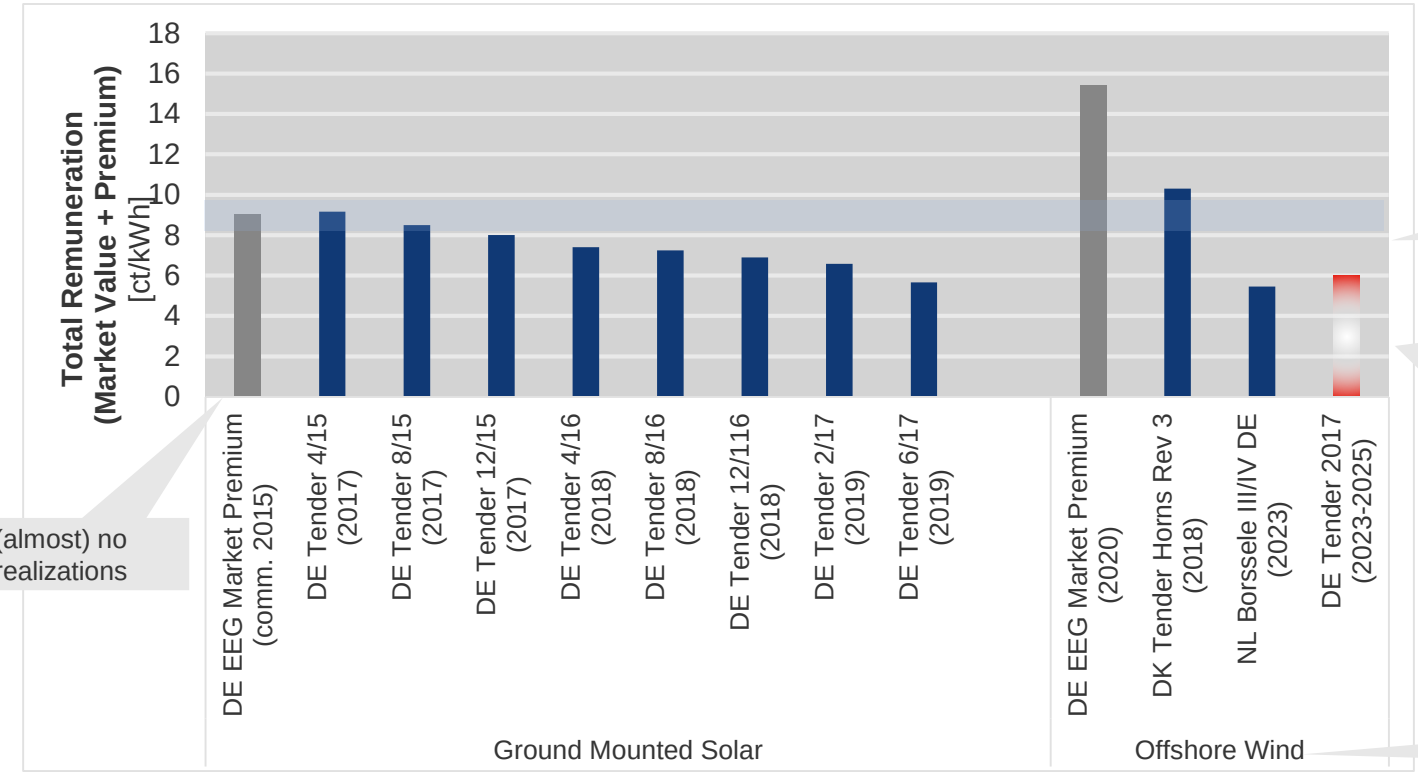
Session “The Competitive Position of Renewable Power”

Christoph Maurer | Cologne | 28 June 2017

consentec

Switch from administratively determined support levels to auctions

Demanded levels of remuneration dramatically decreased with introduction of RES Auctions



(almost) no realizations

typical full costs of new CCGT

3 accepted bids with bid price of ct 0/kWh → no support, revenues fully dependent on market value

1 accepted bid with bid price of ct 6/kWh

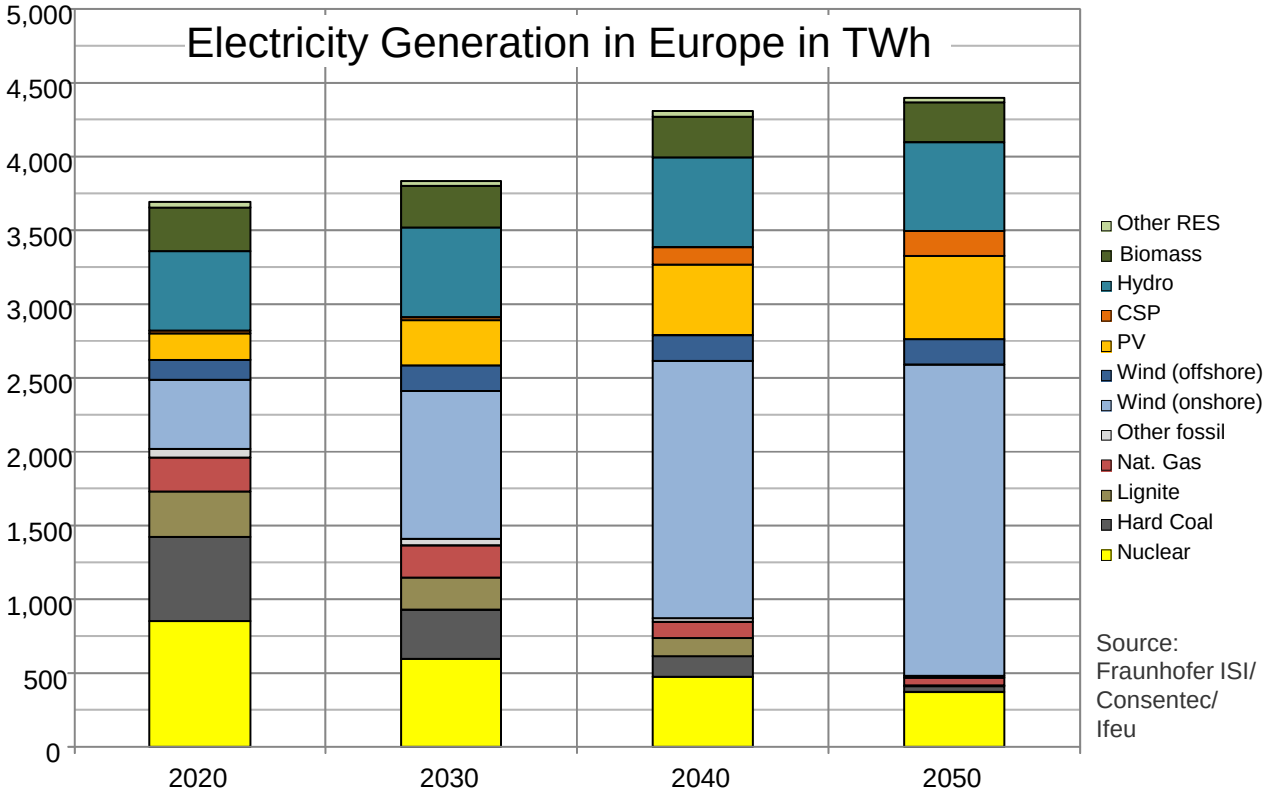
grid connection provided separately

> Auctions have revealed significant cost reduction potentials

> New RES not necessarily more expensive than new fossil plants (not directly comparable, though, because of intermittency)

Role of RES and Europe's climate targets

How to reach 80% GHG reduction in Europe until 2050 in a *cost-optimal* manner? – First insights from a study for German government



Source: Fraunhofer ISI/ Consentec/ Ifeu

preliminary results from study "Langfristszenarien für die Transformation des Energiesystems" (engl. long term scenarios for energy system transformation") commissioned by German Ministry of Economic Affairs and Energy (BMWi): to be published in summer 2017

> To achieve climate targets, significant increase in RES generation (and almost no new fossil gen.) is efficient in medium and long term

Despite cost reductions and long term efficiency, demand for (low-level) RES support might remain at least in the mid-term

Carbon prices inconsistent with long term targets

> carbon price levels consistent with 80% targets (e.g. EUR 35 per ton of CO_2 in 2030, EUR 100 per ton of CO_2 in 2050) far higher than today's prices and projections for near future
  » carbon price as a "political price" highly uncertain
> consequently, current power market prices offer no cost recovery for RES investments with near-by commissioning dates
  » however: several projections see increase in price levels within next ten years → but still too far away to trigger purely market-based investments

Learning curve effects might have public good character

Uncertainties and delays in grid expansion

"Support" for conventional generation might distort level-playing-field

Risk-aversity of traditional RES investors

Despite cost reductions and long term efficiency, demand for (low-level) RES support might remain at least in the mid-term

- Carbon prices inconsistent with long term targets
- Learning curve effects might have public good character
  - > competitors cannot be fully excluded from technology gains
    - » patents etc. offer only partial protection
  - > might result in an underinvestment in RES technologies
    - » especially R&D might remain at an insufficient level
  - > particularly relevant for technologies with steep learning curves
- Uncertainties and delays in grid expansion
- “Support” for conventional generation might distort level-playing-field
- Risk-aversity of traditional RES investors

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- Carbon prices inconsistent with long term targets
- Learning curve effects might have public good character
- Uncertainties and delays in grid expansion
  - > massive European-wide grid expansion together with optimal RES siting likely to deliver cost-optimal energy system transformation
    - » public acceptance for grid expansion is very low, however
    - » regulatory decisions on grid expansion planning not necessarily based on economic rationality
  - > barriers to purely market-based RES investments might be two-fold
    - » no reliable grid connection/access available for best sites
    - » investments at sites with lower productivity might be devalued in the future if grid expansion can be realized
- “Support” for conventional generation might distort level-playing-field
- Risk-aversity of traditional RES investors

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> low wholesale prices have negatively affected revenues of conventional power generation
  » early retirement, low level of new investment
> (at least) suspected risks for security of supply → general debate on electricity market design in Europe
> many major countries are introducing capacity remuneration mechanisms
  » RES often not fully eligible for those mechanisms
> inherent risk that capacity payments constitute some kind of subsidy for fossil generation → reducing market prices and earnings potentials for RES

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> up to now, financing of RES investments often differs significantly from financing of market-based generation
  - » project finance
  - » very low levels of equity
  - » private investors and small companies → low securities/collaterals
  - » funding by public banks
> FIT/sliding market premium support schemes enabled such financing structures by strictly limiting risk exposure of investors
> market-based investments would likely require other financing and ownership structures → not impossible, but will take time

RES support schemes based on well-designed tendering processes appropriate solution for the time being

competitive support schemes safeguard ambitious transformation process, but can pave the way for market-based investments

> support for RES investments becomes a scarce good → will incentivize innovations and reveal cost-saving potentials → higher public acceptance for RES support

> risk exposure for investors could be gradually increased if desired (e.g. fixed premium, technological neutrality, cross-border competition)

> competitive process will also reveal optimal ownership structure (finance, acceptance, project management)

careful design of RES auctions is crucial success factor

> past auctions often resulted in poor quotas of timely realized projects

» auction design will have to include sufficient incentive schemes (penalties backed by securities) for project realization even if circumstances turn out to be unfavorable

» trade-off between low demanded support levels and project realization

> important differences among RES technologies beyond required support level

» differences in market and grid integration costs → externalities

» project risks, permit procedures, realization periods

Different RES technologies might require tailor-made auction design

One-size-fits-all solutions unlikely

Offshore Wind

> installation sites publicly owned and a scarce resource themselves
> in Germany: planning and construction periods for DC grid connection and necessary onshore grid reinforcement >> planning and construction period for offshore wind farms
> huge investments, high planning costs, low competition
> uncertain technological development

> *administrative pre-development of projects (like in NL, DK, DE after interim period) and grid connection → tendering at the end of pre-development phase*

Ground-Mounted Solar

> typically no permits necessary or permits easy to achieve
> abundance of available sites → environmental concerns might be limiting factor
> typical construction periods < 6 months
> broad range of investors, producers, service providers

> *simple tendering scheme with limited realization periods, low levels of prequalification and high flexibility for bidders*

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