Capacity booking platforms assessment

Final report

Client: E-Control contracting lead (EU NRAs and ACER)
Date: 15 September 2015 (all data in report updated as of 19 August 2015)
Version: V3.5 issued for distribution

Reputation built on results

Contents

Executive Summary

- The EU NRAs and ACER have requested that Baringa analyse the current degree of implementation of the relevant European requirements by the three gas capacity booking platforms and their respective operators (GSA by GAZ-System, PRISMA by PRISMA and RBP by FGSZ) with a focus on Commission Regulation (EU) No 984/2013 of 14th October 2013 establishing a Network Code on Capacity Allocation Mechanisms in Gas Transmission System (NC CAM). A number of other associated requirements were also captured and analysed.
- We have assessed compliance on the different aspects on the basis of the required functionality being available in the production environment i.e. the environment used to run the live auctions.
- At the time of writing (August 2015), GSA is non-compliant on five out of twelve NC CAM legal requirements, PRISMA is non-compliant on one out of twelve, and RBP is non-compliant on five out of twelve. The roadmaps for both the GSA and PRISMA platforms include the implementation of functionality for full compliance with all twelve CAM NC requirements prior to 1st November 2015 . The features planned for RBP include the implementation of functionality for compliance with two additional requirements, with two remaining requirements (1:n bundling and competing capacity) to be determined for inclusion at a later stage.
- Both GSA and RBP meet the majority of the other EU NC associated requirements at either a basic level of compliance or as part of the platform roadmap for implementation prior to 1st November 2015. PRISMA has a high overall level of compliance with all EU NC associated requirements.
- Due to its extended history, large number of users and independent governance and development, PRISMA is functionally rich and is currently able to deal with more complex situations (e.g. competing capacity, buyback, surrender) than both GSA and RBP. However, the cost for PRISMA is typically higher for TSOs than the cost for either GSA or RBP.
- TSOs will be obliged to meet the terms of the NC CAM by 1 November 2015. The TSOs on either side of an IP will have to work together to determine the solution to be adopted for that IP. In consideration of this, they will need to manage the risk that the chosen platform may not fully meet the requirements of NC CAM. Regulatory intervention may be required in the event of a dispute between the TSOs in the choice of platform for an IP.
- This study has also considered the potential for interoperability across the platforms and there does not appear to be an easy solution to this – a simple “front end” interoperability may be lower cost but not deliver much benefit, whereas a completely interoperable system is likely to be very complex, expensive and take many years of development.

Context and Scope

Recap on our assignment

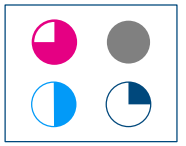
- Baringa partners were asked to analyse the current degree of implementation of the relevant European requirements by the three booking platform operators (GSA, PRISMA and RBP) with a focus on EU NC CAM. Other associated requirements were also captured and analysed.

- The study aims to capture the status quo as of July/August 2015 with an anticipated outlook on compliance by 1st November 2015.

- This study was and is being undertaken by EU NRAs and ACER (with a contracting lead E-control) In order to meet the Madrid 27th EU Gas Regulatory Forum invitation, as a basis to support a legally compliant and fully operational co-operation model between the platforms.

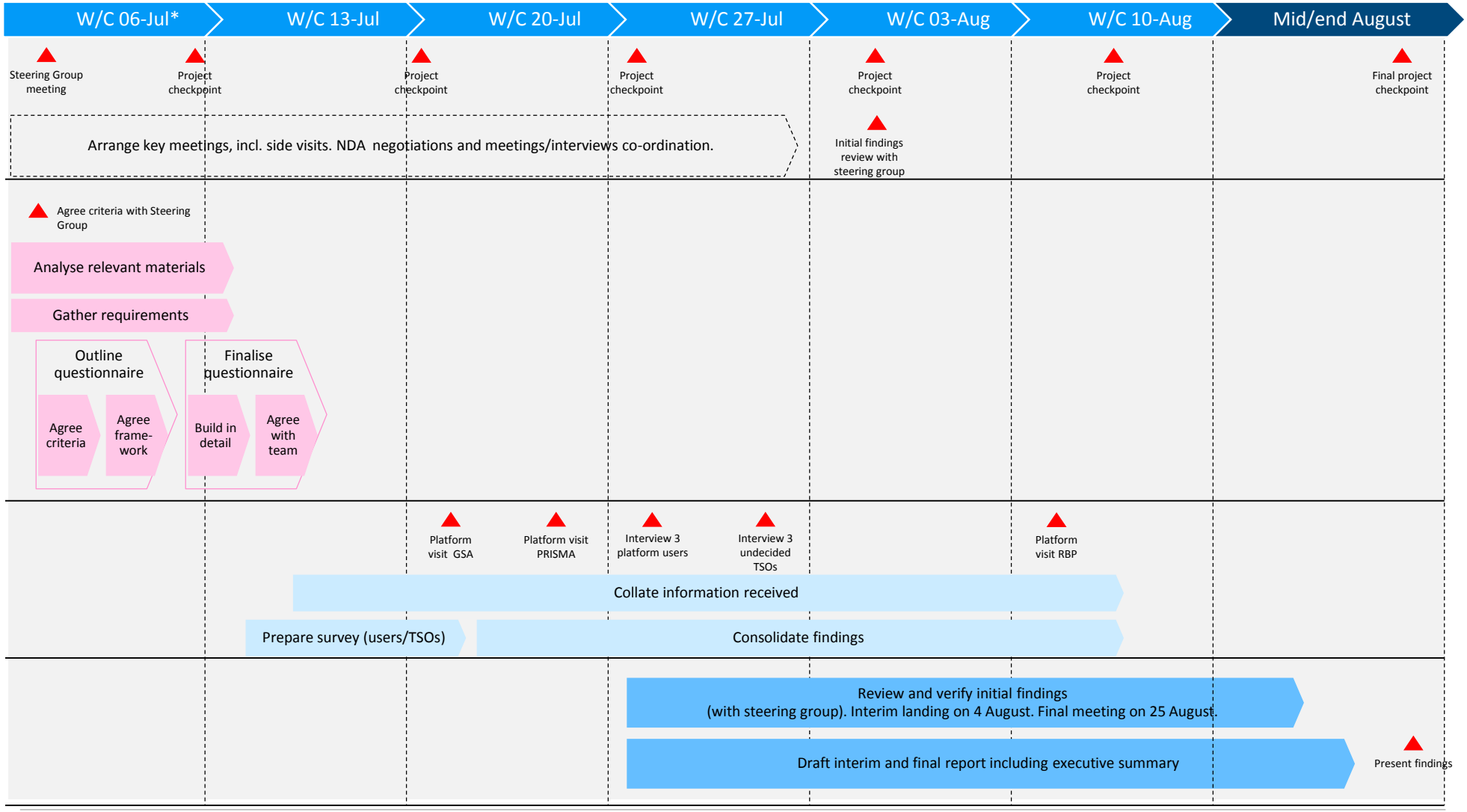
Approach

Overview of our approach

Phase	1. Establish scope / initialise	2. Agree requirements and numerical weighting	3. Develop questionnaires	4. Platforms testing; other info gathering	5. Consolidate responses and verify	6. Present findings
	PRISMA EUROPEAN CAPACITY PLATFORM RBP REGIONAL BOOKING PLATFORM GAZ system					
Activities	• Analyse the relevant booking platform materials, and work with you to ensure the appropriate information is included in the study • Confirm scope, assessment criteria and weighting • Plan meetings and teleconferences	• Work with Steering Group to agree the assessment criteria for coverage (=requirements) • Establish high-level framework for questionnaire • Agree numerical weighing of components of analysis, resulting in scorecard	• Draft detailed questionnaires around the framework • Collaborate with you to ensure completeness of the questionnaires	• Carry out questionnaire to extract key data for analysis of platforms • Carry out on-site testing of platforms in accordance with 5 scenarios • Interview undecided TSOs (Net4gas, Eustream, Plinacro), and survey other undecided TSOs • Survey 5 platform users in personal phone interviews (approached via EFET: Axpo, ENOI, Centrica, Engie and RWE).	• Finalise questionnaires for analysis • Allow platforms time to respond, addressing any questions • Complete analysis of responses	• Create final report and executive summary • Present findings to Steering Group
Deliverables	✓ Project scope agreed ✓ Finalised project plan ✓ Agreed criteria and weighting	✓ Questionnaires framework agreed ✓ High level assessment for review (incl. scoring)	✓ Agreed, final questionnaires	✓ Raw data for analysis ✓ User and TSO surveys / interview results ✓ Testing results (internal)	✓ Finalised analysis ✓ Platform assessment results	✓ Final executive summary ✓ Final report ✓ Recommendations

Approach

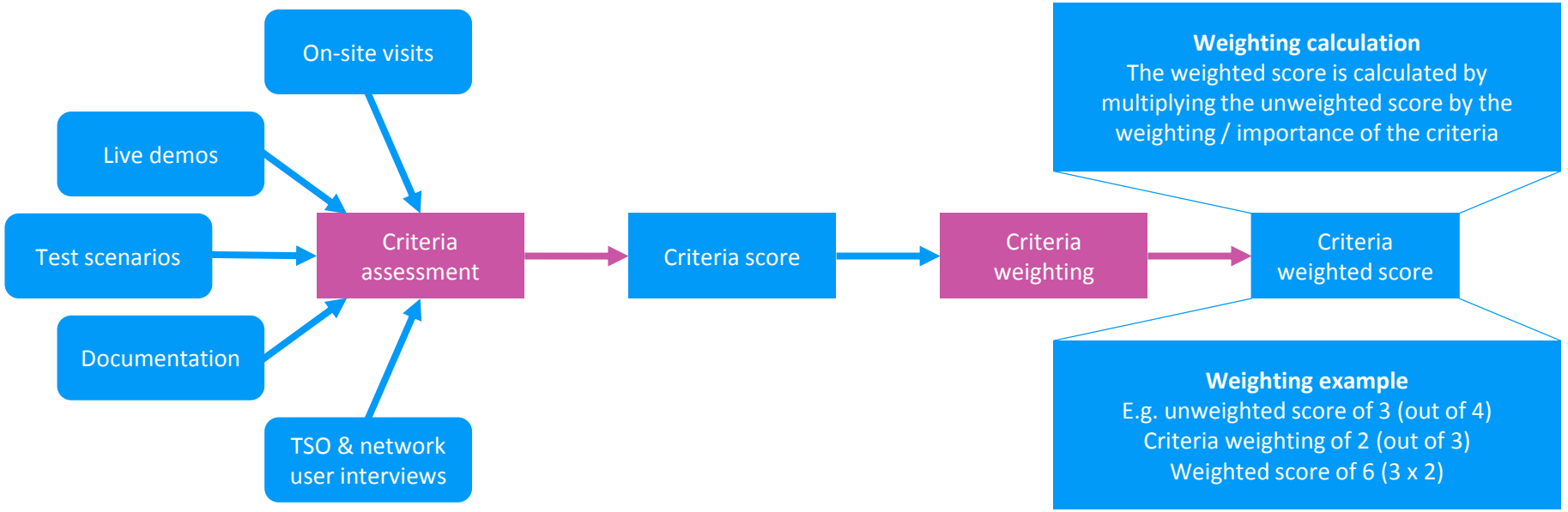
Timeline followed by project



Assessment methodology

Scoring process

- Information has been gathered through a combination of on-site visits, live demos, five test scenarios, the review of documentation, brief surveys to all EU undecided TSOs, 3 sample interviews with undecided TSOs and 5 sample network users (see appendix for more background). This data has been used to provide a score for each of the assessment criteria, which was then weighted according to the importance of each of the criteria.
- The scoring of criteria uses a 0 to 4 range (4 being the highest); for core and associated requirements, platforms are awarded one point for documentation, one point for live availability of the function, one point for this criteria having been met through demonstration during the study via a demo or testing, and one point for fulfilment of the CAM NC requirement.
- For enabling IT and user friendless requirements, platforms are awarded one point for live availability of any relevant function, one point for fulfilment of the criteria at a base level, one point for platform specific considerations of the criteria, and one point for a sufficiently mature implementation of functionality to meet the criteria.
- For those criteria where demonstration is not applicable (e.g. data security) or not included in CAM NC, one point has been reserved for matching leading practice regarding this criteria. For the avoidance of doubt, scoring is provided per criterion with no aggregation. Note that test scenarios (see appendix i) were used to confirm various functions are available in each platform, and should not be considered as extensive testing. The functionality can be expected to have been tested to a much greater extent by the platform operators themselves.



Assessment methodology

Criteria weighting

- 30 criteria of assessment were agreed during initiation of the study and all of these were weighted according to their agreed relative importance, where a weighting of “1” indicated low importance, “2” indicates medium importance, and “3” indicates high importance.

Formal requirements compliance

ID	Sub-category	Item	Weighting
1	NC core requirements	Allocation of firm capacity	3
2		Allocation of interruptible capacity	1
3		Bundling of capacity products	3
4		Ascending clock auctions (yearly, quarterly, monthly)	3
5		Uniform price auctions (day-ahead, within-day)	3
6		Day-ahead bid roll over	2
7		Support of kWh/h and kWh/d as capacity unit	2
8		Secondary capacity trading	3
9		Automated bidding	2
10		Reporting of platform transactions (bidders and public)	2
11		Bundling of capacity in 1:n situations	3
12		Offer of competing capacity products	1
13	NC associated requirements	Surrender of capacity	1
14		Buyback of capacity	2
15		REMIT data reporting obligations	3

User friendliness

ID	Sub-category	Item	Weighting
16	Enabling IT	Authorisation level management	2
17		Network point display and administration	2
18		Secure platform access for network users	3
19		Peak service load	2
20		(Financial) insurances taken up to cover disruptions	1
21		Data backup and security	3
22		Continuing development (EU / national regulations)	3
23		Shipper and user registration on the platform	3
24		Graphical user interface of the platform	3
25		Options for connection to the platform	1
26		TSO and shipper automated communication	3
27	User friendliness	Multi-currency booking	1
28		Credit limit check	2
29		Cost reflective fees	3
30		Cost transparency for TSOs	3

Platforms summary

GSA scoring

Legend

Each platform receives an unweighted score from 0 to 4 based on the four aspects stated below.

NC core and associated requirements		Enabling IT and user friendliness requirements	
In compliance with the criteria – 1 point	Fully documented – 1 point	In compliance with the criteria – 1 point	Platform specific considerations – 1 point
Available in the live environment – 1 point	Tested / demoed during this study – 1 point	Available in the live environment – 1 point	Maturity of implementation – 1 point

ID	Category	Requirement	GSA		
			Unweighted	Weighted	Comments
1	NC core requirements	Allocation of firm capacity	●	12	Full compliance with CAM NC firm capacity allocation
2		Allocation of interruptible capacity	●	4	Full compliance with CAM NC interruptible capacity allocation
3		Bundling of capacity products	●	12	Full compliance with CAM NC 1:1 capacity bundling
4		Ascending clock auctions (yearly, quarterly, monthly)	●	12	Full compliance with CAM NC ascending clock auctions
5		Uniform price auctions (day-ahead, within-day)	◑	6	Partial compliance; day-ahead and within-day to be implemented in live environment
6		Day-ahead bid roll over	◑	4	Functional, to be implemented by mid-October
7		Support of kWh/h and kWh/d as capacity unit	●	8	Full compliance with capacity unit support
8		Secondary capacity trading	◕	6	Functional, to be implemented by mid-October
9		Automated bidding	●	8	Full compliance with automated bidding
10		Reporting of platform transactions (bidders and public)	●	8	Full compliance with reporting platform transactions and auction results
11		Bundling of capacity in 1:n situations	◔	3	Function documented, to be implemented by mid-October
12		Offer of competing capacity products	◔	1	Function documented, to be implemented by mid-October
13	NC ass. req.	Surrender of capacity	◔	1	Function documented, to be implemented by mid-October
14		Buyback of capacity	◔	1	Function documented, to be implemented by mid-October
15		REMIT data reporting obligations	●	8	Full platform transaction reporting capability, likely compliance once REMIT finalised
16	Enabling IT	Authorisation level management	●	8	Full control over the management of user authorisation and access
17		Network point display and administration	●	8	Full control over the management of network points
18		Secure platform access for network users	●	12	Secure access for both TSO and shipper users
19		Peak service load	●	8	GSA infrastructure capacity is running at roughly 60% total available, and can be scaled virtually
20		(Financial) insurances taken up to cover disruptions	◑	2	Overall TSO insurance in place, platform specific financial insurance to be explored by October
21		Data backup and security	◕	9	Data backup & security aligned to enterprise standards, few specific considerations for platform
22		Continuing development (EU / national regulations)	●	12	Planned and documented development milestones for future capability
23		Shipper and user registration on the platform	●	12	Clear registration processes for TSOs and shippers
24		Graphical user interface of the platform	●	12	Clear and easy to use GUI
25		Options for connection to the platform	◑	2	UI in live production, trading users web services available but not yet used in production
26		TSO and shipper automated communication	◑	6	TSO web services connection available but not yet used in production
27	User friendliness	Multi-currency booking	●	4	Multi currency booking; with ForEx rates from European Central Bank
28		Credit limit check	◕	6	Basic credit limit function, more complex real-time check being tested though TSO pilot
29		Cost reflective fees	●	12	Alignment of fees to costs: see further slides on ‘Charging structures’ and ‘Governance’
30		Cost transparency for TSOs	●	12	Transparency of charging structure: see further slides on ‘Charging structures’ and ‘Governance’

Platforms summary

PRISMA scoring

Legend

Each platform receives an unweighted score from 0 to 4 based on the four aspects stated below.

NC core and associated requirements		Enabling IT and user friendliness requirements	
In compliance with the criteria – 1 point	Fully documented – 1 point	In compliance with the criteria – 1 point	Platform specific considerations – 1 point
Available in the live environment – 1 point	Tested / demoed during this study – 1 point	Available in the live environment – 1 point	Maturity of implementation – 1 point

ID	Category	Requirement	PRISMA		
			Unweighted	Weighted	Comments
1	NC core requirements	Allocation of firm capacity	●	12	Full compliance with CAM NC firm capacity allocation
2		Allocation of interruptible capacity	●	4	Full compliance with CAM NC interruptible capacity allocation
3		Bundling of capacity products	●	12	Full compliance with CAM NC 1:1 capacity bundling
4		Ascending clock auctions (yearly, quarterly, monthly)	●	12	Full compliance with CAM NC ascending clock auctions
5		Uniform price auctions (day-ahead, within-day)	◔	9	Compliance - in live environment; no within-day auctions run yet in live environment*
6		Day-ahead bid roll over	◔	6	Functional and in production, not yet been used in live auctions*
7		Support of kWh/h and kWh/d as capacity unit	◕	4	Partial compliance; kWh/d to be implemented by mid-October
8		Secondary capacity trading	●	12	Full compliance with secondary trading facilitation
9		Automated bidding	●	8	Full compliance with automated bidding
10		Reporting of platform transactions (bidders and public)	●	8	Full compliance with reporting platform transactions and auction results
11		Bundling of capacity in 1:n situations	●	12	Full compliance with CAM NC 1:n bundling
12		Offer of competing capacity products	●	4	Full compliance with CAM NC competing capacities
13	NC ass. req.	Surrender of capacity	●	4	Full compliance with capacity surrender methodology in CMP
14		Buyback of capacity	●	4	Full compliance with capacity buyback methodology in CMP
15		REMIT data reporting obligations	●	8	Full platform transaction reporting capability, likely compliance once REMIT finalised
16	Enabling IT	Authorisation level management	●	8	Full control over the management of user authorisation and access
17		Network point display and administration	●	8	Full control over the management of network points
18		Secure platform access for network users	●	12	Secure access for both TSO and shipper users
19		Peak service load	●	8	PRISMA infrastructure is physical and used / available capacity is approx. 30% available
20		(Financial) insurances taken up to cover disruptions	●	4	Platform specific insurance plus service provider insurance with total annual cap of €30m
21		Data backup and security	●	12	Platform specific data backup and security standards and policies
22		Continuing development (EU / national regulations)	●	12	Planned and documented development milestones for future capability
23		Shipper and user registration on the platform	●	12	Clear registration processes for TSOs and shippers
24		Graphical user interface of the platform	◔	9	Usable UI with some issues (navigation and performance), usability improvement underway
25		Options for connection to the platform	◔	3	GUI available plus web services available and limited services for users
26		TSO and shipper automated communication	●	12	Fully fledged web services interface available and used by the majority of PRISMA TSOs
27	User friendliness	Multi-currency booking	●	4	Multi currency booking, with ForEx rates from European Central Bank
28		Credit limit check	●	8	Complex and mature real-time credit limit function, aligned to TSO credit mechanism
29		Cost reflective fees	●	12	Alignment of fees to costs: see further slides on 'Charging structures' and 'Governance'
30		Cost transparency for TSOs	●	12	Transparency of charging structure: see further slides on 'Charging structures' and 'Governance'

Note. Baringa considered criteria with IDs 5 and 6 for PRISMA, and ID5 for RBP respectively, as technically compliant with CAM NC, and therefore did not account as non-compliant on slide 12 overview of compliance as of 19 August 2015. The criterias' compliance is rooted in functions being available in live environment, but not yet running in auctions. This is a consequence of taking account of discussions in the study Steering Group of 25 August 2015.

Platforms summary

RBP scoring

Legend

Each platform receives an unweighted score from 0 to 4 based on the four aspects stated below.

NC core and associated requirements		Enabling IT and user friendliness requirements	
In compliance with the criteria – 1 point	Fully documented – 1 point	In compliance with the criteria – 1 point	Platform specific considerations – 1 point
Available in the live environment – 1 point	Tested / demoed during this study – 1 point	Available in the live environment – 1 point	Maturity of implementation – 1 point

ID	Category	Requirement	RBP		
			Unweighted	Weighted	Comments
1	NC core requirements	Allocation of firm capacity	●	12	Full compliance with CAM NC firm capacity allocation
2		Allocation of interruptible capacity	●	4	Full compliance with CAM NC interruptible capacity allocation
3		Bundling of capacity products	●	12	Full compliance with CAM NC 1:1 capacity bundling
4		Ascending clock auctions (yearly, quarterly, monthly)	●	12	Full compliance with CAM NC ascending clock auctions
5		Uniform price auctions (day-ahead, within-day)	◕	9	Compliance - live; no day-ahead or within-day auctions run yet in live environment**
6		Day-ahead bid roll over	◔	2	Function documented, to be implemented by November
7		Support of kWh/h and kWh/d as capacity unit	◑	4	Partial compliance; TSOs do have access to function; kWh/d to be implemented by November
8		Secondary capacity trading	◕	9	Partial compliance; OTC available in RBP, other secondary capacity on Trading Platform
9		Automated bidding	●	8	Full compliance with automated bidding
10		Reporting of platform transactions (bidders and public)	●	8	Full compliance with reporting platform transactions and auction results
11		Bundling of capacity in 1:n situations	○	0	No current plans to implement 1:n bundling***
12		Offer of competing capacity products	○	0	No current plans to implement competing capacity***
13	NC ass. req.	Surrender of capacity	◔	1	Function documented, to be implemented by November
14		Buyback of capacity	◔	1	Function documented, to be implemented by November
15		REMIT data reporting obligations	●	8	Function documented, to be implemented by November
16	Enabling IT	Authorisation level management	●	8	Full control over the management of user authorisation and access
17		Network point display and administration	●	8	Full control over the management of network points
18		Secure platform access for network users	●	12	Secure access for both TSO and shipper users
19		Peak service load	●	8	High capacity, high availability infrastructure – average load 1%, testing peak 6%
20		(Financial) insurances taken up to cover disruptions	●	4	Platform specific insurance (€1-1.5m) in place, FGSZ cover other losses via Hungarian Civil Code.
21		Data backup and security	●	12	Platform specific data backup processes and security standards
22		Continuing development (EU / national regulations)	●	12	Planned and documented development milestones for future capability
23		Shipper and user registration on the platform	●	12	Clear registration processes for TSOs and shippers
24		Graphical user interface of the platform	●	12	Clear and easy to use GUI
25		Options for connection to the platform	◔	3	GUI, SOAP and Edigas* (not yet used) connection to platform available for users
26		TSO and shipper automated communication	●	12	SOAP and Edigas* protocols in use and documented
27	User friendliness	Multi-currency booking	◑	2	Multi-currency supported though no conversion (or exchange rates data) within platform
28		Credit limit check	◕	6	Basic credit limit function in place
29		Cost reflective fees	●	12	Alignment of fees to costs: see further slides on 'Charging structures' and 'Governance'
30		Cost transparency for TSOs	●	12	Transparency of charging structure: see further slides on 'Charging structures' and 'Governance'

**FGSZ as operator of RBP, provided on 2.09.2015 edig@s 5.1. sample xml messages for use by network users with RBP (e.g. auctions results, acknowledgment etc). These edig@s-compatible messages were developed within the scope of the RBP-GSA cooperation and are ready to use (e.g. with the same SOAP UI client program that was demonstrated to Baringa for the usage of the SOAP-protocol based RBP xml messages), and are available since the middle of August, but they were not yet used by network users (RBP had no auctions between mid August and 1.09.2015). These files are confidential and under copyright protection, therefore FGSZ requested to verify, and not to share them with third parties. **Note. Baringa considered criteria with IDs 5 and 6 for PRISMA, and ID5 for RBP respectively, as technically compliant with CAM NC, and therefore did not account as non-compliant on slide 12 overview of compliance as of 19 August 2015. The criterias' compliance is rooted in functions being available in live environment, but not yet running in auctions. This is a consequence of taking account of discussions in the study Steering Group of 25 August 2015.*

****FGSZ advised that it is ready to start implementation process on TSO request.*

Platforms compliance

Overview as of 19 August 2015

- Observations on platforms compliance as of 19th August 2015:
- Based on the perspective of existing and tested functionality, PRISMA has a greater degree of compliance with the requirements, along with a larger and more established user base and experience.
- The other two platforms (GSA, RBP) have achieved a lower level of compliance, with a focus on longer term auctions.

GSA	PRISMA	RBP
▶ As of 19th August 2015, GSA is non-compliant on five out of twelve CAM NC legal requirements: – Day ahead & within-day trading – Day ahead bid rollover – Secondary market trading – 1:n capacity bundling – Competing capacity ▶ Day ahead (plus bid rollover) and within-day trading functions have been developed and tested by GAZ-System, and are pending national regulatory approval for implementation into the live / production system due October 2015, in accordance with the 1st November deadline of NC CAM. ▶ Two core NC associated requirements have not yet been developed (buyback, surrender).	▶ As of 19th August 2015, PRISMA is non-compliant on one out of twelve CAM NC legal requirements: – Support of kWh/d ▶ All core NC associated requirements have been developed.	▶ As of 19th August 2015, RBP is non-compliant on five out of twelve CAM NC legal requirements: – Day ahead bid rollover – Support of kWh/d – Secondary market trading – 1:n capacity bundling – Competing capacity ▶ Secondary market functionality is at present split across two platforms (RBP and the FGSZ' Trading Platform, a balancing products & capacity trading system), with 'over the counter' currently within RBP. Full functionality for secondary market capability and functionality to automatically roll over day ahead bids into within-day auctions are planned prior to 1st November. ▶ Two core NC associated requirements have not yet been developed (buyback, surrender).
▶ 2 registered TSOs* ▶ 44 registered shippers ▶ 122 registered trading users ▶ Edigas messaging	▶ 32 registered TSOs (incl. 17 German TSOs)* ▶ 455 registered shippers ▶ 1,561 registered trading users ▶ Custom XML messaging	▶ 2 registered TSOs ▶ 35 registered shippers ▶ 82 registered trading users ▶ Custom XML messaging (SOAP, Edigas)

*GSA: 4 active TSOs, of which 2 TSOs are running pilot projects. 2 registered TSOs concern separate TSO-systems, (being) certified by EC and NRAs under 3rd package. For background consult EC-certifications overview, as updated by EC on 4.09.2015, and available at https://ec.europa.eu/energy/sites/ener/files/documents/certifications_decisions.pdf. PRISMA: 35 active TSOs, including 3 pilot running TSOs.

Platforms compliance

Planned for 1st November 2015

- Observations on platforms compliance as planned for 1st November 2015:
- Given its existing, tested and delivered functionality, PRISMA poses the least risk in achieving complete compliance by 1st November 2015. PRISMA already has most of the requirements in place as of this study.
- The other two platforms (GSA and RBP) have more significant development work to undertake prior to 1st November, including the risks associated with projects of this type.
- The scope of this study has not included the validation of the development plans for the platforms.
- Any TSOs making the choice of platform will have to undertake their own due diligence, along with an assessment of the risks and mitigations, given that the obligations to comply with CAM NC will be on the TSOs.

GSA

- By 1st November 2015, GSA is planned to meet all the functional requirements of CAM NC, subject to associated risks, particularly for developing 1:n capacity bundling and competing capacity functions.
- Day ahead (plus bid rollover) and within-day trading functions have been developed and tested by GAZ-System, and are pending national regulatory approval for implementation into the live / production system due October 2015, in accordance with the 1st November deadline of NC CAM.
- 1:n capacity bundling and competing capacity are at an earlier stage of development, though are on the product roadmap for implementation prior to 1st November.

PRISMA

- By 1st November 2015, PRISMA is planned to meet all the functional requirements of CAM NC.
- Support of kWh/d has been developed and tested by PRISMA, and is due to be implemented in the next release of the platform due October 2015, in time with the 1st November deadline of NC CAM.

RBP

- By 1st November 2015, RBP will be non-compliant on two out of twelve CAM NC legal requirements:
  - 1:n capacity bundling
  - Competing capacity
- Full functionality for secondary market capability and functionality to automatically roll over day ahead bids into within-day auctions are planned prior to 1st November.
- While there is a high level solution for 1:n capacity bundling, there are no plans for this nor competing capacity to be implemented prior to 1st November.
- Plans to migrate anonymous secondary trading from Trading Platform to RBP by 1st November

Platforms summary

Comparative scoring

Legend

Each platform receives an unweighted score from 0 to 4 based on the four aspects stated below.

NC core and associated requirements		Enabling IT and user friendliness requirements	
In compliance with the criteria – 1 point Available in the live environment – 1 point	Fully documented – 1 point Tested / demoed during this study – 1 point	In compliance with the criteria – 1 point Available in the live environment – 1 point	Platform specific considerations – 1 point Maturity of implementation – 1 point

ID	Category	Requirement	GSA		PRISMA		RBP	
			Unweighted	Weighted	Unweighted	Weighted	Unweighted	Weighted
1	NC core requirements	Allocation of firm capacity		12		12		12
2		Allocation of interruptible capacity		4		4		4
3		Bundling of capacity products		12		12		12
4		Ascending clock auctions (yearly, quarterly, monthly)		12		12		12
5		Uniform price auctions (day-ahead, within-day)		6		9		9
6		Day-ahead bid roll over		4		6		2
7		Support of kWh/h and kWh/d as capacity unit		8		4		4
8		Secondary capacity trading		6		12		9
9		Automated bidding		8		8		8
10		Reporting of platform transactions (bidders and public)		8		8		8
11		Bundling of capacity in 1:n situations		3		12		0
12		Offer of competing capacity products		1		4		0
13	NC ass. req.	Surrender of capacity		1		4		1
14		Buyback of capacity		1		4		1
15		REMIT data reporting obligations		8		8		8
16	Enabling IT	Authorisation level management		8		8		8
17		Network point display and administration		8		8		8
18		Secure platform access for network users		12		12		12
19		Peak service load		8		8		8
20		(Financial) insurances taken up to cover disruptions		2		4		4
21		Data backup and security		9		12		12
22		Continuing development (EU / national regulations)		12		12		12
23		Shipper and user registration on the platform		12		12		12
24		Graphical user interface of the platform		12		9		12
25		Options for connection to the platform		2		3		4
26		TSO and shipper automated communication		6		12		12
27	User friendliness	Multi-currency booking		4		4		2
28		Credit limit check		6		8		6
29		Cost reflective fees		12		12		12
30		Cost transparency for TSOs		12		12		12

Platforms summary

Additional criteria

- In addition to the 30 scored criteria, 5 additional criteria were defined and included in the study. These criteria were not scored or weighted but were documented, the results of which are included below.

ID	Category	Requirement	GSA	PRISMA	RBP
31	Additional criteria only documented, not weighted	Support for multiple categories of firm/interruptible capacity	Yes	Yes	Yes
32		Preservation of data and availability for NRAs	5 years+ depending on national regulation	Up to 10 years	Up to 10 years
33		Measures for data security and confidentiality	Aligned to organisation-wide standards within GAZ-system	Yes	Yes
34		24/7 availability of the platform	Yes	Yes	Yes
35		24/7 helpdesk (in English)	Yes – technical support and business support available 24/7	Partial – technical support available 24/7, business support limited to working hours	Partial – technical support available 24/7, business support limited to working hours

Platforms summary

Charging structures

- The following tables set out the current charging structures (which may evolve); these differ per platform, and are described by undecided TSOs interviewed as part of the study as an issue given the potential need for several TSOs to utilise two or more platforms based on their neighbours' choice of platform.

GSA

- GSA charges TSOs for use of the platform based on the number of interconnection points (IPs) they hold within the platform.
- The running costs of GSA are relatively fixed and the addition of a small number of TSOs would not substantially increase the total operating costs, resulting in an overall lower cost per TSO the more TSOs are on the platform.
- Past a certain 'tipping point' of adding TSOs, users and network traffic, the running cost of the GSA platform would increase through the need for additional infrastructure. It is likely however that this would still result in an overall lower cost per TSO.
- There are no fees paid by shippers or users

PRISMA

- PRISMA charges 65% of its costs to TSOs for use of the platform primarily based on the ENTSOG voting rights system. This reflects country population, gas consumption and total transported through TSO-network volumes.
- The majority of the remaining cost is charged equally per participating TSO. A small proportion of costs (approx. 5%) is charged 1-1 per TSO for any national specific requirements, and PRISMA only pass on maintenance and IT provider costs.
- This charging system results in a fee range of approx. €100k per year to €1.1m per year per TSO.
- Majority of costs charged to TSOs. By default there are no feeds paid by shippers or users, with an optional service for shippers for the use of web services charged at €1400 per month (based on pass through of costs according to Prisma).

RBP

- RBP Core Services are priced equally between TSO members. These services concern CAM NC requirements including the enabling IT. A basic service costs 48.000 EUR/TSO/year (this can include servicing up to 50 IPs for auctions and 2ndary markets). Baringa understands that the total costs for a TSO are typically higher.
- For additional services (i.e. those not explicitly required by CAM NC) a specific fee is applicable, equal for all TSO Members who use the given service (including the enabling IT).
- For tailor-made services, a specific fee is applicable for the given TSO based on actual costs of the change request and a feasibility study provided to the given TSO.

Platforms summary

2015 business plan budget comparators, using agreed in study definitions (snapshot 19.08.2015)

- Part of the scope of platform assessment is presenting a holistic view of the cost per platform. To this end a number of comparative metrics have been devised using approximate calculations based on total platform operating cost and number of platform assets (TSOs, shippers, users, IPs, and network points). All figures are taken as a snapshot of August 2015, and all figures (TSOs, users, IPs, auctions conducted etc.) are likely to change in the future.
- It has been noted that it is difficult to provide an exact comparison across platforms given the differing business models and organisational structures (i.e. GSA and RBP are owned by a TSO, run fewer auctions overall and may include some shared costs, whereas PRISMA is a separate legal entity with a large number of registered TSOs and separate accounting). The figures below are presented as current costs per platform as of August 2015, and do not accommodate any change in costs caused by upward scaling.
- The cost per auction comparator included below includes both long term auctions (yearly, quarterly and monthly) that all platforms are currently running and short term auctions (day-ahead) that currently only PRISMA are running. This has significantly increased the number of auctions run by PRISMA in a comparable timescale (46511 of 50244 auctions in relevant comparison period are day-ahead i.e. short term). Additionally it is noted that each platform has a different history, launch date, total running times, and are at different stages of development (i.e. some platforms have been running for a shorter or longer duration, with varying levels of experience. RBP held its first auction on 10 December 2014). We have therefore used auction data from comparable 8-month period for all 3 platforms, December 2014 to July 2015 inclusive. We have taken accordingly pro-rated part of annual budget as basis for cost per auction calculation.

GSA	PRISMA	RBP
2 registered TSOs* - €200k per TSO	32 registered TSOs* - €281k per TSO	2 registered TSOs - €275k per TSO
44 registered shippers - €6.8k to €9.1k per shipper	455 registered shippers - €19.8k per shipper	35 registered shippers - €15.7k per shipper
122 registered trading users - €2.5k to €3.3k per user	1,561 registered trading users - €5.8k per user	82 registered trading users - €6.7k per user
12 IPs (excl. 1 pilot IP) - €33k per IP (€21k per IP typically charged)	107 IPs - €84k per IP	6 IPs - €68.8k to €91.7k per IP
190 auctions held in 8-months' comparison period - €1404 per auction	1304 total network points - €6.9k per point	323 total network points - €1.7k per point
	50,244 auctions held in 8-months' comparison period - €119 per auction	900 auctions held in 8-months' comparison period - €407 per auction

*GSA: 4 active TSOs, of which 2 TSOs are running pilot projects. 2 registered TSOs concern separate TSO-systems, (being) certified by EC and NRAs under 3rd package. For background consult EC-certifications overview, as updated by EC on 4.09.2015, and available at https://ec.europa.eu/energy/sites/ener/files/documents/certifications_decisions.pdf. PRISMA: 35 active TSOs, including 3 pilot running TSOs.

Please note that these figures are not the amounts charged to the specified parties; charging structures are detailed on the previous slide

Platform summary

Auction algorithms overview

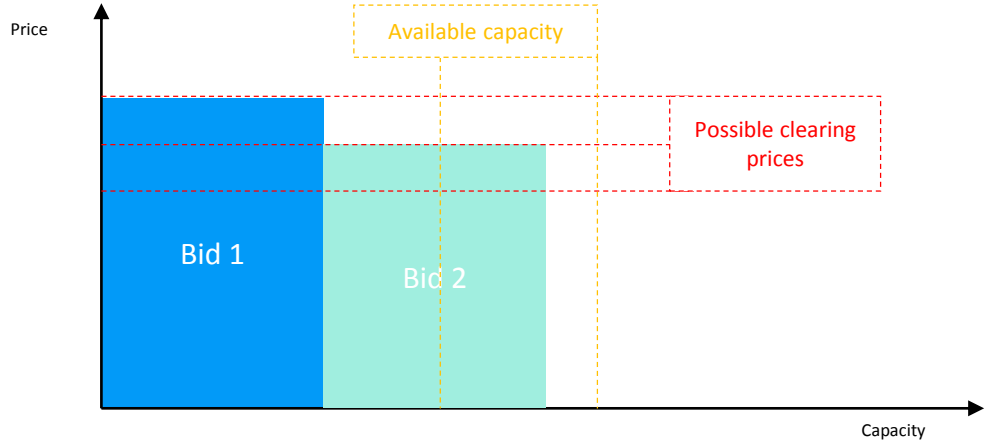
- The two auction algorithms specified within CAM NC (Article 17 'Ascending Clock auction algorithm' and Article 18 'Uniform-Price auction algorithm') received additional focus during the study via the review of logical documentation that describes the implementation of the algorithms or through examination of the platform source code that enact the platform rules that meet EU CAM NC requirements.

	GSA	PRISMA	RBP
Ascending Clock auction algorithm	• GSA has demonstrated and documented all sections of the Ascending Clock auction algorithm detailed in EU CAM NC Article 17, including bidding rounds, bid validation, small and large price steps, and the first time undersell.	• PRISMA has demonstrated and documented all sections of the Ascending Clock auction algorithm detailed in EU CAM NC Article 17, including bidding rounds, bid validation, small and large price steps, and the first time undersell.	• RBP has demonstrated and documented all sections of the Ascending Clock auction algorithm detailed in EU CAM NC Article 17, including bidding rounds, bid validation, small and large price steps, and the first time undersell.
Uniform-Price auction algorithm	• GSA has demonstrated and documented all sections of the Uniform-Price auction algorithm detailed in EU CAM NC Article 18, including bidding rounds, bid validation, bid sorting, capacity allocation and all possible scenarios for section 18.9 (also known as fill / kill / pro-rata / demand lower than available capacity). • GSA day-ahead and within-day auctions have been developed but are still to be implemented in the live environment.	• PRISMA has demonstrated and documented all sections of the Uniform-Price auction algorithm detailed in EU CAM NC Article 18, including bidding rounds, bid validation, bid sorting, capacity allocation and all possible scenarios for section 18.9 (also known as fill / kill / pro-rata / demand lower than available capacity). • PRISMA within-day auctions have been implemented but are still to be run in the live environment. Day-ahead auctions are in use in live environment.	• RBP has demonstrated and documented all sections of the Uniform-Price auction algorithm detailed in EU CAM NC Article 18, including bidding rounds, bid validation, bid sorting, capacity allocation and all possible scenarios for section 18.9 (also known as fill / kill / pro-rata / demand lower than available capacity). • No day-ahead or within-day auctions have been run yet in the live environment.

Platform summary

Auction algorithms article 18.9

- CAM NC Article 18.9 refers to a specific set of scenarios that may occur during the bid sorting and capacity allocation stage of a Uniform-Price auction. Four possible scenarios ('fill', 'kill', 'pro-rata', and 'demand lower than available capacity') have been identified depending on allocated capacity and bid minimums.
- At this stage, GSA, PRISMA and RBP should produce the same results in all four scenarios based on documentation and discussion with the platform operators. The extent to which this has been verified is as far as the logical / high level algorithmic level; detailed testing using exactly the same test data / factors (e.g. bid amounts, round timing etc.) has not been conducted.



GSA	PRISMA	RBP
All four scenarios have been confirmed and documented within GSA use cases	All four scenarios have been documented and are catered for via automated processes within PRISMA	All four scenarios have been confirmed and documentation produced on request
The clearing price for the 'fill', 'kill' and 'pro-rata' scenarios is set as the price of the minimum valid bid	The clearing price for the 'fill', 'kill' and 'pro-rata' scenarios is set as the price of the minimum valid bid	The clearing price for the 'fill', 'kill' and 'pro-rata' scenarios is set as the price of the minimum valid bid
The clearing price for the 'demand lower than available capacity' scenario is set as the auction starting price	The clearing price for the 'demand lower than available capacity' scenario is set as the auction starting price	The clearing price for the 'demand lower than available capacity' scenario is set as the auction starting price

Platforms summary

Data security

- The data security of each platform and platform operator was assessed at a high level against several industry standards covering user access, security processes and the exchange of data between systems.
- Data security was one of several areas of focus for the study, and as noted above was examined according to common IT best practice and was not covered at a low level of detail.
- Please see the appendix for more detail on each element considered with the study

	GSA		PRISMA		RBP	
Protocols	HTTPS	✓	HTTPS	✓	HTTPS	✓
	AS2	✓	AS2	✓	AS2	PART**
	SOAP	NOT USED*	SOAP	✓	SOAP	✓
	S/MIME	✓	S/MIME	✓	S/MIME	✓
Industry standards	ISO 27001	✓	ISO 27001	✓	ISO 27001	✓
	Two factor user authentication	✓	Two factor user authentication	✓	Digital certificates	✓
	Modern software support	✓	Modern software support	✓	Modern software support	✓
	Basic exploit resilience	✓	Basic exploit resilience	✓	Basic exploit resilience	✓

*GSA does not currently use SOAP, though this can be implemented with relatively low cost and effort

**RBP does not currently use AS2, though there are AS2 servers available for use if this functionality is requested by a TSO

Platforms summary

Governance (TSO decision making) arrangements as of August 2015 (1)

- This is a summary overview of governance status quo of each platform. Please see next slide for elaborated detail on governance of the platforms.
- Each platforms governance was assessed at a high level through interviews with the platform staff during the site visits, and based on provided by platform operators documentation. We note that the scope of the study did not include the assessment of pros and cons of business models employed by platform owners.
- Governance maturity varies per platform.

GSA	PRISMA	RBP
▶ Platform with recent history. ▶ Governance is being developed though platform is still primarily TSO owner based (GAZ-System). ▶ First pilots with TSOs Net4gas and Eustream are being conducted (first auctions already performed), which may lead to a governance change.	▶ Platform with significant history. ▶ PRISMAs articles of association clearly assign decision making roles and describe various levels of decisions with 75%/60% thresholds. ▶ Voting power is based on shares in PRISMA. The shares are determined based on (proxy of) country population, gas consumption and total transported through TSO-network volumes.	▶ Platform with recent history. ▶ Governance is still primarily TSO owner based (FGSZ), with other member TSO (Transgaz) a customer rather than co-owner of the platform. ▶ FGSZ is ready to set-up a separate entity, if and when required.

Platforms summary

Governance (TSO decision making) arrangements as of August 2015 (2).

GSA

- The governance and direction of the GSA platform is formally owned by GAZ-System, with features and functionality added on an ad-hoc basis based on user / TSO requirements.
- Currently GSA auction platform operations are carried out as an auction platform project, with costs separated for accounting purposes within the framework of GAZ-SYSTEM as a TSO.
- Should additional TSOs become users of the GSA platform (e.g. through pilots with Net4Gas and Eustream), more detailed governance arrangements will need to be developed.

PRISMA

- PRISMA is registered as a GMBH, with various decision making bodies primarily composed of shareholder TSOs. Decisions are taken using weights of shareholding rights of TSOs. The shareholding rights are based on ENTSOG voting system (or a proxy of that system, where not applicable). Nationally, for multiple TSOs, shares are decided differently per country. Key decisions require a 75% majority, while less strategic decisions require a 60% majority.
- The governance details of decision making are laid down in article 8 of Articles of Association. In addition to decision making bodies, there are various topical working groups, including a working group for providing information on latest developments to EU NRAs and EC. All the changes in the PRISMA's GTCs are consulted with all the relevant NRAs, and market participants. This caters in addition for regulatory governance for a number of TSOs who have specific references to PRISMA's GTCs in their Network Codes. We note that there is no specific provision in EU NCs for a standard approval procedure of such GTCs by NRAs.
- Each new member TSO has to sign a service agreement, co-operation agreement and shareholder agreement. In addition associate memberships or observer roles are allowed, with no voting participation. Associate memberships are for 3 years, providing a lower cost opportunity to explore participation in PRISMA. Associate members can request development of specific national requirements. Associate members who sign before 1.11.2015 get a guaranteed price for acquisition of voting shares in PRISMA.

RBP

- The governance and direction of the RBP platform is formally owned by FGSZ, with transferred to FGSZ decision making on features and functionality development on a case-by-case basis, solely based on the given user (or TSO) requirements. RBP is operated as an auction platform project, with costs separated for accounting purposes within the framework of FGSZ as a TSO.
- Each new member TSO has to sign a TSO Membership Agreement. Optionally, TSOs are advised by FGSZ to sign a bilateral cooperation agreement to arrange for bundling responsibilities, to which FGSZ as a platform operator is not a contracting party. With Transgaz, the cooperation agreement was incorporated into the TSO Membership Agreement. Responsibilities for bundling were agreed as part of Interconnection Agreement as well.
- Joint Venture agreement* for the operation of the RBP with Transgaz was considered, but not signed. A study showed that incorporating and running a separate legal entity would have nearly doubled the current costs of RBP without significant added value for the potential shareholders.
- Presently, governance is managed at basic level through change process being stipulated in the TSO Membership Agreement. FGSZ is open to discuss different governance models should that be required by RBP's TSO Member(s).

*This (draft) agreement was requested by Baringa during site visit in Siofok, but not provided to Baringa due to confidentiality, and draft character of the agreement.

Network user & undecided TSO feedback

Summary of feedback

- Interviews and surveys with network users and undecided TSOs were used to identify any gaps in the testing and verification of compliance, and to understand TSO requirements and priorities for deciding on a platform. Data was collected and aggregated, with the subjective views of the respondents reflected below rather than any detailed analysis conducted. Additionally, based on feedback from the steering group, Centrica has been excluded from the functional and user friendliness scores due to limited experience with all three platforms. See Appendix III for full list of company names.

	GSA		PRISMA		RBP	
	Advantages	**Disadvantages**	**Advantages**	**Disadvantages**	**Advantages**	**Disadvantages**
Network users	• Good performance • User friendly layout • Easy to register and use	• Unclear tariff representation • Lack of comfort bids	• Easy and quick registration • High number of TSOs • Rich functionality • Comfort bidding • High level of automation	• Performance issues during reporting • Performance issues during bidding • GUI can be difficult to navigate • New filtering process difficult to use	• Good performance • Modern UI and design	• Complicated registration process • Different gas calendar used for auctions in 2015 (Q1 was on other platforms Q4) • Non-intuitive layout • No filter on publication of auction results • Low helpdesk support
Undecided TSOs	• Flexibility in TSO connection • Potentially lower charges	• Low overall experience in automated TSO connections • Governance structure tied to platform owning TSO	• Manageable cost structure • Strong experience in automated TSO connections • Mature governance structure	• Inflexibility in data / interface requirements when connecting backend system • Unique IDs per IP per direction rather than just per IP	• No specific advantages mentioned	• Unclear charging structure • Unclear governance structure
Functional score range (1-10)	4 - 8		7		3 - 6	
User friendliness score range (1-10)	6 - 8		4 - 7		3 - 6	

Conclusions

This study has assessed the capability of the three platforms against the requirements of NC CAM

- The EU NRAs and ACER have requested that Baringa analyse the current degree of implementation of the relevant European requirements by each booking platform operator with a focus on EU NC CAM. Other associated requirements were also captured and analysed. This report has set out our analysis.
- This report has set out the level of compliance currently delivered by the three platforms, and that anticipated by the platform operators to be delivered by 1 November 2015.
- Currently, GSA is non-compliant on five out of twelve NC CAM legal requirements, PRISMA is non-compliant on one out of twelve, and RBP is non-compliant on five out of twelve. The roadmaps for both the GSA and PRISMA platforms include the implementation of functionality for full compliance with all twelve CAM NC requirements prior to 1 November 2015. The features planned for RBP include the implementation of functionality for compliance with two additional requirements, with two remaining requirements (1:n bundling and competing capacity) to be determined for inclusion at a later stage.
- Both GSA and RBP meet the majority of the other EU NC associated requirements at either a basic level of compliance or as part of the platform roadmap for implementation prior to 1st November 2015. PRISMA has a high overall level of compliance with all EU NC associated requirements.
- Where a decision is still pending, it is anticipated that the TSOs on either side of an IP will work together to determine the platform to be used at an IP. The obligation to meet the requirements of NC CAM rests with the TSO, as will any penalties associated with a failure to do so. We would presume therefore that the TSOs will jointly assess and agree on the choice of platform.
- It is noted that for the energy island of Estonia, Latvia, Lithuania and Finland, the platform choice is still being initiated. Given exemption status under NC CAM linked to EC-directive, the TSOs of these markets (in consultation with NRAs) are advised to initiate a study into a common platform solution, based on outcomes of the platform discussions at EU-level for other EU-markets.
- In addition, the other undecided TSOs who responded to our survey underlined the importance of interoperability of any chosen solution with back-end systems of TSO capacity management systems. Baringa has assumed that this is most assured when all TSOs follow CAM/CMP NC Business requirements as developed by ENTSOG for implementation*, and for messaging conforming to Edigas.
- The potential next steps for undecided TSOs and platform operators were discussed at the concluding meeting with the Steering Group for the study. These are summarised in the following section.

** Chapter 2 BRS clarifies its scope as a document used by TSOs and Auction offices (platforms) for inter alia CAM NC implementation, quote: "This BRS covers requirements for the harmonised implementation of auctions for primary capacity, for secondary market capacity right transfer processes and congestion management procedures as specified in the CAM NC/CMP guidelines. The requirements therefore define the necessary interfaces for the implementation, from an IT perspective, of a capacity allocation and congestion management system." We should note that BRS itself mentions in chapter 2 scope that 'Cooperation between Auction Offices' is not covered in existing version.*

Potential next steps

These cover a number of potential issues and outcomes

1. **Decisions for undecided TSOs / IPs** where TSOs of adjacent markets, in legal consultation with NRAs to determine procurement criteria, will run a tender process per IP to choose which platform will be used.
    1. If a decision cannot be reached by adjacent TSOs and NRAs on common procurement criteria, ACER may decide after 6 months in accordance with ACER review powers.
    2. Following best practice (of an interviewed undecided TSO), one may add criterion of 'reasonable endeavours of interoperability' with other platforms as procurement criterion.
    3. This is considered the most desirable way forward in terms of cost and complexity, though some thought will need to be given on CAM NC requirements not currently specified in exact detail (e.g. how competing capacity will be handled). This may result in several EU TSOs connecting to multiple platforms.

2. **Interim approach using rotating platforms for undecided IPs** where multiple platforms are are alternately used for an IP. Every quarter / month, each platform operator takes the lead in offering capacity for that quarter / month. This option is proven based on power markets experience, where a similar rotating concept is implemented for market coupling.
    1. This requires back-end systems of TSOs and Network Users to co-operate with all three platforms.
    2. Common industry standards such as Edigas should be encouraged to easily enable use of all platforms.
    3. This option may only be valid as a transitional stage to an agreed solution or until the platforms are interoperable.

3. **Interoperability** where all three platforms are able to communicate directly with each other. This is not an easy approach – as a basic level of interoperability may be delivered at a reasonable cost but not deliver much benefit, and a fully interoperable system may be very complex, costly and take a significant amount of time to deliver.
    1. Interoperability could extend from a unified front end to complete functional interoperability, such that the operation of one platform on one side of an IP and a corresponding platform on the other side of the IP will lead to the same results.
    2. Common industry standards such as Edigas (assuming the next version includes all required for NC CAM implementation changes) should be encouraged to enable easy use of all platforms.
    3. Depending on the level of interoperability required, this could require a significant level of technical and process integration, with a corresponding cost and effort to implement and maintain.

Illustrative interoperability scenarios

The potential levels of interoperability and associated benefits, challenges, implications and costs still need to be considered – two potential scenarios are illustrated here:

Common Front-End model (a minimal interoperability model?)	
Description	Implications (pro/con)
Common front end to communicate bids, and get auction results; Auction performed separately for each IP on a single and defined platform; Platforms communicate via a standard data exchange format or common front-end.	Still need to have a single platform per IP, and the TSOs either side of the IP will have to agree this; One interface for network users; TSOs may still need to interface to more than one platform, if different platforms are used for their different IPs; Relatively simple architecture.

Anticipated relative cost - low

Full functional model (a complete interoperability model?)	
Description	Implications (pro/con)
Ability to bid at the same time for any IP, from any platform with the same end result; Auctions to be performed at every platform with a participating user for every IP; No need to choose one underlying platform per IP – each TSOs can choose their preference.	No need for a single platform per IP – could have multiple platforms per IP; Would require explicit definition of rules and processes for auctions – so that platforms simply encode this; Would require extensive testing across potential combinations to make sure results are truly identical and that there is no advantage based on access to the auction; Will probably need a common or duplicated repository of bids across platforms; Obligations, risks, failures and penalties would have to be managed across vendors; TSOs will need multiple interfaces to platforms; Complex architecture.

Anticipated relative cost - substantial

Common Front-End model (minimal interoperability)

Users

- Access to 1 common front-end

Underlying platform(s)

- Platforms exchange messages

GAZ system PRISMA EUROPEAN CAPACITY PLATFORM RBP REGIONAL BOOKING PLATFORM

IPs

- Each IP is linked to a single platform

TSOs

- Interface to the platforms used for their IPs*

For reference, two illustrative examples for costs estimates to connect two platforms, to accommodate different platforms per IP, were offered by TSOs, taking part in the study and based in different gas regions (as defined under ACER GRI framework):
One example of an estimated cost for a small TSO (with limited number of IPs) to connect to and maintain two platforms is approx. €35k for implementation, €45k monthly fees and €25k yearly maintenance costs. However, another example shows higher costs. The estimated cost for a bigger TSO (with high number of IPs) to connect and maintain two platforms is approx. €300k for implementation and €150k yearly maintenance costs just for the connection to the second platform and under estimation that the backend system has not to deal with competing capacity in its system (this might be the case if two IPs with competing capacity are sold one IP on the first and other IP on the second platform).

Full functional model (complete interoperability)

Users

- Users access auctions at any IP through a single platform

Underlying platform(s)

- Platforms exchange messages

GAZ system PRISMA EUROPEAN CAPACITY PLATFORM RBP

IPs

- Each IP is linked to ALL platforms

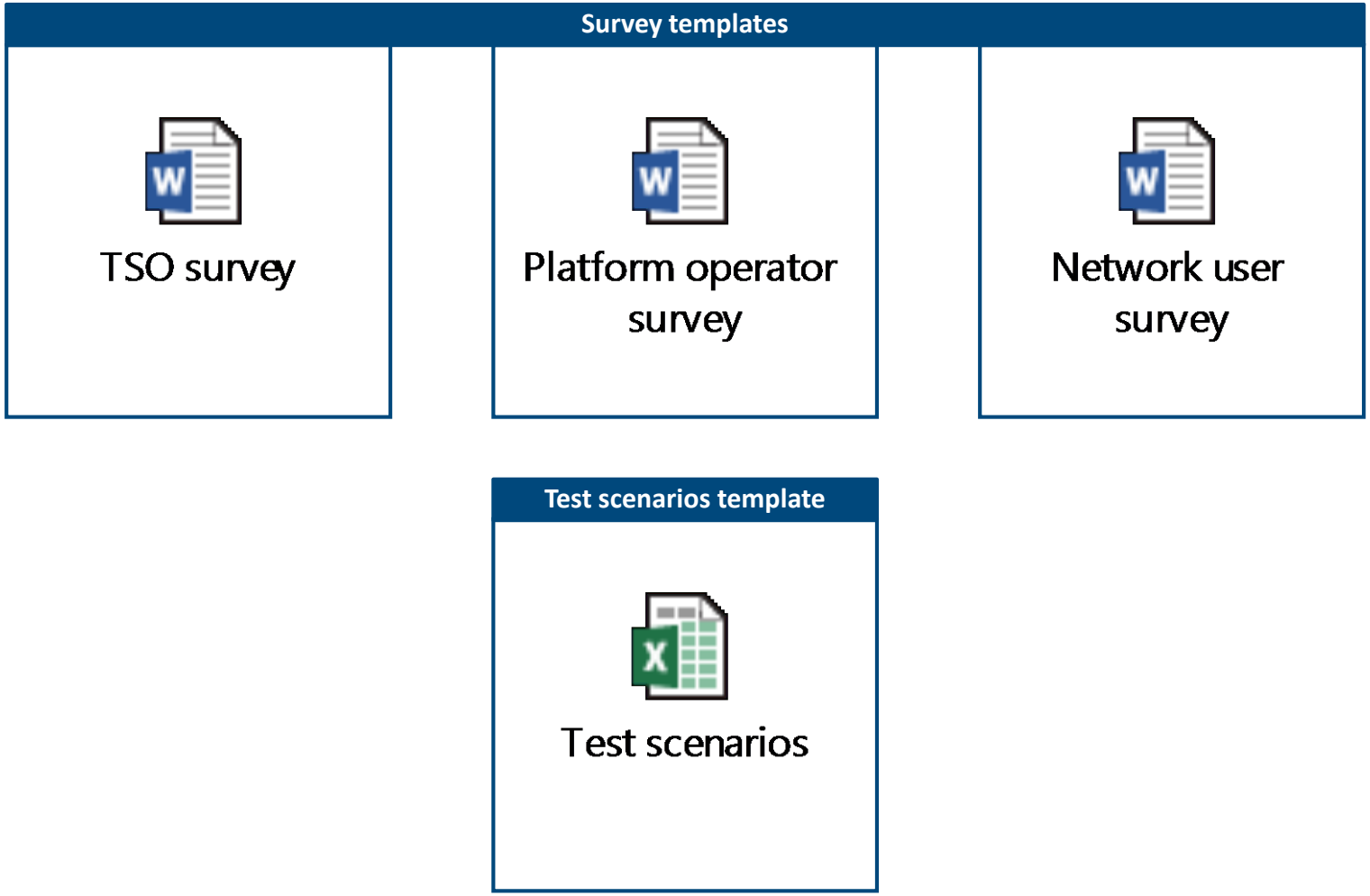
TSOs

- TSOs interfaced to all platforms for their IPs

Appendix

Appendix i)

Data gathering templates



Appendix ii)

Documents reviewed

Document type	Platform	Document title	Received from
Physical copy	GSA	GAZ-SYSTEM Auction Platform Rules (November 2014)	Hubert Kabulski
Physical copy	GSA	Power of Attorney	Hubert Kabulski
Physical copy	GSA	GAZ-SYSTEM Auctions Instruction Manual System User (Shipper)	Hubert Kabulski
Physical copy	GSA	GSA – Shipper's Manual	Hubert Kabulski
Physical copy	GSA	Change of Platform User Information Form	Hubert Kabulski
Physical copy	GSA	Appendix no 3 to the Agreement for making the GAZ-SYSTEM Auctions Platform (GSA) available to the Client	Hubert Kabulski
Physical copy	GSA	Agreement for making the GAZ-SYSTEM Auctions Platform (GSA) available to the Client	Hubert Kabulski
Physical copy	GSA	GSA System Communications Interface Specification ver. 1.10	Hubert Kabulski
Physical copy	GSA	GAZ-SYSTEM Auctions As-Build Documentation	Hubert Kabulski
Digital copy	GSA	Updated Presentation – status as of 27 Jul 2015	Adam Marzecki
Digital copy	GSA	all algorithms (RAR archive) – Competing Capacity, Buy Back, Comfort Bid, Surrender, Competing – many points	Adam Marzecki
Digital copy	PRISMA	2015-07-20 Capacity booking platform survey filled.xlsx	SharePoint
Digital copy	PRISMA	PRISMA 220715.docx	SharePoint
Digital copy	PRISMA	PRISMA 230715.docx	SharePoint
Digital copy	PRISMA	PRISMA day plan 230715.pptx	SharePoint
Digital copy	PRISMA	PRISMA_220714_Test scenarios_for distribution_final.xlsx	SharePoint
Digital copy	PRISMA	PRISMA_230714_Test scenarios_for distribution_final.xlsx	SharePoint
Digital copy	PRISMA	150714_Platform survey_for distribution_Word version_updated with 2 columns.docx	SharePoint
Digital copy	PRISMA	2015-07-20 Capacity booking platform survey filled.xlsx	SharePoint
Digital copy	PRISMA	PRISMA Business Plan 2016-2020 - Scheme.xlsx	SharePoint
Digital copy	PRISMA	2014-09-12 PRISMA GTCs Glossary X-2014 approved.pdf	SharePoint
Digital copy	PRISMA	2014-09-12 PRISMA GTCs X-2014 approved.pdf	SharePoint
Digital copy	PRISMA	2014-09-15 PRISMA GTCs ATTs X-2014 approved.pdf	SharePoint
Digital copy	PRISMA	2015-07-17_certificate of insurance as of 2015-07-17.pdf	SharePoint
Digital copy	PRISMA	Background of PRISMA.pptx	SharePoint
Digital copy	PRISMA	INT Auction Calendar_valid_from_06-07-2015.xls	SharePoint
Digital copy	PRISMA	KON interconnection point overview.xls	SharePoint
Digital copy	PRISMA	KON shipper overview.xls	SharePoint
Digital copy	PRISMA	PRISMA_Documentation_Auctioning.pdf	SharePoint
Digital copy	PRISMA	PRISMA_Documentation_Automated Shipper Connection.pdf	SharePoint
Digital copy	PRISMA	PRISMA_Documentation_Backup and Recovery.pdf	SharePoint
Digital copy	PRISMA	PRISMA_Documentation_Central Functions.pdf	SharePoint
Digital copy	PRISMA	PRISMA_Documentation_Configuration.pdf	SharePoint
Digital copy	PRISMA	PRISMA_Documentation_Credit Limit Management.pdf	SharePoint
Digital copy	PRISMA	PRISMA_Documentation_CSV Pattern Specification.pdf	SharePoint
Digital copy	PRISMA	PRISMA_Documentation_Customer Management.pdf	SharePoint
Digital copy	PRISMA	PRISMA_Documentation_Domain Model.pdf	SharePoint
Digital copy	PRISMA	PRISMA_Documentation_Email Pattern Specification.pdf	SharePoint
Digital copy	PRISMA	PRISMA_Documentation_FCFS.pdf	SharePoint
Digital copy	PRISMA	PRISMA_Documentation_Glossary.pdf	SharePoint
Digital copy	PRISMA	PRISMA_Documentation_Grid Data Management.pdf	SharePoint
Digital copy	PRISMA	PRISMA_Documentation_Interface Agreement.pdf	SharePoint
Digital copy	PRISMA	PRISMA_Documentation_Platform Admin.pdf	SharePoint
Digital copy	PRISMA	PRISMA_Documentation_Secondary.pdf	SharePoint
Digital copy	PRISMA	PRISMA_Documentation_Support Concept.pdf	SharePoint
Digital copy	PRISMA	PRISMA_Documentation_Surrender.pdf	SharePoint
Digital copy	PRISMA	PRISMA_Documentation_System Architecture.pdf	SharePoint
Digital copy	PRISMA	PRISMA_Documentation_User Interface.pdf	SharePoint
Digital copy	PRISMA	Ascending Clock Auctions.pptx	SharePoint
Digital copy	PRISMA	Auctions Times.pptx	SharePoint
Digital copy	PRISMA	Bundled_Competing Auctions.pptx	SharePoint
Digital copy	PRISMA	Conversion.pptx	SharePoint
Digital copy	PRISMA	Guideline Business Continuity Management.pdf	SharePoint
Digital copy	PRISMA	Reverse auctions.pptx	SharePoint
Digital copy	PRISMA	Surrender.pptx	SharePoint
Digital copy	PRISMA	Uniform Price Auctions.pptx	SharePoint
Digital copy	PRISMA	hsst-msg.xsd	SharePoint
Digital copy	PRISMA	BTC_PRISMA - Error Code List V 2.3.3.xlsx	SharePoint
Digital copy	PRISMA	core-pure.xsd	SharePoint
Digital copy	PRISMA	msg-pure.xsd	SharePoint
Digital copy	PRISMA	BTC_PRISMA - Additional CRs - Functional Specification V 2.4.2.pdf	SharePoint
Digital copy	PRISMA	BTC_PRISMA - CSV Pattern Specification V 2.4.1_track_change.pdf	SharePoint
Digital copy	PRISMA	BTC_PRISMA - Email Pattern Specification V 2.4.2_change_track.pdf	SharePoint
Digital copy	PRISMA	BTC_PRISMA - Functional Specification V 2.4.2.pdf	SharePoint
Digital copy	PRISMA	BTC_PRISMA - Shipper Service Interface Agreement V 2.4.2_track_change.pdf	SharePoint
Digital copy	PRISMA	BTC_PRISMA - TSO Service Interface Agreement V 6.4.2_track_change.pdf	SharePoint
Digital copy	PRISMA	hsst-msg.xsd	SharePoint
Digital copy	PRISMA	BTC_PRISMA - Error Code List V 2.4.2.xlsx	SharePoint
Digital copy	PRISMA	core-pure.xsd	SharePoint
Digital copy	PRISMA	msg-pure.xsd	SharePoint
Digital copy	PRISMA	Usability -01- Expert and User Analysis Report.pdf	SharePoint
Digital copy	PRISMA	Usability -02- Expert and User Analysis Report Presentation.pdf	SharePoint
Digital copy	PRISMA	Usability -03- User Test Report.pdf	SharePoint
Digital copy	PRISMA	Usability -04- Implementation Guide.pdf	SharePoint
Digital copy	PRISMA	Usability -05- Web-Repositories.pdf	SharePoint
Digital copy	PRISMA	2015-06-23_PRISMA Consultation 2015.pdf	SharePoint
Digital copy	PRISMA	01 SLA No.01 User Support.pdf	SharePoint
Digital copy	PRISMA	02 SLA No. 01 User Support Appendix 1 .pdf	SharePoint
Digital copy	PRISMA	03 SLA No. 01 User Support - Service Requests Appendix 2.pdf	SharePoint
Digital copy	PRISMA	04 SLA No. 1 Appendix 3 List of included dates for functional support in non-peak times.pdf	SharePoint
Digital copy	PRISMA	05 SLA No.02 Operation Platform.pdf	SharePoint
Digital copy	PRISMA	06 SLA No. 02 Operation Platform Appendix 1.pdf	SharePoint
Digital copy	PRISMA	07 SLA No.03 Operation Token Service.pdf	SharePoint
Digital copy	PRISMA	08 SLA No.03 Operation Token Service Appendix 1.pdf	SharePoint
Digital copy	PRISMA	09 SLA No.04 IT Security.pdf	SharePoint
Digital copy	PRISMA	10 SLA No.04 IT Security Appendix 1.pdf	SharePoint
Digital copy	PRISMA	11 SLA No.05 Service Management.pdf	SharePoint
Digital copy	PRISMA	12 SLA No. 05 Service Management Appendix 1.pdf	SharePoint
Digital copy	PRISMA	PRISMA_Documentation_Backup and Recovery.pdf	SharePoint
Digital copy	PRISMA	Agreement on Automated Interfaces PRISMA_Shipper_Template.pdf	SharePoint
Digital copy	PRISMA	NDA_PRISMA_Shipper_Template.pdf	SharePoint
Digital copy	PRISMA	2012-12-04 Cooperation Agreement_final_v1.00_signed.pdf	SharePoint
Digital copy	PRISMA	2014-07-01_Articles of Association_v0.1_final.pdf	SharePoint
Digital copy	PRISMA	2014-10-28 SC_from_1-2015.pdf	SharePoint
Digital copy	PRISMA	2015-03-31_Associated Customer Service Contract.pdf	SharePoint
Digital copy	PRISMA	2015-04-01_Association Agreemt for Associated Members.pdf	SharePoint
Digital copy	RBP	00_FGSZ_intro_en.pdf	Balázs Tatár
Digital copy	RBP	01_RBP_Introduction_Baringa.pdf	Balázs Tatár
Digital copy	RBP	02_RBP_Technical_Baringa.pdf	Balázs Tatár
Digital copy	RBP	03_RBP_Commercial_Baringa.pdf	Balázs Tatár
Digital copy	RBP	RBP Information Technology Provisions.pdf	Balázs Tatár
Digital copy	RBP	rbp_user_manual_2.1.pdf	Balázs Tatár
Digital copy	RBP	Regional Booking Platform Webservice Documentation 4.0.pdf	Balázs Tatár
Digital copy	RBP	regional_booking_platform_mukodesi_szabalyzata_4268-2015_mekh_hat_angol.pdf	Balázs Tatár
Digital copy	RBP	rendszerhasznalo_tagsagi_megallapodas_4268-2015_mekh_hat_angol.pdf	Balázs Tatár
Digital copy	RBP	TMA_Baringa.pdf	Balázs Tatár
Digital copy	RBP	use_of_digital_certificate_on_the_rbp_v2.0.pdf	Balázs Tatár

Microsoft Excel Worksheet

List of reviewed documents

Business Requirements Specification (BRS) for CAM NC and CMP (March 2015*)

Network Code on Capacity Allocation Mechanism

*ENTSOG has developed a final version of the BRS for CAM and CMP, which was approved in July 2015. Currently these BRS are used by EASEEgas for the development of the Message Implementation Guidelines (MIGs) for CAM and CMP. The publication on ENTSOG' website is expected for Q4/2015. Source: ENTSOG.

Appendix iii)

List of interviewed network users, and list of undecided TSOs provided with voluntary survey

Network users
Axpo (detailed)
Centrica (detailed)
Enoi (detailed)
Engie (detailed)
RWE (detailed)

Undecided TSOs
Eustream (detailed)
Net4Gas (detailed)
Plinacro (detailed)
Latvijas Gāze
Creos
Gasum (brief response)
Swedegas
Ambergrid (brief response)
Elering (brief response)
Magyar Gáz Tranzit (brief response)
Desfa
Bulgartransgaz

Appendix iv)

Network user feedback regarding future development with platforms

- Following more general quotes were noted, in addition to specific notes, summarised previously per platform:
- *"There is an expectation that within-day auctions will increase complexity and the need for timely support."*
- *"Will be carefully examining the within-day market before participating in within-day (WD) auctions once they go live; we don't anticipate major need for within-day at all points across Europe. Points where WD will be required, will depend on national reserve pricing of WD by TSOs (NRAs) and congestion. Therefore now don't see need for e.g. automated connection to platform(s) for webservices for WD, or need for any sophisticated tool to place WD bids."*
- *"Don't necessarily trust exchange rates on platform – see that as an indicative reserve tariff; no need for this currency conversion on platforms for firms, that use own tools to confirm which rate they will use (to e.g. do the hedging etc). Clear pricing in national currency/tariff to be paid is key."*
- *"Additionally a map would be useful for providing information on the network as a point of reference when booking capacity – this is applicable to all platforms."*
- *"Preference is for a single, unified platform for capacity booking across Europe. An alternative to single unified platform could be a single unified front end – either would save a large amount of time (~50%) on trading capacity. The current process may typically take an hour each day. In the future due to growth of trading this may increase to 2-3 hours a day. With a single platform there should be a significant saving in time and thus cost savings could be achieved internally for each trading company across Europe. "*
- *"In the longer term, preference would be for one unified booking platform across Europe, particularly for auctioning of bundled capacity across borders. We do note that for us, as we 98% of time use PRISMA and remaining time use other platforms – efficiency gains through single platform wouldn't be large. See largest productivity gains as being in improving the speed of the search and filter functions in PRISMA. However, if there is one platform, this invites to develop firms more specialised tools to improve use of this platform (now one would need to develop at least 3 tools/interfaces)."*
- *"If responsibility for platform would shift from TSOs funding to shippers funding platforms as well, would want to see some cost efficiency control on this. Otherwise multiple platform solution needed to keep pressure on innovation and costs for platforms. Learning working with more than one platform is manageable for larger network users, much less so for smaller traders across Europe. Thus multiple platforms potentially less good for number of players operating across Europe."*

Appendix iv)

Undecided TSO feedback regarding future development with platforms

- Following more general answers from surveyed undecided TSOs were noted, in addition to specific notes from interviews, summarised previously per platform:
- *"The choice of platform will depend on quality (simplicity for the market players and TSOs, compatibility with other IT systems, etc.) and pricing. As said above it will be coordinated with other adjacent TSOs and ideally one platform will be chosen. Worth to note, that at the moment and in foreseeable future we do not have the issue of congestion at interconnection points, the application of auctioning system will be more requirement of legislative nature rather than practical need. In our opinion the charges of the platforms should be related to the costs incurred once the services are provided on the auctioning on certain IPs. In that respect the charging policy of PRISMA, where the fees depend on ENTSOG voting rights (which distributed between member states partially in equal shares and partially depending on population), seems to be unacceptable. GSA fee model, related to IPs, seems much more attractive. We are not familiar with RBP fee model yet."*
- *"The actual market development in Baltic states started last year from Lithuania and is followed this year by Estonia (and hopefully will continue in Latvia 2017 latest). We are working hard to go forward with rapid market developments and integration. There will be analysis ongoing this year on regional market development and possible integration of markets, which may influence the scope of application of CAM platform in this region. Therefore choosing the suitable platform remains question of more detailed discussions once more clarity on regional market set-up appears. We suppose it should be not earlier than 2016."*
- *"We are starting to open the markets. This means we must consider how to sell the pipeline capacity in the future. We are starting a consultation in next month, where we go through this process (of platform selection etc.)."*
- *"(We) have not started the Capacity Booking Platform test(s) yet, therefore objective feedback cannot be given, nevertheless (we) are working to co-operate with the Capacity Booking Platform operators to connect our own existing (system) and to support a certain level of integration at a commercially feasible level."*

Appendix v)

Criteria descriptions

ID	Category	Requirement	Description
1	NC core requirements	Allocation of firm capacity	The allocation of firm capacity products via auction – CAM NC Article 8
2		Allocation of interruptible capacity	The allocation of interruptible capacity products via auction – CAM NC Article 21
3		Bundling of capacity products	Automated bundling of two capacity products on the same IP – CAM NC Articles 19 and 20
4		Ascending clock auctions (yearly, quarterly, monthly)	The creation and holding of auctions for long term products in accordance – CAM NC Article 17
5		Uniform price auctions (day-ahead, within-day)	The creation and holding of auctions for short term products in accordance – CAM NC Article 18
6		Day-ahead bid roll over	The automatic rollover of valid, unsuccessful bids from day-ahead to within-day – CAM NC Article 15 par 10
7		Support of kWh/h and kWh/d as capacity unit	The available energy units used to express capacity – CAM NC Article 10
8		Secondary capacity trading	Functionality to offer and make an offer for secondary capacity – CAM NC Article 27.2, para C
9		Automated bidding	Functionality to automatically enter bids against any price step within an ascending clock auction* – CAM NC Article 17.6
10		Reporting of platform transactions (bidders and public)	Publication of auction results in according with CAM NC publication times – CAM NC Articles 11.10-11.11, 12.9-12.10, 13.8-13.9, 14.9-14.10, and 15.12-15.13
11		Bundling of capacity in 1:n situations	Art 3.5; Art 8.2; Art 27.2(a) CAM NC
12		Offer of competing capacity products	Functionality to cater for capacity that can only be allocated by reducing related capacity in a separate auction – art 3.5 CAM NC
13	NC ass. req.	Surrender of capacity	Functionality for network users to surrender capacity won from a previous auction
14		Buyback of capacity	Functionality for TSOs to buy back capacity sold in a previous auction
15		REMIT data reporting obligations	Likelihood of compliance with ability to report data required for REMIT
16	Enabling IT	Authorisation level management	Functionality to manage levels of user access and permissions
17		Network point display and administration	Functionality to create and manage network points by TSOs
18		Secure platform access for network users	Data security protocols in place for network user access
19		Peak service load	Infrastructure capacity available and used, and scalability of infrastructure
20		(Financial) insurances taken up to cover disruptions	Insurance to cover liability of lost revenue through platform failure
21		Data backup and security	Data backup, data retention and data security processes, standards and policies
22		Continuing development (EU / national regulations)	Level of planned future development of platform
23		Shipper and user registration on the platform	Registration process for network users
24		Graphical user interface of the platform	Usability of web front end of the platform
25		Options for connection to the platform	Options (GUI, web services) available for network users to access and utilize the platform e.g. submitting bids
26		TSO and shipper automated communication	Level of support for automated connections to the platform through web services
27	User friendliness	Multi-currency booking	Level of support for non-local currency within platform
28		Credit limit check	Functionality to set and enforce network user credit limits
29		Cost reflective fees	Alignment of platform usage fees to total operating cost (TSOs, Users)
30		Cost transparency for TSOs	Level of transparency of charging structures used to charge TSOs

*for avoidance of doubt. Formal criterion of "automated bidding" does not include comfort function of bidding in advance of auctions, as e.g. offered by Prisma, and as mentioned by interviewed shippers in feedback.

Appendix vi)

Platform pilots

GSA

Overview of PL-CZ pilot project (IP Cieszyn)

- Pilot project with Net4Gas regarding the bundled capacity of IP Cieszyn
- Co-operation agreements agreed
- Test auctions (day-ahead and within-day) held
- Pilot extended to IP Lanzhot.

Overview of PL-SK pilot project (IP Lanzhot)

- Pilot project with Eustream regarding the bundled capacity of IP Lanzhot.
- Co-operation agreements agreed
- Test auctions between Eustream and Net4Gas held

PRISMA

- PRISMA's pilot projects are in line with the 2015 version of the ACER CAM NC Roadmap, that is being prepared. Version dated October 2014 available here

RBP

GSA Interoperability pilot

- Aim is to provide interoperability between platforms by connecting one TSO to one platform
- Some cost savings for TSO by connecting to single platform
- Principle that bordering IP issues should be solved by platform operators rather than TSO

Appendix vii)

Platform descriptions (provided by platform operators) - GSA

GSA overview

GSA platform development is based on the architecture of the IT system that serves the auctioning of the capacity of the Polish natural gas transmission system since 2013. This system presents an advanced, state of the art IT solution. The primary goal of establishment of the GSA is to provide CAM NC services to the interested TSOs, as well as the market participants.

Despite its short history, the GSA platform has successfully conducted 262 auctions so far, with the traded capacity (bundled and unbundled) exceeding 396 GWh/h. It serves two TSOs on the permanent basis and 44 registered shippers (122 users).

GSA platform proved also to be a viable solution to the other TSOs. By August 2015, Net4Gas (CZ) and Eustream (SK) have already tested the functionalities of the GSA Platform by conducting the pilot auctions at IPs such as Cieszyn and Lanzhot. It demonstrates our rapid development, effectiveness and commitment to meet the highest standards, as well as market's expectations. Together with our partners, we want to develop a cost effective tool which would address particular market needs. GSA platform is being considered seriously as the tool for the development of the Ukrainian natural gas market.

GAZ-SYSTEM S.A. (as the GSA owner) encourages network users to take advantage of modern tools which safely translate the principles of the European network codes into the day-to-day operations of the TSOs and the shippers.

GAZ-SYSTEM S.A. coordinates the daily operations within two natural gas transmission systems. Thus, it is a pioneer in implementing the principles of the European network codes in the CEE Region having great understanding of Shippers' needs. GSA quality has been proved by relevant certificates such as ISO 9001:2008, ISO 14001:2004, ISO/IEC 27001 and provides 24/7 helpdesk. The IT provider is equally ISO and AQAP 2210:2006, AQAP 2110:2009 certified.

GAZ-SYSTEM S.A. strongly supports the multiplatform solution, as it will provide an opportunity select the most appropriate solution for individual TSOs. GSA platform is open for cooperation with all Platforms, interested parties, NRAs and Shippers. We are convinced that cooperation is essential to implement all the necessary solutions to finalize the natural gas market development in the EU. Having stated that, GSA invites all of the interested parties to test GSA Platform functionalities free of charge.

GAZ-SYSTEM S.A. is aware of other platforms with a different track record of auctions in the EU. Nevertheless, there are still certain markets in Europe deciding on the target solution and relevant TSOs still discussing different options. Thus, we strongly believe that the multi-platform concept should constitute the final solution. Competition is a key aspect benefiting the users of the platforms allowing to deliver the most efficient and effective solutions addressing the needs of the particular market participants, and GSA as a platform will be a part of this environment.

Find more at: https://auctions.gaz-system.pl/

Appendix vii)

Platform descriptions (provided by platform operators) - PRISMA

PRISMA chose not to provide a summary slide for the study, citing in an email on 6th August 2015 a need for the report to be independent and objective.

Appendix vii)

Platform descriptions (provided by platform operators) - RBP

RBP overview

RBP stands for 'Regional Booking Platform,' which is an electronic auction and capacity trading platform developed on the basis Regulation 984/2013/EU (CAM NC) and additional associated requirements of the European gas market. RBP offers CAM NC-compliant capacity booking procedures for bundled and unbundled capacities for transmission system operators and network users. Secondary capacity trading and further comfort functions, for instance tailor-made auctions, allocation of domestic network points or regulatory license management are featured as well. The inclusive, open-end development policy of RBP enables the continuous improvement of the existing services based on the feedback of the market participants and efficiently promotes the creation of new services.

Network Users and TSOs perform their business transactions in the RBP Application, which is an Internet-based thin client solution (rbp.fgsz.hu, soon rbp.eu), accessible only for registered users. The publicly accessible RBP Portal (rbpportal.fgsz.hu, soon portal.rbp.eu) serves general publication and information purposes.

Various connection models assist TSOs and network users to optimise the usage of RBP according to their business operations: Intuitive graphic user interfaces, built-in excel uploads and freely accessible SOAP interfaces empower users to customise their connection according to their data exchange requirements, and to flexibly upgrade these when required.

In developing RBP, high performance and availability, secure access and the convenient administration of a high number of simultaneously running capacity auctions had been of paramount importance. RBP was designed to permanently host running auctions in the range of several hundreds, with (geo)redundant hot backup IT infrastructure and a minimal switch-over time between the RBP servers.

The operator of the RBP is FGSZ Ltd, an ISO 9001:2008 and ISO/IEC 27001:2005 certified multi-platform operator and the independent transmission system operator (ITO) of the Hungarian natural gas transmission network. Currently, FGSZ (Hungary) and Transgaz (Romania) are TSO Members of RBP and further TSOs are invited to join in the near future.

Appendix vii)

Platform descriptions – feedback platforms to final study report, which was not included in main report (1).

GSA.

GSA advised to amend benchmarking illustrative calculations methods, to reflect the range of cost per IP and Network point on PRISMA (min and max value).

BARINGA: The benchmarking snapshot methodology was discussed at Steering Group and we remain with the averages as indicative. Minimum and maximum values would need to be derived for all 3 platforms, and would not be meaningful given that 2015 budget figure is one number per platform.

GSA advised that starting from 1 Sept 2015, GSA are offering on the GSA platform (Production environment) bundled/unbundled day ahead auctions.

BARINGA: The cut-off date for input data into the final report was set for 19 August 2015 for all platform operators. This anticipated development for 1 September 2015 is therefore mentioned here for information purposes.

PRISMA.

PRISMA advised that the automated bidding criterion should include comfort function as offered on PRISMA.

BARINGA: For the purpose of this report and based on the legal requirement, the formal criterion of "automated bidding" was defined to not include the comfort function of bidding in advance of auctions. The criteria definition makes this clear.

Appendix vii)

Platform descriptions – feedback platforms to final study report, which was not included in main report (2).

RBP.

RBP advised, that it offers the 1:n bundling and competing auctions only in case of concrete TSO demand. Since it is very unlikely that any TSO requests such functions from RBP until 1 November 2015, RBP will most likely not offer these functions. RBP notes that FGSZ as well as HEA challenges the mandatory implementation of 1:n bundling and competing auctions where no such function (conditional to prior agreements) is required bythe TSOs and the NRAs. As such, these functions clearly stand out from all the rest, which have to be implemented unconditionally.

BARINGA: For the purpose of this report, the criteria have been classified into 4 main categories, i.e. CAM network code core requirements, CAM network code associated requirements, enabling IT requirements as well as user friendliness requirements. The requirements of "bundling of capacity in 1:n situations" and "offer of competing capacity products" have been included under the CAM network code core requirements. This is as originally discussed and agreed.

RBP further advised that undecided TSO opinions on RBP are misleading in its current form. In the TSO opinion cells on RBP, RBP asked to appropriately reflect on the fact that the three interviewed undecided TSOs have not had relevant experience with RBP. In the past, Net4Gas, Eustream and Plinacro participated in meetings in ENTSOG and within the framework of the Visegrad4 cooperation, where RBP was presented in general. Since the live operation of RBP has started in December 2014, none of them showed any interest in RBP and did not conduct any discussion about RBP with FGSZ. Questions regarding the charging structure and the governance structure are linked to the discussion about the TSO Membership Agreement, which document is provided to TSOs on request. Without knowing this document, RBP can understand that for these TSO, the charging structure and the governance is "unclear."Due to the very small sample, RBP questions the validity of the scores and propose to remove scores as they do not reflect a statistically significant partofnetwork users (and TSOs).

BARINGA: For the purpose of this report, it was agreed in Steering Group to interview a limited number of undecided TSOs and representative users. Their feeback has been included in this report, and their names have been specified in Appendix III.

Appendix viii)

Technical definitions

Term	Definition
HTTPS	Secure data communication protocol across a network (typically the internet) IETF standard: RFC 2818
AS2	Secure data communication protocol IETF standard: RFC 4130
S/MIME	Encryption and data signing standard IETF standards: RFC 2045, RFC 3851, RFC 5751
Two factor user authentication	The use of multiple authentication factors to gain access to software IETF standard: RFC 6238
ISO 27001	Industry standard for the management of information security ISO standard
Digital certificates	Electronic document used to ensure authenticity and security of communication IETF standard: RFC 5280, EU Directive: 1999/93/EC
Modern software support	Software requirements (e.g. web browsers) are up to date and currently supported by software vendors
Basic exploit resilience	A check against common security flaws in web platforms e.g. HTML / SQL / XML injection
SOAP	Communication protocol for web service information exchange W3 standard: SOAP
XML	Annotation system for encoding machine readable documents W3 standard: XML
Edigas	Industry specific data communication protocol. We note an ongoing update to current Edigas-version 5.1 (latest documents: 3 July 2015). Edigas standard