IMBALANCE NETTING IMPLEMENTATION PROJECT

ENTSO-E – ECS Workshop on Electricity Balancing

Vienna, 2017/04/25
GL EB – Imbalance Netting - Requirements

**IGCC** formally identified as starting point

- IGCC
- INC
- E-GCC
- not bound by legislation, but willing to implement

**Status Quo**

1. Implementation Framework
2. Implementation Framework approval

**All TSO Platform**

1. Appointment of entity
2. Implementation of platform

Accession process to IGCC started
Basic Principle

- **aFRR-Activation**
- **Control Area Balance**
- **ACE**
- **Secondary Controller**
- **aFRR-Request**
- **Imbalance Netting Process Function**
- **Correction**
- **aFRR-Demand**
- **other Control Areas**

Control Area 1:
- aFRR-Activation → aFRR → Control Area Balance → aFRR-Demand → aFRR-Request → Secondary Controller → ACE → aFRR-Demand → Control Area Balance

Control Area 2:
- aFRR-Request → aFRR-Activation → aFRR → Control Area Balance → ACE → Secondary Controller → aFRR-Demand → aFRR-Request

Control Area 3:
- Control Area Balance → aFRR → aFRR-Activation → Secondary Controller → aFRR-Request

Other Control Areas:
- Correction → ACE → Correction → aFRR-Demand → aFRR-Demand → Control Area Balance → Correction
Integration into the Secondary Control Loop and Signal Exchanges

Basic Principle

- aFRR demand of IGCC member
- Correction value via Virtual Tie-Line (VTL)
- ATC, profile, manual limits
- On/off signal
− Since May 2010, all four German TSOs have launched the so called Grid Control Cooperation (GCC) to optimize secondary control procurement and activation

− In the area of imbalance netting the International Grid Control Cooperation (IGCC) has been set up which is currently consisted of 11 TSOs from 8 countries

− REE and REN plan to join the cooperation by 2018
The IGCC MLA

All IGCC Members are parties to one agreement

A two level working structure

Strengthen decision making
✓ Clear rules in decision process

Flexibility: Update of Annexes

Solution about liability clauses, rules for cost sharing
Monthly Percentage of Avoided pos. aFRR-Activations (last 6 Months)

Reduction of positive aFRR activation due to Imbalance Netting

Benefits of Imbalance Netting
Benefits of Imbalance Netting

Monthly Percentage of Avoided neg. aFRR-Activations (last 6 Months)

Reduction of negative aFRR activation due to Imbalance Netting

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%
Benefits of Imbalance Netting

Monthly Value of Netted Imbalances

Value of Netted Imbalances - Monthly Values (Million €)

Month

Mil. €

10/11 01/12 04/12 07/12 10/12 01/13 04/13 07/13 10/13 01/14 04/14 07/14 10/14 01/15 04/15 07/15 10/15 01/16 04/16 07/16 10/16
Value of Netted Imbalances - Development

Value of Netted Imbalances - Monthly Values (Million €)

Month

Mil. €

Benefits of Imbalance Netting
1. Introduction
2. History of IGCC
3. European Platform
4. Timeline & Next Steps
Members of PT

**IGCC** formally identified as starting point

Current situation

PT Member

- IGCC
- E-GCC
- INC
Way of working

Implementation project
- IGCC
  - IGCC Member n
  - IGCC Member 1
- EG IGCC
- SC IGCC

European discussion
- PT IN
  - PT IN Member n

basis for discussion
provides input

Key Issues
- Identification
- Requirements development
- Implementation Framework

Amendment
- EB GL
  - ACER
    - ENTSO-E (MC oder SOC)
    - decision

Deadlines and Requirements
Requirements from GL EB

Implementation Framework

1. Introduction
2. High level design of the European Platform
3. Roadmap & Timelines for the implementation
4. Definition of functions
5. Governance
6. Proposal of entity
7. Framework for harmonization of the terms and conditions
8. Cost sharing
9. Algorithm

Designation of entity/entities

Implementation of Platform

Settlement of intended exchange
Settlement Principle

✓ The determination of the IGCC energy quantities is performed for each settlement period ➞ 15 min

✓ The IGCC energy is separate for export and import

✓ Settlement is determined for each settlement period for IGCC import and IGCC export of all IGCC Members

✓ The IGCC settlement aims ➞ sharing of gained benefits in a fair manner between IGCC Members

✓ Based on avoided aFRR energy costs

✓ No Negative benefit for an IGCC member while IGCC has overall positive benefit
Current IGCC Settlement

Opportunity Prices for Imbalance Netting

- Opportunity Price = Opportunity Value / IGCC Volume
- IGCC Settlement Price: Energy weighted \((E_{\text{Imp},i} \text{ and } E_{\text{Exp},i})\) average of the opportunity prices \((C_{\text{Imp},i} \text{ and } C_{\text{Exp},i})\)
- Symmetric price for IGCC imports and exports
  \[
  C_{\text{IGCC}} = \frac{\sum_{i=1}^{n} (C_{\text{Imp},i} E_{\text{Imp},i} + C_{\text{Exp},i} E_{\text{Exp},i})}{\sum_{i=0}^{n} (E_{\text{Imp},i} + E_{\text{Exp},i})}
  \]

Calculation of Cost Reduction

- Cost reduction for a participant is driven by the spread between the opportunity price and the IGCC settlement price
  \[
  R_{\text{IGCC}} = \sum_{i=1}^{n} (C_{\text{Imp},i} - C_{\text{IGCC}}) \cdot E_{\text{Imp},i} + \sum_{i=1}^{n} (C_{\text{IGCC}} - C_{\text{Exp},i}) \cdot E_{\text{Exp},i}
  \]
1. Introduction
2. History of IGCC
3. European Platform
4. Timeline & Next Steps
Timeline and Next steps

- Finalization of Implementation Framework
- Settlement of intended exchange (TSO-TSO settlement)
- Impact assessment
- Priorization of IN and aFRR
Backup
Algorithm

Parameters

Optimisation Regions

Optimisation Functions

Equal Treatment

Imbalances

aFRR-Optimization

\[ \min k^T x \]

Objective Function

\[ Ax = b \]

Constraints

\[ Cx \leq d \]

\[ x_l \leq x \leq x_u \]

ATCs

ATFs