

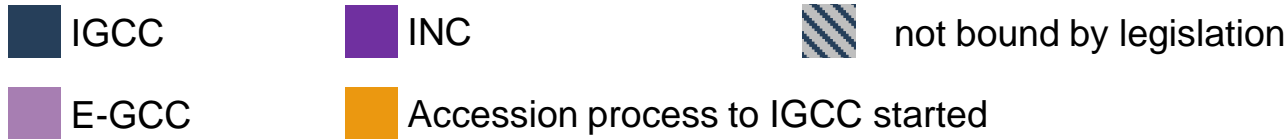
IMBALANCE NETTING IMPLEMENTATION PROJECT

*ENTSO-E – ECS
Workshop on
Electricity
Balancing*

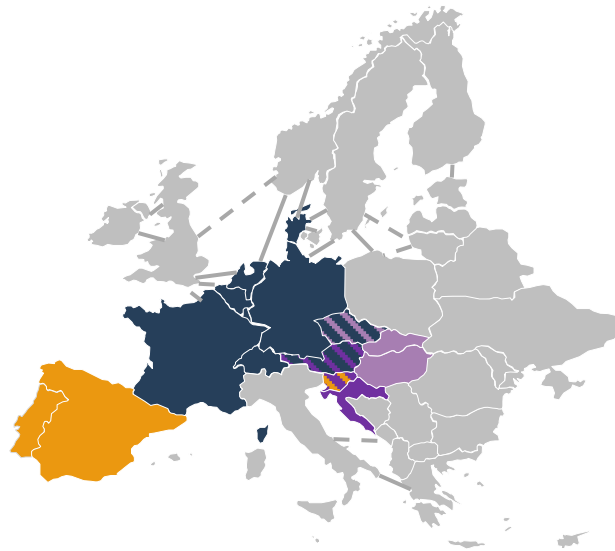
Markus Maurer,
PT IN convenor
Vienna, 2017/04/25

GL EB – Imbalance Netting - Requirements

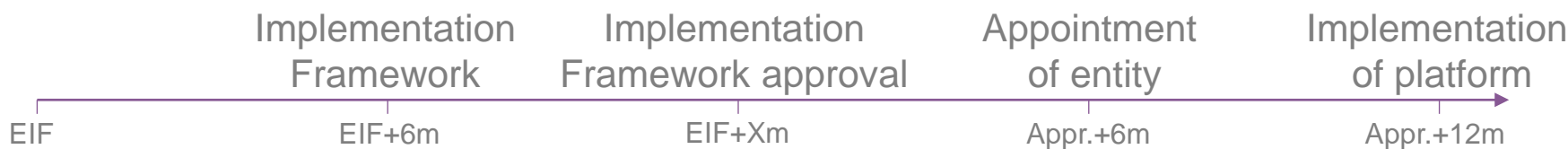
IGCC formally identified as starting point



Status Quo



All TSO Platform



1 Introduction

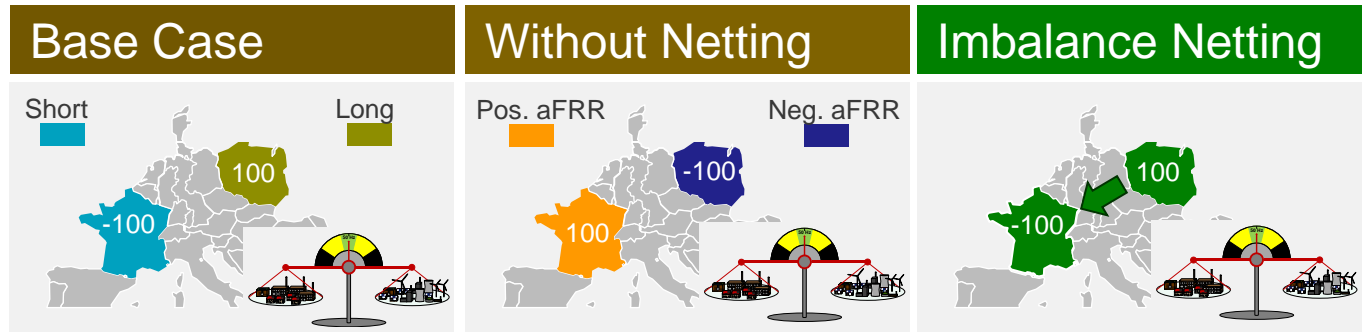
2 History of IGCC

3 European Platform

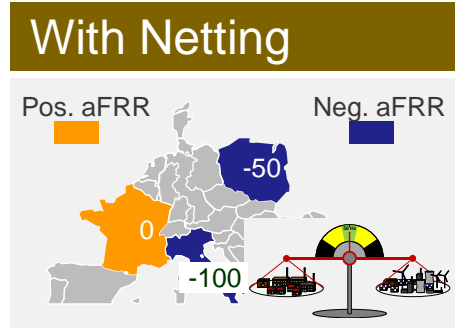
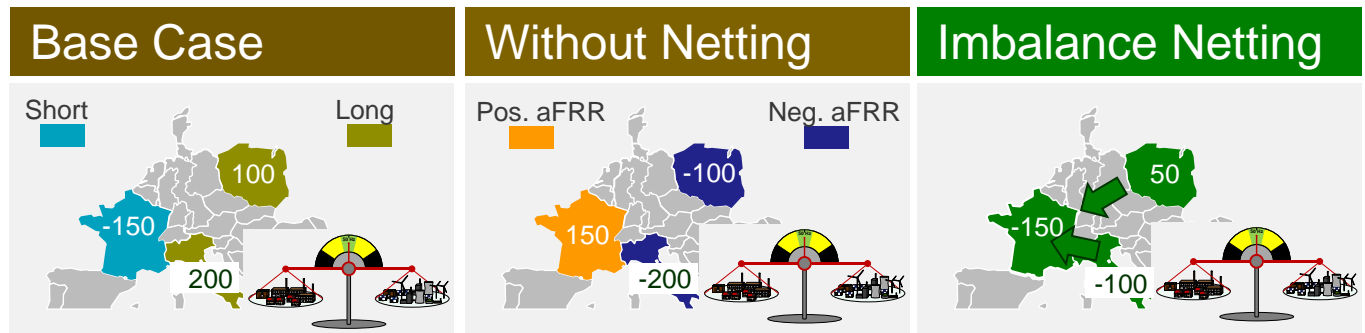
4 Timeline & Next Steps

Basic Principle

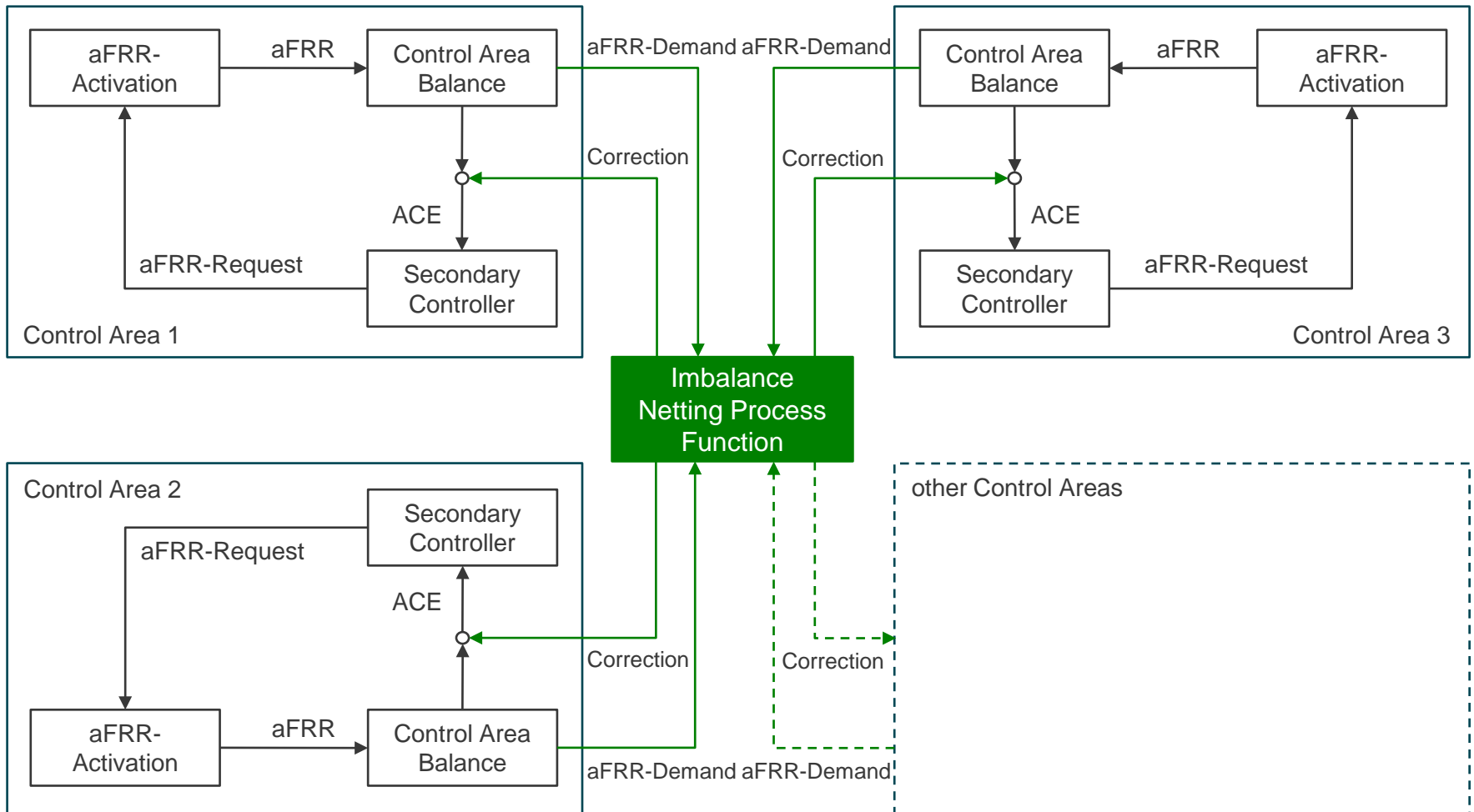
Imbalance Netting – Example 1



Imbalance Netting – Example 2

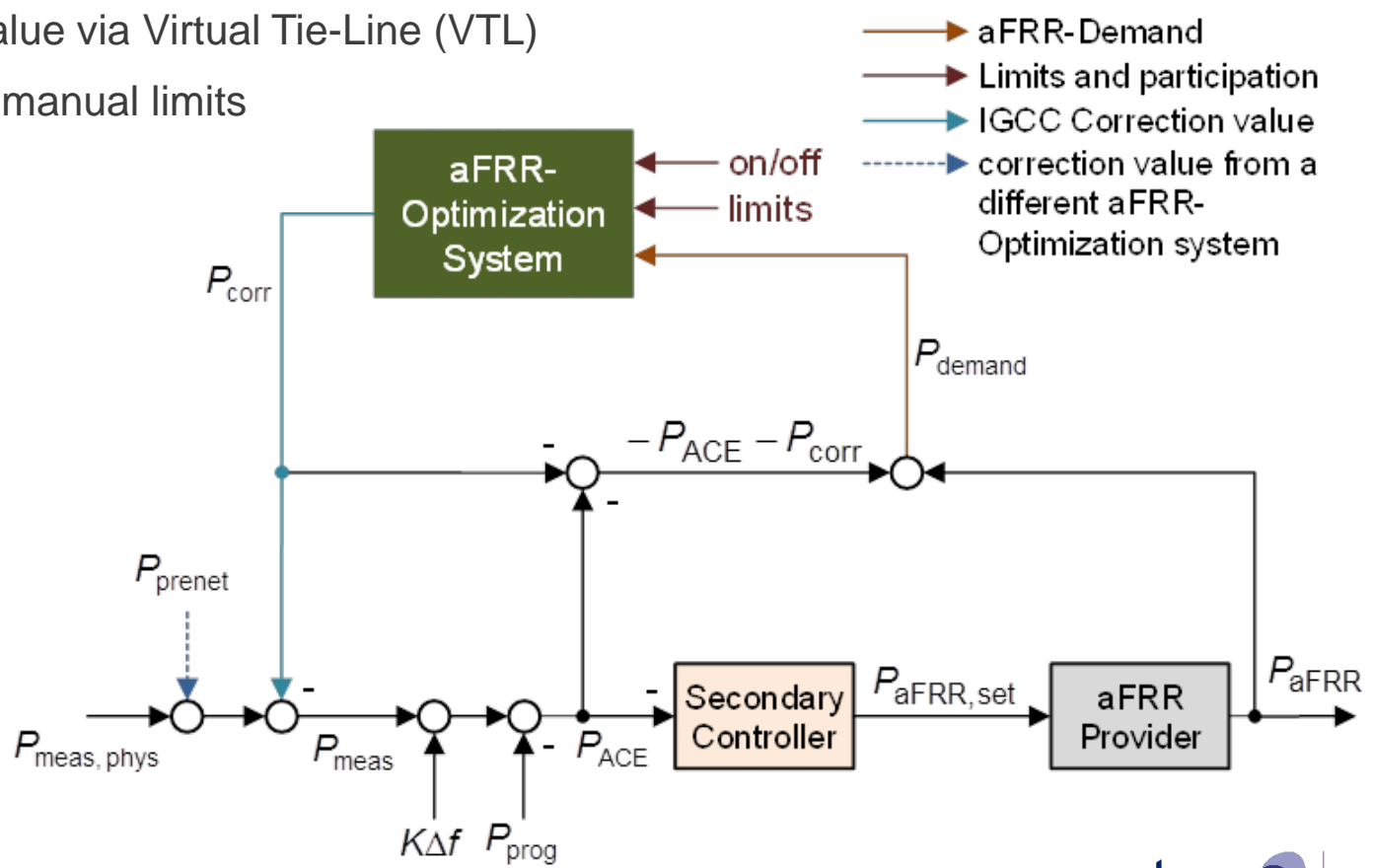


Basic Principle



Integration into the Secondary Control Loop and Signal Exchanges

- aFRR demand of IGCC member
- Correction value via Virtual Tie-Line (VTL)
- ATC, profile, manual limits
- On/off signal



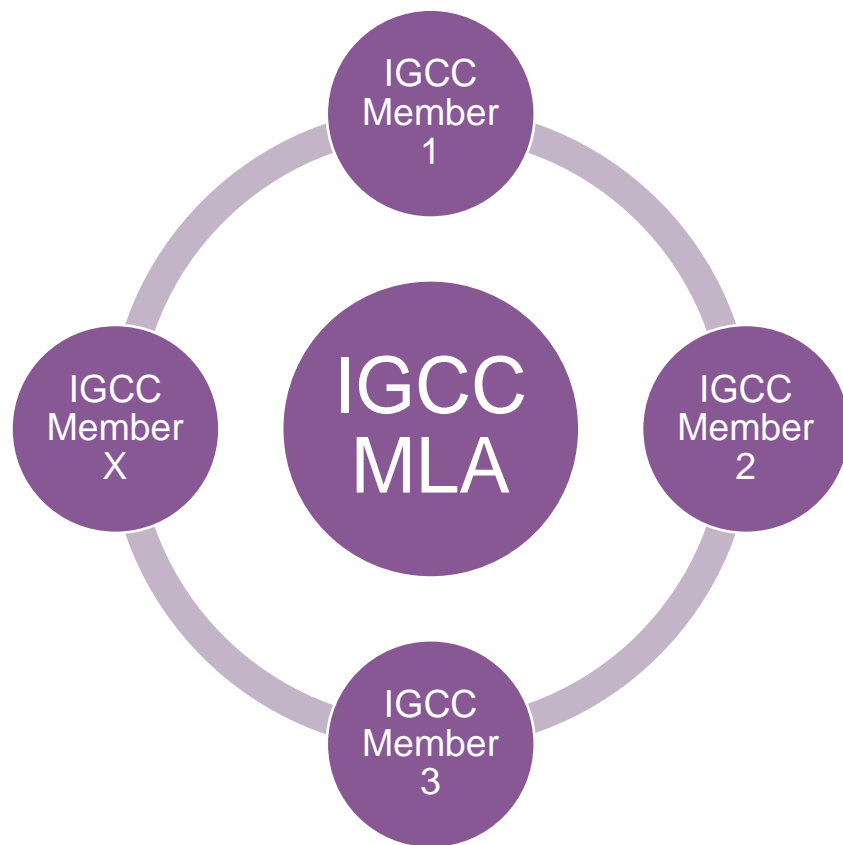
History of IGCC

- 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

Status Quo



The IGCC MLA



All IGCC Members are parties to one agreement

A two level working structure

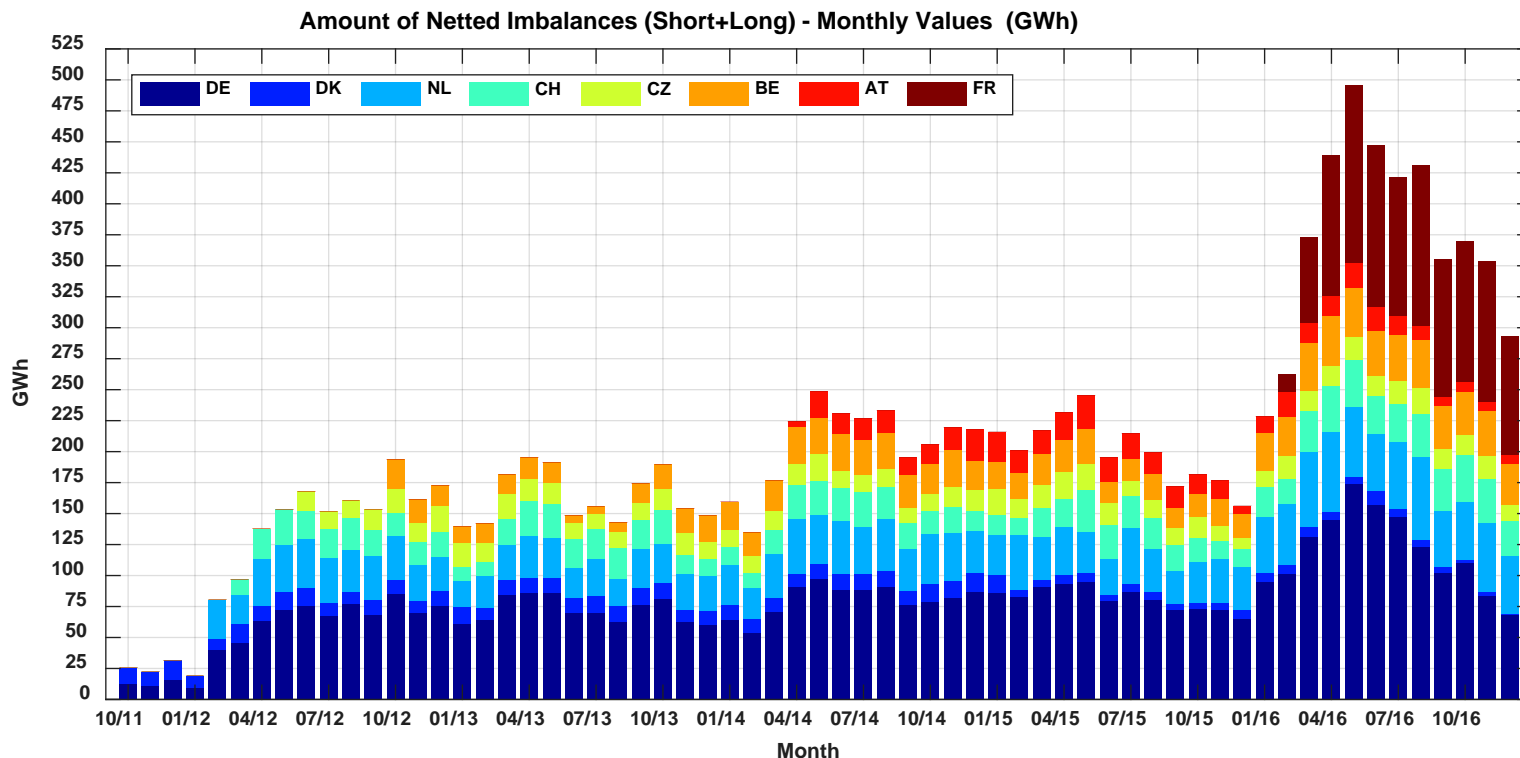
Strengthen decision making

- ✓ Clear rules in decision process

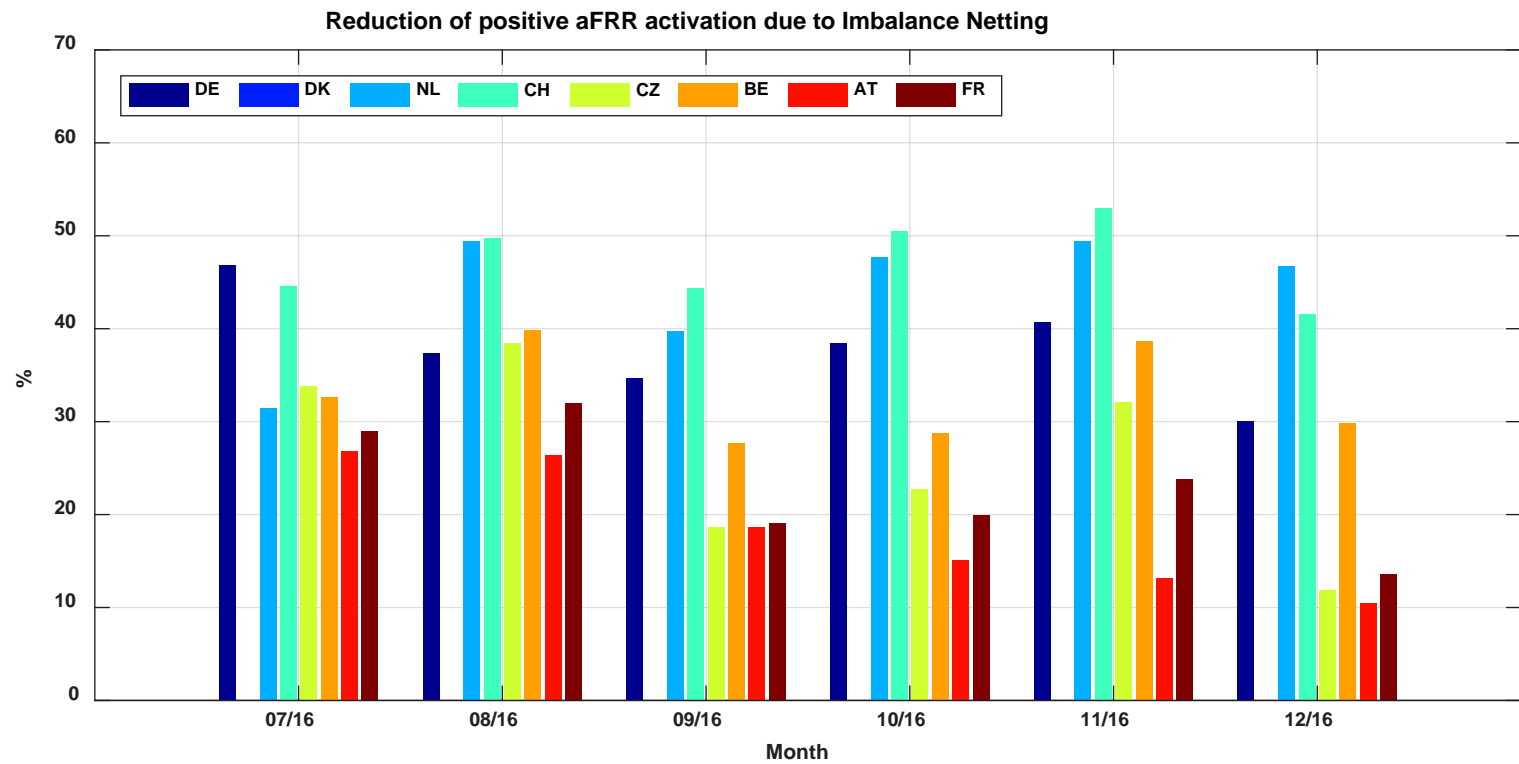
Flexibility: Update of Annexes

Solution about liability clauses, rules for cost sharing

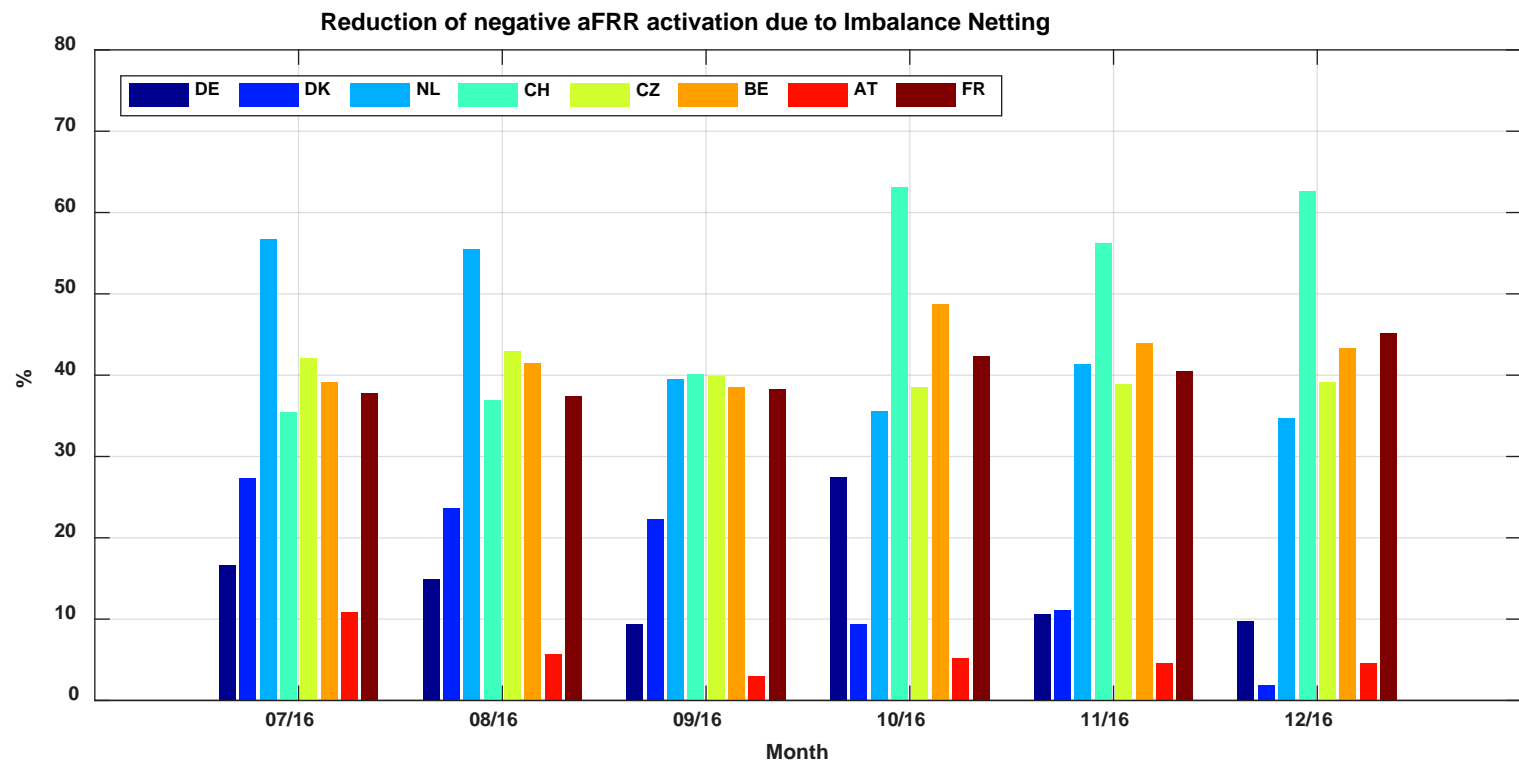
Monthly Volumes of Netted Imbalances



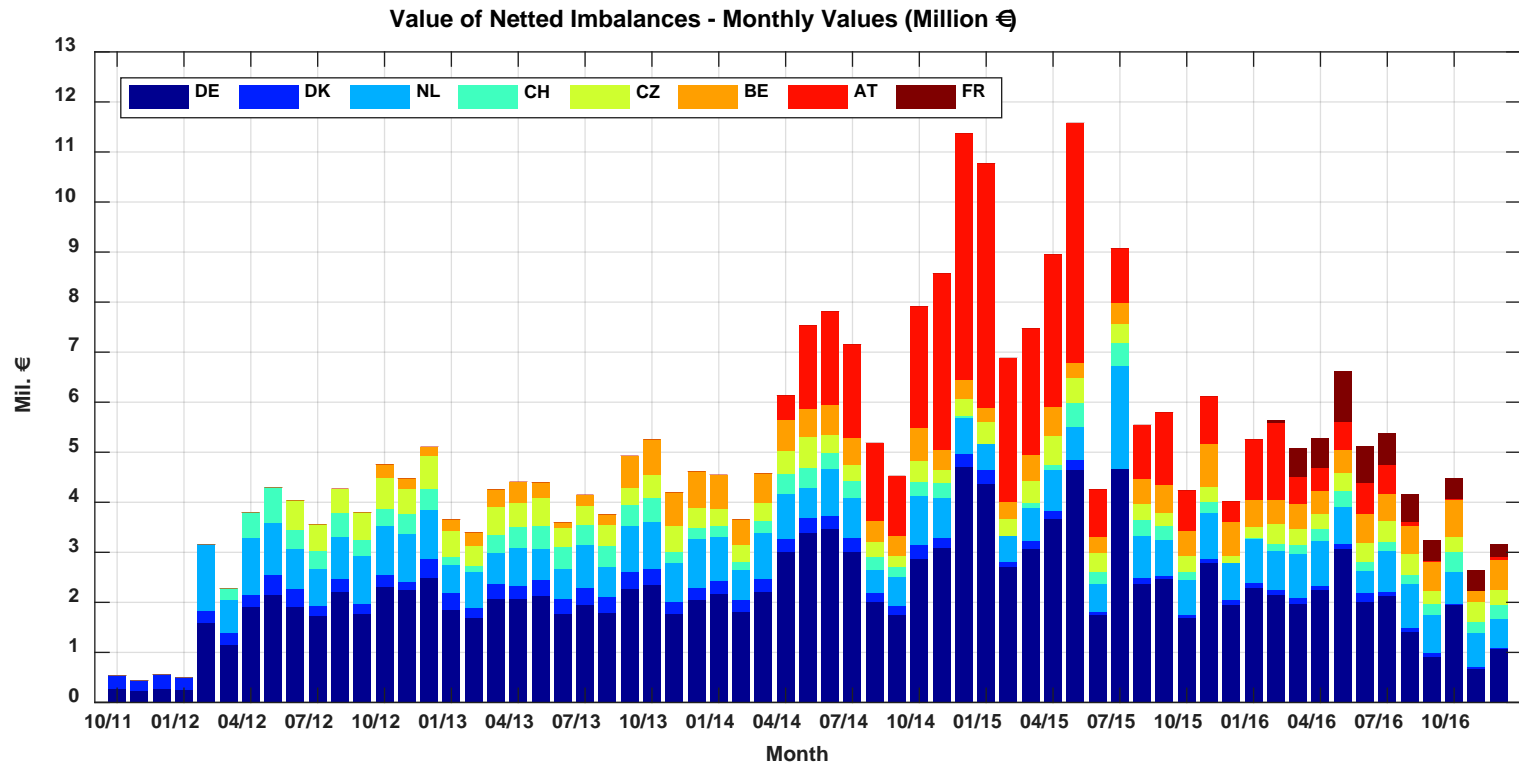
Monthly Percentage of Avoided pos. aFRR-Activations (last 6 Months)



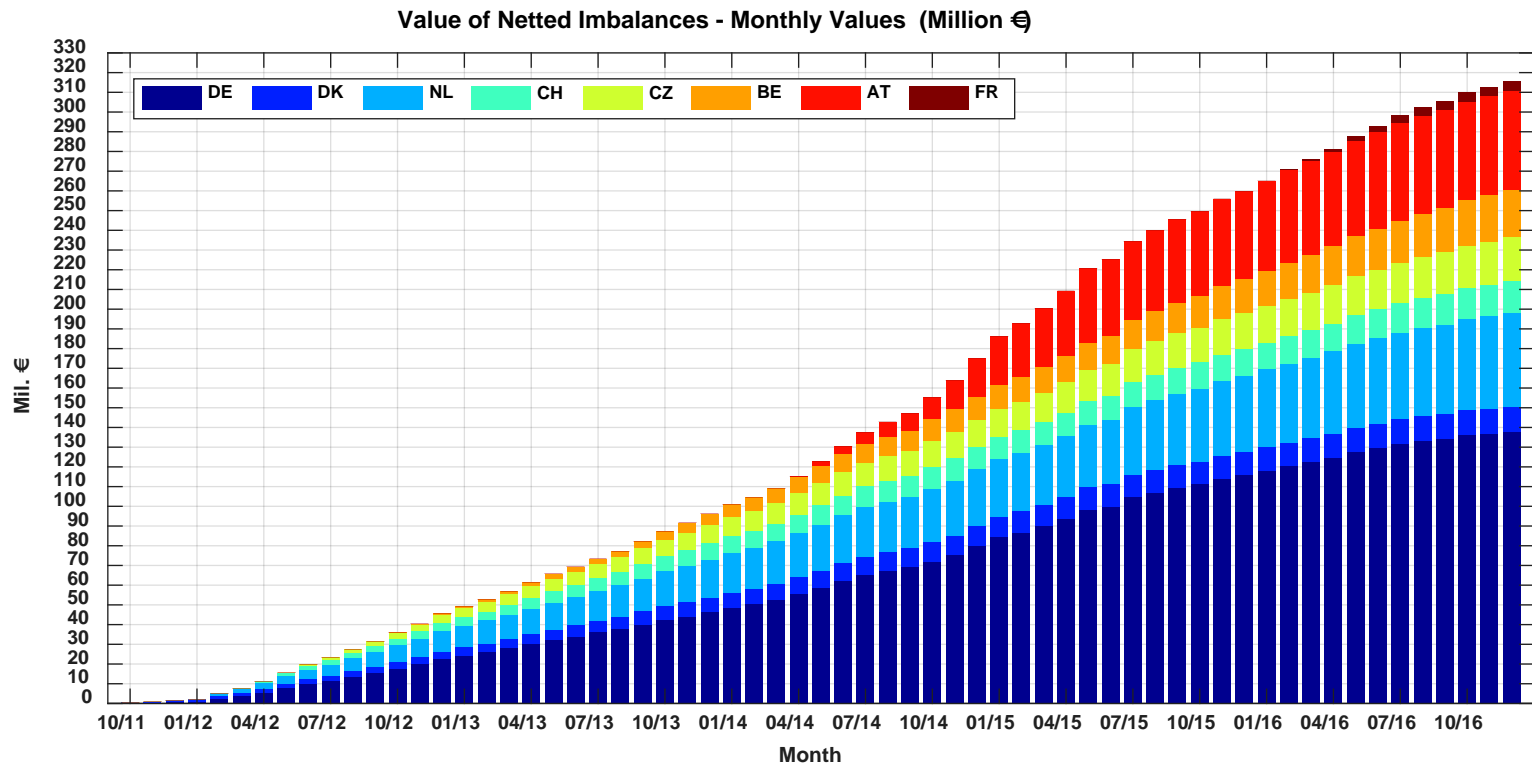
Monthly Percentage of Avoided neg. aFRR-Activations (last 6 Months)



Monthly Value of Netted Imbalances



Value of Netted Imbalances - Development



1 Introduction

2 History of IGCC

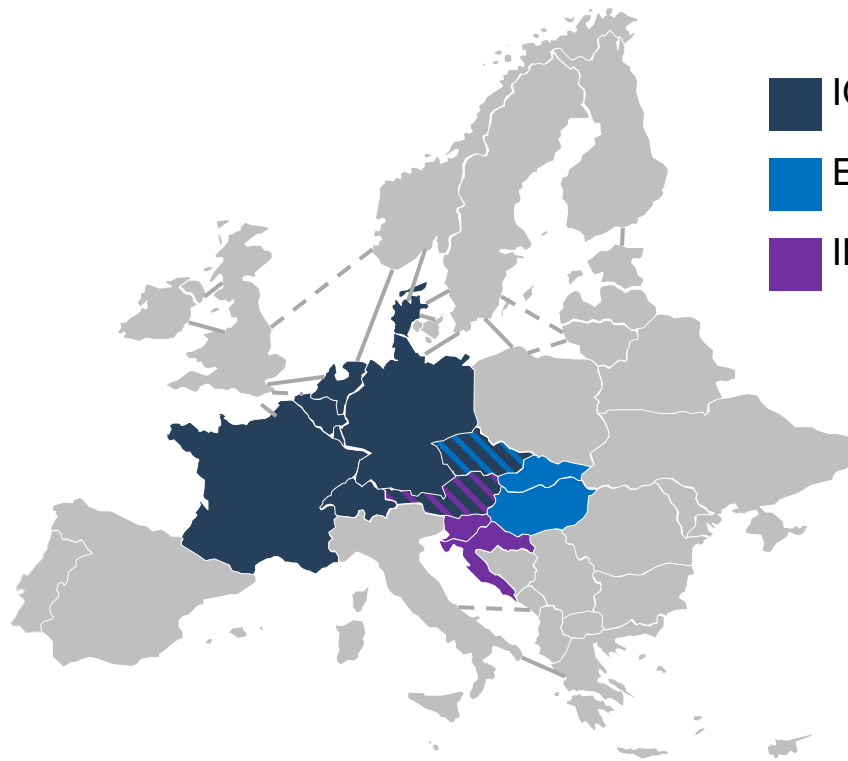
3 European Platform

4 Timeline & Next Steps

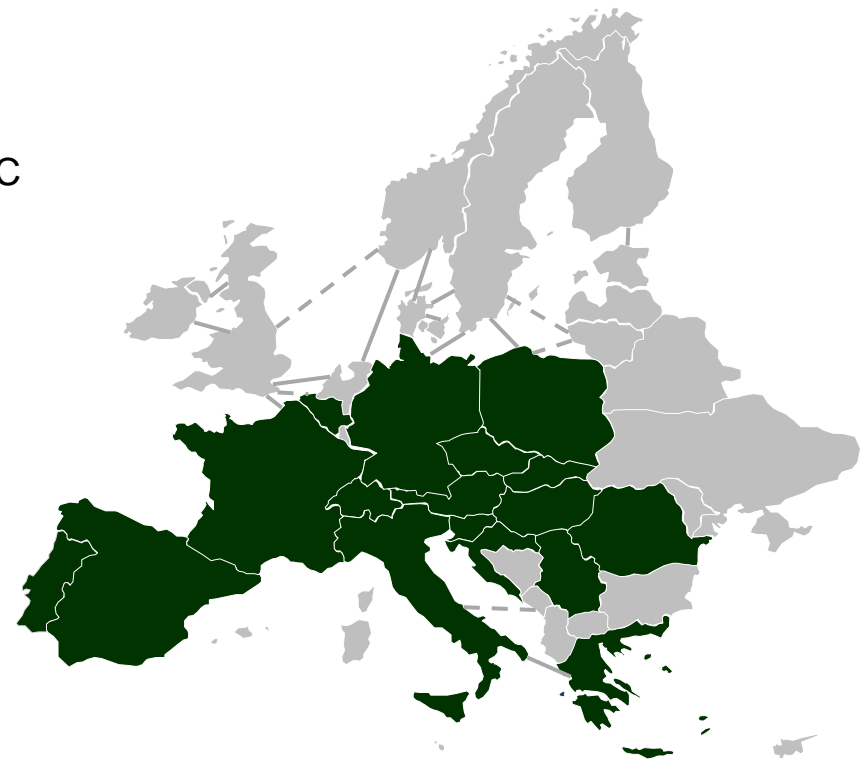
Members of PT

IGCC formally identified as starting point

Current situation

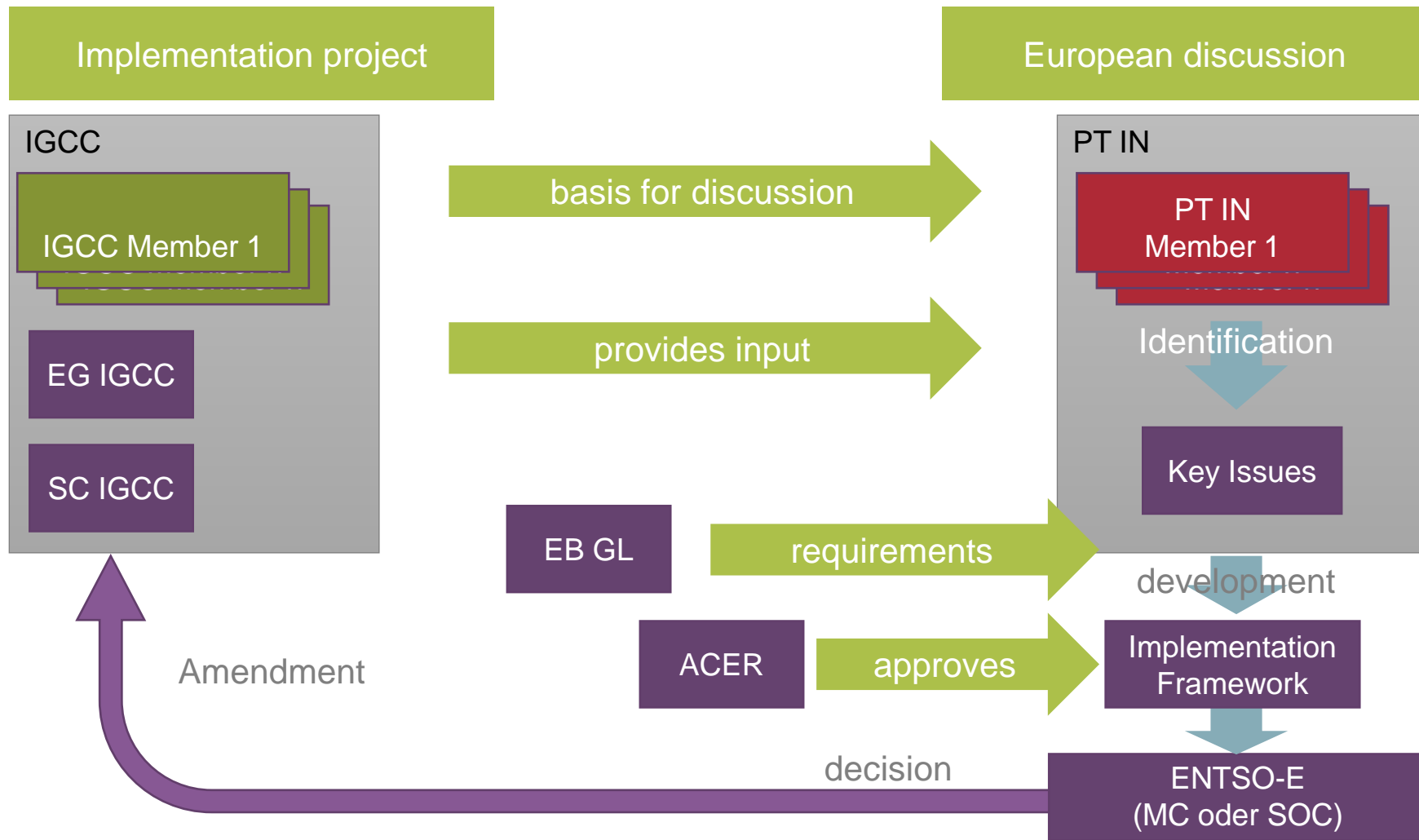


PT Member



- IGCC
- E-GCC
- INC

Way of working



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

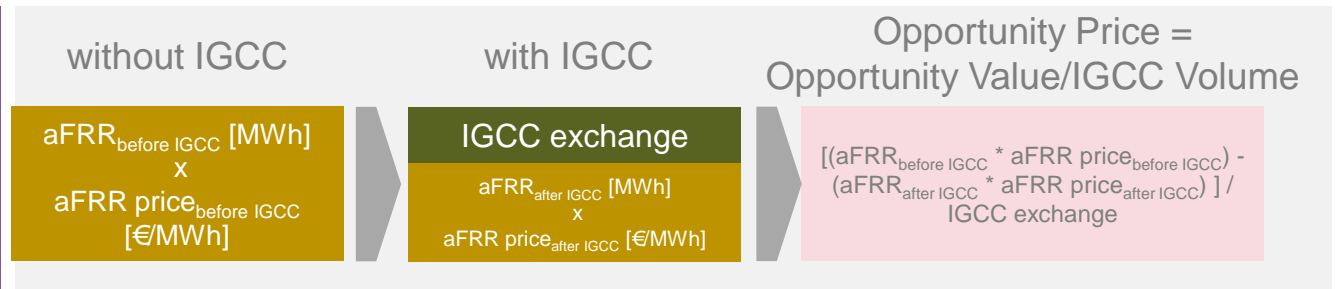
Settlement of intended exchange

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



IGCC Settlement Price

- IGCC Settlement Price (C_{IGCC}): **Energy weighted** ($E_{\text{Imp},i}$ and $E_{\text{Exp},i}$) **average** of the **opportunity prices** ($C_{\text{Imp},i}$ 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

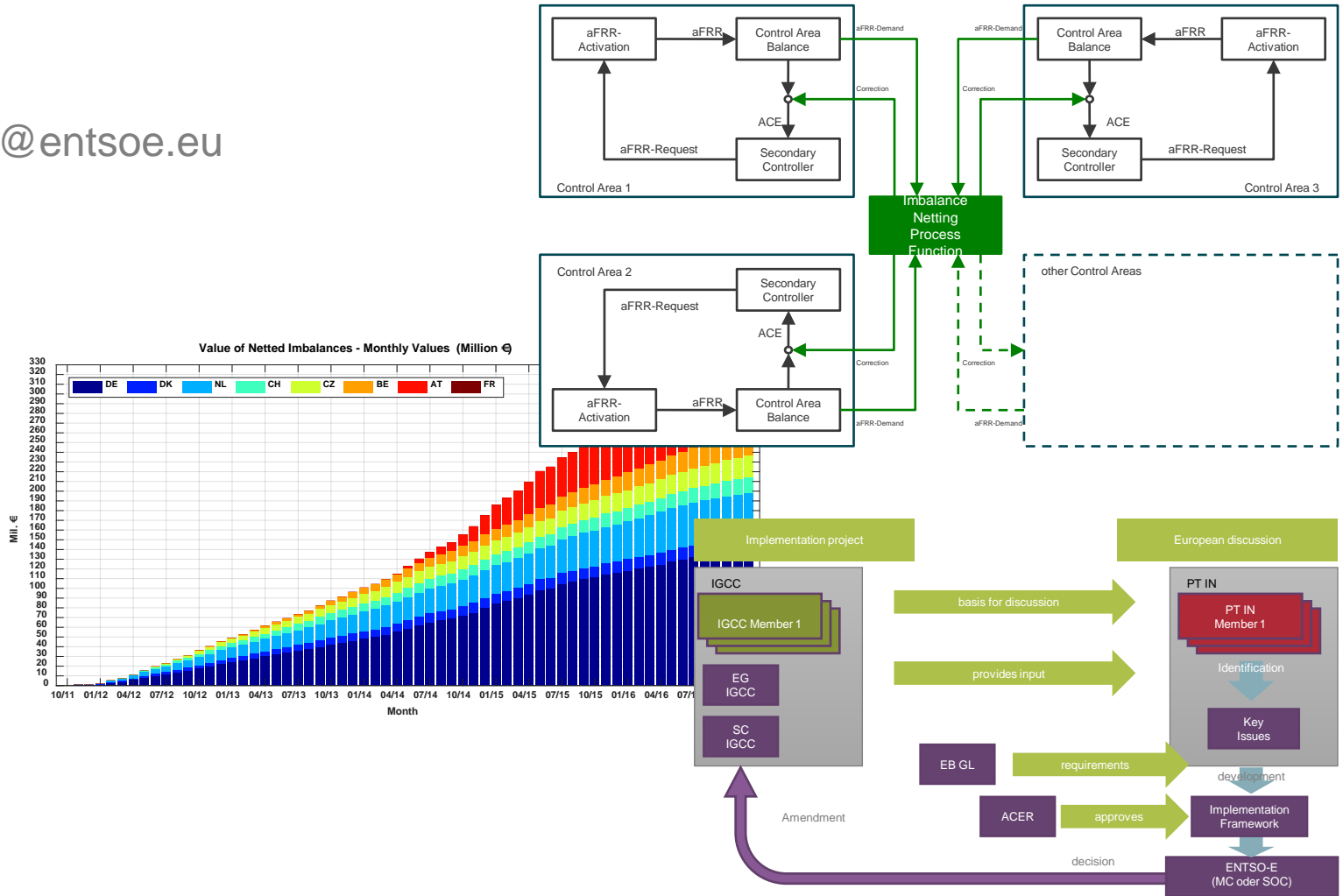
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Questions?

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Backup

Algorithm

