Towards effective congestion management: challenges of CACM implementation

Market ESC

Brussels, 3 December 2015

Regulation 714 sets the rules…

1.5. The methods adopted for congestion management shall give efficient economic signals to market participants and TSOs, promote competition and be suitable for regional and Community-wide application.

1.7. When defining appropriate network areas in and between which congestion management is to apply, TSOs shall be guided by the principles of cost-effectiveness and minimisation of negative impacts on the internal market in electricity. Specifically, TSOs shall not limit interconnection capacity in order to solve congestion inside their own control area, save for the abovementioned reasons and reasons of operational security (1). If such a situation occurs, this shall be described and transparently presented by the TSOs to all the system users. Such a situation shall be tolerated only until a long-term solution is found. The methodology and projects for achieving the long-term solution shall be described and transparently presented by the TSOs to all the system users.

2.1. Congestion-management methods shall be market-based in order to facilitate efficient cross-border trade. For that purpose, capacity shall be allocated only by means of explicit (capacity) or implicit (capacity and energy) auctions. Both methods may coexist on the same interconnection. For intra-day trade continuous trading may be used.

3.1. Capacity allocation at an interconnection shall be coordinated and implemented using common allocation procedures by the TSOs involved. In cases where commercial exchanges between two countries (TSOs) are expected to affect physical flow conditions in any third-country (TSO) significantly, congestion-management methods shall be coordinated between all the TSOs so affected through a common congestion-management procedure. National regulatory authorities and TSOs shall ensure that no congestion-management procedure with significant effects on physical electric power flows in other networks is devised unilaterally.

Source: REGULATION (EC) No 714/2009 on conditions for access to the network for cross-border exchanges in electricity – Annex 1

So what does CACM say about it?

(6) Capacity calculation for the day-ahead and intraday market time-frames should be coordinated at least at regional level to ensure that capacity calculation is reliable and that optimal capacity is made available to the market. Common regional capacity calculation methodologies should be established to define inputs, calculation approach and validation requirements. Information on available capacity should be updated in a timely manner based on latest information through an efficient capacity calculation process.

(10) TSOs should use a common set of remedial actions such as countertrading or redispatching to deal with both internal and cross-zonal congestion. In order to facilitate more efficient capacity allocation and to avoid unnecessary curtailments of cross-border capacities, TSOs should coordinate the use of remedial actions in capacity calculation.

(12) TSOs should implement coordinated redispatching of cross-border relevance or countertrading at regional level or above regional level. Redispatching of cross-border relevance or countertrading should be coordinated with redispatching or countertrading internal to the control area.

CACM has significant references to Regulation 714

(3) Regulation (EC) No 714/2009 sets out non-discriminatory rules for access conditions to the network for cross-border exchanges in electricity and, in particular, rules on capacity allocation and congestion management for interconnections and transmission systems affecting cross-border electricity flows. In order to move towards a genuinely integrated electricity market, the current rules on capacity allocation, congestion management and trade in electricity should be further harmonised. This Regulation therefore sets out minimum harmonised rules for the ultimately single day-ahead and intraday coupling, in order to provide a clear legal framework for an efficient and modern capacity allocation and congestion management system, facilitating Union-wide trade in electricity, allowing more efficient use of the network and increasing competition, for the benefit of consumers.

Article 18

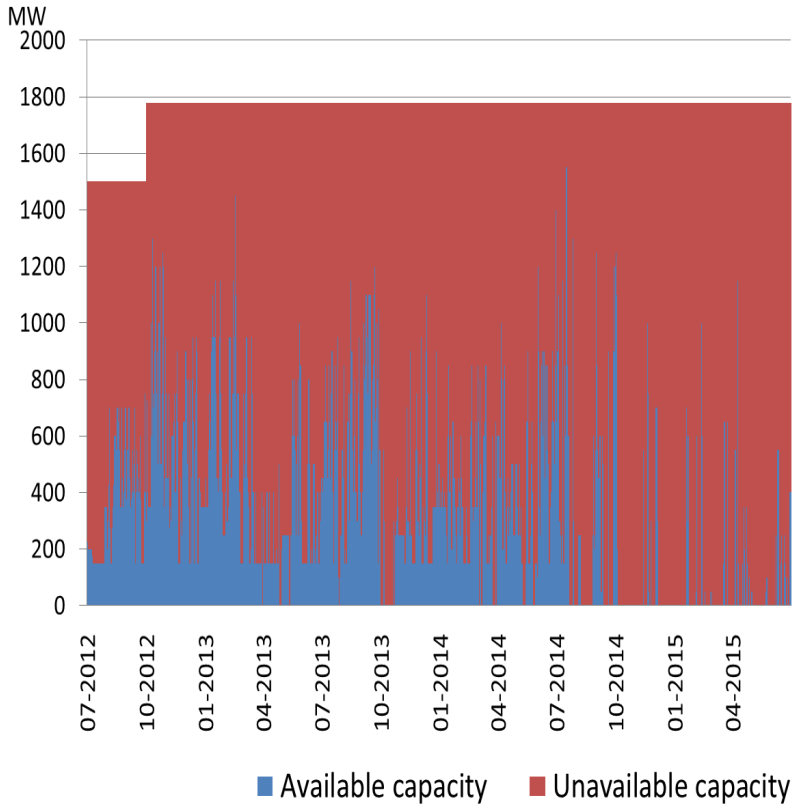
3. For each scenario, all TSOs shall jointly draw up common rules for determining the net position in each bidding zone and the flow for each direct current line. These common rules shall be based on the best forecast of the net position for each bidding zone and on the best forecast of the flows on each direct current line for each scenario and shall include the overall balance between load and generation for the transmission system in the Union. There shall be no undue discrimination between internal and cross-zonal exchanges when defining scenarios, in line with point 1.7 of Annex I to Regulation (EC) No 714/2009.

Challenges to overcome in CACM

- Achieving the **Energy Union** needs to **share market integration benefits collectively.**
- A positive overall social welfare for a region (or Europe) should prevail in the decision making process above local loss of social welfare.
- Not only a challenge for CACM, but also for other guidelines to come (balancing !).
- (Flow Based) Market coupling is a first step for the day ahead, but many things need to be improved.

NTC values on the DK1-DE border are decreasing over time !

Available capacity from DK1 to DE



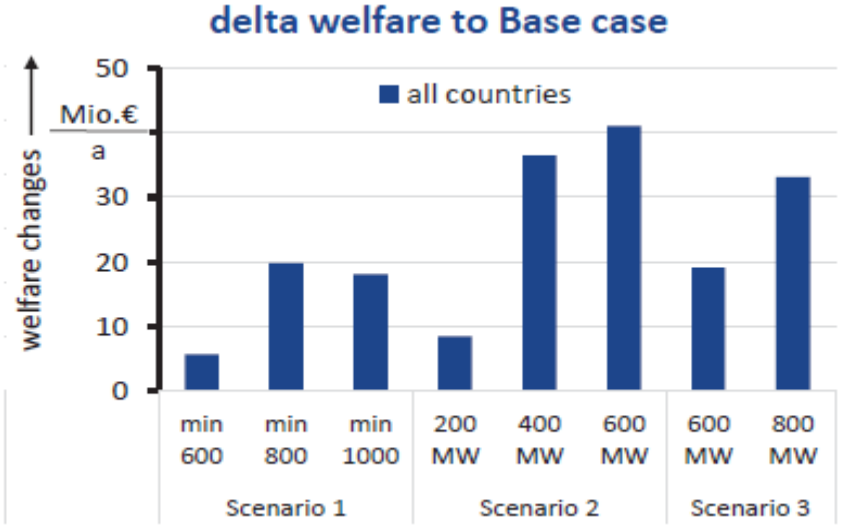
Source: RWTH AACHEN UNIVERSITY

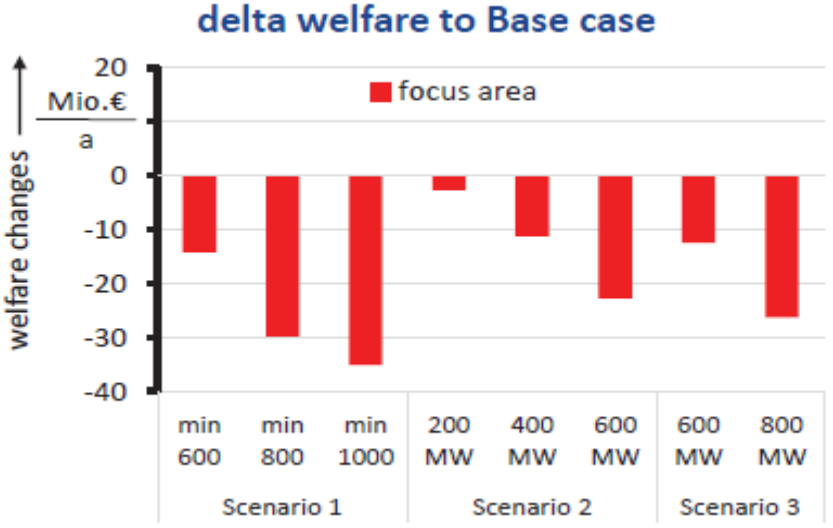
- The main **cause of the curtailment** of transmission capacity on the border is **internal congestion from northern Germany to southern Germany.**
- The Danish and German TSOs conducted a **study (*) on the socio economic welfare of higher transmission capacity**, to be achieved with redispatch

(*) full study: see

http://www.energinet.dk/SiteCollectionDocuments/Engelske%20dokumenter/El/Report_TenneT_Socio_Economic_DK1_DE_interconnector%20PDF.pdf

Example of lack of TSO cooperation leading to a suboptimal capacity allocation: DE/DK1 interconnector





- The study shows that **removing capacity reductions on the Danish-German interconnector has a significant European welfare gain**
- So far, since Denmark and Germany have a negative economic welfare the proposal for redispatching has not been put in practice.
- The result is welfare losses in a number of surrounding countries
- Note: EURELECTRIC does not take position to the details of the study, but we want only **to address this example as a challenge for CACM and further processes**

(focus area = GE and DK, global welfare area (all countries) = NO, SE, FI, NL, BE, FR, CH, IT, PL, SV, AT, CZ, SL and HU)

RWTH AACHEN UNIVERSITY

BE-LU interconnector

- A plan to install a phase shifter to connect the Elia and RWE grid in LU is being developed
- Main reason: security
- Unclear is:
  - Business case (welfare effects)
  - Availability for the market
  - Impact on flow based coupling

NL-NO border

- Recent NorNed capacity reductions
- No clear explanation why there are reductions
- Regulators seem not to be involved

Technical report on Bidding Zone Review

- **Still many unanswered questions**
- **It would be worthwhile to really explain and make suggestions to improve**

Some questions (1/2)

3. In section 2.3. (Congested areas in 2011/2012 and their future evolution), ENTSO-E recognises that regional initiatives are not using homogenous approaches to capacity calculation which leads to limited comparability of the data.

→ The capacity calculation approaches in the regional initiatives should be first harmonised to ensure that the graphs show understandable and comparable results.

→ A lot of "strange" explanations for congestion ("assumed reasons"; "maintenance activities" in Area 6-7; impact of newly constructed lines is not analysed for many areas, …)

Exp: On the capacity reductions between German and Denmark in the planning phase (congested area 21, page 19): there is no justification why the capacity is regularly congested, if it is a fault in the line or a one sided decision of the German TSO or something else. Instead there is a long list of investments that might possibly alleviate the congestion in 2018, but that list has no place in a factual description of 2011 and 2012.

- So first: the justification for the congestion in the planning phase is missing.
- Second: compare that to congested area Nr 4 (p 13) between NL and DE: there it is mentioned that the congestion is due to wind power in Germany. So there is no internal consistency in the report when congestion due to similar causes in area 21 and 4 is not described in a similar way.
- The third question, which is not answered in the report: why is the border congested due to wind power in Germany, shouldn't the congestion be within Germany with the demand in the South?

(Questions related to section 2.3 on the following slide)

Some questions (2/2)

(Follow-up questions on section 2.3)

Exp: The German grid development plan from summer 2013 (second version) shows that a lot of grid investment in Germany is needed, most obvious are the four corridors A to D. If you look in ENTSO-Es cluster of critical and congested network elements (p 10 and 11), there is just one critical area within Germany (22,10,16 and MN) a cluster in the east. If you assume the 4 corridors in the German plan are necessary to alleviate congestion, what is the consistency between the two plans? Just corridor D seems to be reflected in the ENTSO-E plan.

→ Graph 4 shows that there is a lot of congestion in CWE in D-2 and D-1 but graph 5 shows that the congestion is almost removed in real-time. We can wonder whether really "all" transmission capacity has been offered to the market, or whether some transmission capacity has not been offered in the D-1 phase?

→ It would be interesting to have a graph (such as graph 4) showing the evolution year by year of the congested areas. Figures from 2011 & 2012 show already that the different congested areas are discussed and in most cases, the congestions are solved. In particular, it would be interesting to have a clear picture of what will actually remains as problems in 2016.

4. The aim of section 2.4 (Day ahead market prices analysis) is unclear.

Overall picture

- A common grid model is not a common calculation
- Most coordination is still bilateral
- Redispatch is a hidden process
- Cross border connections are treated differently from internal connections
- NRA approach is not coordinated

What is the outlook to come to efficient integrated congestion management?

- What will be delivered when and where?
- What are the critical issues?
  - Legal?
  - Technical?
  - TSO regulation?