EXPERT OPINION CONCERNING POTENTIALS FOR FURTHER NATIONAL OR CROSS-BORDER MARKET INTEGRATION AND ITS IMPLICATIONS FOR THE GERMAN GAS MARKET

BACKGROUND, SCOPE AND SUMMARY

Expert opinion on behalf of Bundesnetzagentur

Vienna, 04.05.2016

BACKGROUND AND PURPOSE OF THE STUDY

Since 1998 the European Union pursues the target of creating a functioning internal gas market (Directive 98/30/EG). The respective legislative packages aim to strengthen consumer rights, to open new business opportunities, to ensure non-discriminatory network access and to foster cross-border trade. Regulation (EG) 715/2009 requires the preparation of EU network codes to enforce effective harmonization of network access to transmission systems. Germany has already contributed to a noticeable increase of competition and liquidity by the integration of formerly 28 market areas (2006) into two large cross-quality market areas.

The (updated) ACER Gas Target Model[1] (AGTM) published on 16th January 2015 shifts the focus on fostering the liquidity of wholesale markets for the further development of the German and European gas market. To this end, ACER has introduced a comprehensive set of metrics for liquid wholesale markets and thus has provided an initial assessment of the degree of fulfillment of these metrics for European gas markets.

In addition to that, the AGTM includes concrete proposals for the development of market places if these criteria are not met and are not expected to be met in the medium term.

In this context, market integration[2] is an essential measure to stimulate market development. When assessing specified market integration projects, the related costs and benefits need to be properly considered through an individual detail analysis.

Cross-border integration projects may create superior competition, increase liquidity and strengthen security of supply in Germany and Europe. On the other hand, such European projects entail also economical, legal, technical and organizational hurdles. Therefore, it is essential to provide a comparative assessment of alternative national and European projects based on the aspects of wholesale market functioning and supplementing consideration of security of supply issues.

This expert opinion aims at evaluating the status quo of German market areas based on specified metrics and at deriving complementary criteria for the assessment of national and/or cross-border measures for market integration. Furthermore, these criteria shall be applied for selected market integration options and their implications for the gas market shall be identified.

[1] http://www.acer.europa.eu/Events/Presentation-of-ACER-Gas-Target-Model-/Documents/European%20Gas%20Target%20Model%20Review%20and%20Update.pdf
[2] See also Annex 6 of GTM II: http://www.acer.europa.eu/Events/Presentation-of-ACER-Gas-Target-Model-/Documents/A14-AGTM-13-03d_GTM_Annex%206%20-%20Gas%20market%20integration%20and%20connection%20tools_final.pdf

Thereto, this expert opinion focuses on the following aspects of market integration from a German perspective, which are based on the (ideal-type) integration models provided by the AGTM:

- development of market health and market participants' needs metrics introduced by the AGTM,
- resulting harmonization needs (in the areas of network access, storage (regulation), tariffs, etc.),
- security of supply and
- the impact on marketable (technical) capacities.

It needs to be emphasized that this expert opinion can neither substitute a detailed cost benefit analysis for a specified integration project nor preempt the final results of such a much more detailed analysis.

In addition to market integration, this expert opinion shall also address, if and to which extent internal measures in the existing German market areas can contribute to market development and the fulfillment of AGTM requirements.

SUMMARY

The preparation of this expert opinion comprised three consecutive phases with distinct issues and objectives. These steps, illustrated in the following figure, have also been reflected in the structure of this document.

Figure 1: Phases of preparation for the expert opinion

Phase 1 was mainly aimed at determining the extent to which the German market areas NCG and GASPOOL fulfilled the various market health and market participants' needs metrics provided by the AGTM in 2014. In addition to that, a trend analysis was conducted in order to estimate the future development of these metrics for the calendar year 2017.

Phase 2 was dedicated to the identification and evaluation of internal measures for the existing German market areas, which could potentially add to the improvement of the abovementioned AGTM metrics while keeping the existing market structure with two cross-quality market areas in place.

The concluding phase 3 focused on the improvement of market functioning, and thus the AGTM metrics, of the German market areas by measures of market integration. In a first step, prerequisites and characteristics of the ideal-type market integration models provided by the AGTM have been described and selected for the purpose of effective German market integration. Based thereupon, an initial assessment of preselected market combinations has been done by considering the respective potential for improvement of the relevant metrics and potential impacts on the German end-users' security of supply. Based on the results of this initial assessment, the most promising market integration options have been selected for further detail analysis. The detail analysis considered the following dimensions:

- market health and market participants' needs metrics of the AGTM
- direct access to (new) sources of gas and potential implications of market integration on the amount of firm capacity
- changes of relevant metrics regarding security of supply
- implications for the competitive situation in the storage market
- need for harmonization of market rules related to the actual implementation of considered market integration options

Phase 1: Market health and market participants' needs metrics of German market areas

Current fulfillment of the thresholds for functioning markets provided by the AGTM

Market health metrics serve as the basis for the analysis of competitiveness, resilience and security of supply of gas markets. The assessment of these metrics for the German market areas shows that the thresholds for the required *Number of Supply Sources (NoS)* as well as the *Residual Supply Index* (RSI) are fulfilled in 2014. The target level of market concentration for individual suppliers (measured by the *Herfindahl-Hirschman Index (HHI))* is closely missed in both German market areas. The results of the market health metrics in 2014 are summarized in the table below:

Table 1: Market health metrics for NCG/GASPOOL (fulfillment of thresholds is marked in green)

	NoS	HHI	RSI
GASPOOL	4	2.965	111%
NCG	4	2.743	148%
Threshold	≥ 3	≤ 2.000	≥ 110% of demand

Market participants' needs metrics, which address market aspects especially relevant for the effective management of wholesale risks, comprise metrics concerning order book volumes, bid/offer-spreads, trades etc. for spot, prompt and forward market segments. Analysis of these metrics shows that in 2014 the various liquidity and volume thresholds provided by the AGTM are broadly not fulfilled.

Notwithstanding the improvement of the results regarding the spot market segment, the degree of fulfillment for the prompt and forward market either declined or remained at a low level. Overall, in 2014 the German market areas fall short of the requirements identified in the AGTM for functioning wholesale markets. The following figure illustrates the aggregated fulfillment of AGTM thresholds per market segment (as mean of degrees of fulfillment of individual indicators per segment) for the years 2013 and 2014:

Table 2: Degree of fulfillment of market participants' needs metrics for NCG/GASPOOL

	Degree of fulfilment 2013			Degree of fulfilment 2014		
	Spot	Prompt	Forward	Spot	Prompt	Forward
GASPOOL	62%	15%	3%	67%	15%	2%
NCG	79%	40%	15%	80%	21%	5%

Expected future fulfillment of the thresholds for functioning markets provided by the AGTM

In line with the principles of the self-evaluation process provided by the AGTM, this expert opinion also includes a projection of selected AGTM metrics for the German market areas NCG and GASPOOL to the year 2017.

In the field of market health metrics no considerable changes regarding existing supply sources or import shares of individual suppliers to the German market are to be expected until 2017. Considering the future development of indigenous production, national demand, import capacities, etc. provided by the national network development plan (NEP) 2015, the results for 2014 can be assumed to be much the same in 2017.

Selected market participants' needs metrics have been extrapolated based on existing data spanning from 01/2013 until 09/2015. Based on a rolling analysis of 12-month periods and linear regression, trends for the development of relevant market participants' needs metrics have been identified and projected to 2017 (due to the relatively short period of existing data without claim to long-term validity).

According to these projections, spot markets in NCG and GASPOOL continue their positive development. The prompt market segment shows a downward trend for NCG while results for GASPOOL remain more or less unchanged at the existing low level. For the case of the forward segment a tendency for a stable development at NCG and decreasing liquidity and volume for GASPOOL becomes apparent. As a consequence of these results, it cannot be derived that the current market areas NCG and GASPOOL can achieve a level of sufficient market functioning in prompt and forward market segments in the mid-term future. The erstwhile significant gap between NCG and GASPOOL in 2013 tends to decrease over time and according to the trend analysis, GASPOOL may catch up to NCG, especially in the spot and prompt segment of the wholesale market.

Conclusion regarding the fulfillment of the thresholds for functioning markets provided by AGTM

All in all the analysis of actual and prospective AGTM metrics results reveals that especially the fulfillment of market participants' needs metrics in prompt and forward market segments falls substantially short of the AGTM requirements for functioning gas markets. Therefore, measures with an emphasis on stimulating the prompt and forward segments of the wholesale market are imperative. This expert opinion addresses avenues for such measures in two different forms:

- internal measures for the German market areas
- cross-market measures of market integration

Phase 2: Internal measures for the German market areas

Phase 2 of the expert opinion focused on identifying measures within the existing German markets, which might lead to an improvement of AGTM metrics. As a consequence of the findings in phase 1 the analysis focused on measures which pre-eminently trigger improvements in the prompt and forward segment of the wholesale market. The following table summarizes potential internal measures, which have been identified and addressed in the expert opinion:

Table 1: Identified internal measures and their expected impact on wholesale market segments

No.	Market internal measures	Expected impact on segment		
		Spot	Prompt	Forward
Increase of VTP access for physical gas flows				
1.	Establishment of (at least interruptible) VTP access for transit flows	Yes	Yes	No
Increase of the share of transactions executed in the organized market				
2.	Improved transparency concerning access options to the organized market	Yes	Yes	Yes
3.	Execution of gas auctions in the organized market	Yes	Yes	Yes
4.	Fuel gas procurement of German TSOs using the organized market	Yes	Yes	Yes
5.	Reduction of VTP fee	Yes	No	No
Increase of the turnover of transactions in the organized market				
6.	Improved transparency concerning the aggregated demand in the market areas	Yes	Yes	Yes
7.	Improved transparency concerning the overall system status in the market areas	Yes	Yes	Yes
8.	Extension of the EFET agreement by appendices for NCG and GASPOOL	Yes	Yes	Yes
9.	Offer of within-day capacity at connection points to storages and end users (power plants)	Yes	No	No
10.	Introduction of a simplified VTP access procedure for paper traders	No	Yes	Yes

No.	Market internal measures	Expected impact on segment		
		Spot	Prompt	Forward
11.	Implementation of restrictions for the linking of balancing groups	Yes	Yes	Yes
12.	Improved planning security concerning total cost of network access/transport	No	No	Yes
13.	Obligations/incentives to increase number of market makers/reduce market making spreads	No	Yes	Yes
14.	Complete fade-out of the conversion fee	Yes	Yes	Yes

Synoptic evaluation of identified internal measures

Estimating actual impacts of the above mentioned internal measures on market functioning was not part of this expert opinion. However, in view of the considerable shortcomings of the German market areas with regards to the AGTM metrics in the prompt and forward market, it is highly doubtful that these measures will prove to be sufficient to create functioning prompt and forward markets.

Phase 3: Cross-market measures - Market integration incl. German market areas

As a result of the earlier self-evaluation in the phases 1 and 2 of this expert opinion, the concluding phase 3 focused on measures of market integration and their potential to be driving force for the further development of German market areas. Thereto, both national and cross-border options for the German market areas NCG and GASPOOL have been considered.

Market integration models

In order to gain a better understanding on how market integration could work out in a national or cross-border context, the integration models and key characteristics described by ACER in the AGTM have been reflected in this expert opinion. In this context, it is important to note, that these models are exemplary and represent ideal-type integration models, which do not claim to give a complete picture of market integration avenues and explicitly leave room for adaptions and alternative designs.

The ideal-type ‘market merger’ thereby represents an integration model with maximized benefits but at the same time also highest coordination and harmonization needs, while the integration model ‘trading region’ describes an alternative approach with the potential to reduce harmonization needs significantly.

Thus, in the trading region approach aspects of end user supply and balancing of these supplies remain on the national agenda and the mandatory harmonization needs concentrate on the following aspects:

- definition entry/exit system (potentially considering different gas qualities) und design of the according capacity model
- design of a simplified balancing model for the trading region
- design of the integrated VTP concerning trade notifications, allocations, etc.

In addition to the integration models introduced by the AGTM, alternative models which, in comparison to these ideal-type models, potentially further reduce the implementation and harmonization efforts may be applied.

However, what all models have in common is the establishment of a central, integrated VTP, which serves as transfer and delivery point for all wholesale transactions in the expanded market area. The ‘satellite model’ of the AGTM equally entails a single VTP, but the conditions for the application of this model would limit applicability for German market areas to those geographic market options, which presumably do not provide sufficient momentum for the required wholesale market development.

Initial evaluation of pre-selected options for market integration

In a first step towards the identification and evaluation of the most promising options for market integration 13 cross-border options for market integration plus the obvious national option, were evaluated based on their fundamental potential to stimulate the further development of the German gas market.

Final selection of the most promising options for market integration

From these 14 pre-selected options, the most promising options have been selected based on their impact on the development of market health metrics, market participants’ needs metrics and selected metrics regarding security of supply.

Essential for the final selection of the most promising options was the maximization of presumable benefits for both German market areas and the prevention of potentials for discrimination between market participants in these two German market areas.

The following table summarizes the results concerning the development of considered metrics for the pre-selected options based on their degree of fulfillment of given thresholds:

Figure 2: Degree of fulfillment of AGTM and security of supply metrics for pre-selected market integration options

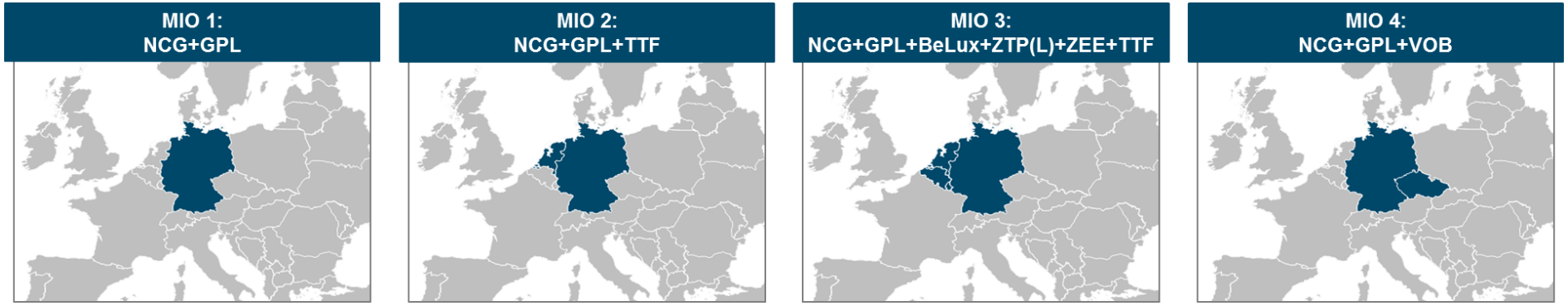
	Degree of fulfillment (2014)									
	Market health metrics			Market participants' needs metrics			Security of supply			
	NoS	HHI	RSI	Spot	Prompt	Forward	N-1	IRDI	SDC*	SRC**
Threshold	≥ 3	≤ 2.000	≥ 110% of demand	100%	100%	100%	≥ 100%	≤ 2.000	% of demand	% of max. rate
GPL	100%	67%	100%	67%	15%	2%	100%	88%	35%	107%
NCG	100%	73%	100%	80%	21%	5%	100%	93%	28%	95%
NCG+GPL	100%	74%	100%	100%	37%	19%	100%	100%	31%	100%
NCG+GPL+TTF	100%	100%	100%	100%	87%	66%	100%	100%	29%	85%
NCG+GPL+BeLux+ZTP(L)+ZEE	100%	81%	100%	100%	40%	20%	100%	100%	26%	87%
NCG+GPL+BeLux+ZTP(L)+ZEE+TTF	100%	100%	100%	100%	88%	66%	100%	100%	26%	78%
NCG+GPL+VOB	100%	71%	100%	100%	37%	19%	100%	100%	33%	97%
NCG+TTF	100%	93%	100%	100%	86%	66%	100%	95%	27%	78%
NCG+BeLux	100%	83%	100%	81%	21%	5%	100%	100%	23%	79%
NCG+BeLux+ZTP(L)+ZEE	100%	79%	100%	99%	30%	6%	100%	95%	21%	74%
NCG+PEGN+TRS	100%	93%	100%	83%	23%	6%	100%	100%	31%	90%
NCG+CEGH	100%	72%	100%	100%	34%	8%	100%	98%	32%	94%
GPL+TTF	100%	94%	100%	100%	85%	66%	100%	100%	30%	81%
GPL+BeLux	100%	89%	100%	68%	15%	2%	100%	100%	27%	87%
GPL+BeLux+ZTP(L)+ZEE	100%	87%	100%	95%	19%	3%	100%	100%	25%	80%
GPL+BeLux+ZTP(L)+ZEE+TTF	100%	100%	100%	100%	86%	66%	100%	100%	25%	73%

(*) Storage Demand Coefficient (SDC): This coefficient analyses to which amount the demand of the considered market area can be met by the available working gas volume.

(**) Storage Rate Coefficient (SRC): This coefficient compares the maximum available withdrawal rate of storages within the market area and the necessary amount of gas to cover demand in case of emergency (which occurs once in twenty years, according to Regulation (EU) 994/2010).

This final selection process resulted in four market integration options (MIOs), illustrated below, which were evaluated subsequently in detail based on complementary criteria.

Figure 3: Selection of the most promising MIOs



Complementary evaluation of the most promising options for market integration

In order to evaluate the most promising options complementary criteria were considered. Even though a final assessment of a specifically defined market integration project requires a detailed cost benefit analysis, the application of these complementary criteria in such an early stage has the purpose of:

- estimating the impact on the amount of marketable firm capacity based on existing and planned interconnection between to-be-integrated markets,
- revealing potentials for direct access to (new) sources and diversification of the competitive situation in the storage market,
- assessing the anticipated effects on security of supply of German end users and
- enabling a comparative assessment of market model characteristics and the regulatory framework of to-be-integrated markets and outlining the technical complexity of such an integration project in terms of harmonization needs (differentiated between *mandatory* and *recommendable*), legal/regulatory coordination requirements, etc.

Synopsis of the evaluation of most promising options for market integration

Market health and market participants' needs metrics of the AGTM

In view of the current and to be expected degree of fulfillment of market health metrics for NCG and GASPOOL, the evaluation of the most promising options underlines that only options of cross-border market integration which include the TTF (MIO 2, MIO 3) have the potential to create a sufficiently diversified supply situation. In addition to the already fulfilled metrics regarding number of supply sources and RSI (for NCG, GASPOOL and all MIOs), these MIOs would also allow for the fulfillment of the HHI metric for all German end users.

Concerning the market participants' needs metrics, the situation is quite comparable. Only the cross-border integration of both German market areas with at least the TTF would constitute a substantial improvement regarding these metrics and a virtually complete fulfillment of the AGTM thresholds for the entire German gas market.

The national integration option (MIO 1) respectively the additional integration with the Czech VOB (MIO 4) may lead to an improvement of the metrics compared to the current state, however, compared to the integration options including the TTF to a significantly smaller extent.

Security of supply

In view of the considered metrics (and their underlying assumptions) the analysis shows a high level of infrastructural security of supply for the market areas NCG and especially GASPOOL, which remains widely unchanged in the context of the national integration (MIO 1).

Likewise, in the international context a broadly similar picture of high security of supply emerges. Only storage-related metrics show a discernable decline of results for integration options with Western neighboring markets (MIO 2, MIO 3).

Storage

While the individual review of the German market areas reveals, that diversification of storage providers falls short of HHI-related thresholds, all considered MIOs indicate the potential to reduce market concentration to the required level. In this context, it has to be noted that the respective values reflect the total technical capacities and does not consider currently bookable capacities.

Network access

The analysis of the impact of market integration on existing capacity reveals considerable interconnection deficits in worst case nomination scenarios for all considered integration options. Moreover, parts of the remaining freely allocable entry capacity (entry FAC) depend on seasonal demand respectively storage usage in the considered markets.

To the extent of this dependence on seasonal demands, the remaining marketable entry FAC represents the average value of a dynamic[3] technical capacity. It needs to be considered that without non-quantified costs for measures to maintain this capacity, it cannot be provided as yearly FAC able to cope with worst case nomination scenarios.

Based on the identified interconnection deficits, the theoretical capacity restriction rate derived from an average assessment is largest for the national integration (MIO 1). From a German perspective, the lowest value for this metric is revealed for MIO 3 (cross-border integration with Western neighboring markets) and MIO 4 (cross-border integration with Czech VOB). The preservation of the firm access to an integrated VTP in such constellations (based on entry FAC) requires commercial or technical measures. Their costs (or alternatively the restriction of the firm VTP access) need to be considered in the course of a cost benefit analysis at a later stage.

Concerning additional, directly accessible sources for the German market, especially MIO 2 and the MIO 3 show potential for additional supply diversification (direct access to LNG, British NBP, etc.).

Harmonization needs and coordination requirements

The identification and evaluation of harmonization needs as well as harmonization requirements is based on the definition of 46 criteria (evaluation criteria). Depending on the integration model, they have been defined as mandatory respectively recommendable and have been applied in evaluating the most promising integration options for both the integration models ‘market merger’ and ‘trading region’.

On the basis of these criteria a comprehensive analysis of market model characteristics and the regulatory framework of to-be-integrated markets and a comparative assessment with German conditions and circumstances was conducted.

Noticed differences were documented as harmonization needs and constitute, subject to an individual legal/regulatory detail assessment, actual harmonization tasks in case of the implementation of considered MIOs

This evaluation reveals a significantly high level of mandatory harmonisation needs in the area of network access for any cross-border integration, especially for a complete integration of markets based on the AGTM ideal-type model market merger.

In case of implementation of the trading region integration model provided by the AGTM, mandatory harmonisation needs mainly refer to the joint trading region, while aspects of end user supply and balancing of these supplies remain on the national agenda and do not require extensive harmonization.

[3] Bookable capacities are re-calculated and offered on a short term basis in order to reflect the mentioned dependency on seasonal demands, etc.

In the area of security of supply, storages and tariffs, the harmonization needs have been mainly qualified as recommendable, as it can be assumed that they are either broadly addressed by fundamental harmonization efforts related to the establishment of the EU internal market or harmonization is perceived as non-mandatory from a legal or operational perspective.

National rights and obligations regarding security of supply as well as the power of local authorities to act for the purpose national crisis management are considered to remain unaffected by market integration.

Subsequent evaluation requirements for specified market integration projects

The evaluation of the most promising options for market integration was solely based on publicly available information and the ideal-type integration models of the AGTM.

In order to make precise assessment of the potential and implications of a specific market integration project, the following (evaluation) steps are required in a subsequent stage:

- definition of the scope of market integration (inclusion of market areas, gas qualities, hubs),
- detailed concept for a selected integration model describing the functionalities of the integrated market regarding network access, balancing, tariff, market roles, etc.,
- detailed concept for the entry/exit system (based on the detail analysis of the extent and frequency of interconnection deficits as well as definition of measures for the prevention of bottlenecks),
- cost benefit analysis (based on the specified concepts listed above) and
- case-by-case review of legal/regulatory harmonization needs.

Conclusion

Any proposed market integration project with the aim to foster the prompt and forward segments of the wholesale markets of NCG and GASPOOL should – based on the results of this expert opinion – include at least both German market areas and the TTF, as only with such an integration setting fulfillment of the AGTM thresholds for functioning markets can be expected.

It needs to be highlighted that such projects require, in addition to the coordinated treatment of harmonization needs and coordination requirements, a thorough consideration of all expected benefits and arising costs. In this context, especially capacity restrictions as a consequence of market integration need to be properly considered – either by reducing theoretical benefits (if access to the VTP is to be partly restricted) or by considering costs of actions required to preserve free access to the VTP.

DISCLAIMER

This document has been prepared by Wagner & Elbling GmbH ("Wagner, Elbling & Company") at the request of Bundesnetzagentur ("Client"). This report was prepared for the sole benefit and use of the Client and is based on the scope of work agreed with the Client that may not meet the interest or priorities of any third party.

The report must be construed in the context in which it was prepared including the constraints relating to availability of time and information, the quality of that information, scope of work Wagner & Elbling GmbH agreed with the Client and Wagner & Elbling GmbH assumptions and qualifications, in each case, as more fully set out in this report. Information and the opinions expressed are subject to change without notice.

The information contained in this document is supplied to any person only on the condition that Wagner & Elbling GmbH and any employee of Wagner & Elbling GmbH are not liable for any information within the document including any error, inaccuracy, whether negligently caused or otherwise, or for any loss or damage suffered by any person due to such error, omission, or inaccuracy.