PRIOGEN

SDE tracker: reduce risks without costs

Summary SDE tracker

- Renewable Energy projects in the Netherlands are supported via the so called SDE support system.
- The SDE support system presumes you are achieving a certain market value for the power you produce.
- Priogen offers the SDE tracker; this guarantees you recieve exactly the market value as projected in your SDE subsidy grant.
- Using the Priogen SDE tracker safeguards your business case; no forecasting risk, no market risks, no hedging costs, no hassle. And we offer all of this free of costs!
- Priogen is able to offer the SDE tracker free of costs. We levareg our excellent forecasting and portfolio managment skills to out perform the market and so capturing margin.

Background: SDE basics

- In the Dutch Market, renewables on land are supported by the SDE system.
- The SDE system consists of a guaranteed price (Basis Bedrag; BB) per MWh produced. The price is made up of the 'market value' and an 'uplift' to cover for the higher costs of renewable power compared to the 'market value' of power.
- The 'market value' is called "CorrectieBedrag (CB)" in SDE terminology
- The government pays out: BB minus CB
- **The SDE recipient is responsible for achieving the CB; performing better or worse is one's own risk.**
  - The government (in practice: research institute ECN) calculates CB each year. CB calculations are based on EPEX prices, shaping factors, EPEX costs and imbalance costs. The CB is the same for every renewable source (so all wind parks on land have the same CB, all solar parks have the same CB etc.).

For good order: there is some additional complexity due to a floor in the pay out, however that is out of scope of this presentation; effects are currently neglectable. See https://www.rvo.nl/subsidies-regelingen/stimulering-duurzame-energieproductie/aanvragen-sde/berekening-sde for all the relevant details

Perspective of asset owner

- Renewable investment is ‘hedged’ by the recieveing of the BB (“SDE subsidie beschikking”)
- Actual income comes from
  - Government pays out: BB-CB (circa 50-60% of the BB)
  - Power Off-taker pays out: CB (circa 50-40% of the BB)

- As the asset owner, you want to ensure that the CB used by the Government is equal to the CB received by the Power Off-taker
  - Priogen does so by offering the so called SDE tracker

- For good order: selling GoO provides additional income, this is however (so far) not corrected for in the BB price.

How is CB determined

- Determine the yearly EPEX baseload price (public information)
  - Non-weighted average of 365 daily EPEX prices
- Determine the discount for shaping and imbalance (see appendix)
  - This is determined by SDE/RVO (calculation methodology is partly a black box)
- The shaping and imbalance factor for wind is around 85% (*). This means that a MWh of power produced by a windmill has an average value of 85% of yearly baseload EPEX price.
  - Why not 100%?
    1. If there is more wind -> lower EPEX day price
    2. If there is no wind -> higher EPEX day price
    3. Inevitable forecasting errors, leading to imbalance costs
    4. 'Window to market costs' (EPEX membership & fees etc.)

(*) for solar, approaching 100%

Priogen offers the SDE tracker to help mitigate market risks for renewable asset owners

- Priogen mirrors the ECN calculation of CB and takes all the related market risks (*)
- Result: Asset owners receives the CB from Priogen and receives BB-CB from SDE; net result: Asset owner receives BB
- Advantages Asset Owner
  - De-risking the project; projects are budgeted on BB and asset Owner has now secured it by actually receiving the BB
  - No hedging or forecasting/imbalance risks,
  - No operational hassle
- Priogen has extensive forecasting and trading know how. This coupled with our extensive infrastructure enables us to achieve lower imbalance costs compared to ECN's calculations.
- Please note that GoO are outside scope (and provide additional upside).

(*) excluding GoO and Floorprice risk

Priogen also offers alternatives to the SDE tracker (1/2)

1. Fixed discount (e.g. 13% for wind, 5% for solar); Priogen buys every MWh 'as produced' for 87% (100%-13%)of the baseload price

   Advantages

   - No forecasting, shaping or imbalance risk
   - Suitable for portfolio of renewable assets
   - Possibility to outperform SDE assumptions
   - Possibility to 'click' the baseload price

   Disadvantage

   - May lead to mismatch with SDE subsidy (price Priogen's payout will deviate from the CorrectieBedrag-price SDE assumes)

Priogen also offers alternatives to SDE tracker (2/2)

2. Imbalance discount only (e.g. 3%); Priogen buys every MWh 'as produced' for 97% (100%-3%) of the hourly EPEX price.

   Advantages

   - No forecasting or unbalance risk.
   - Suitable for portfolio of renewable assets.
   - Possibility to outperform SDE assumptions.

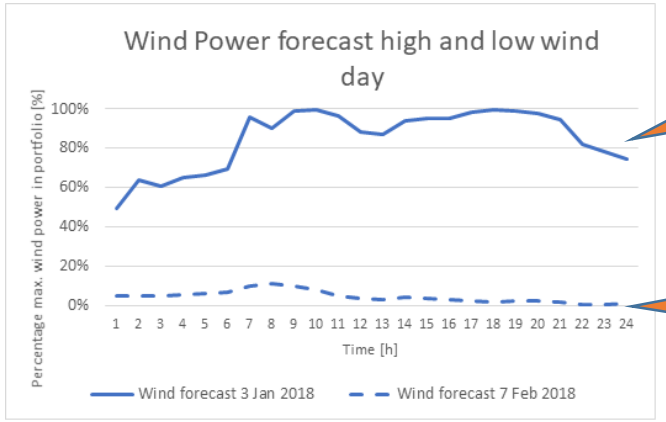
   Disadvantage

   - May lead to mismatch with SDE subsidy (price Priogen pays out will deviate from the CorrectieBedrag-price SDE assumes)
   - Risk of underperforming SDE assumptions.
   - Income volatile; full 'cannibalization risk' ("more wind leads to low EPEX prices")

3. Forecasting DA only (may include bonus/malus)
4. Cash flow analysis, based on 20 y climatology

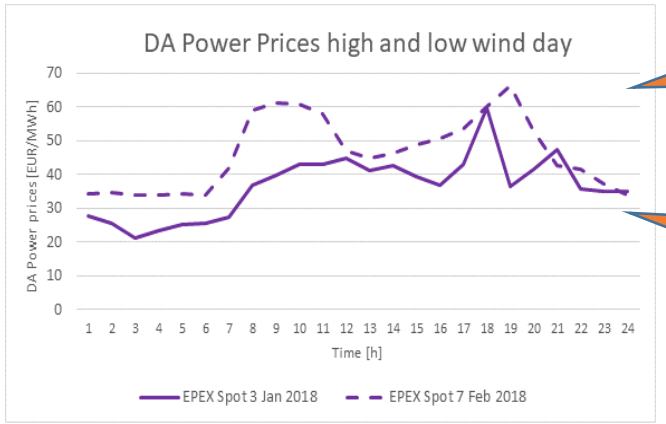
Appendix: Shaping & Imbalance costs

- Shaping Costs: prices are lower when there is lots of wind (as more supply leads to lower prices)



High wind day

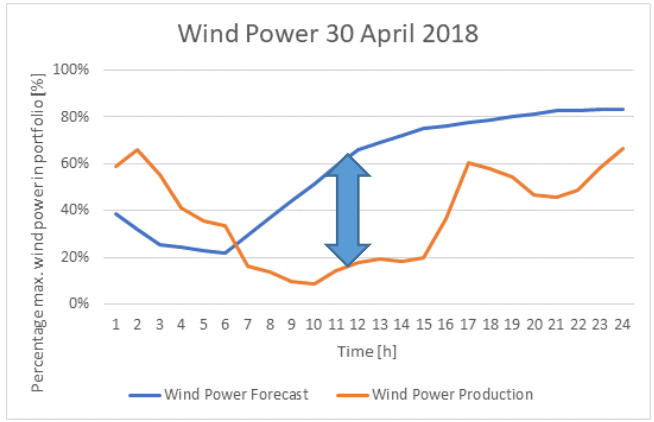
Low wind day



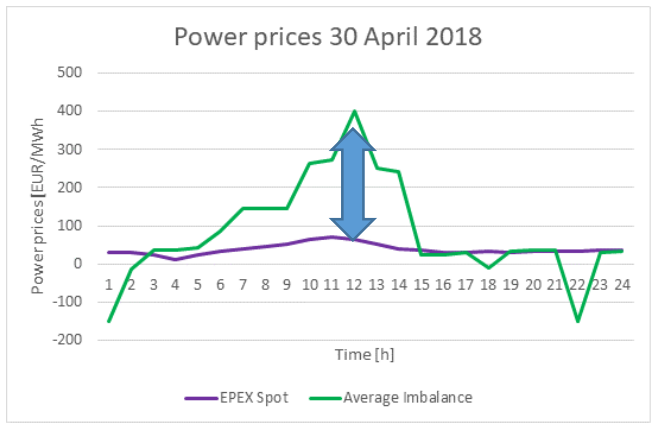
Low wind: higher prices

High wind: lower prices

- Imbalance costs: The inevitable forecasting errors lead to additional costs, as imbalance costs can be 10* normal prices. This means one bad day of forecasting costs 10 days of revenues…



The gap between the lines is the forecasting error



The gap between the lines are the imbalance costs

Data source: Priogen Wind portfolio

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