



PRIØGEN

Hedging renewables in a subsidy free market

1. Past & Present
2. Room for Risk Takers
3. Revival of Cal+5 baseload liquidity ?

Priogen (Amsterdam, 2009)

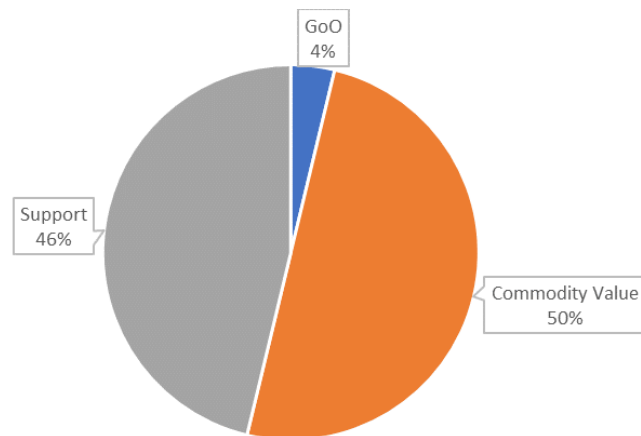


- ▶ Trading European short term power markets.
 - ▶ Trade decisions based on a data driven approach with in-depth meteo analysis.
 - ▶ Weather models.
 - ▶ Meteorological staff.
 - ▶ Flexibility pricing models.
 - ▶ Detailed production and consumption forecasts.
 - ▶ Strong expertise in pricing and managing ST market risk
- ▶ Portfolio management for external Wind and Solar assets.
 - ▶ Result: Risks & Revenues tailored to your risk appetite
- ▶ Connecting innovative development projects to the 'real world'
 - ▶ Sponsored by grid operators, governments and R&D partners.

Past & Future Renewables

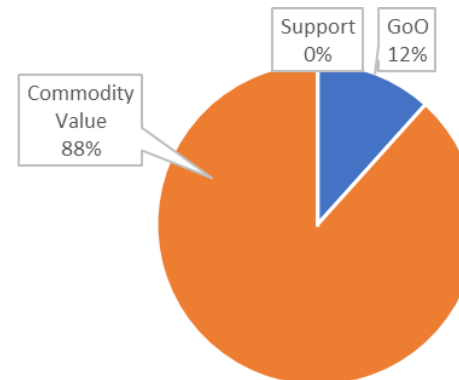
Past: subsidy based

- Total income required for cost recovery: 80 euro/MWh, 10+y.
- GoO: 3-0 euro/MWh
- Commodity: 40 euro/MWh
- Support: 35-40 euro/MWh (indexed to commodity, so Commodity+ Support = constant)



Future: subsidy free

- Total income required for cost recovery: 60 €/MWh, 10+y.
- GoO: 3-10 €/MWh
- Commodity: 57-50 €/MWh



Past & Future Hedging Renewables

Past

- Support grant is 95% de-risking the business case income
 - 10+ year duration
- Only operational market risks remain
 - forecasting risk, depending on market some shaping risk
 - Typical hedged in 1-3 year contracts

Future

- At investment decision, commodity exposure need to be hedged (or taken)
 - 10+ year duration
- Full Commodity exposure
 - Baseload risk (“reference”)
 - Shaping risk (“(what does it costs to convert renewable output to “reference”)
 - Forecasting risk



How to hedge renewables in 'future' scenario ?

- Developer perspective
 - Lower risk -> Lower (financing) costs
 - To mirror the risk of the 'past' situation, a 10 year fixed price output needs to be sold (to a credit worthy off taker)
 - GoO are increasing in value
- Buyer perspective
 - Buying wind output has shaping risk (*costs to convert renewable output into baseload*) and commodity risk (*how will baseload Cal+10 develop ?*)
 - (Industrial) buyers are used to yearly index trackers (rather than 10 y fixed price)
 - Want to contribute to energy transition (as important for Staff/DowJones Sus. Index, tender, green bonds etc.); GoO long term contract is proof



So we see a hedging mismatch

Topic	Seller Perspective	Buyer perspective
GoO Tenor	Long term	Long term
GoO Price	Fixed price	Fixed price
Commodity Exposure Tenor	Long term	Mid/Long term
Commodity Exposure Price	Fixed price for output	Yearly baseload index

← Need
for Risk
Taker



Conclusion: subsidy free renewables trigger a need for new risk takers

- **Shaping Service:** converting renewable output to baseload for 10 years
 - Reasonable credit standing required
 - High risk (& margin) market
- **Baseload Buying:** Buying baseload Cal+2 till Cal+10 at fixed price
 - Good credit standing required
 - Very high risk (& margin) market

Expected volume: European power consumption circa 3000 TWh/y; if we presume 25% is generated with renewables, this means 750 TWh/y shaping & hedging need... (in baseload equivalent: 85000 MW)



Priogen



Why: enable the energy revolution

How: analyze, forecast and manage financial value of MW variation by data driven approach

What: maximize electric flexibility value

Contact details Mr. Remco Frenken:

▶ rf@priogen.nl

▶ +31683970398

▶ www.priogen.com