Asset Optimisation and Trading

Stefan Dohler
Head of Asset Optimisation and Trading

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Central AOT allows for clear and significant value creation

Benefits of integrated AOT organisation

- Allow for value creation synergies (e.g. hedging)
- Competitive advantage in trading and portfolio management through knowledge sharing in integrated commodity markets
- Effective risk control
  - Risk Management will also remain a central function in the new organisation

Trading volume 2012 (external)

<table>
<thead>
<tr>
<th>Commodity</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electricity (TWh)</td>
<td>1,930</td>
</tr>
<tr>
<td>CO2 (EUA and CER), mt</td>
<td>720</td>
</tr>
<tr>
<td>Gas (TWh)</td>
<td>1,450</td>
</tr>
<tr>
<td>Coal (Swaps and FFA), mt</td>
<td>65</td>
</tr>
<tr>
<td>Number of counterparts</td>
<td>~600</td>
</tr>
<tr>
<td>Transactions per day</td>
<td>&gt;1,200</td>
</tr>
</tbody>
</table>

Asset Optimisation and Trading

Asset Optimisation
- Maximise the value of Vattenfall assets in the day-to-day operations up to ~1 month

Portfolio Management
- Manage assets to maximise value and develop and execute hedge strategy
- Support Group on investments / divestments decisions

Trading
- Market access for Vattenfall Group
- Execution of Vattenfall flows and proprietary trading
- Sourcing for hard & liquid fuel

Operations
- Develop IT systems, models for optimisation, pricing, risk management and price forecasting
- Projects for implementation of new products and processes
The hedge strategy supports Vattenfall’s financial targets

- Relevant key indicators are monitored and deliver the basis for the hedge strategy
- Hedging focuses on Funds from Operations (FFO)
- The hedge strategy is optimised on Group level, safeguarding an adequate allocation to business regions

Feedback loop

- Minimum profit / cash flow required
- Assess risks of potential various hedge strategies
- Define risk preference and derive a fitting hedge strategy

Protection against financial downside
Support financial targets given by the owner
Reduce volatility in earnings and cash flow

Debt / Equity
ROCE
FFO / Adjusted Net Debt

Minimum profit / cash flow required
Assess risks of potential various hedge strategies
Define risk preference and derive a fitting hedge strategy

Feedback loop
Vattenfall’s hedging position

Percentage hedged of planned electricity generation (2013: remaining part of the year)*

<table>
<thead>
<tr>
<th>EUR/MWh</th>
<th>2013</th>
<th>2014</th>
<th>2015</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nordic region</td>
<td>45</td>
<td>42</td>
<td>40</td>
</tr>
<tr>
<td>Continental Europe</td>
<td>55</td>
<td>50</td>
<td>45</td>
</tr>
</tbody>
</table>

* as of 30 Sep, 2013
Financial regulation could lead to less possibilities to hedge our portfolio efficiently

1 | Drivers of change
---|---
- In response to the financial crises in 2008, regulators have pushed for tighter regulatory control over financial markets
- Regulators increasingly call for financial market rules to be extended to the energy sector as well

2 | Policy objectives
---|---
- Increased transparency
- Improved market integrity and oversight
- Reduced systemic and operational risks

G20 Leaders’ statement, the Pittsburgh Summit – 2009
“All standardized OTC derivatives contracts should be traded on exchanges or electronic trading platforms, where appropriate, and cleared through central counterparties by end-2012 at the latest.”

3 | Regulatory outcome
---|---
- EMIR: Over-the counter derivatives regulation (implementation from 2013 until 2019)
- MiFID II: Revision of financial markets regulatory regime (expected soon)
- REMIT: Market integrity in EU gas & power markets
What is the impact of increased regulation on the market?

Higher risks lead to higher costs triggering a liquidity spiral that could lead to higher prices for market players and end-consumers.
Vattenfall supports transparency and proportionate regulation

- Vattenfall supports transparency in commodity markets and recognises the need to implement a strong regulatory framework for banks and other financial institutions.

- Vattenfall primarily trades in physical products (gas, power, CO2) to hedge the commercial risk of its portfolio. In terms of risk, Vattenfall’s trading activities are very limited compared to its main business.

- Mandatory clearing, arising from financial regulations such as EMIR and MiFID II, can be costly and would lead to less room for investments (e.g. in renewables and infrastructure), less possibilities to hedge our portfolio efficiently and less market liquidity.

- Physical traded products which are intended to be settled physically do not have the same features as financial instruments and should not be treated in the same way.
Headlines about plant closures dominated the news lately

15-20 GW are under pressure in Germany, 10-15 GW in France & Benelux as well as 10-15 GW in UK

<table>
<thead>
<tr>
<th>Owner</th>
<th>Typ</th>
<th>Plant</th>
<th>MW</th>
<th>Fuel</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>RWE</td>
<td>Decom.</td>
<td>Amer 8</td>
<td>610</td>
<td>Coal</td>
<td>Q1 2016</td>
</tr>
<tr>
<td>Long-Term Moth-balling</td>
<td>Moerdijk</td>
<td>430</td>
<td>Gas</td>
<td>NL</td>
<td>Q4 2013</td>
</tr>
<tr>
<td>Long-Term Moth-balling</td>
<td>Gersteinwerk F+G</td>
<td>710</td>
<td>Gas</td>
<td>DE</td>
<td>Summer 13</td>
</tr>
<tr>
<td>Long-Term Moth-balling</td>
<td>Weisweiler H+G</td>
<td>540</td>
<td>Gas</td>
<td>DE</td>
<td>Q2 2014</td>
</tr>
<tr>
<td>(2 small plants)</td>
<td>85</td>
<td>Gas</td>
<td>NL</td>
<td>Q1 2013</td>
<td></td>
</tr>
<tr>
<td>Long-Term Moth-balling</td>
<td>Emsland B+C</td>
<td>720</td>
<td>Gas</td>
<td>DE</td>
<td>Q2 2014</td>
</tr>
<tr>
<td>special</td>
<td>Confidential</td>
<td>1.170</td>
<td>Coal</td>
<td>DE</td>
<td>Q4 2013-14</td>
</tr>
<tr>
<td>Under review</td>
<td>Westfalen C, Frimmersdorf P+Q, Goldenbergwerk</td>
<td>900</td>
<td>Coal / Lignite</td>
<td>DE</td>
<td></td>
</tr>
<tr>
<td>EnBW</td>
<td>Decom.</td>
<td>Marbach GT</td>
<td>77</td>
<td>Oil</td>
<td>DE asap</td>
</tr>
<tr>
<td>E.ON</td>
<td>Decom.</td>
<td>Kiel</td>
<td>161</td>
<td>Coal</td>
<td>Q4 2015</td>
</tr>
<tr>
<td>E.ON</td>
<td>Decom.</td>
<td>Walheim 1+2</td>
<td>270</td>
<td>Coal</td>
<td>DE</td>
</tr>
<tr>
<td>E.ON</td>
<td>Decom.</td>
<td>Reserve</td>
<td>1037</td>
<td>Gas/Coal</td>
<td>DE 2012 - 2016</td>
</tr>
<tr>
<td>Hanno ver SW</td>
<td>Decom.</td>
<td>Herrenhausen</td>
<td></td>
<td>DE 2015</td>
<td></td>
</tr>
</tbody>
</table>

Source: Montel, Vattenfall
Base power prices

- All prices pulled down by falling coal & CO2 prices, while in Germany the dash for renewables supported the trend
- Due to the different fuel price developments, the spread between the gas-dominated Dutch market and Germany increased significantly despite an increasing market integration in Europe
- The hydro balance is important for the spread between Central Western Europe & Nordics

Source: Endex, EEX, PNX, GME
Nordic Power Consumption - sum 365 days

- The annual Nordic consumption reached 400 TWh years ago.
- Consumption dropped in 2009, but seems to have recovered.
- However, a more dramatic drop is seen on temperature and climate corrected consumption.

Source: ENTSO-E, Vattenfall
• The hydro balance deteriorated during last winter due to cold and dry weather
• Rainy weather since mid-October has improved the hydrological balance significantly
• All in all, the hydro balance is now close to normal with a slight deficit in hydro reservoirs and a surplus in snow stack
Coal in Germany and gas plants in the Netherlands in a relatively good position

Cal14 DE & NL Spreads

Clean Dark/Spark Spreads (CDS/CSS)

- In Germany, nearly all the CSS are in deep negative territory – record lows were reached end of August 2013
- At least, the CSS in the Netherlands are partly positive but the level is clearly far too low to recover investments into CCGTs
- Only a significant change in the power plant structure or in commodity prices can change the picture, whereas latter is less likely

Source: ENTSO-E, Vattenfall
Increasing share of renewables brings short-term volatility

- Until late 2011, the system was stabilised.
- From the beginning of 2012, rocketing installed capacity of renewables has led to a steeper merit order curve.
  - In times of high renewable production, spot prices are very low while in times of low renewable production, prices can be quite high.
  - Those price changes that occur overnight trigger high volatility.

Source: Vattenfall
Low volatility trend across all products and markets (long-term)

- Volatility in long-term markets has stabilised on a low level
- Steep decrease in coal and gas below 10%
- Volatility is higher during winter times when the energy system is tight
- “Political shocks” can occur anytime and lead to increased volatility

Source: Vattenfall
Conclusions

• Uncertainties from many perspectives – i.e. political, regulatory and prices on the energy wholesale markets – are here to stay. Thus, power markets will continue to be volatile especially on the near horizon.

• Looking years and decades ahead, it is unlikely that we will only see one trend or direction in the different markets. In this context, history will repeat and an active and professional position management of the financial exposure will be key for the sustainable success of Vattenfall.

• With a very balanced and robust asset portfolio – with respect to all kind of market moves – Vattenfall is in a pretty good starting position to tackle the future challenges of the energy market in Europe given by the three main pillars of European Energy Policy: Sustainability, Security of Supply and Competitiveness.