Industry Recommendation for the Swiss Power Market

# Balancing Concept Switzerland

Principles of balance management of the Swiss power market

This document was drawn up by:

swissgrid

BC – CH, 2019 edition

Verband Schweizerischer Elektrizitätsunternehmen
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**Chronology Balancing Concept CH**

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|---|---|
| 28 November 2006 | Entry into force of the first version of the Balancing Concept |
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| 7 May 2020 | Entry into force of the current version of the Balancing Concept |

**Responsibility of the commission**
Swissgrid is responsible for maintaining this document and developing it further.

The VSE commission EVU-TSO supervised the revision process.

The Balancing Concept was accorded the status of an electrical industry document for the power market by a resolution of the VSE board.

It is considered a guideline within the meaning of Art. 27 Para. 4 of the Electricity Supply Ordinance.

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# Foreword

This document is an electrical industry document that falls within the sphere of responsibility of the National Grid Company. It is part of a comprehensive policy for electricity supply in the open power market. Electricity industry documents contain guidelines recognised throughout the industry, as well as recommendations for using the power markets and for organising the energy business. As such, they fulfil the requirements of the Electricity Supply Act (StromVG) and the Electricity Supply Ordinance (StromVV) for the power supply companies (PSC).

Electrical industry documents are prepared, regularly updated and extended by industry experts within the meaning of the subsidiarity principle. The provisions that apply as guidelines within the meaning of the StromVV are self-regulation standards.
The documents are hierarchically divided into four different levels.

– Basic document: market model for electrical energy (MMEE)
– Key documents
– Implementation documents
– Tools/software

This Balancing Concept Switzerland (BC-CH) document is a key document.

# 1. Introduction

(1) This document describes the framework conditions and the structure of balance management for the Swiss scheduling[1] and control area.

(2) The StromVG and the market model for electrical energy of the VSE (MMEE CH) provide for a separation of energy supply and grid usage. This establishes the foundation for the competition in electricity generation, trade and sale, giving all market participants the opportunity to operate freely on the power market. The transmission grid and the distribution grids are the physical infrastructure of the “electricity marketplace”.

(3) Balance management is critical for efficient organisation of the electricity marketplace. Balance management covers all technical, organisational and settlement processes required to maintain the electrical energy and power balance in the electricity system (Art. 2 Para. 1 lit. d StromVV). Balance management is a key task of the National Grid Company (Art. 20 Para. 2 lit. b StromVG) and requires cooperation with the stakeholders.

(4) Balance management includes regulations on the topics indicated in the figure below.

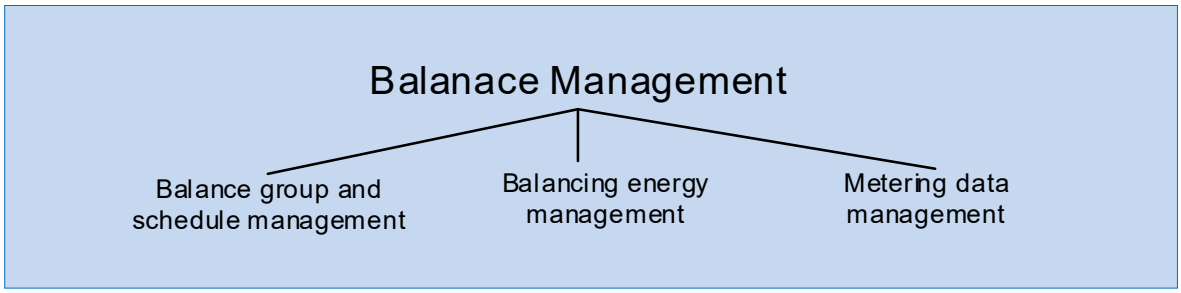


**Figure 1: Components of balance management**

(5) The individual areas relate to different periods and are described in detail in chapters 3 to 5.

(6) Balance management considers and is based on other industry documents and European standards, such as international scheduling standards, especially the ESS regulation[2], the Metering Code and the Transmission Code.

(7) The contracts and other documents prepared specifically for implementation are available at www.swissgrid.ch (balance group and schedule management, as well as balance energy: balance group contract, ancillary services (AS): ancillary service contracts) and www.strom.ch (metering data management: SDAT-CH).

(8) In Switzerland, the National Grid Company is responsible for implementing balance management (Art. 20 StromVG).

# 2. Stakeholders and their roles as part of balance management

Stakeholders are legal or natural persons who participate on the market. Roles are defined areas of responsibility for the individual stakeholders. Accordingly, stakeholders can take on several roles simultaneously. The individual roles and the associated contracts are described below.

1 Scheduling area (SA): refers to the region for which the TSO operates a scheduling management system in its role as balance group coordinator. Control area means the region in which the TSO is responsible for power and frequency control. In Switzerland, the control area and scheduling area are the same.

2 ENTSO-E scheduling system: ENTSO-E standard for the electronic exchange of data between stakeholders and transmission system operators.

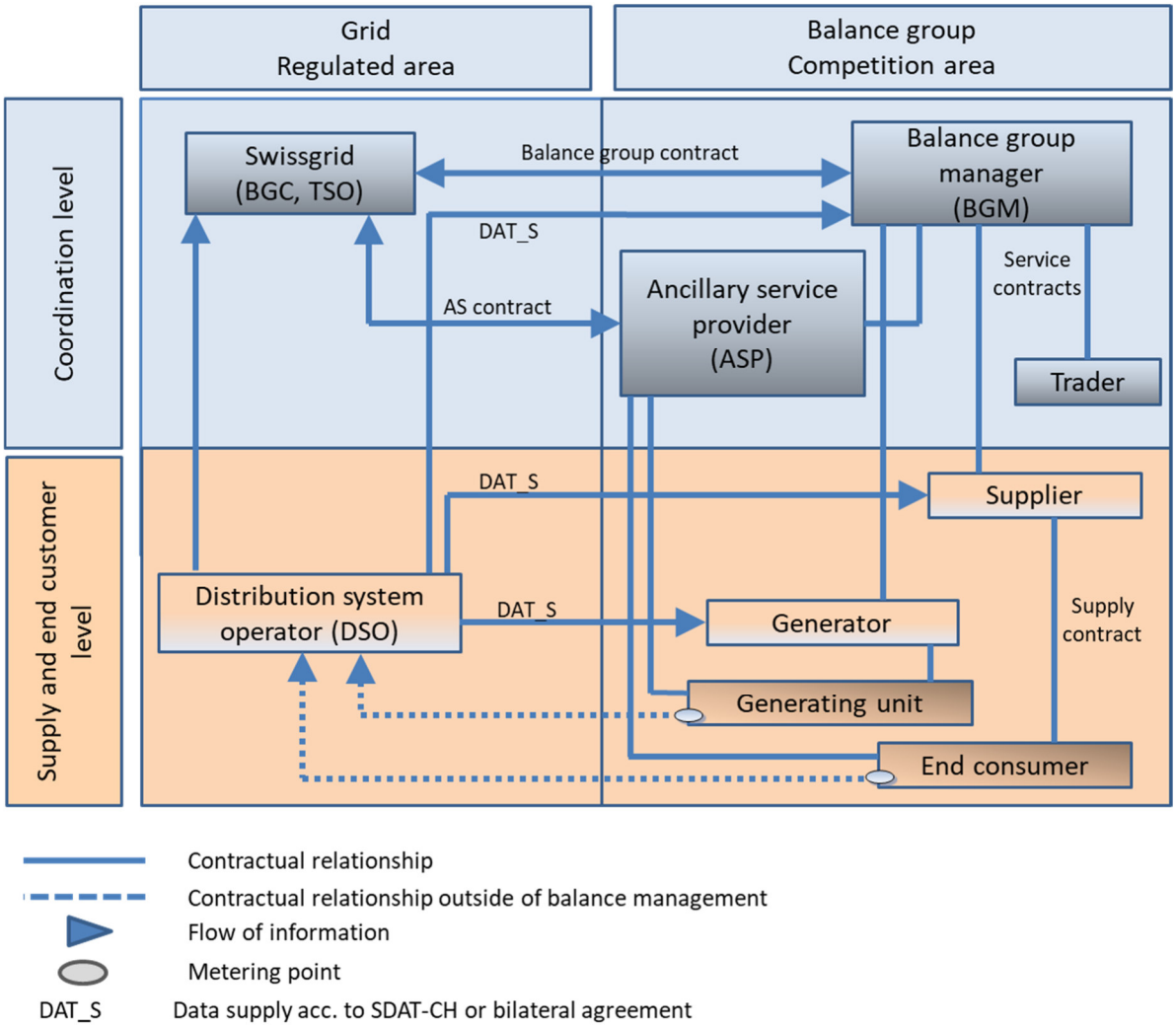


**Figure 2: Key roles[3] and their fundamental contractual relationships within the scope of balance management[4]**

## 2.1. The National Grid Company in its roles as balance group coordinator (BGC) and transmission system operator (TSO)

(1) Basic responsibility of the National Grid Company as the BGC and TSO (a comprehensive description is provided in the StromVG):

> The National Grid Company is responsible for balance management, which ensures a balance between generation and consumption in Switzerland at all times.

(2) The BGC concludes contracts with DSOs and other stakeholders that are directly connected to the transmission grid, and these contracts regulate the data delivery.

(3) The BGC concludes balance group contracts with the balance group managers (BGM) (Art. 23 Para. 3 StromVV). It is responsible for schedule management within the Swiss scheduling area.

(4) The fact that all end consumers are pooled in balance groups via suppliers enables the BGC to assign a single party, namely the BGM, as a point of contact and contracting party for each balance group as part of balance management.

(5) The unavoidable differences between forecast and actual consumption within the balance groups with assigned metering points are balanced to the second by the National Grid

3 The balance group for renewable energies, as well as the ancillary service providers (the latter can be generating units or end consumers), are deliberately not shown for purposes of simplification.

4 Only the contracts that are relevant for balance management are shown here. Other contractual relationships are possible.

Company as part of balance management. The National Grid Company procures the ancillary services for imbalance settlement and charges the BGM for the balance energy (Art. 15 Para. 1 lit. b StromVV).

(6) In emergencies, the National Grid Company can instruct stakeholders to implement certain measures as defined in the legal provisions and based on corresponding agreements (Art. 20 Para. 2 lit. c StromVG), which are described in the Transmission Code.

(7) In its role as BGC, the National Grid Company is responsible for:

a) checking the approval of stakeholders as BGMs and managing the BG register;
b) checking, confirming and making any necessary changes to submitted schedules or rejecting them.

## 2.2. Distribution system operators (DSOs)

(1) Basic responsibility of DSOs[5] (Art. 8 StromVG, Art. 8 StromVV):

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| The DSO provides the necessary data for the BGM, the National Grid Company, the suppliers and the generators. In addition, it manages the assignment of the metering points to the balance groups, ASPs, suppliers and generators. |

(2) In connection with balance management, it uniformly records and supplies the necessary metering data that the individual stakeholders need – free of discrimination, as required and in good time (Art. 8 Para. 3 StromVV). The DSOs manage the assignment of all metering points from end consumers to suppliers and from generating units to generators as well as to their balance groups. The data transmission must be regulated in the SDAT-CH document or in contracts with the National Grid Company, the BGM and the supplier or the generator.

## 2.3. Balance group managers (BGMs)

(1) Basic responsibility of the BGMs:

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| The BGMs have a responsibility towards the National Grid Company to ensure the best possible balance of procurement and supply in their balance group at the time of delivery and compliant schedule management. |

(2) The BGMs are responsible for keeping the difference between effective consumption and generation and the registered schedules as low as possible. The remaining differences due to forecast uncertainty, for example, are balanced by the National Grid Company and settled with the BGMs at balance energy prices. The relevant details are regulated in the balance group contract.

(3) The BGMs prepare schedules that reflect the sum of the delivery and purchase transactions with other balance groups. They coordinate these schedules with these balance groups and report them to the National Grid Company. They are responsible for the accuracy of their schedules.

(4) In principle, all stakeholders can decide whether they want to establish their own balance group or join an existing balance group. Binding, non-discriminatory standards have been defined for establishing balance groups, and they can be found in the balance group contract. The BGM is responsible for the internal organisation of the balance group.

(5) Example of the stakeholder-roles relationship:
Stakeholders are rarely just BGMs. They are often also traders, ASPs and generally also suppliers.

## 2.4. Balance group manager for the balance group for renewable energies (BGM BG-RE)

(1) In addition to the regular tasks of a BGM, the BGM BG-RE is essentially responsible for the following for their balance group:

[5] Swissgrid takes on this role for metering points on the transmission grid.

The balance group for renewable energies receives the electricity from generators, which it does not market itself, prices this electricity at a reference market price and sells it via a load curve metering facility with automatic data transmission or an intelligent metering system. It pays the enforcement agency the reference market price for the electricity retrieved in line with the schedule.

(2) The BGM BG-RE is appointed by the Swiss Federal Office of Energy (Art. 24 Para. 1 Strom VV). Plants that are funded under the EnG (Energy Act)[6] and are not fitted with a load curve metering facility with automatic data transmission or an intelligent metering system remain in the general supplier's balance group.

(3) The BGM BG-RE charges the costs for the unavoidable balance energy for the BG-RE and its enforcement costs with the SFOE to the grid surcharge fund (Art. 24 Para. 4 StromVV).

## 2.5. Traders

(1) Basic responsibility of traders:

Traders buy and sell energy from stakeholders. Their energy trading transactions are processed with the help of schedules.

(2) Traders conclude contracts (purchase and sale) for energy (e.g. standard trade products (base, peak) with various stakeholders. The energy is exchanged between the trade partners' balance groups (traders, power exchange, etc.) using schedules. No metering points are assigned to the balance group of a pure trader.

(3) Traders can also deliver to end consumers via schedules. The prerequisite for this is that the end consumers have concluded an open contract with a supplier which permits this delivery. The schedules are processed via the supplier's BGM.

(4) Example of the stakeholder-roles relationship:
Traders are often also BGMs so they can process their business autonomously. Smaller retailers can form balance groups via service contracts to safeguard the processing of their business.

## 2.6. Generators

(1) Basic responsibility of generators:

Generators must assign each of their injection points (= generation units) to precisely one supplier, which is assigned to a balance group (Art. 23 Para. 1 Strom VV). The responsible DSO performs this assignment based on the information provided by the generator.

(2) Generators operate one or more generation units and inject energy into the grid via injection points. The assignment of the generation units to a supplier and the relevant balance groups is a prerequisite for marketing the generated energy.

(3) They promptly report the power plant deployment schedules to the National Grid Company via responsible BGMs to the extent required for the congestion forecasts.

(4) Example of the stakeholder-roles relationship:
If generators operate a larger power plant fleet, they are often also BGMs and traders to ensure they can optimally market the generated energy.

## 2.7. Generating units

(1) Basic responsibility of generating units:

Generating units (injection points) must be assigned to precisely one supplier, which is assigned to a balance group (Art. 23 Para. 1 StromVV). The responsible DSO performs this assignment based on the information provided by the generator.

[6] This excludes plants as defined under Art. 25 EnG (one-off payments for photovoltaics systems).

(2) Generating units inject electrical energy into the grid via injection points. The assignment of the generation units to a supplier and a balance group is a prerequisite for marketing the generated energy.

## 2.8. Suppliers

(1) Basic responsibility of suppliers:

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| Suppliers procure energy to supply their end consumers. The procurement is based on consumption forecasts for the end consumers that they supply. The metering points of every end consumer are assigned to the relevant supplier and precisely one balance group. The responsible DSO performs this assignment based on the information provided by the supplier. |

(2) Suppliers supply energy to end consumers with which they have concluded an open contract.

(3) Example of the stakeholder-roles relationship:
Suppliers that supply the majority of the end consumers in a certain geographic area generally operate their own balance group and may also be a generator.
Smaller suppliers that do not want to operate their own balance group typically conclude a service contract with a BGM.

## 2.9. End consumers

(1) Basic responsibility of end consumers:

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| End consumers (metering points) must have a supplier. Every metering point is assigned to precisely one supplier, one balance group, one DSO and, optionally, one ASP. The DSO generally performs this assignment at the supplier's initiative (Art. 23 Para. 1 StromVV). |

(2) End consumers are the customers that procure the electrical energy from one or more exit points in the distribution grid or, in certain cases, in the transmission grid. They conclude an open contract with a supplier and, if necessary, additional delivery contracts with traders. The supplier organises the assignment of every feed-out point to the supplier with which the end consumer has concluded an open contract, as well as to the relevant balance group.

## 2.10. Ancillary service providers (ASPs)

(1) Basic responsibility of the ASPs:

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| Within the scope of balance management, the ASPs provide ancillary services for the National Grid Company in the role of TSO. |

(2) The ASP transmits the necessary information to the BGM so the BGM can deliver the AS in line with the schedules.

(3) ASPs may be stakeholders that represent generating units, traders and end consumers that meet certain technical and organisational requirements.

## 2.11. Overview table of the roles and their tasks

| | **Balance group management and schedule management** | **Balancing management** | **Metering data management** |
|---|---|---|---|
| **National Grid Company (TSO/BGC)** | Receipt, verification, review and confirmation of the BGM schedules.<br>Coordination with foreign transmission system operators. | Procurement of control power and control energy for imbalance settlement. Settlement of balance energy with the BGMs. | Receipt, verification and confirmation of the aggregated DSO metering data per balance group. |
| **DSOs**[7] | | | Assignment of all metering points of end consumers and |

[7] The TSO takes on the role of DSO for metering points that are connected directly to the transmission grid.

| | Balance group management and schedule management | Balancing management | Metering data management |
|---|---|---|---|
| | | | generating units to balance groups, suppliers and ASPs.<br>Recording and delivery of metering data to TSOs, suppliers and BGMs. |
| **BGMs** | Collect and aggregate the schedules of suppliers, generators, ASPs and traders that relate to their balance group and forward these to the BGC. | Settlement of the balance energy settlement. | Receipt and verification of the aggregated metering data supplied by the DSOs. |
| **BGM BG-RE** | The BG-RE receives the electricity from the operators, which inject the electricity at the reference market price and sell it via a load curve metering facility with automatic data transmission or an intelligent metering system. | Settlement of the balance energy settlement. | Receipt of the metering data with regard to the generation by plants that are assigned to the BG-RE. The data are transmitted by the DSOs. |
| **Traders** | Carrying out energy trade via schedules. | | |
| **Generators** | Creation and transmission of forecast schedules to the BGMs (depending on the service contract with these BGMs).<br>Timely notification of the power plant schedules (basis for congestion forecast) to the TSO, potentially via the responsible BGMs, where applicable. | | Receipt of the metering data of their generating units from the respective DSO. |
| **Suppliers** | Creation and transmission of schedules to the BGMs (depending on the service contract with these BGMs) | | Receipt and verification of the metering data of their end consumers from the respective DSO. |
| **ASPs** | | Provision of control power and control energy. | |

# 3. Balance group management and schedule management

## 3.1. Balance group management

### 3.1.1. Setup and responsibilities of balance groups

(1) All stakeholders are entitled to apply in writing to be registered as a BGM with the National Grid Company.

(2) Balance groups (BGs) exchange electricity inside Switzerland and across the scheduling areas. Electricity exchanges between BGs take place based exclusively on schedules.

Metering points (e.g. of generating units and/or end consumers) can be assigned to a BG irrespective of the connection point's voltage level.

The power and energy balance of a BG must be balanced to the best possible extent at every delivery time. The National Grid Company charges the remaining balances to the BGM as balance energy per unit of scheduling time.

(3) Every BG is managed by a BGM. The BGMs inform the National Grid Company of adjustments to their master data.

(4) The detailed regulations for BGs are contained in the balance group contract.

### 3.1.2. Balance Group Register

(1) The National Grid Company maintains a central register of all BGs registered for the Swiss scheduling area. The National Grid Company grants every BGM free access to this register. This is where BGMs can view their master data, which must be modified if changes occur.

(2) The National Grid Company publishes the name and ID of all active BGs on the Internet.

### 3.1.3. Balance group identification

(1) Individual balance groups are identified using a unique ID based on the ENTSO Identification Coding Scheme (EIC).

(2) Every BGM operating in the Swiss scheduling area must register with the National Grid Company or the responsible issuing body in the country in which the relevant stakeholder is registered in order to receive an EIC code. The BGM must notify the National Grid Company of the ID.

## 3.2. Schedule management

(1) Schedule management is one of the requirements for maintaining the power capacity of the security of supply in an open market with a balance group system. Schedules are used for managing the energy exchange between the balance groups (BG).

(2) Schedules enable electricity to be exchanged between two national balance groups or between one national balance group and the neighbouring country.

### 3.2.1. General

(1) A schedule consists of power values per time interval. It indicates how much energy is to be exchanged between the balance groups within the Swiss scheduling area or with foreign stakeholders for every time interval.

(2) Adequate capacity rights are a prerequisite for exchanging electricity with a neighbouring country. These must first be purchased from the BGM or the foreign stakeholder. More information can be found in the relevant allocation rules.

(3) To ensure smooth schedule management, the following conditions must be met:

- defined schedule management processes
- binding nomination times

- binding processes for correcting the schedules one day in advance (long term and day-ahead), during the current day (intraday) and until the working day after the next (post scheduling[8]: only within Switzerland).
- defined schedule formats and transmission paths
- compatibility with European standards
- standardised schedule formats and settlement option

(4) The above conditions are described in greater detail below and are regulated in the balance group contract in a binding manner.

(5) In the event of disruptions in the schedule management systems or disturbances in the transmission grid, the National Grid Company may restrict or suspend the processing of schedule notifications. In such cases, the National Grid Company immediately notifies the BGM and takes all commercially reasonable measures to re-establish the conditions necessary for correctly processing schedule notifications.

### 3.2.2. Schedule management processes

(1) Part of schedule management takes place the day beforehand (normally referred to as day ahead schedule management). Another part takes place after the day-ahead coordination and during the day of delivery (normally referred to as intraday). The precise times for the schedule notification are defined in the balance group contract.

(2) Schedules are normally indicated in MW to three decimal places in the required time interval (e.g. hour or quarter hour) for the entire 24 hours of the following day (average output values in the requested time interval).

(3) Schedules can also be registered during intraday or, within Switzerland, even retrospectively according to the nomination rules defined by the BGC (see balance group contract).

(4) The BGC issues a confirmation of receipt to the BGM after receiving a schedule. This merely confirms that the BGC has received the schedule, but not the semantics (logic) and executability of the schedule.

(5) The BGC then checks the semantics and validates the consistency and executability of the received schedule.
If the check leads to a negative result, the BGC sends a request for the BGM to correct the schedule within a certain period. If a validated schedule cannot be established before the expiration of this deadline, the rules defined by the BGC in advance apply for the processing.
In the check leads to a positive result, the BGC sends the BGM the schedule confirmation.

(6) The BGM can assume that its schedule will be executed only once it has received the schedule confirmation. All schedules confirmed by the BGC are binding and are executed by the National Grid Company.

### 3.2.3. Responsibility of the balance group managers (BGMs)

(1) The BGM is responsible for the content and the timely transmission of the schedules to the BGC. The BGM is responsible for taking the necessary steps if no schedule confirmation is received.

(2) Before the BGMs send their schedule to the BGC they should coordinate their transactions with other BGMs in order to prevent schedule differences. This ensures that the BGC receives a consistent schedule notification from both BGMs.

[8] To minimise their balance energy costs, correct scheduling errors or subsequently present ancillary service retrievals in the schedule, the BGMs have the opportunity to execute transactions amongst themselves within Switzerland for a certain period and with retroactive effect.

# 4. Balance compensation management

(1) Balance compensation management aims to ensure a balance between electricity generation and consumption at all times.

(2) The imbalances of all balance groups in Switzerland lead to an imbalance in the Swiss control area. The National Grid Company needs to use control power and control energy to ensure that Switzerland is in balance at all times. The National Grid Company procures this from the ASPs in a market-based, transparent and non-discriminatory procedure (Art. 22 Para. 1 Strom VV).

(3) This procurement of the control power and control energy required for balance compensation management is described in the Transmission Code.

(4) The BGMs are responsible for keeping the difference between effective consumption and generation and the registered schedules as low as possible.

(5) Balance energy is the 15-minute balance between the sum of all confirmed schedules and all metered values of the end consumers and generating units belonging to the balance group. The balance energy is settled between the National Grid Company and the BGMs in line with the provisions in the balance group contract. The intention of the balance energy price is to create effective incentives so the BGMs fulfil their obligation to establish the best possible balance.

# 5. Metering data management

## 5.1. General

(1) Metering data management is based on the Metering Code Switzerland (MC-CH) and the implementation document «Standardised data exchange for the Swiss electricity market» (SDAT-CH).

(2) Metering data are required to settle the energy supplies between balance group managers, suppliers, end consumers and generators or generating units, as well as to settle the grid usage. As part of the metering data management, the distribution system operators (DSOs) determine and prepare all of the data necessary for balance management and the authorised stakeholders with these data. To ensure seamless settlement, the necessary data must be recorded and transmitted in the data formats as defined in the binding standards specified in the MC-CH, after which they are carefully verified and submitted to the authorised stakeholders as required and on time in line with the SDAT-CH.

(3) Metering data management involves the determination, preparation, processing and delivery of the data that is necessary for balance management, including the data for change processes.

(4) Metering data management records the actual consumption and the actual generation and so forms the basis for settling energy supplies, grid usage and balance energy.

(5) The clear separation of the activities into generation, transport and distribution requires the data necessary for the individual processes to be made accessible only to the authorised stakeholders.

## 5.2. Recording and exchanging metering data

(1) Every DSO installs and operates all the necessary equipment for recording the metering values and forwards these values to the authorised stakeholders.

(2) The stakeholders require metering data from the DSO to fulfil balance management. Both the scope and the processes of data exchange are described in the Metering Code and in the data exchange implementation document (SDAT-CH).

## 5.3. Metering point assignment

(1) Every metering point can be assigned to only one balance group, one ASP and one supplier. Generators, generating units, end consumers and suppliers to which a metering point is assigned are entitled to receive the metering data.

(2) The DSOs are responsible for ensuring that all metering points of end consumers and generating units in their grid area are always assigned to a balance group, a supplier or a generator. If the generating unit or the end consumer provides AS, this metering point is also assigned to an ASP.

(3) The DSO assigns metering points for which no supplier is known to the general supplier or the substitute supplier and their balance group.