Case Study - Germany

Dimitri Wenz, Bundesnetzagentur
Vienna, 12.12.2017
1. German gas market fundamentals
2. NC Bal implementation in Germany
   2.1 Information Provision
   2.2 Operational Balancing
   2.3 Imbalance Charges
   2.4 Within-Day-Obligations
   2.5 Neutrality Arrangements
3. Summary
1. German gas market fundamentals
The transmission system

High calorific gas

Low calorific gas

Source: German TSOs

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Basic facts

- 16 TSO; >500 DSO
- 2 Market Area Managers (MAM)
- 2 cross quality entry-exit systems = balancing zones
- >300 active shippers
- 2016 stats:
  - Imports: 1,626 TWh
    (Russia 28%; Norway 19%; NL 16%)*
  - Exports: 770 TWh
    (CZ 46%; NL 18%; SUI 12%)*
  - Consumption: >850 TWh

* BNetzA Monitoring Report 2017
Balancing – Regulatory Framework

- Implementation of all NC BAL provisions as of 01.10.2015
- Adoption of several provisions of then applicable BNetzA Ruling GaBi Gas 1.0 (valid from October 2008)
  - Information provision
  - Balancing charges
  - Reporting obligations
  - etc.

Commission Regulation (EU) No 312/2014 (NC Balancing)

Ruling GaBi Gas 2.0

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2.1 Information Provision
• To allow the shippers to balance their portfolios, information regarding their inputs and off-takes has to be provided

• **Allocation** information is provided in order to calculate daily imbalance quantity
  • Reconciliation is out of scope

• **Three types of offtakes**
  • intraday metered (IDM)
  • daily metered (DM)
  • non daily metered (NDM)

• One of three **information models** for NDM to be applied per balancing zone
  • base case, variant 1, variant 2
### 2.1 Information Provision: NC BAL

<table>
<thead>
<tr>
<th></th>
<th>Day Ahead</th>
<th>Within Day</th>
<th>After the Day</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Intra Day Metered</strong></td>
<td>N/A</td>
<td>Measured flows at least twice per day</td>
<td>Meter reading</td>
</tr>
<tr>
<td><strong>Daily Metered</strong></td>
<td>N/A</td>
<td>N/A</td>
<td>Meter reading</td>
</tr>
<tr>
<td><strong>Non Daily Metered</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Base Case</td>
<td>Forecast</td>
<td>Forecast at least twice per day</td>
<td>Final Forecast</td>
</tr>
<tr>
<td>Variant 1</td>
<td>N/A</td>
<td>Apportionment of measured flows at least twice per day</td>
<td>N/A</td>
</tr>
<tr>
<td>Variant 2</td>
<td>Forecast</td>
<td>N/A</td>
<td>N/A</td>
</tr>
</tbody>
</table>

- Measured flows: at least twice per day
- Forecast: at least twice per day
- Final forecast: N/A
- Apportionment: N/A
## 2.1 Information Provision: GaBi 2.0

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<td>meter reading</td>
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<td></td>
<td></td>
</tr>
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<td>N/A</td>
<td>N/A</td>
<td>meter reading</td>
<td></td>
</tr>
<tr>
<td></td>
<td>except variant 1: apportionment of measured flows at least twice per day</td>
<td></td>
<td></td>
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<tr>
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<td></td>
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</tr>
</tbody>
</table>
IDM information provision GaBi 2.0

- **Day ahead**
  - Measured flows: N/A

- **Within day**
  - Measured flows at least twice per day

- **After the day**
  - Meter reading

---

**Intra day metered**

- **6:00 first provision**: Measured flows from 6:00 to 12:00
- **19:00 second provision**: Measured flows from 12:00 to 15:00
  - Flows from 6:00 to 12:00 included in second provision

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Example: Intraday metered

- **D, 16:00**: Measured flows 6:00 - 12:00
- **D, 19:00**: Measured flows 12:00 - 15:00

**14:00 D-1:** Entry-nomination

- After
- **14:00 D-1:** possible renominations

**Entry**

**93**

**MAM**

**D+1:** meter reading (per shipper)

**15**

**DSO1**

**90**

**DSO2**

**60**

**DSO3**

**15**

**shipper**

<table>
<thead>
<tr>
<th>Entry</th>
<th>Exit</th>
</tr>
</thead>
<tbody>
<tr>
<td>93</td>
<td>90</td>
</tr>
</tbody>
</table>

Balancing group D

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1200: DSO (forecasting party) provide forecast to MAM
1300: MAM provides aggregated forecast to shippers
Example: Non daily metered

1400 D-1: Entry-nomination

35

1300 D-1: NDM forecast

1200 D-1: NDM forecast (per shipper)

D-1 forecast = Exit allocation

DSO 1

DSO 2

DSO 3

Balancing group D

Entry

Exit

35

35

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Breakdown of network areas by number of suppliers operating
(These figures (%) do not take account of company affiliations)

Source: Bundesnetzagentur, Monitoring Report 2017

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Total Balancing Action Quantities GY 15/16

Data source: ACER
Own calculations
2.2 Operational Balancing
I. Operational Balancing: NC BAL

TSO is undertaking balancing actions in order to:

• maintain the transmission network within its operational limits;
• achieve an end of day linepack position in the transmission network different from the one anticipated on the basis of expected inputs and off-takes for that gas day, consistent with economic and efficient operation of the transmission network.

through:

• purchase and sale of short term standardised products on a trading platform
• the use of balancing services.
Two step approach

1. MAMs are obliged to meet an existing need for balancing gas **initially** through the use of **internal balancing gas** (in particular linepack).

2. If the use of internal balancing gas is not expedient or **not sufficient** to meet demand, MAMs shall procure and use **external balancing gas**
   - MAM to apply strict MOL
I. Operational Balancing: GaBi 2.0

Balancing Gas – Merit Order List

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Global</strong></td>
<td><strong>Quality</strong></td>
<td><strong>Locational</strong></td>
<td><strong>Locational</strong></td>
</tr>
<tr>
<td>PEGAS GPL/NCG</td>
<td>GPLH, GPLL, NCGH, NCGL</td>
<td>PEGAS TTF, ICE TTF</td>
<td>GPL/NCG: predefined balancing zones</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>NCG: IPs Vreden/Elten</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>GPL/NCG: non standardized products, e.g. Long Term Options, DSM</td>
</tr>
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</table>

* NCG only

Source: Gaspool, NCG

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2.3 Imbalance Charges
II. Imbalance Charges: NC BAL

Daily Imbalance Charge =
daily imbalance quantity \times \text{marginal buy/sell price}

daily imbalance quantity = \text{inputs} - \text{off-takes}

\text{marginal buy price is the higher of:}
- the highest price of any purchases of title products in which the transmission system operator is involved in respect of the gas day; or
- the weighted average price of gas in respect of that gas day, plus a small adjustment.

\text{marginal sell price is the lower of:}
- the lowest price of any sale of title products in which the transmission system operator is involved in respect of the gas day; or
- the weighted average price of gas in respect of that gas day, minus a small adjustment.
II. Imbalance Charges: GaBi 2.0

<table>
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</tbody>
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<table>
<thead>
<tr>
<th>Balancing Platform (till 2019)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Locational</strong></td>
</tr>
<tr>
<td>GPL/NCG: predefined balancing zones</td>
</tr>
<tr>
<td>NCG: IPs Vreden/Elten</td>
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**Locational**

GPL/NCG: non standardized products, e.g. Long Term Options, DSM

Source: Gaspool, NCG

Small adjustment = +/- 2%
II. Imbalance Charges: GaBi 2.0

Weighted average price

Highest purchase

Marginal buy price

Small adjustment

Marginal sell price

Lowest sale

- 2%       +2%

MAM buy actions

MAM sell actions

Gas day D

€/MWh

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2.4 Within-Day-Obligations
Within day obligations are

- a set of rules imposed by a TSO on its shippers with regard to their inputs and off-takes within the gas day

TSOs are entitled to apply WDOs

- in view of **ensuring** the **system integrity** of its transmission network and
- **minimising** its need to undertake **balancing actions**.
Within day obligations can be applied to

- **the system position**
  - to keep the system within certain limits

- **a shipper’s position**
  - to keep it within a certain range

- **specific entry-exit points**
  - to limit flows or flow variations (e.g. ramp rates)
German approach aims to strike a balance between TSO/system requirements and shipper’s needs

<table>
<thead>
<tr>
<th><strong>TSO</strong></th>
<th><strong>Shipper</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>• Ensure system integrity at any time</td>
<td>• No (trade) limitations within day</td>
</tr>
<tr>
<td>• Balancing gas availability</td>
<td>• Sufficient information provision</td>
</tr>
<tr>
<td>• Incentives for <em>appropriate shipper behavior</em> within day</td>
<td>• Access to flexibility</td>
</tr>
<tr>
<td>• Minimise balancing actions</td>
<td>• No cross subsidisation</td>
</tr>
<tr>
<td>• Cost recovery</td>
<td></td>
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Key features of the German WD incentive regime:

- Within day charges only apply if MAM has to **buy and sell** balancing gas on MOL1 on the respective gas day and MAM faces **costs** from this balancing actions
- Within day tolerance for **Intraday Metered offtakes** (7.5% with regard to the daily offtake)
- Cost reflective within day charge
- The daily balancing regime is not affected by the WD regime
  - no end of day tolerance!
- IPs
- Storage
- Production
- VTP

Allocation = nomination

No forecast risk for shippers > No need for a tolerance

- NDM

Allocation = D-1 forecast

- IDM

Allocation = Measured flows

forecast risk for shippers remains > WD tolerance provided
III: Within-Day-Obligations: GaBi 2.0

- IDM Offtake = Entry 2.400

Tolerance
- 2400 * 7.5% = 180

- Volumes beyond tolerance will be charged if MAM will buy **and** sell balancing gas during the day **and** will face costs from that balancing actions.
2.5 Neutrality Arrangements
Neutrality Mechanism: NC BAL

- NC BAL identifies four financial streams
- TSO / MAM must remain cost neutral
- TSO / MAM might apply usage-dependent neutrality charge
- If „variant 2“ applies, separate neutrality charge for NDM to be implemented
Neutrality Mechanism: GaBi 2.0

IDM

NDM

Balancing
charge

Entry

Exit

IDM-neutrality

NDM-neutrality

balancing

gas

€ / MWh

12 month

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3. Summary
• Provisions of NC BAL fully implemented as of October 2015 in Germany (Ruling GaBi. 2.0)
• NC BAL provides some leeway for Regulators to develop national balancing rules
  • Information provision
  • Within-day-obligations
  • Short term standardised products
  • Balancing charges calculation
  • ...
• Variant 2 information model can act as a driver for retail competition and foster market liquidity
• GaBi Gas 2.0:  

• Best practice guidelines on the use of standard load profiles for demand estimation purposes ("Leitfaden Abwicklung von Standardlastprofilen"):  
  https://www.bdew.de/internet.nsf/id/ABEAHK-3-leitfaeden-de/$file/160630_Leitfaden_Abwicklung_von_Standardlastprofilen_Gas.pdf (German version)
Thank you for your attention!

Dimitri Wenz
Assistant Head of Section