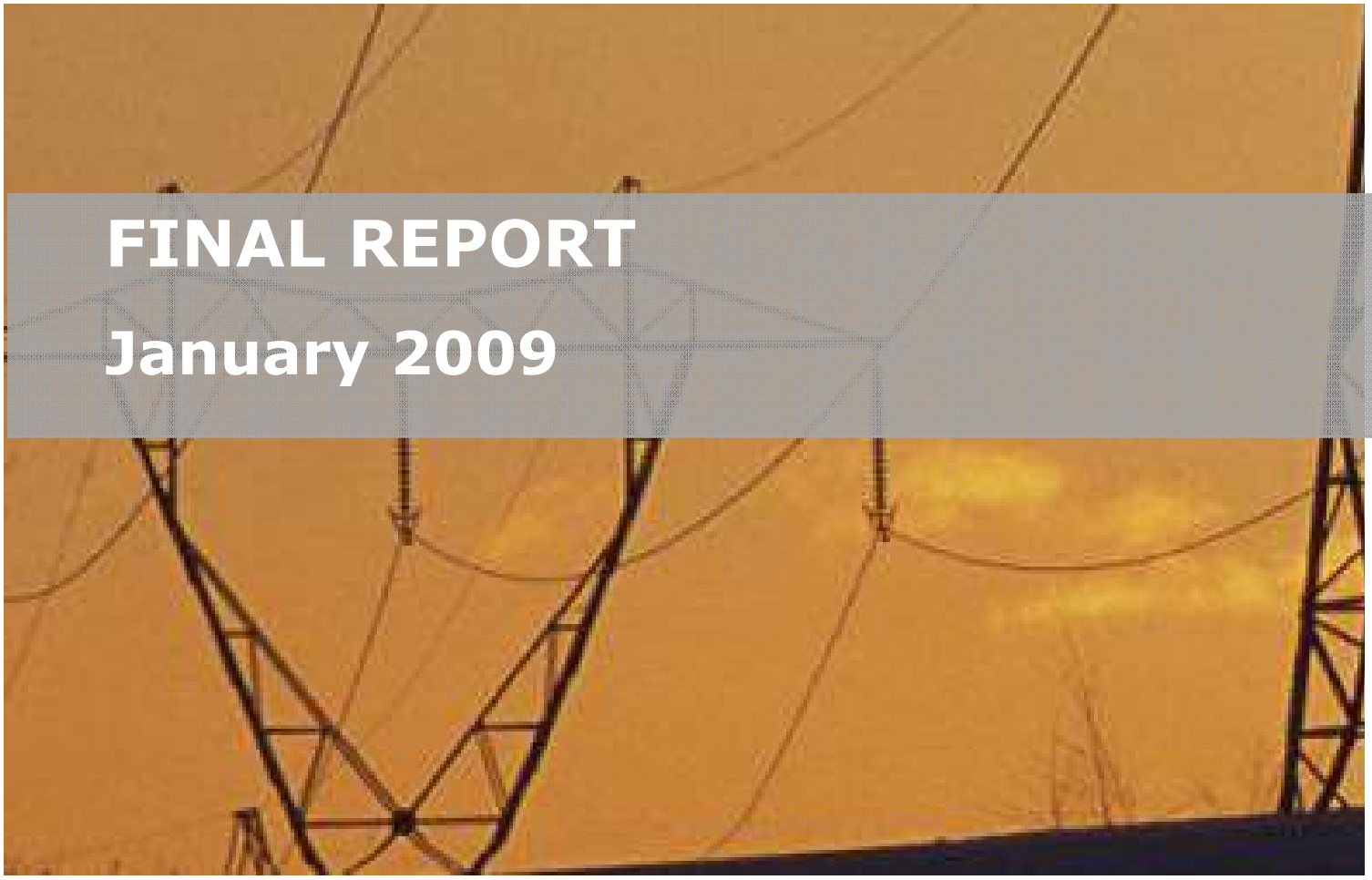

FINAL REPORT

January 2009

Development and Implementation of a Coordinated Model for Regional and Inter-Regional Congestion Management

EuroPEX
Association of European Power Exchanges

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Overview

Background

1. ETSO and EuroPEX present this Final Report as the conclusion to a project which commenced in November 2007. An Interim Report was published on the ETSO and EuroPEX websites in April 2008 and which formed the basis of an industry-wide consultation exercise on its findings. The consultation exercise provided the primary feedback determining the direction and subject matter for this Final Report.

2. The Final Report should be read in conjunction with the Interim Report for completeness of understanding as it builds on and further develops some of the key the content, methodologies, references and definitions described in the Interim Report.

3. Both the Interim Report and a complete set of the consultation documents and responses can be found on the ETSO and EuroPEX websites.

Consultation exercise

4. The key messages from the consultation exercise were as follows:

   - There is general support for the "glidepath approach" to market integration and increasing consensus on the market solutions which would deliver this.
   - A clear requirement for the development of a more detailed roadmap to market integration.
   - A need to elaborate on the "Dome Coupling" concept as an option for further market integration.

5. The consultation exercise and feedback received formed a significant input to the continuing work of the project and acted to guide the priorities for the Final Report.

Generic templates

6. The template concept builds on the glidepath approach with the aim of providing generic guidance for the evolution of individual initiatives as geographic scope and degree of market integration increases. A Template is presented for each of the market timescales considered; forwards, day-ahead and intraday capacity allocation, with a further Template considering a similar approach to the evolution of capacity determination methods.

7. Templates are an important contribution in ensuring greater overall coordination between numerous market initiatives.

Roadmap to market integration

8. A roadmap framework is developed for the key day-ahead timescale which considers the evolution of differing integration initiatives currently taking place within market regions (i.e., explicit methods, volume coupling and price coupling) against the general assumption that further integration between market regions is need to reach the gaol of the IEM.

9. Two broad options exist in terms of achieving an optimal approach to increasing integration between regions:

   - Horizontal extension of price coupling
   - Interregional Dome Coupling

10. Whilst these options are not mutually exclusive, they present differing challenges in respect of roles, responsibilities and governance. Horizontal extension requires a high degree of harmonisation, whilst it can be foreseen that the Dome Coupling approach allows for greater diversity of regional solutions in the transition to the IEM.

Conclusions

11. The main conclusions of the project are as follows:

   - The Electricity Regional Initiatives have made good progress to date, but the overlapping regional approach is now becoming a barrier to market coupling solutions.
   - Few examples of market integration initiatives between regions exist and a more coordinated approach is needed if existing initiatives are to adequately align at the pan European level.
   - More 'top down' direction is needed to foster further and more coordinated progress at the inter-regional and pan European levels, but it is equally important to maintain the current progress of 'bottom up' initiatives led by TSOs and Power Exchanges.

12. The main risk associated with the current regional approach is the development of incompatible solutions going forward which slow progress and prevent closer cooperation at the inter-regional level. The project has identified a need to establish a means of ensuring a coordinated approach across the widest range of regional market initiatives.

Next steps

13. A centrally facilitated 'Market Integration Design Project' is proposed as a means of ensuring:

   - The establishment of robust and consistent design principles for market integration solutions
   - Providing a focus for coordination of inter-regional and pan European level initiatives going forward
   - Fostering a higher level of compatibility in the initiatives currently underway

14. The key participants of the Market Integration Design project should remain the TSOs and PXs, however, an appropriate Steering Forum should be established to provide top down direction and to oversee the necessary level of coordination needed to achieve the level of market integration required to support the goal of the IEM.

15. It is proposed that the Steering Forum includes representatives of the major stakeholders in the energy markets.

1 Introduction

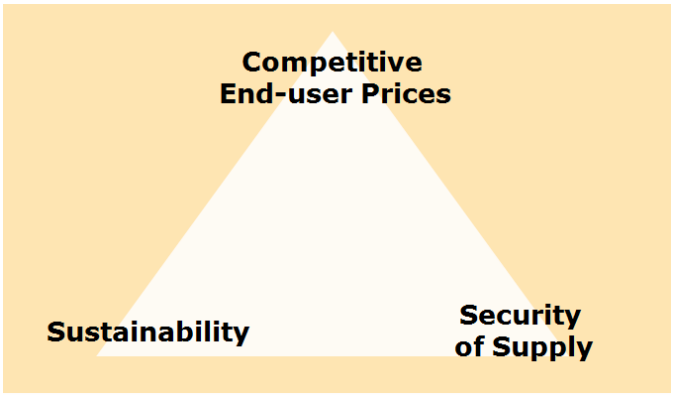
16. ETSO and EuroPEX were charged with an action from the Florence Forum of September 2007:

'*The Forum requested ETSO and EuroPEX to write a common discussion paper before March 2008 to address the implementation of regional and interregional capacity allocation methods, in particular the governance of the bodies running the system and to address the technical, legal and commercial challenges implied by the Consentec target model. Other stakeholders were invited to contribute to the discussion and ETSO and EuroPEX were invited to take particular account of the work so far done by EFET.'* The result from this work was presented at Florence Forum in November 2008.

17. This is the second report documenting this work. It does not replace the first report, the Interim Report, but is to be regarded as an extension to that report.

18. The three political goals for the power sector have been visualized with the triangle below. A well functioning Internal Energy Market (IEM) is a key means to reach these goals since it generally stimulates efficiency in both the utilization and the development of the power system. In particular, the IEM can reap the benefit of trade which will be significant in the power sector.

Figure 1 The three political goals of the energy policy.



19. It is however unclear exactly how the development towards IEM should be carried out, particularly how congestions in the power grid should be managed in order to achieve efficient, market based solutions across Europe. For this reason, a road map with different paths for further integration has been developed. The roadmaps should deliver on, and be measured against, this objective of efficiency. There are several key success factors:

a. Optimal use of the transmission network
    i. Increased access and economically efficient utilisation
    ii. Secure network operation
b. Robust wholesale energy markets

i. Effective trading products and platforms

ii. Strong wholesale market liquidity and price formation

iii. Support to emerging energy markets

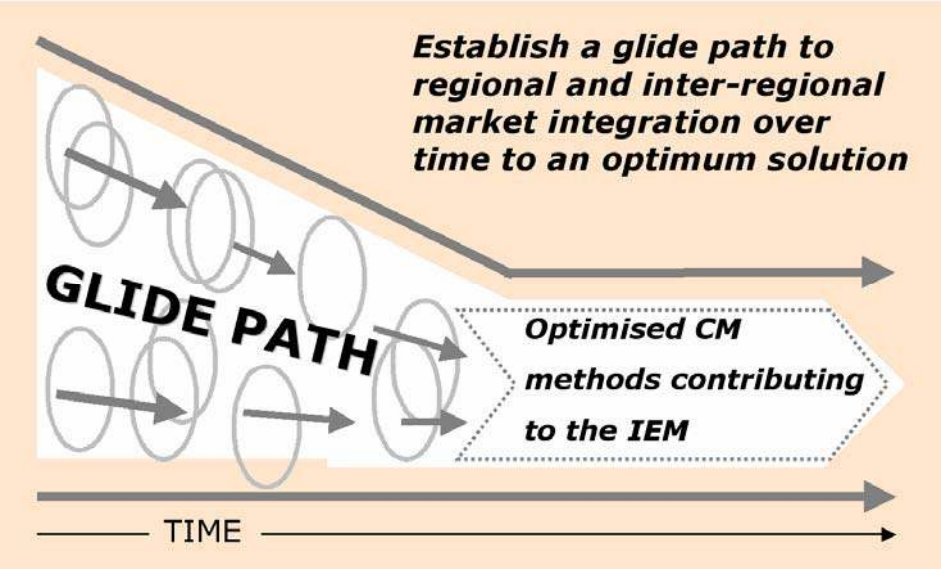
c. Effective competition

i. Legal, regulatory and governance frameworks facilitating trust and market confidence

ii. Facilitating supply and demand side competition

20. The Glidepath model presented in the Interim Report remains a key concept. It represents the progressive integration and convergence of congestion management solutions and principles, contributing towards the integration of markets across Europe.

Figure 2 The glidepath concept as introduced in the Interim Report.



21. It is important to recognize that the glidepath model does not in itself deliver the IEM target, it can only describe the pragmatic means by which the diversity that exists today in European energy markets can integrate over time through focused development processes leading to an optimized and seamless set of arrangements. The target of the IEM can only be reached through complimentary and parallel effort addressing more fundamental issues associated with market liberalization, structure, access and competition.

22. The glidepath, therefore, determines a more realistic target for the many market integration initiatives currently underway by seeking to identify an optimal position where the progressive integration of markets at regional and inter-regional levels lead to a seamless mechanism contributing to the IEM.

23. The glide path concept is further developed in this report. The glide path as it was introduced in the Interim Report proposed a gradual process of increasing integration and

harmonization leading towards an optimal solution for the IEM. This glide path has been further developed in two ways:

a. ***Generic templates***, aiming to rank various solutions based on their efficiency and ability to manage complexity. The templates attempt to map the different congestion management methods, to help each Market Region in Europe identify its placement and to anticipate possible individual paths to be taken toward further integration.

b. Alternative ***road maps*** for further integration of the European power markets - i.e., a collective path towards the IEM. One alternative is based on price coupling and another alternative is based on Dome Coupling. This is used to map the present situation as well as current initiatives for further development.

24. This report is structured as follows. Chapter 2 provides a summary of the responses from the consultation to the Interim Report. The generic templates are described in chapter 3. Chapter 4 gives an overview of the present situation as well as the ongoing initiatives to further integrate the power markets. Chapter 5 presents road maps. Finally, chapter 6 presents conclusions and proposes further work to be carried out in order to approach the IEM.

2 Response to consultation on the Interim Report

25. First responses to the Interim Report were given by speakers at the ETSO conference on the April 9th, 2008.

26. The Interim Report was made publicly available on the EuroPEX and ETSO websites the following day, on April 10th. This report was accompanied by a document explaining the consultation process and containing a list of relevant questions on which the project sought responses. The consultation period ended on the May 23rd 2008.

27. A total of 14 written responses were received, 11 of which are publicly available on both websites, and 3 of the written responses were marked as confidential. A number of informal and oral responses have also been received, most notably including DGTREN.

28. The following 11 companies and organizations submitted open written responses:

- Endesa
- GABE
- aee (Spanish Wind Energy Association)
- Nordenergi
- FSE (Danish End-User Association)
- Iberdrola
- EnBW Trading GmbH
- EFET
- Eurelectric
- IFIEC Europe
- IRE (Romanian Institute for Energy Development Studies)

29. A more detailed report of consultation responses, relating to the specific questions, is publicly available at the ETSO and EuroPEX websites.

30. This summary sets out some of the key feedback from the consultation exercise and the key messages that seem to be supported by many of the respondents or new ideas that the project could take into account in its further work.

Glide-path approach

31. The consultation responses revealed support for a glide-path approach, allowing for different solutions to exist along the path to more integrated markets and common solutions across regions. A clear need for a more detailed roadmap towards implementation, illustrating progressive integration step by step for the coming years was highlighted, addressing the following integration areas:

a. Geographic analysis: - integration within and between regions

b. Market Timeframes: - intraday, day-ahead & forward market

c. Implementation: - sequencing and prioritisation, region by region (including impact on local initiatives)

32. Several respondents highlighted the issue that the lack of progress in one region should not prevent other regions from making progress always bearing in mind the overall goal of greater integration – i.e., all regions should seek progress from their current state.

Top-down and bottom-up initiatives

33. There were a range of responses supporting both top-down and bottom-up approaches to making further progress in market integration initiatives. Top-down initiatives are viewed as necessary to define a long-term vision, setting the overall priorities and minimum regional harmonisation criteria. Bottom-up processes are supported for regional developments, allowing for variations in both speed of the development and in the solutions chosen. In addition, bottom-up approaches are necessary for initiatives to gain acceptance for market harmonisation and integration.

34. A combination of the top down direction and guidance acting to encourage quicker and more consistent progress, with implementation issues dealt via practical bottom up initiatives is likely to achieve the highest level of acceptance in the shortest timescale.

35. A key aspect to consider for bottom-up processes is the recognition and implementation of the minimum harmonisation requirements of further development toward inter-regional harmonisation and progress towards realising the long-term vision of the internal energy market in Europe.

Market design solutions

36. The consultation responses provided evidence of an emerging consensus on elements of the market design:

a. Day-ahead market: - there is strong support for implicit auctions in the day-ahead market. There were a range of views on the benefits and application of capacity models, in particular flow-based solutions and enhanced NTC models. These models need to be considered and developed further. They may serve as preferred solutions for various regions in the future depending on the balance of costs, benefits and complexity of application.

b. Intraday market: - there is strong support for regional intraday solutions that facilitate continuous trading. There were varying views on the issue of facilitating a co-ordinated implicit arrangement, like the Elbas and/or OMEL examples, or a split solution with explicit purchase of capacity.

c. Forward cross-border market: - there was strong support for long-term transmission rights, and for the addition of Use-It-Or-Sell-It provisions to physical transmission rights (PTRs). Most respondents supported the further development of financial transmission rights (FTRs), whilst some supported the evolution towards financial

markets (CfDs). All responses from stakeholders requested full firmness of long-term transmission rights (physical or financial).

More information

37. Finally, all respondents identified a need to further develop and elaborate on some of the new ideas put forward in the Interim Report, in particular the concept of 'Dome' coupling which received a positive response but also a request for more detailed explanation of both its practical implementation and its governance challenge.

3 Generic templates

38. There are a variety of market solutions in the European countries and regions. The template is a concept designed to provide general guidance to individual initiatives on potential next steps and direction in the context of achieving increased integration of markets.

39. There are two important dimensions to the question of how to manage congestions in the European power grid:

    a. How much capacity that can be offered to the market – "capacity determination"

    b. How the available transmission capacity should be used – "capacity allocation". This can be separated into three different time dimensions: day-ahead (DA), long term (LT) and intra-day (ID).

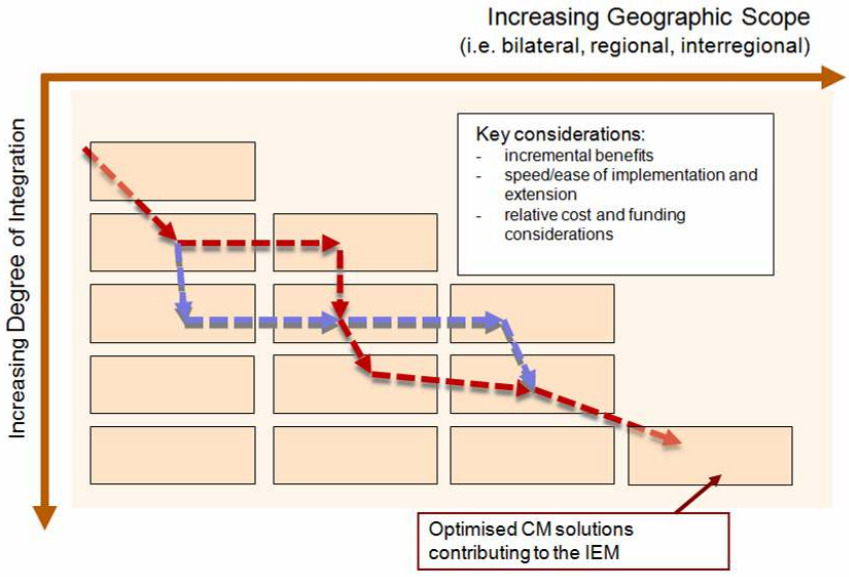
There are thus four separate generic templates presented below.

40. Congestion management methods within the three different time frames are not fully independent of each other. There are prerequisites and conditions to be fulfilled in order to make the whole market design as well as individual time frames functional and effective. Critical interdependencies are considered at the end of this chapter.

How to read the templates

41. The figure below shows the format of the templates:

Figure 3 **Outline of the templates for market integration.**



42. The templates have two dimensions: the vertical scale ranks[1] the various methods according to the degree of sophistication and the horizontal scale ranks the solution in terms of geographical scope. In addition to ranking the solutions, these templates also identify some important prerequisites for each potential step towards the IEM.

43. The template approach is designed to be consistent with the glidepath concept. The general objective is to achieve a glidepath for individual markets progressing from the top left towards the bottom right of the matrix. The final goal depends on local/regional circumstances, and therefore it might not always be located in the bottom right corner of the matrix. The path and the timeline that any individual initiative follows is not prescriptive, and will vary according to circumstances depending on the key factors of incremental benefit, ease/speed of implementation and cost. Hence, the template only describes the general tendencies and does not necessarily recommend a unique path for all markets, a case by case study is essential.

44. On the geographical dimension, there are four categories:

    a. Bilateral solution: any congestion management method that is coordinated between two markets.

    b. Market Region (MR): any congestion management method that encompasses more than two markets - i.e., a sub set of the European markets implementing the same congestion management method.

    c. Across MR: an Inter-regional congestion management method between two or more regions. This applies to cases where there exist separate coordinated congestion management methods for two regions.

    d. Pan-European: all markets and ers in Europe use a single coordinated congestion management method.

3.1 Capacity determination

45. There are two aspects to capacity determination. First, one has to determine where the most important congestions are located. Thereafter, the capacity across these *structural congestions* must be determined. These aspects are presented in the following two sections.

Definition of bidding areas

46. The borders between the bidding areas are often defined to equal the borders between countries. There may, however, be more significant and frequent congestions within some countries. These congestions are typically managed by other means in order to achieve the same price on across the congestion. Costs associated with these means are typically borne by the grid users for instance via the grid fees.

47. When prices do not differ across structural congestions, market players are not incentivized to act in accordance with beneficial solutions. An investor in new generation capacity will, for instance, have no incentive to locate a new plant on the deficit side of the congestion. If it is more economic to invest on the surplus side, e.g., due to cheaper transportation cost of

[1] In the vertical dimension, when two different solutions are considered at the same "stage", there is no ranking between them

fuel, the investor will locate a new plant on the surplus side. This will increase the need for grid re-enforcement and thereby the cost of the power system in total. The result of uniform prices across structural congestions may hence lead to inefficient use and development of the power system.

48. Defining bidding areas according to the underlying physical system does not necessarily mean more bidding areas, rather those bidding areas definitions should be based on pan-European efficiency perspectives rather than national perspectives.

49. The implementation of bidding areas defined by physical (structural) congestions will probably require top-down guidance and strong political commitment. With this improvement, one accepts that prices could vary within a given member state. The price differences will make investments more efficient and improve both value creation and security of supply. The incentives will work towards reducing price differences across the various European price areas, but one has to accept that price differences will remain over time. Just as other goods are cheaper in some regions compared to others, the price of electricity will also differ between regions.

Determination of available transmission capacity (ATC)

50. The TSOs are responsible for determining the available transmission capacity between the bidding areas. There are various methods which differ in complexity and precision concerning physical flows, as described in the Interim Report.

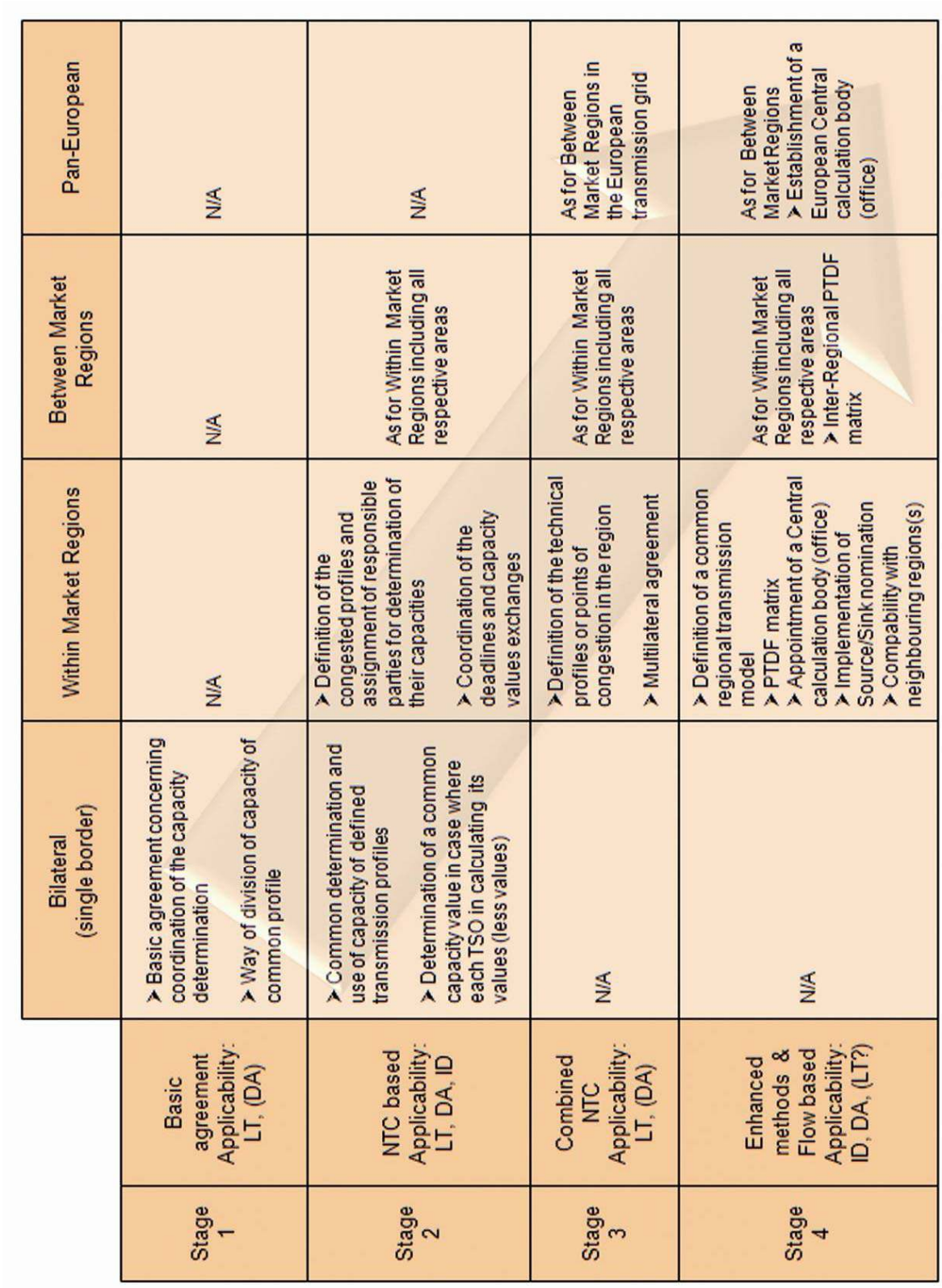
51. The template attempts to map the different capacity determination methods or organizational grades and to draw possible ways towards improvement. Generally, movement towards higher stages (downwards in the diagram below) is understood as increased sophistication of the capacity calculation method. However, the flow-based method is considered as the most advanced, but has not yet been implemented anywhere in Europe. This method's applicability must still be demonstrated. However, NTC-based models seem appropriate for those interconnections where flows are not interdependent and therefore capacity calculation could be considered independent of the flow in other interconnections.

52. The four stages presented vertically are described as follows:

    a. Basic agreement – is typically the initial organizational stage, where TSOs have not agreed on a common capacity value on a particular congested profile but yet they have made an agreement about the common way of use of the profile (ex. Division of the capacity etc.). This method of determining the ATC is primarily applicable for long-term capacity, but can also be used day-ahead. It is less relevant for intraday.

    b. NTC – Net Transfer Capacity – is the most widely used method applied on individual borders. This method of determining the ATC is currently being applied for all the different time frames. A brief description on how NTC calculates ATC is given in the text box.

Figure 4 **Capacity determination template**



Text box 1 - Description of NTC method.

ATC is calculated by shifting generation starting from a basic scenario from one area to the other until congestions appear within the grid of the calculating party. The calculation party shall consider any usable curative measure as a result may violate the security constraints before stopping the calculation process. At the end of the process the involved parties compare their results and agree on the maximum acceptable value. Defining the basic scenario and the technical constrains is crucial for the result of the calculation.

c. Combined NTC – A further refinement in the calculation of the individual ATC for each border is to calculate the regional ATC capacities taking into account the interrelations between them, in what is called the combined NTC method. This method is applied in some regions in Europe and represents better the physical conditions of the regional network. It is also applicable to all time frames.

d. Flow based method – differ from Combined NTC in that 1) ATC values are not predetermined before the allocation process (explicit or implicit) is run and 2) physical flows are respected more exactly. Thus this method does not require any anticipation of the market direction. Flow based methods are not yet implemented in Europe. They could, however, potentially support both regional and interregional capacity calculations. Flow based methods are better suited for calculating capacities in day-ahead and intraday timeframes in the case of meshed networks, whereas they are less suited (e.g., more complex to apply efficiently) for the long term time frame.

53. To apply flow based methods, or even regional combined NTC methods, there is a need for both a:

a. common regional or inter-regional grid model, and

b. central capacity calculation office.

Text box 2 - Description of flow based methods.

Flow based methods use representative models of the energy flows considering the technical constraints of the transmission grid. These models are used in the allocation process to calculate the influence of each requested energy exchange. ATC values are therefore not calculated before starting the allocation process but derive at the end of the allocation process.

A Power Transmission Distribution Factor (PTDF) matrix is required for flow based methods. The matrix represents the impacts of an energy exchange between two zones on each constraint of the entire system.

Introduction of a *source/sink nomination system* seems to be a precondition for Flow based method implementation. Source/sink nomination is a nomination system where the cross-border flow is nominated only to:

- the TSO in which Control Area particular volume of electricity enters the system (where electricity is generated) – source TSO
- and the TSO in which Control Area this electricity is planned to be consumed – sink TSO.

This differs from the current, UCTE defined, nomination system where the cross border flow needs to be nominated explicitly to each TSO on the way of transmission including the ones that are transited only. This has to be further analyzed and developed to be prepared for use.

3.2 Capacity allocation: day-ahead

54. The day-ahead markets are key to the development of an integrated European electricity market:

    a. Day-ahead markets have emerged as the preferred physical market against which derivatives can be traded. Solutions to integrating other timeframes (forward and intraday) often depend on the development and the nature of the day-ahead market.

    b. The importance of the day-ahead market is reflected in the Congestion Management Guidelines, in the progress that has already been made, and in the many day-ahead initiatives currently being undertaken.

55. The Interim Report outlined a number of generic capacity allocation methods for the day-ahead time frame. Implicit auction solutions were clearly found to be the most preferred allocation method. Implicit auctions are potentially superior even for immature markets, provided that at least one of the markets in a Market Region has a reasonable level of liquidity.

56. The generic description in the Interim Report has also attempted to describe the implications of local characteristics and geographical dynamics, and impact of this on the quality of the outcome that the different methods grant.

Figure 5 **Day ahead capacity allocation template**

		Bilateral (single border)	Within Market Regions	Between Market Regions	Pan-European
Stage 1	TPA	➢ Non market-based methods (pro rata, FCFS…) ➢ Transparent and non transaction-based allocation rules ➢ Non compliant with EC/1228/2003 ➢ No regional coordination possible			
Stage 2	Explicit Auctions (PTR)	➢ XB capacity auctions of PTRs for day ahead ➢ Common access rules, bank guarantees & IT exchanges standardization etc. ➢ UIoSI (or UIoLI) ➢ Governance: Between TSOs and Regulators ➢ Physically firm (possible subject to force majeure)	As for Bilateral, except: ➢ Regional coordination of explicit auctions	As for Bilateral, except: ➢ Explicit auctions between two regions that have different coupling systems	As for Bilateral, except ➢ Pan-European coordination of explicit auctions ➢ Governance: Between all European TSOs and Regulators
Stage 3	Implicit auctions (loose Volume coupling)	➢ PX in both areas ➢ Possibility to share bids (curves etc.) other harmonisations ➢ Governance: Cooperation between TSOs and PXs ➢ Sequence of different algorithm ➢ PXs operate essentially autonomous and independent markets ➢ Minimal harmonisation of market arrangements required ➢ Firmness (not subject to force majeure)	As for Bilateral	As for Bilateral, except: ➢ At least two regional implicit coupling systems ➢ Sequential process, interregional coupling (e.g. Dome Coupling) only sets flows between market regions witch then is followed by an intraregional procedure	As for Between Market Regions
	Implicit auctions (Tight Volume coupling)	As for Loose Volume coupling, except: ➢ Sequence for different algorithms ➢ Implies more harmonisation of markets, Coupler aims at replicating local PX price determination rules, possibility to share all bid data ➢ Limits independence of PXs e.g. introduction of new products ➢ Governance: Joint between TSOs and PXs ➢ Firmness (not subject to force majeure)	As for Bilateral	As for Bilateral, except: ➢ At least two regional implicit coupling systems ➢ Governance : Joint between all TSOs and PXs in the involved market regions	As for Between Market Regions
Stage 4	Implicit auctions (price coupling)	As for tight Volume coupling, except ➢ Use of one single price determination algorithm ➢ If not market splitting, possibility to share all bid data, harmonised market rules ➢ Operations/price settings are a collective PX responsibility ➢ Firmness (not subject to force majeure)	As for Bilateral	N/A (Means price coupling of regions with a single algorithm)	As for Within Market Regions

57. Regarding the choice of capacity allocation methods, it's quite straightforward that a movement from Third Party Access (TPA) to implicit allocation is generally an improvement. However, it's not necessary that each market passes through each stage: jumping stages is a clear possibility.

Text box 3 - Market coupling

There are two alternative market coupling approaches: price-based market coupling ("price coupling") and volume- based market coupling ("volume coupling"). In price coupling, both flows and prices are determined by the coupler. On the other hand, in volume coupling only the flows between two markets are determined in the first stage, and prices are calculated subsequently by the local power exchanges. The quality of the volume coupling can be adjusted, from "loose" to "tight", dependent on how well the flow calculation has replicated the bids and local market rules of the individual price determinations. This can impact the degree to which prices fully converge or capacity use is optimized. The most likely application of volume coupling is to calculate flows between Market Regions, rather than within.

58. Market coupling to date has been applied to the borders within a Market Region (a group of markets). Market Regions have adopted price coupling. Price coupling can be organized in two ways: market coupling (where two or more PXs are involved – e.g., TLC) or market splitting (involving only one PX, operating in two or more bidding areas - e.g., Nord Pool, Mibel). This is an organizational issue.

59. The relative benefit of these two solutions, price coupling and volume coupling, for efficient integration of day-ahead capacity allocation generally depends on two factors:

    a. The method's ability to allocate capacity between congested areas to the most beneficiary trade. The nature of adjoining Market Regions in terms of price predictability, size of interconnector capacity, etc will impact this.

    b. The ease with which the method can be implemented - for example, to what extent existing arrangements need to be changed or market rules harmonized.

60. Best practice on the geographical dimension might not be straightforward from the table. This depends significantly on the process in each adjoining market, on what the initial point of departure is, and the general landscape.

3.3 Capacity allocation: long term

61. One key role of the forward cross-border market is to provide market participants with an ability to manage cross border risk. As explained in the Interim Report, either TSOs may allocate forward transmission rights (physical or financial), or PXs may offer financial energy derivatives serving the same purpose.

Figure 6 **Long term capcity allocation template**

		Bilateral (single border)	Within Market Regions	Between Market Regions	Pan-European
Stage 1	TPA	➢ No reservation of capacity ➢ Non market-based methods (pro rata, FCFS…) ➢ Transparent and non transaction-based allocation rules ➢ Non compliant with EC/1228/2003	N/A	N/A	N/A
Stage 2	Explicit Auctions (PTRs w/UIoLI)	➢ Bilateral capacity auctions of PTRs ➢ From multi-year to monthly allocations ➢ Use-it-or-lose-it: only physical exercise of the TR ➢ Joint access rules ➢ Secondary trading platform ➢ Governance: TSOs AO or cooperation agreement (CA) btw TSOs ➢ Coordinated NTC-based ➢ Physical and/or financial firmness might me in place	As for Bilateral, except: ➢ Regional capacity auctions of PTRs ➢ Prerequisities: common access rules, single or compatible interface(s), CRM, invoicing, bank guarantees & IT exchanges standardization	As for Bilateral, except: ➢ Capacity auctions of PTRs Between Market Regions ➢ Prerequisities: common access rules, single or compatible interface(s)	As for Bilateral, except ➢ Pan-European auctions of PTRs
Stage 3	Explicit Auctions (PTRs w/UIoSI)	➢ Use-it-or-sell-it: either physical or financial nomination of the TR ➢ If financial, need to define the pay-back for users ➢ Governance: TSOs AO or CA btw TSOs ➢ Coordinated NTC-based ➢ Physical and/or financial firmness might be in place ➢ Secondary trading platform	As for Bilateral, except: ➢ Prerequisities: common access rules, single or compatible interface(s), CRM, invoicing, bank guarantees & IT exchanges standardization	As for Bilateral, except: ➢ Prerequisities: common access rules, single or compatible interface(s)	As for Between Market Regions
Stage 4a	Explicit Auctions (FTRs)	➢ No physical nomination of TR ➢ Need to define the pay-back for users, i.e. level of financial firmness ➢ Governance: TSOs AO or CA btw TSOs ➢ Coordinated NTC-based ➢ Secondary trading platform	As for Bilateral, except: ➢ Prerequisities: common access rules, single or compatible interface(s), CRM, invoicing, bank guarantees & IT exchanges standardization	As for Bilateral, except: ➢ Prerequisities: common access rules, single or compatible interface(s)	As for Between Market Regions
Stage 4b	Financial Contracts	➢ No allocation of TR ➢ CfD between Bid Areas across the border(s), based on Area to Area spot price difference, or Area to Regional financial contract price difference ➢ Cross border risk may also be managed by trading the forward contracts quoted in the two separate markets ➢ Prerequisities: Established PX spot market(s) with transparent Area Spot prices that are usable as reference prices for contracts linked to the applicable borders/Areas ➢ Recommendable PX listing and offering trading with the CfD contracts and providing Settlement and Cleaning. Market Makers and OTC clearing	As for Bilateral	As for Bilateral	As for Bilateral

62. In the forward cross-border market, the first step may be the introduction of Physical Transmission Rights (PTRs) with "Use-It-or-Lose-it" (UIoLI) schemes at the nomination stage. The borders where there is no third-party access or the access is performed via non-market based methods should evolve towards this as soon as possible.

63. PTRs with UIoLI may evolve towards PTRs with "Use-It-or-Sell-it" (UIoSI) schemes where an auction is available day-ahead, and eventually to Financial Transmission Rights (FTRs).

64. The introduction or energy derivatives may be seen as an alternative to FTRs in those regions where forward financial electricity markets are well developed and sufficiently liquid. The so called CfD contracts that can be used for handling cross-border price risks, and can be based on either the price difference between a bidding area price and a regional reference price or between two bidding area prices.

65. Moving from bilateral forward allocation towards regional and/or eventually inter-regional or pan-European allocation would add value to the market players by making both trading and risk management easier. On the other hand, the larger number of borders involved in the allocation process would increase the implementation effort and the governance become more complex.

66. In order to facilitate the transition towards a wider European integration of forward markets, the first step is to harmonize access rules and create a single interface for market participants.

67. One key point when dealing with Physical Transmission Rights (PTRs) is how to establish the D-1 nomination deadline compared to the gate closure time of the spot markets. On the one hand, market participants may prefer to have a nomination deadline as close as possible to the day-ahead market gate closure. But on the other hand, there are other operational requirements which require an earlier nomination deadline (depending on the day-ahead allocation mechanism).

68. In the case of day-ahead explicit auctions, a minimum lead-time should be foreseen for performing the auction and informing market participants about the results so that they can use the capacities on the day-ahead markets. In the case of day-ahead market coupling, market participants may:

    a. either, prefer the cross-border capacity available for this process to be published with enough time in advance so to allow them to send their bids after having integrated the necessary information beforehand.

    b. or, prefer to reduce as much as possible the time between the D-1 and forwards PTRs nomination deadlines, at the cost of not getting the information related to the cross-border ATC before sending their D-1 bids.

3.4 Capacity allocation: intraday

69. Intraday markets concern the possibilities for trading between market parties after closure of the day-ahead market and before real time balancing actions.[2]

[2] Outside the scope of the paper

70. The objectives for intraday market are to encourage and provide an opportunity for market parties to self-balance in order to minimise balancing actions required in real time and limit imbalance exposure when:

    a. unforeseen events occur after day-ahead market closure;

    b. market parties have an open position which is permitted by market rules or has occurred accidentally;

    c. arbitrage opportunities arise.

71. It is generally recognised that this market can suffer from lack of liquidity or transparency. Another feature of this market is that market participants have limited time available to obtain the energy, acquire capacity, if needed, and nominate their positions.

72. The capacity determination issues for TSOs are also quite specific because of the shorter time periods involved. On one side, there is less uncertainty than for the longer time periods; on the other side, any inaccuracy in determination leaves very short time to react and can directly endanger real time security.

73. To address these specificities, it is recognised that the intraday markets should provide efficient access to wide cross-border market, through markets ensuring efficiency and transparency.

74. From this perspective, the generic template shows that the first main step consists of explicit allocation, on a couple of borders or regionally. In both cases, this requires market participants to secure energy separately from capacity.

75. The consultation showed strong support for the transition to a more coordinated scheme, based on implicit allocation and a market place where each market participant has access to a single point for all offers formulated in the covered region. Different variants, can be considered, such as implicit continuous markets (like the Nordic Elbas) and markets with sequential implicit auctions (the six intraday auctions in Mibel is an example).

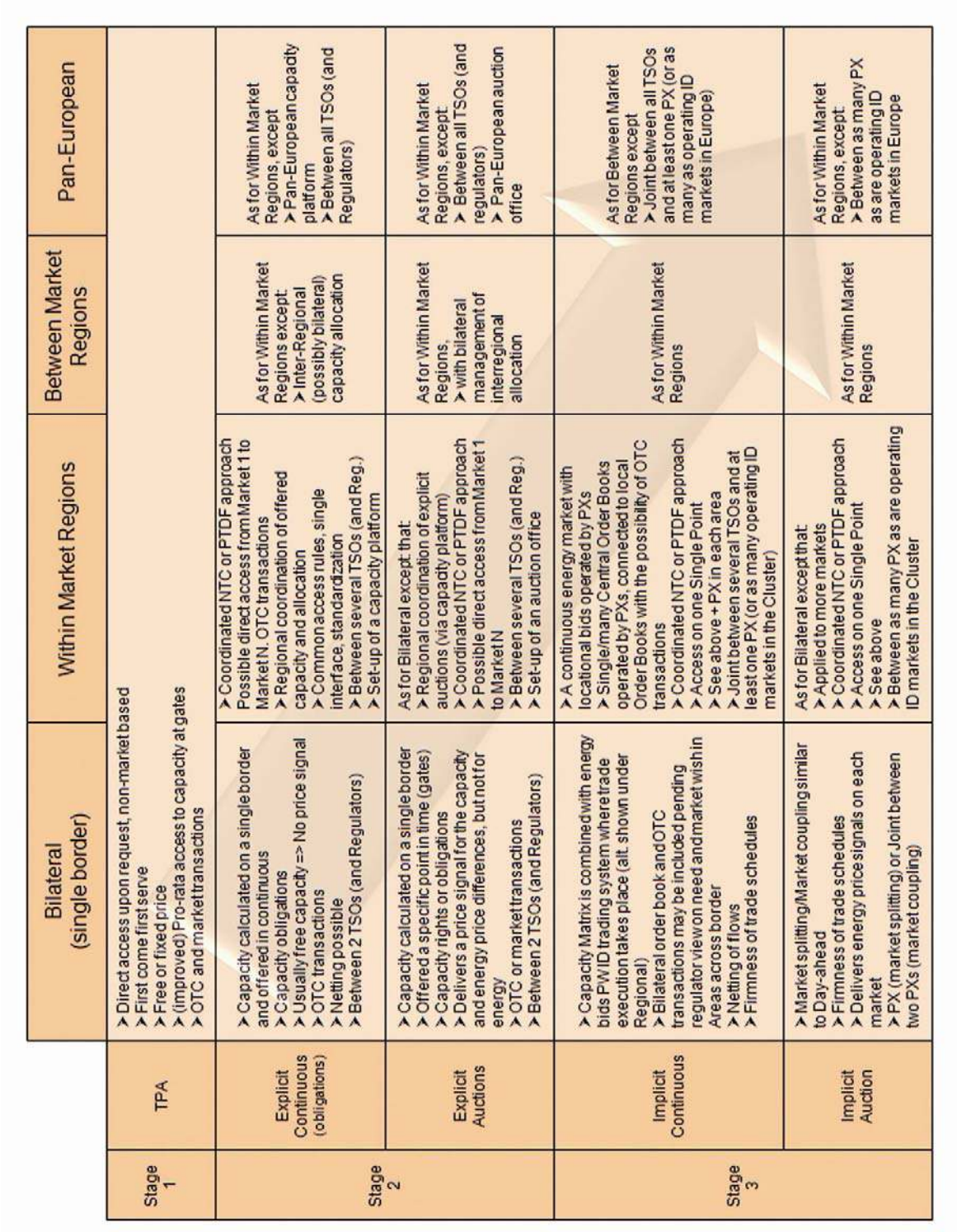
76. The first stage in the generic template are the third party access mechanisms. These are non-market based and not compliant with EC/1228/2003.

77. The second stage is the establishment of explicit auction systems or an explicit continuous allocation system. Both systems require harmonization of systems and rules among the participating TSOs and areas.

    a. The continuous explicit system allocates capacity on a first come first served basis. The capacity could be offered for free or at a pre-defined price. If the allocation is for transmission obligations and not transmission rights then netting becomes possible. The mechanism is not able to generate a price signal for the capacity. Compliance of this system with EC/1228/2003 needs to be assessed.

    b. Explicit auctions allocate capacity through an auction mechanism at specific moments during the day (gates), therefore generating a price signal for the intraday capacity. As for the continuous system, capacity can be allocated as rights or obligations. In the latter case netting is possible.

Figure 7 **Intraday Capacity Allocation Template**



78. The third stage is the establishment of implicit systems where the capacity is allocated at the same time as the establishment of an energy obligation. This appeared to be the favored approach from the consultation responses.

a. Implicit solutions can be organised as a continuous execution of energy deals in given bidding area(s) automatically combined with the capacity utilization needed to match the buy/sell volumes in the deal, or as a number of implicit market splitting/price coupling auctions at specific moments in time during the day (gates). It will require close collaboration between TSOs and PXs, harmonisation of cross-border rules and systems among the participating areas. In implicit trading, automatic netting of available capacity is performed.

b. The continuous implicit system makes use of a capacity matrix combined with energy bids per bidding area in the PX ID trading systems. This leads to a central order book (COB) system (or multiple) for energy bids/offers and available capacities operated by PXs, and this COB is based on the connected local (bidding area) order books. It remains possible for TSOs to allow for OTC transactions of capacity bids running in parallel, but it requires a transparent way of showing when capacity is utilized that way and an automatic update of capacities in the COB system. As long as there is capacity available between bidding areas all energy bids in the COB are accessible for execution from the local order books, and whenever capacity in a given direction has been fully utilized, trades in that direction are no longer visible (executable) in the local order books, thus the market is split in two or more subsets where only executable buy/sell orders are visible on the local bidding area order book level. Accordingly bidding area (local) prices depend on available capacity between areas, and therefore different area prices may develop for a given trading period.

c. Implicit intraday market splitting/price coupling energy auctions operate in a similar way as market splitting/price coupling in the day-ahead market, consequently they have the same well known features as the day-ahead energy auctions. As for day-ahead auctions, they deliver a price signal for the energy in each bidding area, and congestion rents may exist in case of congested borders. Due to tighter time constraints for operation than the day-ahead auction market, it does require a very efficient coordination between the involved PXs and TSOs.

d. The two allocation methods – auctions and continuous - can coexist in the intraday timeframe and still ensure coherent market place. The auctions for all the remaining hours pool the available liquidity and provide the intermittent generation to effectively manage their market exposure, while continuous trading for all the hours that will not be auctioned any more, allow all the market participants to trade until close to real time, where system balancing will take place. Coexistence of the two allocation methods can deliver flexibility in continuous trading alongside efficient convergence of prices in auctions.

3.5 Consistency between time frames

79. There are important prerequisites or conditions to be fulfilled in order to make the whole market design or individual time frames functional and effective.

a. Spot markets must exist or be established on both sides of the congestion to allow for implicit auctions and/or financial transmission rights/derivatives.

b. For intraday allocation the solutions based on implicit auctions with pre-defined matching sessions would probably be based on the day-ahead market coupling solution, while for implicit continuous and explicit methods various arrangements are possible.

c. When an NTC method is used for capacity determination, all capacity allocation methods can be used starting from bilateral explicit auctions to regional price coupling mechanism. The NTC method has no limits concerning use in different time frames.

d. Use of a flow based method for capacity determination is potentially useful for regional and inter-regional solutions where there are interdependent flows. The flow based method seems to be more relevant and effective for the time frames near to the time of operation – i.e., day-ahead and intraday allocation – than for longer time frames.

e. When coordinating projects over the European region, the focus should be on introduction of capacity allocation mechanisms allowing and supporting market integration – i.e., implicit auctions - while the capacity determination methods currently are under development.

4 Present situation and initiatives

80. This chapter gives an overview of the present situation for day-ahead markets. The chapter also contains an overview of initiatives for further integration through improved congestion management.

4.1 Present situation

81. Four regional implicit auction schemes are now operational.[3] This is shown in the figure below.

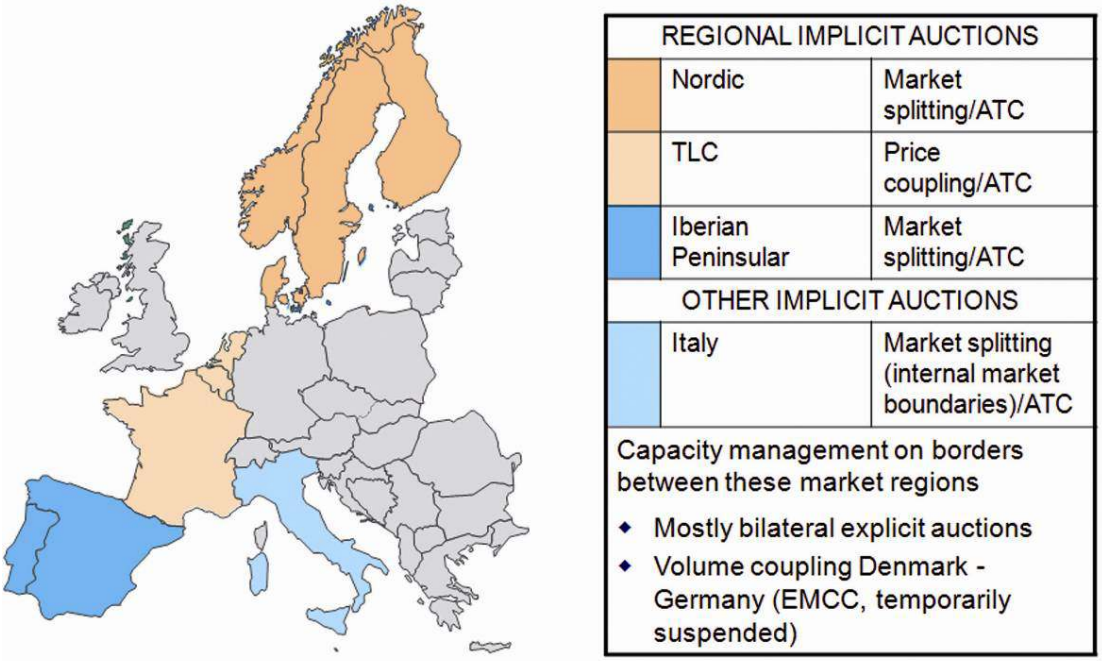
82. Progress to date has been successful where there has been close alignment of interests among the local stakeholders – in particular, where TSOs and power exchanges have had the incentive to lead the process (bottom up).

83. These regional allocation solutions have been developed largely independently within each region, with little Europe-wide coordination or direction. Each has tended to adopt partly unique technical and governance approaches.

84. Implicit auction solutions address capacity allocation on the borders within the group of markets, and are dependent on the existence of a power exchange in each bidding area. Most of the existing solutions use price coupling (including market splitting which is a form of price coupling where only one power exchange operates several individual bidding areas). Explicit auctions are generally used to allocate capacity between the different Market Regions.

[3] Including Italy, which is a market splitting solution to allocate capacity *within* Italy between seven separate bidding areas

Figure 8 Market Regions where implicit auctions are established.

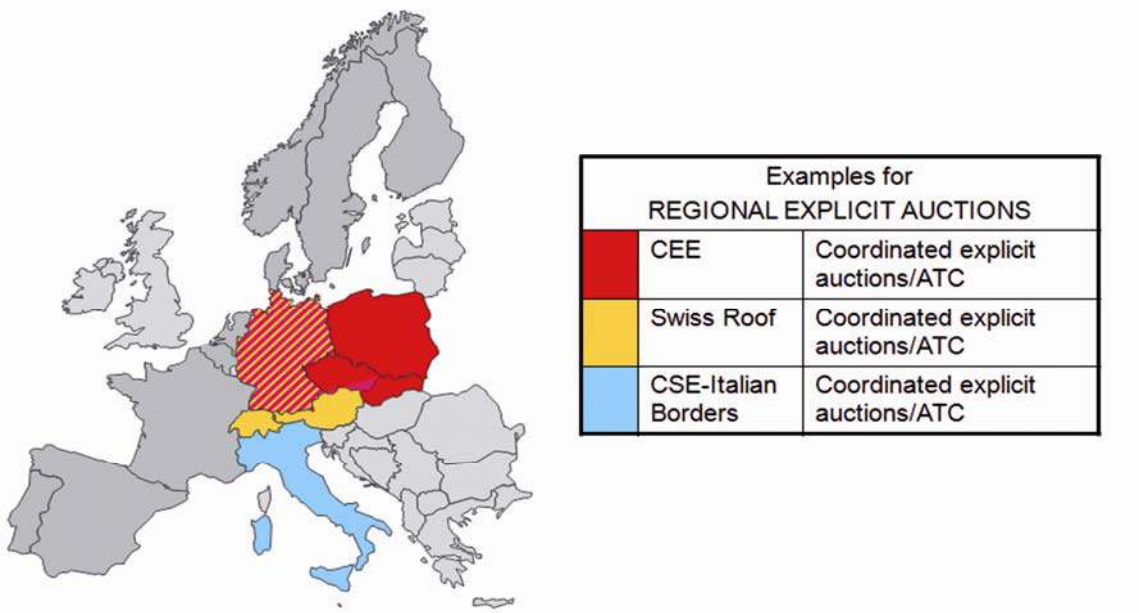


85. The EMCC market coupling between Denmark and Germany (started in September 2008; currently suspended but expecting to be operational in 2009) is the first instance of an alternative to price coupling, namely tight volume coupling. EMCC uses an implicit auction to determine the optimal flows between Denmark and Germany. These flows are then included in the spot market price calculations performed by Nord Pool Spot (NPS) and EEX, which in the case of NPS also determines the flows within the Nordic region.

86. The Spanish Market (Day-ahead and Intraday), has since 1998 accepted bids for energy to be produced or consumed outside the Spanish electrical system in all the different countries with which Spain has a border. During the matching algorithms bids that are economically viable are matched, up to the limit of the commercial capacity published by the System Operator for each individual border in a one side Implicit auction. Since July 2007 the MIBEL started to be a full market splitting for Spain and Portugal, and the one side implicit auction is still applied to other borders of the Iberian Peninsula (the COMELEC network in North Africa). Since June 2006, explicit auctions have been used for allocating yearly, monthly, day-ahead and intraday capacities on the French-Spanish border.

87. There are also a number of coordinated regional explicit auctions mechanisms now operational. Examples are shown in the figure below:

Figure 9 Borders with coordinated regional explicit auctions.



88. Regional explicit auction solutions are border specific. It is, therefore, possible for each TSO to be involved in more than one regional solution.

89. In the current regional explicit auctions, capacity is allocated according to a harmonised set of rules across several borders. In a more fully coordinated mechanism, capacity allocated on one border can influence the capacity allocated on others.

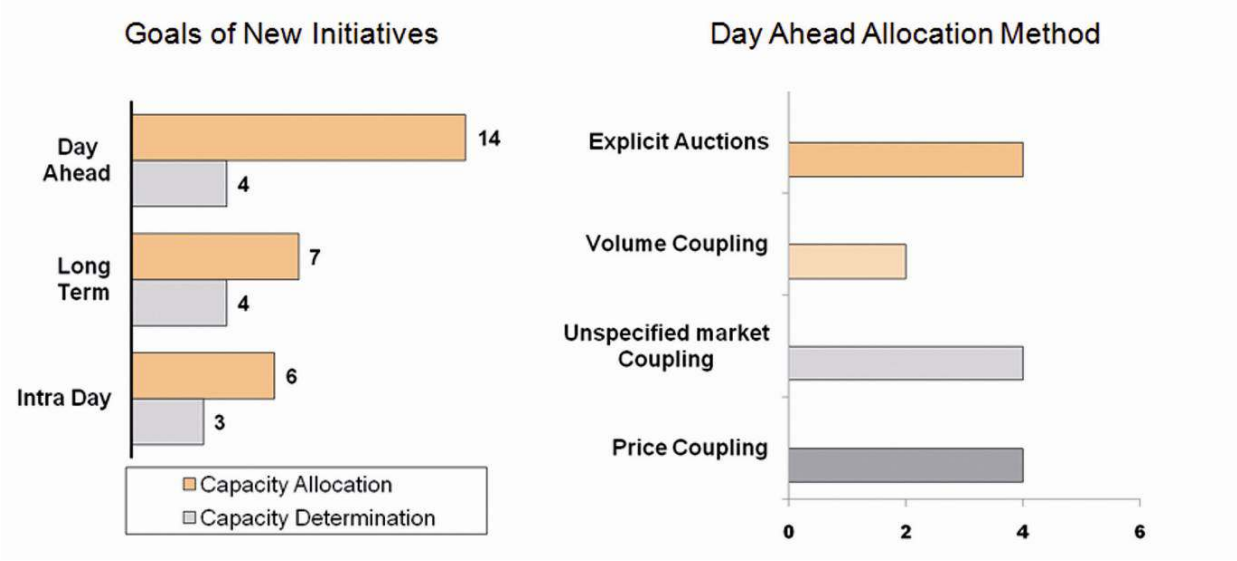
4.2 Current initiatives

90. ETSO and EuroPEX carried out a survey of PXs and TSOs to identify the current initiatives that are working towards further integration of the power markets. Questions regarding the type of improvements, participating parties, obstacles, etc. were asked.

91. The importance of the day-ahead timeframe is reflected in the mix of initiatives currently underway, with the majority addressing day-ahead capacity allocation. Of the 16 initiatives identified, 14 were addressing day-ahead capacity allocation (each initiative may address solutions in more than one time frame). This is shown on the left hand side of the figure below.

92. Of the 14 initiatives looking at day-ahead capacity allocation, 10 were looking to implement market coupling solutions (implicit auction). This is shown in the chart on the right hand side of the figure.

Figure 10 **Replays to the survey of regional initiatives.**

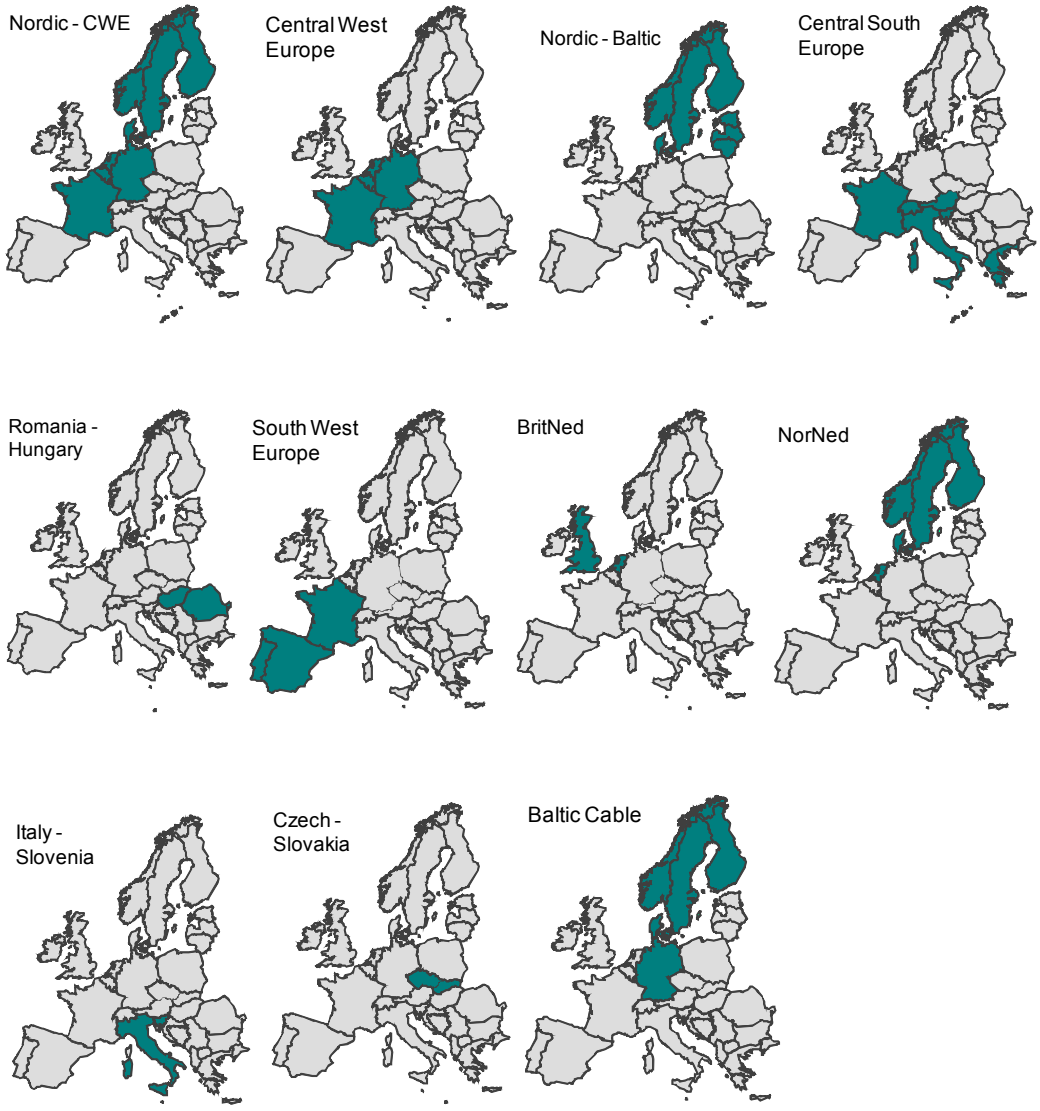


93. Not all initiatives were equally well advanced, and in some the parties involved are still uncertain about which form of implicit auction to adopt: price or volume coupling. Of the initiatives that are clear on the proposed solution, all are seeking either price coupling or tight volume coupling. None claim to be adopting "loose" volume coupling. However, tight and loose are relative terms – and even tight solutions may turn out to have an element of "looseness".

Implicit day-ahead capacity allocation initiatives

94. There are eleven day-ahead market coupling initiatives identified from our survey. In the Northern and Western parts of Europe there is a complicated pattern of initiatives, building against an already well developed set of Market Regions (Nordic, TLC and Mibel). All identified European initiatives are shown on maps below, where the involved countries are marked in green.

Figure 11 Maps showing the areas included in various market coupling initiatives.



95. These initiatives can be grouped into two different types:

a. Horizontal extension of existing Market Regions to additional markets (e.g., CWE, Nordic-Baltic). These initiatives are reported to be progressing reasonably well, led by the TSOs and PXs involved and requiring only limited support and direction from regulators.

b. Coupling impacting more than one existing solution or where the solution is not well defined (e.g., Nordic-CWE, South West Europe, BritNed, NorNed). These initiatives are reported to be progressing less well. Problems frequently cited include governance and organisational arrangements, technical solution, interaction/dependency with other initiatives, impact on existing arrangements and related harmonisation issues. Some are largely led by the TSOs and PXs involved, others are more controlled by regulators and/or governments.

96. In Southern and Eastern Europe, the emergence of regional solutions is less advanced (with the exception of Italy that already has a solution, albeit only within its national borders). These initiatives can be divided into two groups:

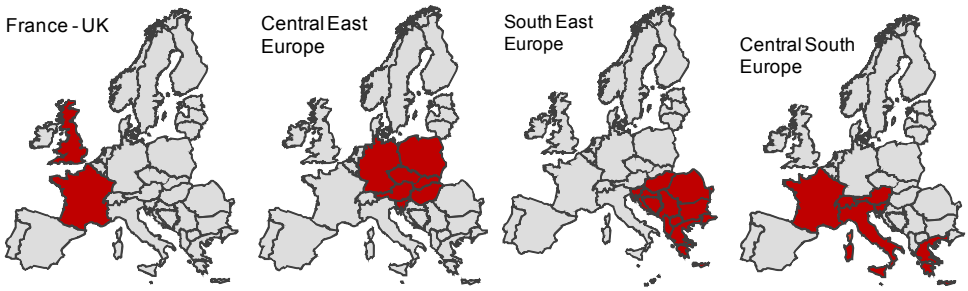
a. Price coupling between certain pairs of markets (Hungary- Romania, Czech Republic-Slovakia). These solutions could eventually become the basis for a wider regional solution, but there is no clear plan on how Market Regions will emerge. Problems cited include the governance and organisational arrangements, conflicting regulatory requirements and getting adequate participation from all necessary parties. Generally there is a relatively high degree of "top down" influence from regulators and/or governments.

b. Market coupling in the CSE region. This is at an early stage and faces key design issues regarding the interaction with the CWE market coupling and the impact of the different market arrangements across the region. A more focused initiative just involving Italy and Slovenia is proposing a volume coupling, but it now faces the next challenge of getting full participation from all relevant parties.

Explicit day-ahead capacity allocation initiatives

97. Four day-ahead regional explicit auction initiatives were identified from our survey. These initiatives address the borders between the involved countries. The maps below show the countries involved in the various initiatives.

Figure 12 Maps showing countries covered by initiatives to establish explicit auctions.



98. The initiatives are at different levels of development, and all generally have a relatively high degree of "top down" influence from regulators and/or governments. Problems frequently cited include the governance and organisational arrangements, technical solution, getting adequate levels of participation from all necessary parties, and conflicting regulatory requirements.

5 Road map

99. The current picture of day-ahead capacity allocation initiatives is complex and confusing, with some initiatives potentially overlapping or being dependent on each other, and it is not clear how these issues will be addressed. This could result in progress on many regional initiatives being stalled. The day-ahead congestion management solutions either in operation or under development across Europe tend to be regional in focus and do not together comprise an integrated European solution. There is a need for greater clarity on how different initiatives fit together, particularly with respect to the implicit auction initiatives.

100. The day-ahead template can be modified to show the level of integration within a Market Region on one dimension, and between other Market Regions on the other, as shown below. For simplicity, only the likely options need be considered:

    a. Within a Market Region: bilateral explicit auctions (between individual markets, implying no "regional" solution), coordinated explicit auctions and price coupling,

    b. Between Market Regions: explicit auctions, loose volume coupling or tight volume coupling.

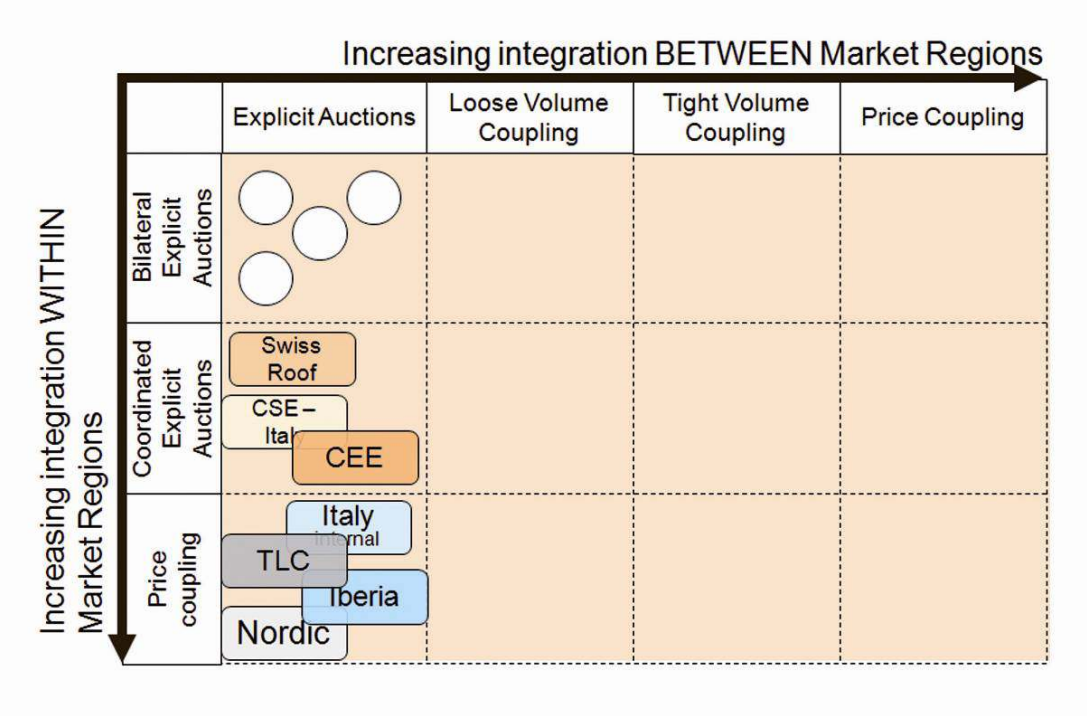
101. Existing markets can then be placed on this modified day-ahead template:

    a. Several markets are not part of any formal regional solution, and are linked simply by bilateral explicit auctions. This is shown with the white circles in the top, left corner.

    b. Four regions (Swiss Roof, CEE, Western German border and Italy-CSE) have established coordinated explicit auctions within themselves, and bilateral explicit auctions to other markets or regions. These are shown in the middle, left cell.

    c. Four price coupled Market Regions have been established (Nordic, Iberia, TLC and Italy on its internal boundaries); but all use bilateral explicit auctions to other markets or regions. These are shown in the bottom, left corner.

Figure 13 **The Market Regions in Europe sharing a common congestion management method for the day-ahead market.**



102. From this position, there appear to be two main ways forward:

a. Creation of a pan European price coupling solution, through a process of progressive horizontal integration among existing Market Regions and/or individual markets, or

b. Creation of a flexible interregional Dome coupling, initially covering certain Market Regions and subsequently extended

These two alternatives are further explained in the sections below.

5.1 Alternative 1: Extended Price Coupling

103. Price coupling across Europe can be designed in a gradual integration perspective. Two steps, which are illustrated on Figure 14 and Figure 15, have been identified:

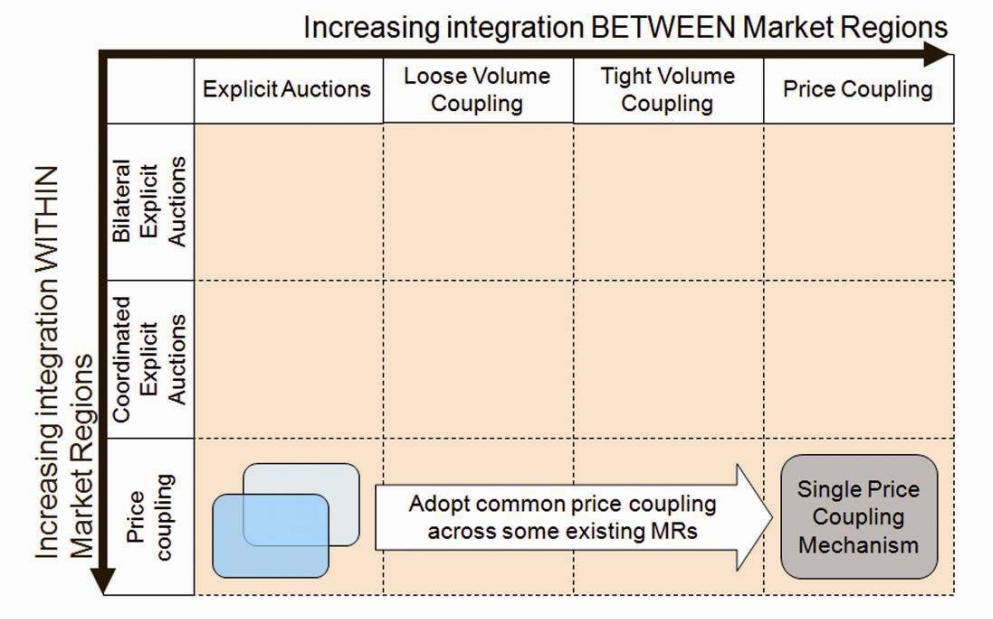
a. In existing Market Regions that are ready to establish a single price coupling contractual arrangements offer a way of progressive integration, building on local competencies.

i. As a single common algorithm calculates prices and volumes across the involved areas, local market access and clearing/settlement arrangements remain an individual PX responsibility. The single algorithm should be the jointly owned and operated by one or several PXs.

ii. Capacity on other borders, for example to other markets or Market Regions, would be allocated using explicit auctions.

iii. The initiative must be open to all markets or Market Regions to join, and must be designed (in terms of governance, contractual and technical requirements) to facilitate gradual extension.

Figure 14 **The first step to establish price coupling across Europe.**

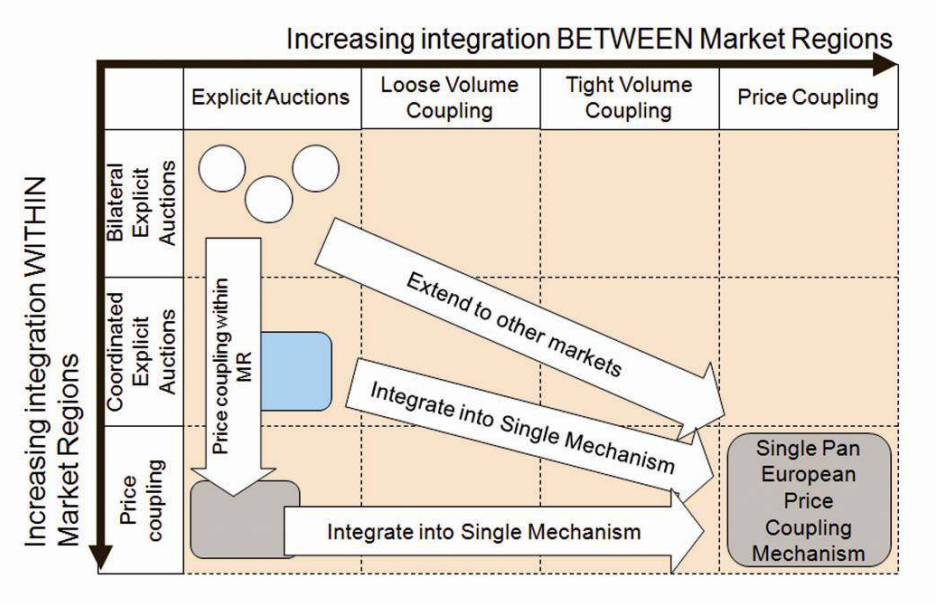


b. Subsequently, the geographic scope of the solution can be gradually extended to include other markets - i.e., horizontal integration.

i. The geographic scope of the solution can be extended to include adjacent markets.

ii. Equally, other markets may have formed their own separate market regions: either Coordinated Auctions or Price Coupled. The markets in these other MR solutions would eventually also join the single mechanism (replacing their separate MR solutions).

Figure 15 **The second step to establish price coupling across Europe.**



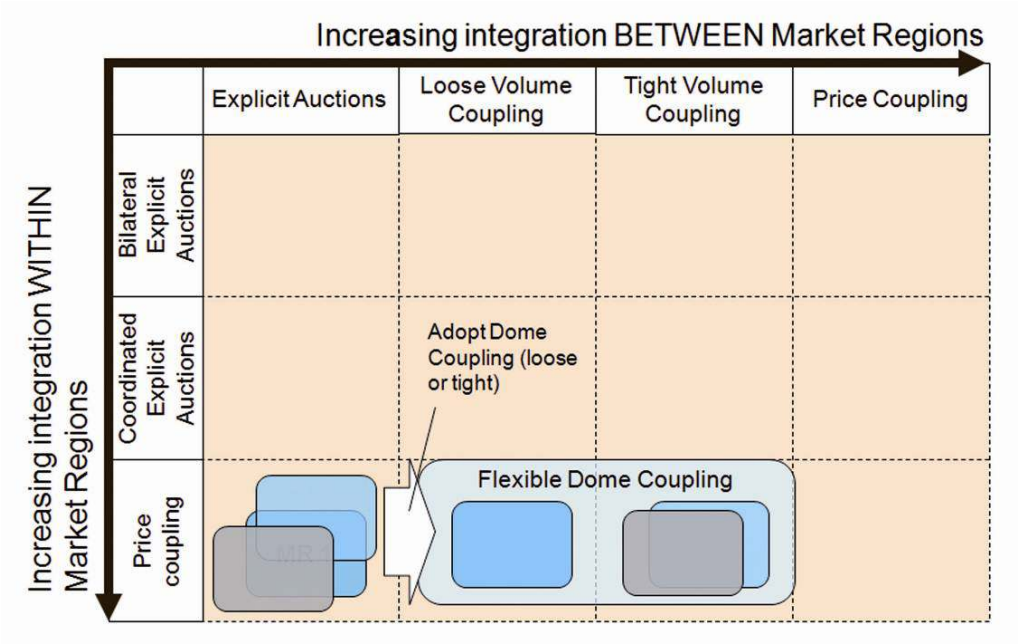
104. This progressive integration process may eventually result in a single pan European price coupling mechanism, or instead with a fewer number of Market Regions: indeed, the benefits of further extending or joining price coupling solutions could become more limited as the integration process develops, compared to the efforts needed. In that case, the remaining Market Regions will be connected by explicit auctions.

5.2 Alternative 2: Dome Coupling

105. The flexible Dome Coupling offers a way to link independent Market Regions using volume coupling. It offers a framework under which further geographic extension and increased integration can be achieved over time.

a. The first step would be the creation of an interregional Dome coupling, able to support both loose and tight coupling, between suitable Market Regions. The individual Market Regions would retain their own regional solutions, under the Dome Coupling.

Figure 16 **The first step to establish Dome Coupling across Europe.**



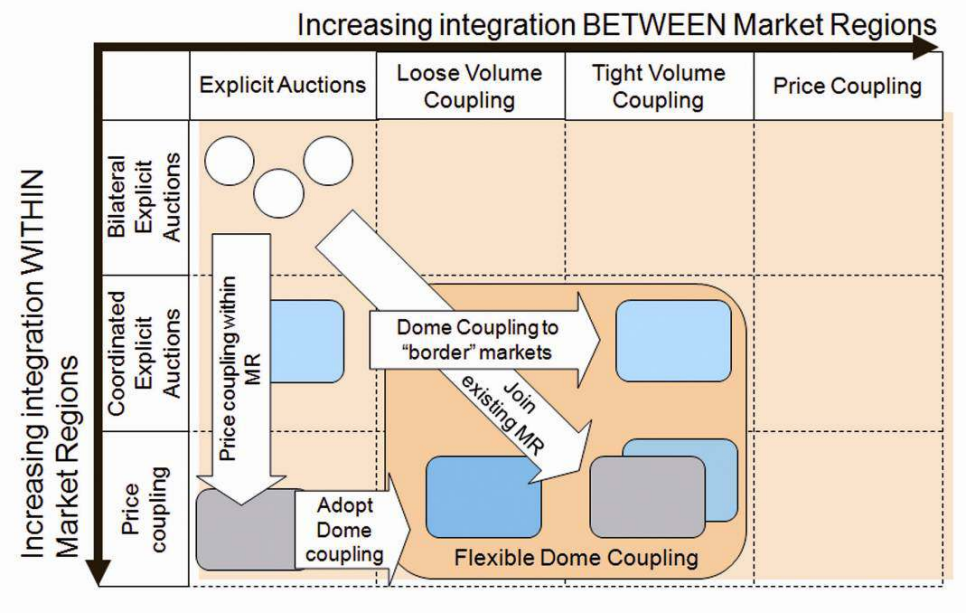
b. The second step is the integration of other markets: either

i. Markets can join an existing Market Region that is already under the Dome Coupling (i.e., horizontal integration), or

ii. Market Regions with coordinated explicit auctions can be integrated via market coupling on their interregional borders, or

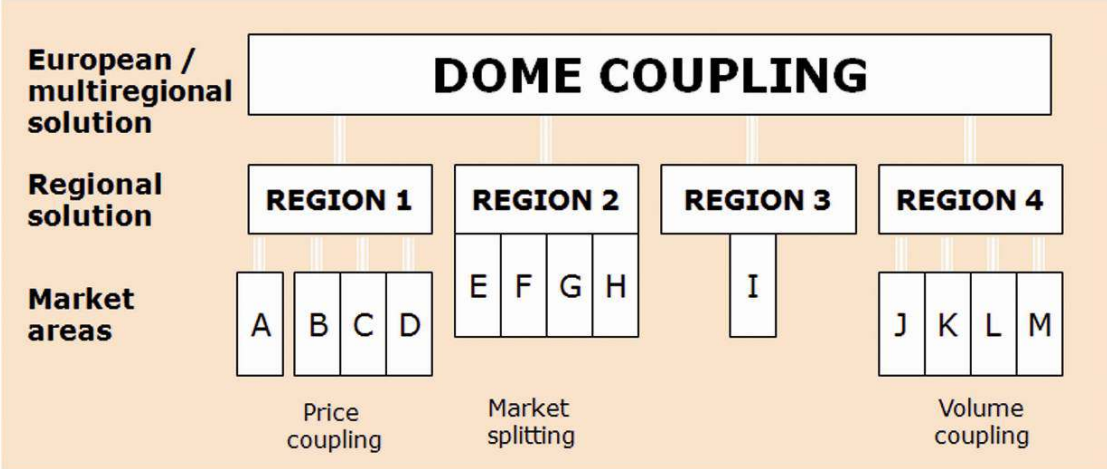
iii. Markets can form a new price coupled Market Region, which then comes under the Dome Coupling in its own right.

Figure 17 **The second step to establish Dome Coupling across Europe.**



106. The result corresponds to the description of the Dome Coupling in the Interim Report. The Dome Coupling calculates the interregional flows. This may be tight or loose depending on whether all regional market rules and data are fully replicated in the Dome Coupling or not. Individual Market Regions have their own solutions to then calculate prices and flows within their regions. The internal solution can be price coupling, market splitting or coordinated explicit auctions.

Figure 18 Dome coupling as presented in the Interim Report.



107. The Dome Coupling solution can subsequently evolve and develop. There are a number of alternatives:

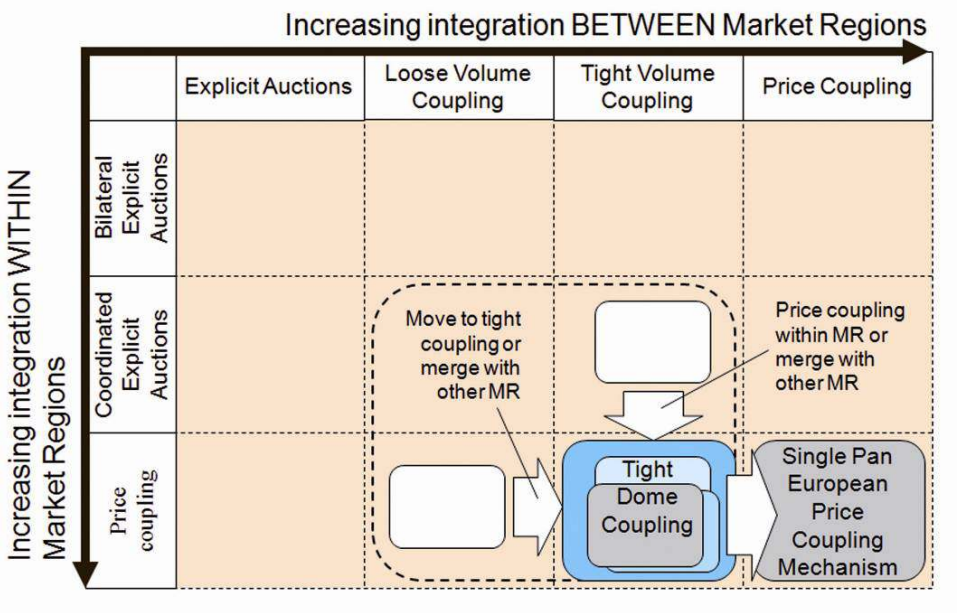
a. Loose volume coupled Market Regions can adopt tight volume coupling, as the technical/governance and harmonisation issues are resolved.

b. Coordinated explicit auction regions can adopt price coupling, once liquid markets are established in at least some of the markets within the region

c. Market Regions can merge, creating fewer, larger Market Regions (i.e., horizontal integration)

d. Ultimately, a single pan European price coupling may emerge, as illustrated in the figure below. However, the efforts needed to achieve such an outcome will be the same as in Alternative 1 (Extended Price Coupling).

Figure 19 Further development of the Dome Coupling into price coupling across Europe.



5.3 Comparing the two alternative road maps

108. A number of specific issues need to be resolved in order to determine the optimal solution for Europe. Various aspects of the two alternatives are discussed below.

109. Extended Price Coupling gives the optimal outcome in the sense that the prices in all bidding areas reflect the marginal bid available to that area. The gain of this compared to tight volume coupling will depend on local circumstance and hence vary from case to case. The performance of loose volume coupling will be highly dependent on local circumstances. It may give results nearly as good as tight volume coupling or it may be significantly inferior.

110. It is clear that price coupling requires greater harmonization than loose volume coupling. It is however still unclear exactly what must be harmonized and this should hence be further investigated.

111. Price coupling is already established in several regions, for instance Nord Pool, Mibel and TLC. It is hence possible to draw on experience from established solutions.

112. The Dome Coupling allows for diversity between the integration of various pairs of Market Regions. This road map may also allow for future flexibility and has the ability to develop into price coupling at a later stage. However, to reach that latter stage, the technical and governance requirements of Dome Coupling may be comparable to the ones needed for Extended Price Coupling.

6 Conclusions

113. For day-ahead allocation, regional market coupling solutions are now established in four market regions, three international (Nordic, Iberia and TLC) and one national (internally in Italy). Coordinated explicit auctions are established in CEE, CSE, Western German borders and the Swiss Roof. Further work is underway in several other areas.

114. Most initiatives are, however, inward looking in that they only address borders between the markets in the particular Market Region. There are some initiatives looking to establish integration on the outward facing borders, to individual markets or other market regions. Some approaches are in effect an extension of an existing market region (e.g., Nordic-Baltic) whereas others potentially imply an interregional solution between discrete MRs (e.g., CWE-Nordic, Italy-Slovenia, Iberia-CWE, South Central Europe). However, even these initiatives tend just to involve the parties directly impacted, and there is little coordination of approach between the initiatives.

115. A further consideration is the wider applicability of any solution across Europe. An approach that may enable integration of two or more Market Regions could become a barrier to a single European solution if it is not suitable for extension to other markets. In particular, there are real risks of there being insufficient co-ordination:

a. Incompatible solutions could develop in Market Regions which could prevent closer cooperation in the future or the potential for extension in the future.

b. Sharing of experience and knowledge is weakened.

c. Initiatives addressing similar issues have tended to engender a competitive situation, which weakens the long term coordination required for a pan European solution.

116. The project has reached the following conclusions with respect to the current situation in respect of market integration initiatives and the needs and requirements looking forward:

- There has been good progress to date in developing solutions to the integration of markets at the regional level, with implicit price coupling mechanisms or coordinated explicit auction mechanisms now established in large parts of Europe.

- The ERIs have contributed a significant impetus to this, but the overlapping regional approach is becoming a barrier to implicit day-ahead coupling solutions (a particular bidding area can only be involved in one price coupling mechanism).

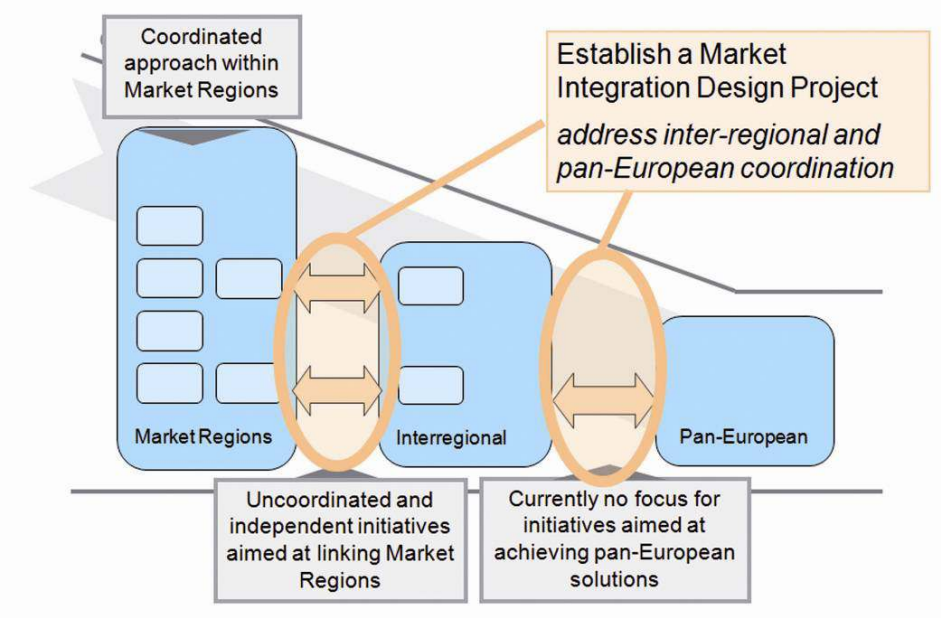
- There are a few examples of integration initiatives between Market Regions making progress, but little evidence of a coordinated European approach applied to their development or implementation.

- A more coordinated and consistent approach is needed if both initiatives within and across market are to effectively align in a way which enables them to contribute to a seamless and integrated market at the pan-European level.

- A more top down approach appears necessary to provide better coordination to the development of market integration design(s) supporting pan-European integration, together with any implications for local market rules.

- The current bottom-up approach should continue to deliver practical solutions at both the regional and interregional level: the top down approach should complement this.

Figure 20 **Illustration of the conclusions that there is coordination within Market Regions, but very little between.**



117. Today we see an approach to market integration driven primarily by the Electricity Regional Initiatives. This approach has provided a framework for progress and for a degree of coordination at regional level. Several examples of market integration are either already implemented or in progress at the regional level. However, fewer initiatives addressing inter-regional issues are underway and it can be observed that these are not well coordinated and are largely being developed independently. Of most concern is the fact that there is no evident means or focus for addressing the coordination of inter-regional design work such that the market integration solutions being considered are compatible with the eventual aim of achieving a pan-European solution.

118. It is now essential, at this stage to address this apparent lack of coordination and to focus on the more fundamental design elements which will facilitate a pan European outcome.

119. Irrespective of which path of integration is taken - i.e., Extended Price Coupling or Dome Coupling - the need for Europe-wide coordination and focus is essential. Both Extended Price Coupling and Dome Coupling require a set of all inclusive European arrangements in order to evolve into a robust pan-European solution.

120. Next steps need to address this lack of coordination and focus on the pan European outcome. There are four broad and interacting elements contributing to the likely success of pan European projects: *robust and consistent design, continued progress, decision making, and legal and regulatory environment.*

a. ***Robust & Consistent Design***. There is a need to establish common design principles for existing and future work to achieve integration between Market Regions. The aim should be a design that achieves:

   i. An appropriate level of harmonisation

   ii. Suitability and flexibility for range of situations

   iii. Facilitating progress, at potentially differing speeds in all regions

   iv. Wide ranging acceptance amongst key stakeholders, Europe-wide

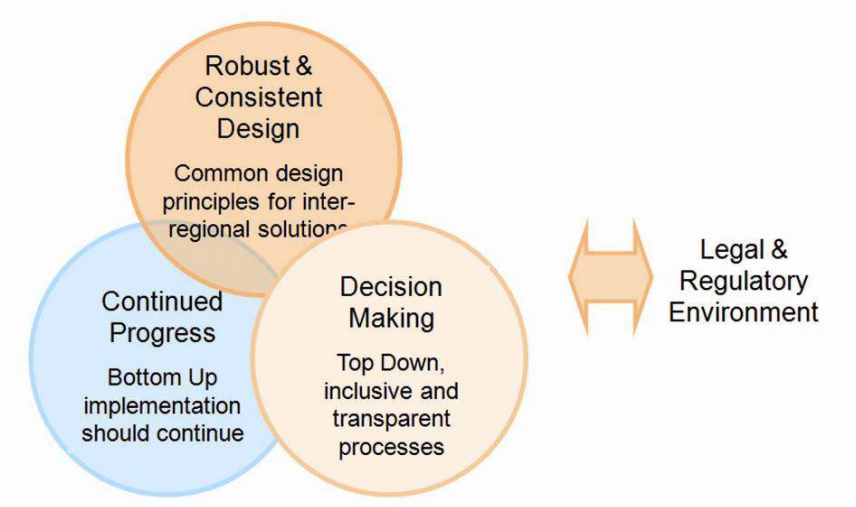
   v. Responsiveness/adaptability to new requirements

b. ***Continued Progress.*** It is essential that current progress is not slowed and that the parties involved today (TSOs, PXs and, as applicable, other stakeholders) remain at the heart of the implementation processes, whilst being guided by more consistent design principles and top down decision making processes where necessary.

c. ***Decision Making***. The addition of a decision making forum is needed to provide a greater top down direction. Decision making needs to seek consensus on the direction of the project proposals and adopt inclusive and transparent processes.

d. ***Legal and Regulatory environment.*** Any such initiative needs to recognise and operate within the context of the current and anticipated Legal and Regulatory environment (the 3rd package and other legislations). These developments are likely to have increasing impact and influence over the solutions considered and it is essential that an active two way interaction with the market integration design developments is established at the earliest opportunity.

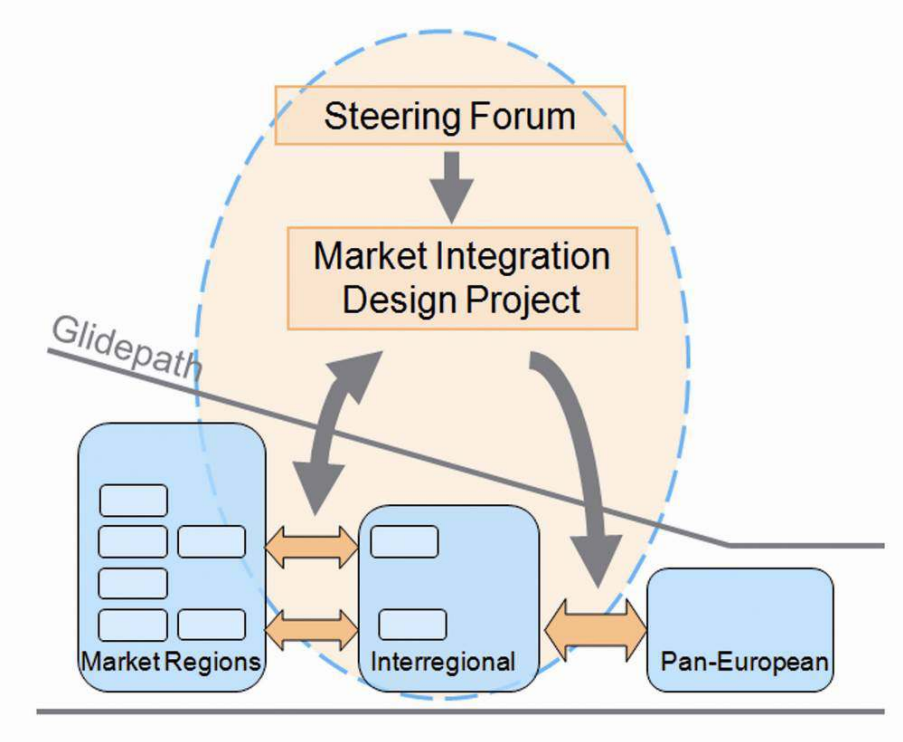
Figure21 Interacting elements contributing to the likely success of pan European projects.



7 Next Steps Proposal

121. The project proposes the establishment of a 'Market Integration Design Project', with a structure designed to address the four key elements for success identified above. There is a need to establish a well structured and appropriately resourced project.

Figure 22 The next step in European integration of congestion management should be establishment of a project focusing on interregional coordination.



122. The Market Integration Design Project can be considered broadly as the combination of two forums as follows:

a. A structured and detailed design project addressing technically oriented market integration solutions at Interregional and pan- European level and across all market timeframes. The key participants in the project would be highly focused experts from TSOs and PXs since these are the parties with the necessary design, implementation and operational experience to deliver solutions.

b. A body acting as a 'Steering Forum' providing direction, guidance and decision making for the design project activities. The proposed key participants in this forum are: EC, ERGEG, ETSO, EuroPEX, energy market participants and other stakeholders represented through established (European) associations, notably Eurelectric and EFET.

123. A clear linkage with respect to the design solutions has to be established with the ongoing Legal and Regulatory developments, in particular the Network and Market Code

development processes envisaged in the 3rd legislative package. It has yet to be established how the work of the Market Integration Design Project and the ongoing development process for Framework Guidelines and Network Codes will interact, and this will need to be considered further in the appropriate forum.

124. Clear terms of reference need to be agreed for the Steering Forum and the Market Integration Design Project covering roles, composition/resourcing, communications and decision making.