FITs and RPSs are under attack – what are the issues and how do we address them?

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(thanks to Luca Bergamaschi and Lena Kitzing)

IGov New Thinking For Energy

University of Exeter

EPSRC Engineering and Physical Sciences Research Council

Caveats and Definitions

- European Focus
- ‘Classic’ Feed-In Tariff (FIT) = the German model where risk of investment is almost completely removed because (1) connection, (2) volume / off-take, (3) price (including degression) all known
- (1), (2), and (3) details affect risk and differ across FIT mechanisms world wide
- Feed-in Premium (FIP) where price is guaranteed relative to electricity price
- RPS (Quota in Europe) where quantity is mandated and where rules about (1), (2), and (3) affect risk and differ across quota mechanisms world wide

FITs and Quotas are Under Attack?

- Need to differentiate between genuine discussions, analysis, needs and criticisms of RE support mechanisms in Europe AND criticisms of RE which are part of a wider resistance to change in the EU.

EC 2013 Renewable Energy Progress Report (ref: Brussels, 27.3.2013 COM (2013) 175 final)

- ‘Further efforts are needed to achieve the 2020 targets’
- ‘The Commission will continue to investigate MSs removal of these barriers and will launch infringement proceedings where MS fail to Act’
- ‘Urgent efforts are needed to reform support schemes to ensure they are designed in a cost-effective, market orientated manner.... The Commission’s guidance is necessary to ensure that support schemes are adjusted regularly....make renewable energy producers part of the energy market (such as by moving from feed-in tariffs to feed in premiums or quotas)’

FITs and Quotas are under attack ?

- I agree that renewable energy (RE) mechanisms are under attack for a number of reasons in Europe
  - Support for RE illuminates the fight in Europe for a new versus old energy system
- In general though, I do NOT agree that the underlying support for renewable energy mechanisms is particularly dented in Europe ie still 20% of energy to be provided by RE by 2020 and pressure for 30% by 2030
  - I do agree that it is accepted that certain changes have to be made to FITs to ensure better integration of RE past a certain level of deployment
  - I do agree that quotas are disappearing in Europe
  - FIPs are theoretically more expensive than FITs so questioned

Reasons for attack – now generally accepted

- The German FIT did not set a cap on support nor include incentives for generation at a certain time of the day
  - Integration issues have become more complex with greater deployment and so there are demands for the ability to curtail and/or for greater incentives for market interaction of output
- Costs have risen with RE deployment and some were slow to degress in line with technology caps
  - Distributional/equity issues, particularly in Germany where large users are exempted and all costs on households

Reasons for attack – more complicated

- Recession and paying back debts from the financial crisis means that all European countries have less money.
    - Those not that interested in the environment do not want to pay bill for renewable energy or energy efficiency if they can reduce GHG more cheaply in short term from natural gas
    - Rise of the Right – on the whole questioning of CC
- September election in Germany and the environment /renewables has been made into a big issue by FDP (potential swing coalition member) (see http://projects.exeter.ac.uk/igov/new-thinking-blog-the-new-energy-system-is-winning-the-fight-for-the-future/)
- Rising energy prices – mainly gas in Europe – is a genuine political issue but mixed with misinformation about the cost of RE measures

Cost components for one kilowatt-hour of electricity for household consumers

Sources: see table below

	2000	2002	2004	2006	2008	2009	2010	2011
	Cent/kWh							
Generation, transportation, distribution	8.6	9.7	10.8	11.8	13.0	14.1	13.9	13.8
CHP Act	0.1	0.3	0.3	0.3	0.2	0.2	0.1	0.03
EEG	0.2	0.3	0.5	0.8	1.1	1.3	2.1 [1]	3.5 [1]
Concession levy	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8
Electricity tax	1.3	1.8	2.1	2.1	2.1	2.1	2.1	2.1
Turnover tax	1.9	2.2	2.5	2.7	3.5	3.7	3.8	4.0
Total	**13.9**	**16.1**	**18.0**	**19.4**	**21.7**	**23.2**	**23.7**	**25.2**

1) The table includes the EEG apportionment levied each year on the basis of the operators' forecasts. The EEG annual statements give rise to calculated figures of around 2.3 Cent/ kilowatt hour (2010) and around 3.2 Cent/ kilowatt hour (2011).

Sources: IfnE [7]; BDEW [23]

http://www.bmu.de/en/service/publications/downloads/details/artikel/renewable-energy-sources-in-figures/?tx_ttnews%5BbackPid%5D=112

Estimated contributory factors to domestic energy price rises Feb 2004 to Jan 2011

	Gas	Electricity
Overall price increase	121%	79%
% of increase in unit costs due to:		
Wholesale energy	66%	54%
Tranmission, distribution and metering	20%	13%
Carbon price	-	9%
Renewables	-	6%
Energy efficiency funding	7%	13%
VAT	5%	5%
Estimated increase in annual bill (2004 to 2010)	£295	£160

Source: Household energy bills – impacts of meeting carbon budgets Committee on Climate Change, December 2011

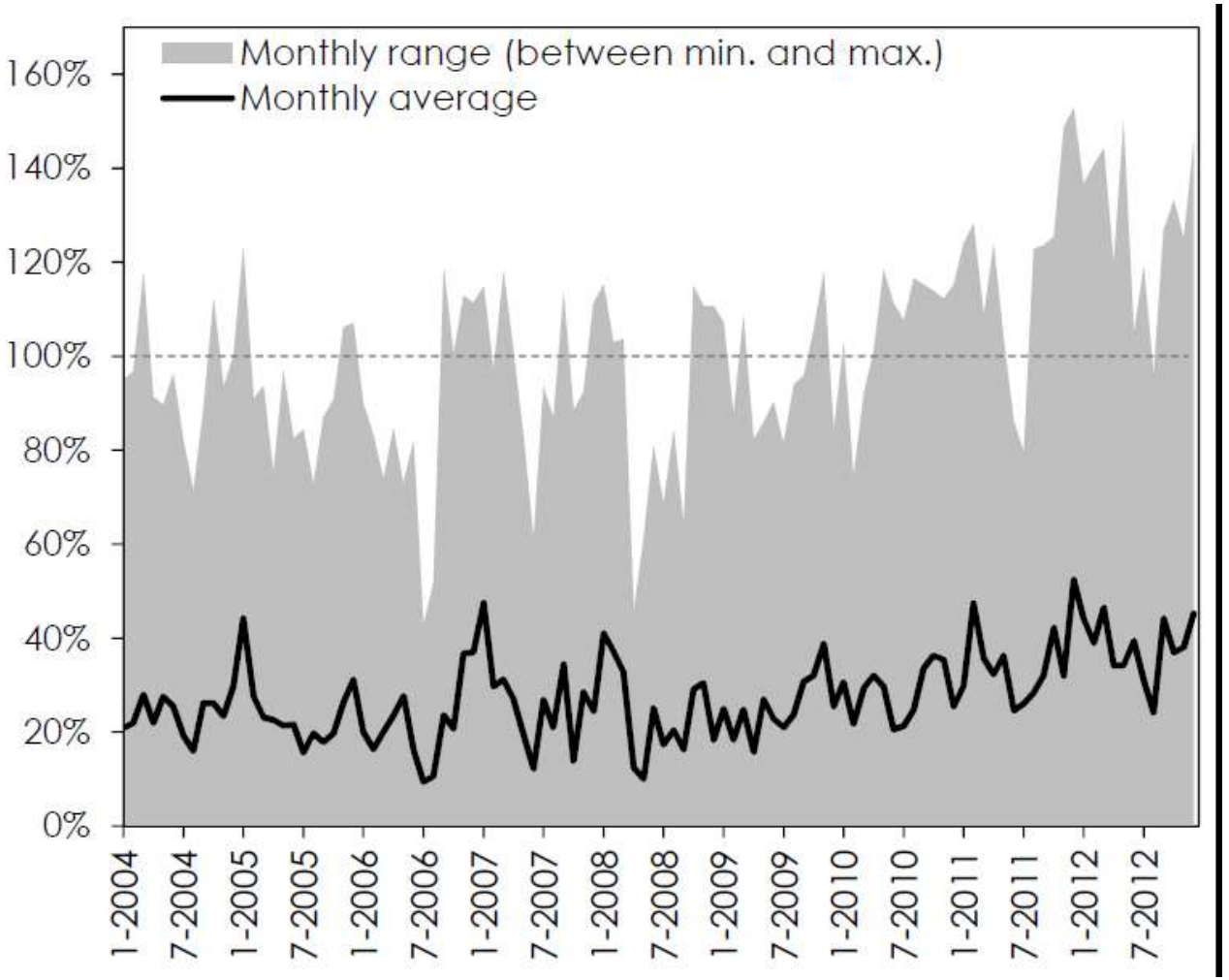
Reasons for attack – more complicated 2

- Wind + PV has led to falling (peak) prices and negative prices
  - Major issue for energy incumbents which have a business model based on making money at the electricity peak and of selling
  - German exports to surrounding countries have also affected the neighbour country power plants economics
- RE + EE threat to current, selling system
- Uncertainty of Japanese energy policy (www.no2nuclearpower.co.uk)
- Strong climate change policies in many European countries
- Taken together, serious resistance by the different incumbent stakeholders across Europe to what is being seen as fight against the 'new' energy system
  - While may slow transition will not stop it

Threats to new system from renewables:

- New record (just over 60%) of simultaneous wind and solar production in Germany. http://www.windjournal.de/erneuerbare-energie/superlative_solarenergie_windenergie

Wind share as a % of production in West Denmark in 2011 and 2012 – 200 hours when wind production was greater than 100% of demand (Kitzing)



How do we address these issues?

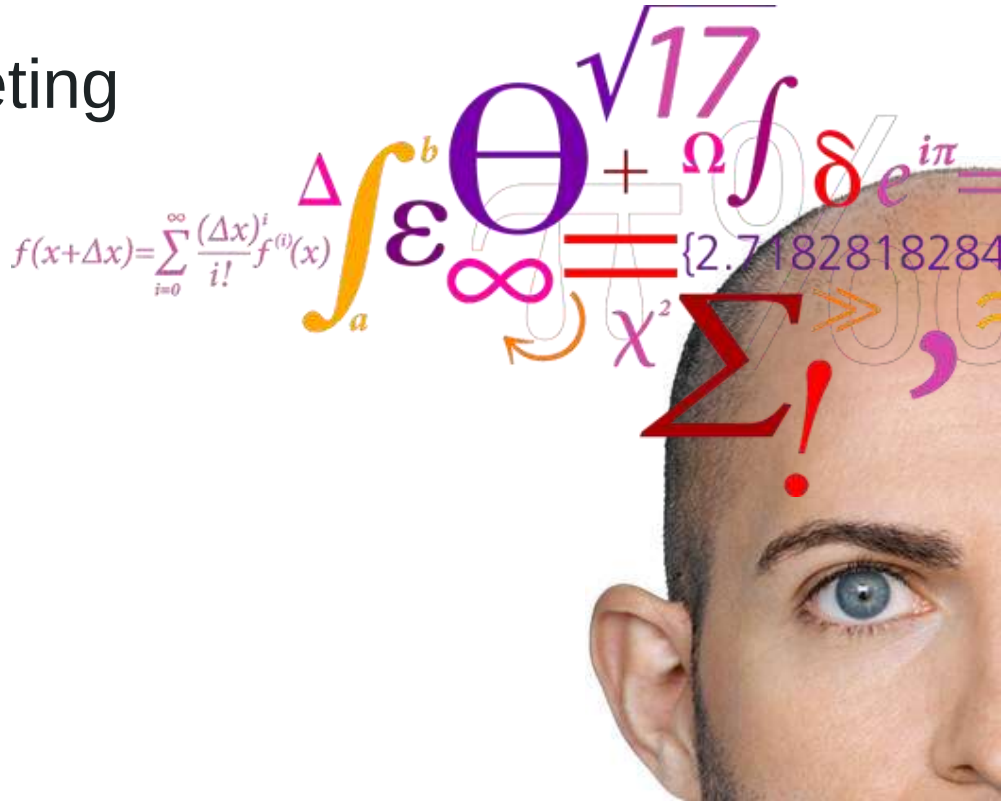
- Recognise energy is political and try to establish open and transparent processes
  - With individuals
  - Within MS, EC and between MS
- Maintain good analysis and communication about technology pathways and costs
  - Ie Do not move to FIPs which will just cost more; better to incentivise dispatch
- Link RE with EE, and wider integration policies
- Target vulnerable customers so that affordability issues are reduced
- Spread benefits of RE around society

Risk implications of renewable support instruments: Comparative analysis of feed-in tariffs and premiums using a mean-variance portfolio approach

ENSYMORA Annual Meeting

Lena Kitzing

14 May 2013



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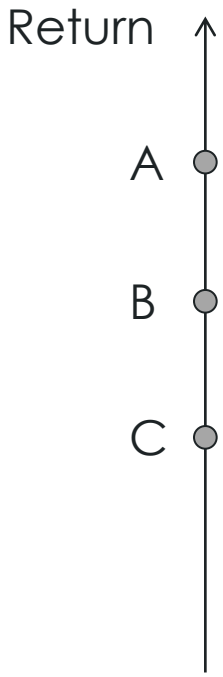
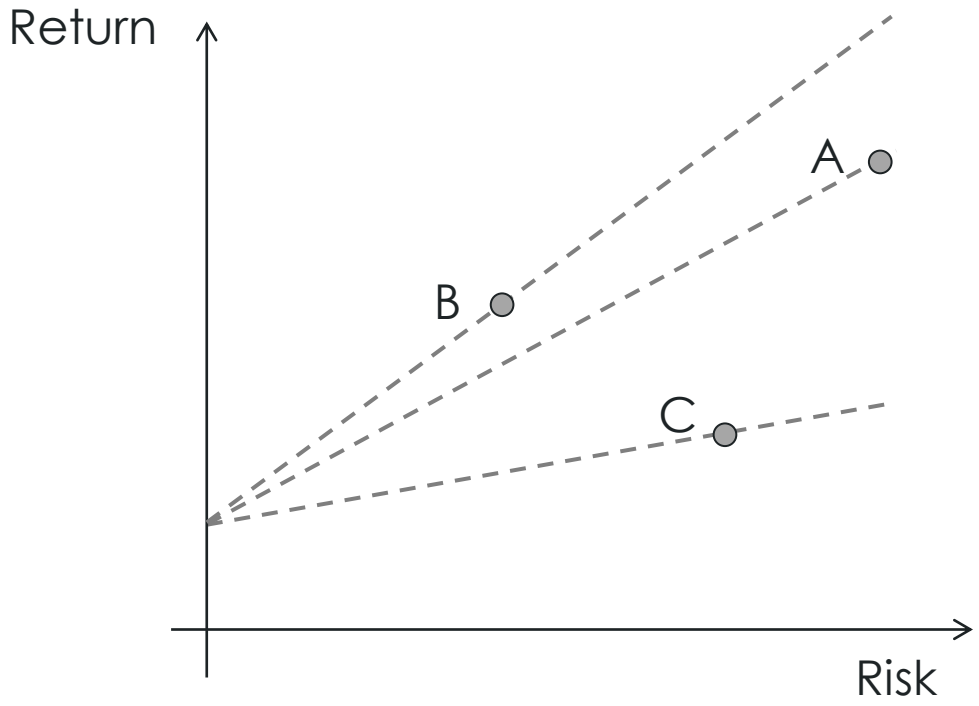
Why consider risk and return?

Cost-benefit analysis



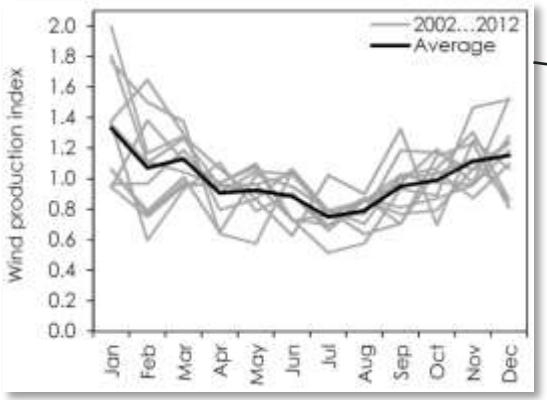
A is most attractive

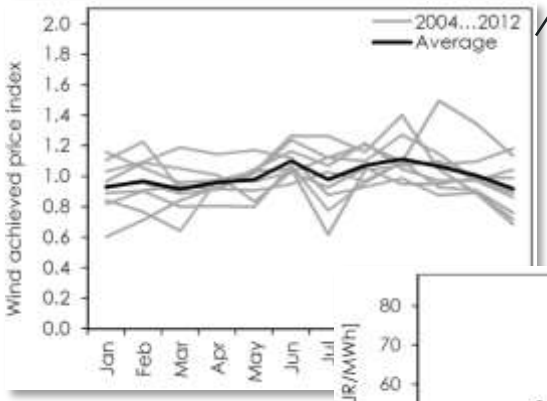
Portfolio Analysis

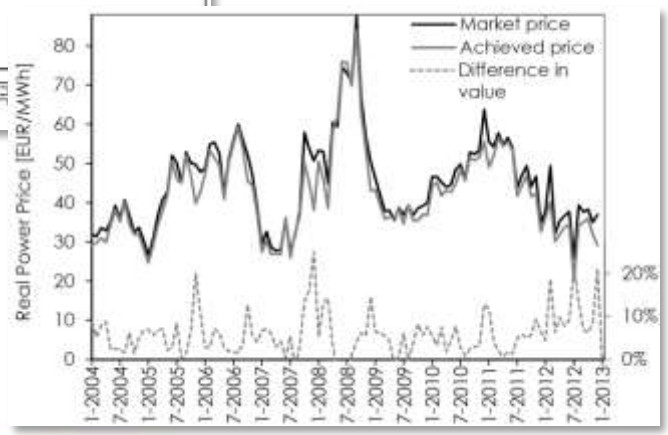


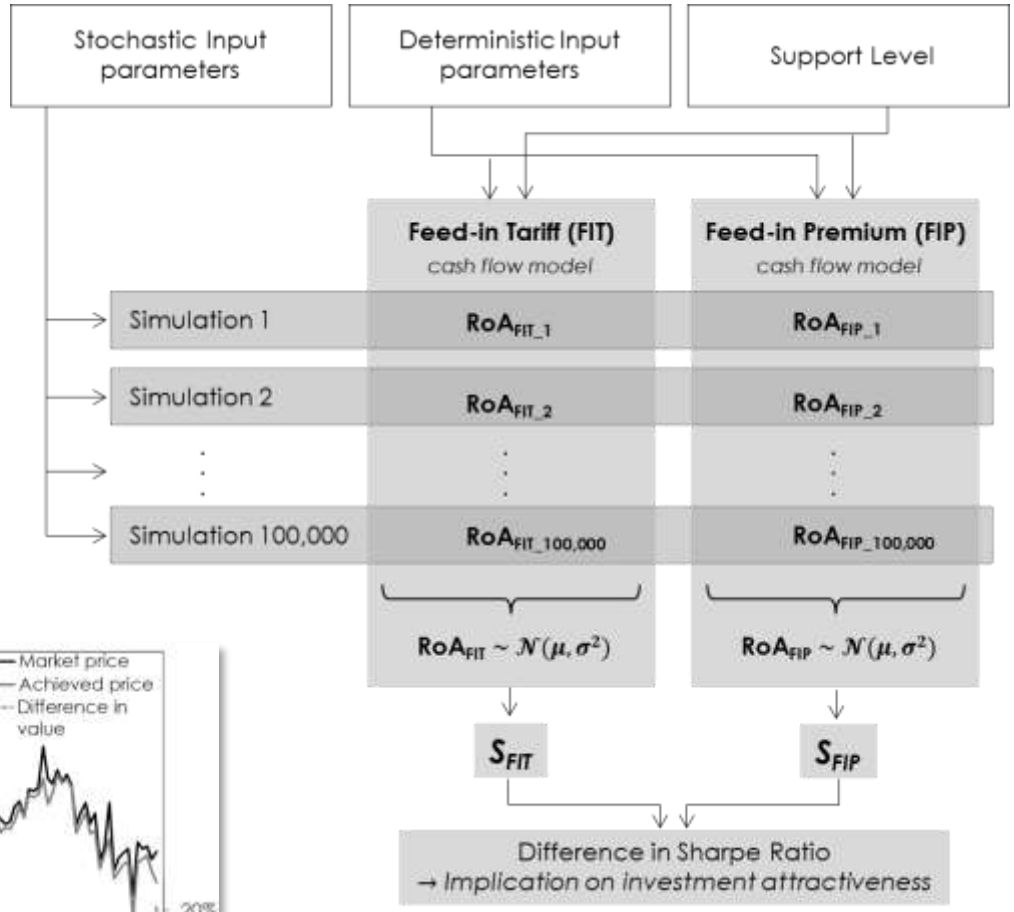
B is most attractive

Simple model – Calculation Procedure

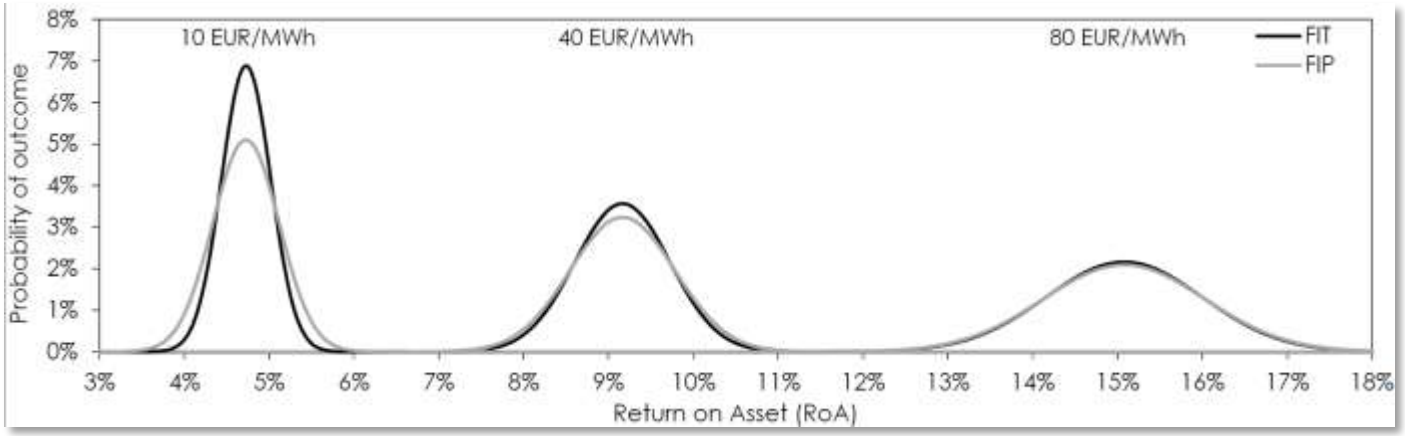


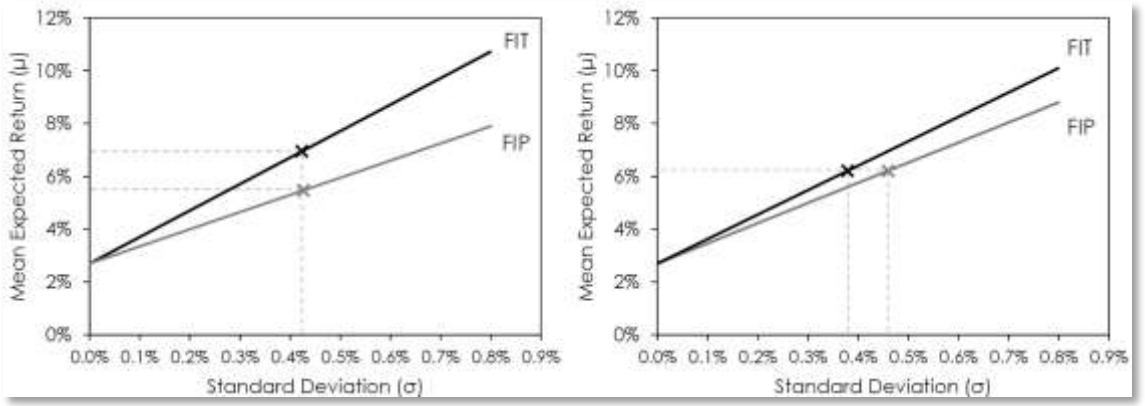






Results (I/II)

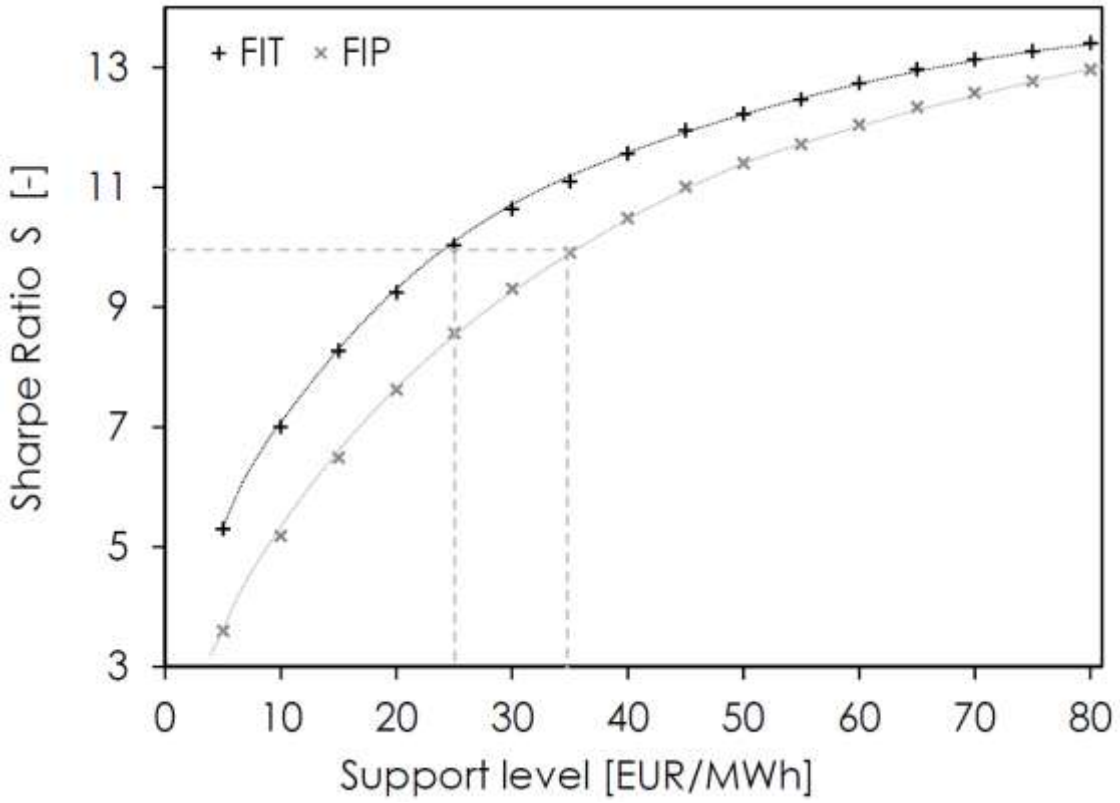




Example for a support level of 20 EUR/MWh

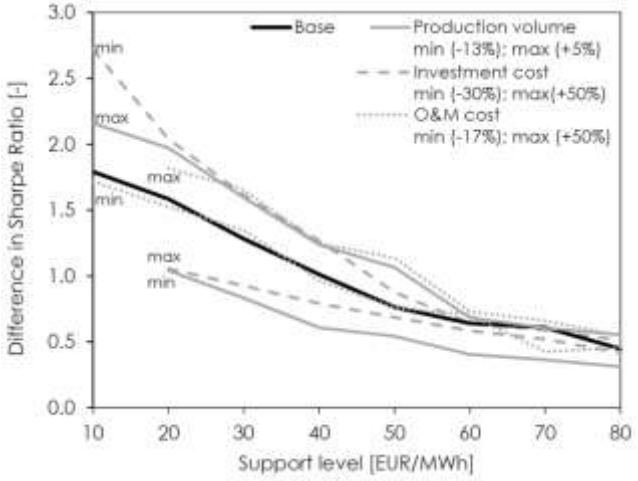
- The FIP exposes the investors to more risk for the same RoA.
- The differences between FIT and FIP are more

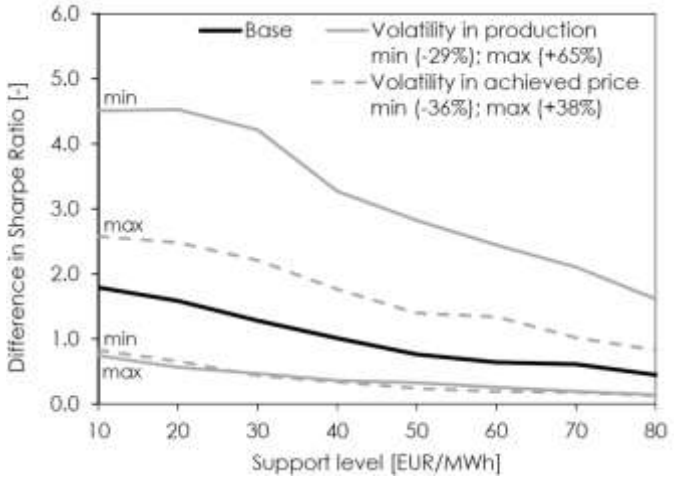
Results (II/II)

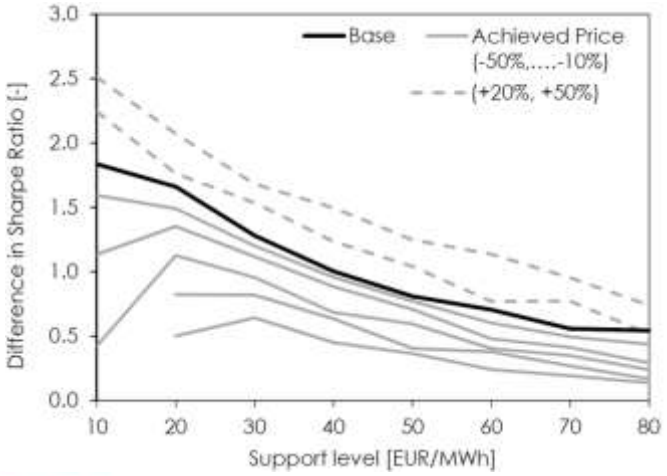


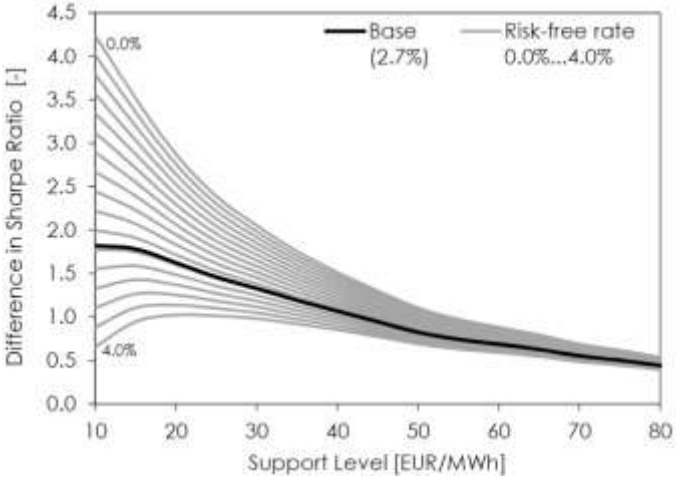
- Using the Sharpe Ratio as indicator for attractiveness of investment, we can derive the required support level relative between the two support instruments
- In the example indicated with dashed lines, the FIP scheme would require a market add-on of 35 EUR/MWh, 40% higher than the required support level under a FIT scheme (25 EUR/MWh).

Sensitivities









- Sensitivity analysis on production volume, price levels, volatility of production volume, volatility of prices, O%M cost, Investment cost, risk-free rate