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2018 Global chemical industry mergers and acquisitions outlook

In search of growth

Contents

Introduction	3
Mega-deals: Where art thou?	4
State-owned enterprises rise in the M&A market	5
Private equity maintains its share in a competitive M&A market	6
Activist investors: Taking an active role in portfolio optimization	8
Mergers and acquisitions activity by chemical sector	9
Mergers and acquisitions activity by geography	11
Summary outlook for 2018 mergers and acquisitions activity	15
Endnotes	16
Contacts	19
Acknowledgments	21

Introduction

Last year, the Deloitte Touche Tohmatsu Limited (Deloitte Global) *2017 Global chemical industry mergers and acquisitions outlook* (2017 Outlook) raised several questions about what merger and acquisition (M&A) activity we might see during the year, including whether mega-deals had served to accelerate global consolidation. During 2017, the number of US\$1 billion deals continued their strong momentum, but with far fewer mega-deals, total deal values were below those achieved in both 2015 and 2016.

Global M&A volume in 2017 was slightly below 2016, but remained robust and was higher than in each of the four years from 2012 to 2015. Activity in 2017 was fueled, in part, by the regulatory divestitures resulting from mega-deals announced in 2015 and 2016. Average deal size dipped due to the absence of mega-deals. Only one chemical deal in 2017 exceeded US\$5 billion as compared to five such deals in 2016 which totaled US\$182 billion in value.

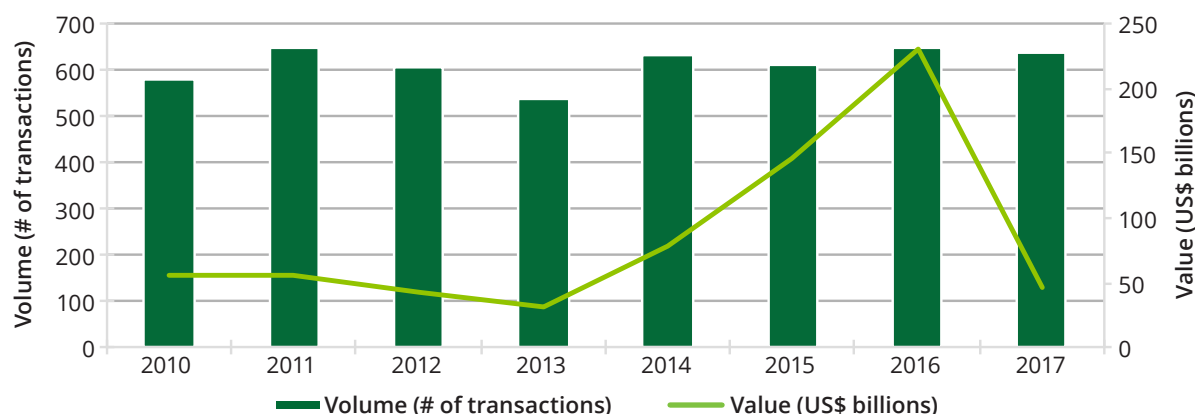
The 2017 Outlook also questioned whether shareholder activists had left the industry. M&A activity in 2017 clearly answered that question, as activists re-emerged and made a significant impact on some of the largest deals¹, both as deal supporters and as blockers to deal completion.

With strong performance and promising prospects in many key end markets² and record-breaking M&A activity over the last several years, some are wondering whether in 2018 chemical companies will turn their attention to optimizing their recent acquisitions and focus on organic growth opportunities. Additionally, with an increase in 2017 of 24.0 percent in the S&P 500 Chemical Industry Index and 24.6 percent in the Dow Jones Chemicals Titans 30 Index³, will high valuations hinder M&A activity in 2018?

With the last two quarters of 2017 experiencing the lowest volumes of M&A since Q3 of 2015, will this downward trend continue into 2018? What will 2018 hold for the chemical M&A market? With extensive consolidation in the fertilizers and agricultural chemicals and industrial gases sectors over the last few years, will consolidation activity pick up in another sector and help propel chemical M&A? Will state-owned enterprises (SOEs) continue to flex their strength in the global deal market? How will private equity investors compete with strategic suitors, who can take advantage of available synergies to win deals in a lofty pricing environment? Will coatings, resins, fine chemicals or other sectors further consolidate?

These and other questions will be explored in the *2018 Global chemical industry mergers and acquisitions outlook*.

Figure 1. Global chemical merger and acquisitions activity (2010 to 2017)



Total activity (2010 to 2017)

	2010	2011	2012	2013	2014	2015	2016	2017
Volume (# of transactions)	579	646	609	537	635	612	650	637
Value (US\$ billions)	55.6	55.1	41.8	31.8	77.8	145.8	231.1	46.4

Source: Deloitte Touche Tohmatsu Limited analysis of data from S&P Capital IQ, January 2018. Data is from 1 January 2010 to 31 December 2017.

Mega-deals: Where art thou?

Throughout 2015 and 2016, there were prominent multi-billion dollar deals in a number of chemical sectors. These were a means for acquirers to make strategic moves and gain scale. A combination of available and inexpensive financing along with robust share prices were a catalyst for this boom in mega-deals. The pace of US\$5 billion+ deals slowed in 2017, back to pre-2015 levels, as many sectors may have already reached a point where regulatory constraints challenges further consolidation on the same scale (for example, in industrial gases, fertilizers and agricultural chemicals). As shown in Figure 2, the volume of US\$1 billion+ deals was similar to the previous three years even though only one mega-deal was announced in 2017.

Mega-deals announced in prior years continued to drive M&A activity in 2017 and are expected to drive activity in 2018. Regulatory divestitures, such as Bayer's announced sale of significant parts of its seed and non-selective herbicides businesses to BASF for US\$7 billion⁴, may still be forthcoming from other announced mega-deals. Further divestitures from Bayer may also be required⁵. In addition, certain assets of the combined Linde / Praxair will likely be sold to win approval from regulators⁶. Others may seek to divest as their combined businesses narrow their focus on core competencies.

There may yet be larger deals forthcoming in 2018 in some of the more fragmented sectors of specialty chemicals. In 2017 several large transactions within the coatings sub-sector were explored, but by the end of 2017 these had not resulted in any announced deals⁷. Within commodities, The Wall Street Journal reported that LyondellBasell had approached Braskem with a takeover offer. Neither party has confirmed this report, but if it were to happen, it would represent the biggest deal since 2016, given Braskem's market capitalization of more than US\$10 billion⁸. There had also been rumors of a potential merger of state-owned Sinochem and state-owned ChemChina to support industry consolidation in China and create a global leader; however, this has not been publicly acknowledged by either party⁹. And finally, there was the US\$20 billion Clariant/Huntsman announced merger that did not come to fruition, due in part to shareholder activists¹⁰. Further M&A activity involving either party might happen.

As seen in 2017, there is clearly still an appetite amongst industry participants for large, transformative M&A transactions which will likely translate into a continued robust M&A market in 2018—and perhaps even a few mega-deals.

Figure 2. Activity over US\$1 billion (2010 to 2017)

	2010	2011	2012	2013	2014	2015	2016	2017
Volume (number of transactions)	10	11	11	8	13	16	12	13
Value (US\$ billions)	39.2	36.7	23.8	13.6	52.6	126.3	205.7	29.2

Source: Deloitte Touche Tohmatsu Limited analysis of data from S&P Capital IQ, January 2018. Data is from 1 January 2010 to 31 December 2017.

State-owned enterprises rise in the M&A market

In recent years, many large oil and gas companies have announced investment in additional petrochemical capacity in the US¹¹. In many cases, these investments are being made through joint ventures with SOEs. Many of these SOEs are from emerging markets. Their investments are disrupting the industry as they expand into the petrochemical space and increase the emphasis on low-cost production as a competitive advantage.

In January 2018 SABIC acquired a 24.9 percent interest in Clariant AG, representing additional investment into the specialty chemicals sector¹². Saudi Aramco and SABIC have also announced a preliminary agreement¹³ to build a US\$20 billion¹⁴ petrochemical facility that could begin production by 2025. These investments, along with any other moves downstream, will have a similar impact on the commodities market as those by other large oil and gas companies. Aramco has also made investments in recent years in other downstream companies such as a joint venture with LANXESS AG in a synthetic rubber business (ARLANXEO) and the acquisition of the polyols business of Novomer in late 2016¹⁵.

Outside of Saudi SOEs, it is expected that Chinese SOEs will also continue to impact the M&A market. While there has been no immediate indication of a merger between the two largest Chinese chemical companies, Sinochem and ChemChina, excess capacity is still a dominant theme in the Chinese market, which may drive many SOEs to combine in order to

balance supply with demand and relieve some of the downward pressure on pricing that comes with excess capacity. In China's 13th Five-Year Plan covering the period from 2016 to 2020, the National People's Congress of China approved certain measures including support for consolidation and reorganization of certain industries in an effort to address the over-capacity impacting the domestic and international markets¹⁶.

As will be further discussed in the *Mergers and acquisitions activity by geography* section of this Outlook, capital outflow regulations may also impact where Chinese SOEs are able to invest and drive consolidation within the Chinese market. However, recent clarification from Chinese regulators suggest that there may be a softening of these regulations where deals have strategic rationale for buyers, allowing SOEs to continue driving activity both inside and outside of China¹⁷.

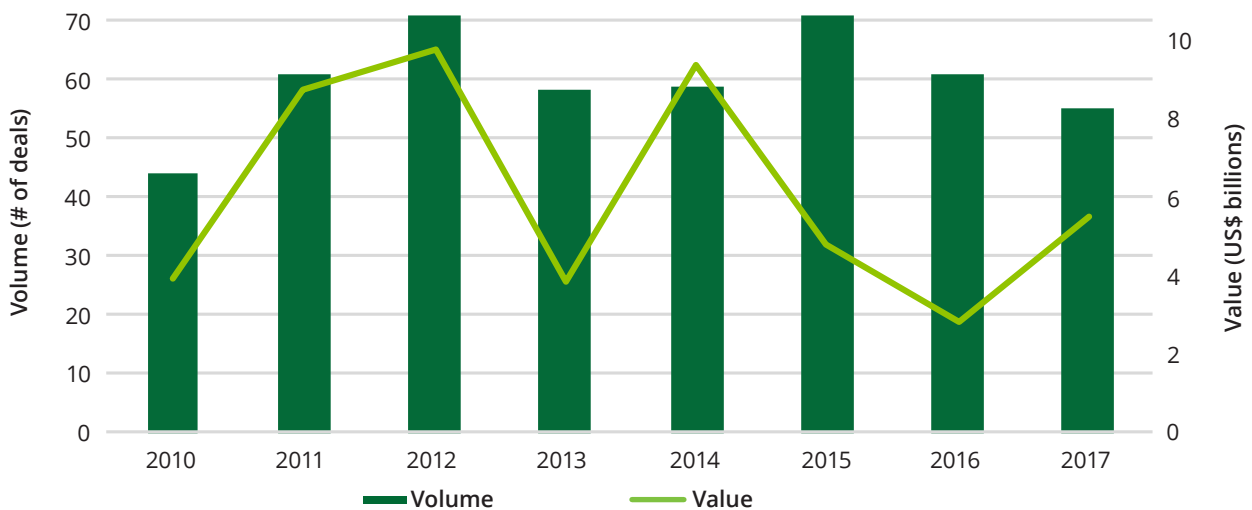
It is expected that SOEs will continue to impact the overall M&A market in 2018 through investments in downstream operations by oil and gas companies or continued consolidation of petrochemical players to compete with well-funded SOEs. Given the resources at their disposal, there is also potential for SOEs to make larger acquisitions in their home countries and abroad.

Private equity maintains its share in a competitive M&A market

Even with record levels of available capital, private equity players have had a slightly more pronounced decrease in chemical M&A activity in 2017 than strategic buyers with 2017 marking the lowest level of private equity activity since 2010. Despite lower volume, investment value approached levels achieved in 2012 and 2014. This was driven by a few larger transactions such as PAG Asia Capital's US\$3.1 billion investment in the Yingde Industrial Gases business¹⁸, the acquisition by SK Capital Partners of the Fire Safety and Oil Additives businesses of Israel Chemicals Ltd. for approximately

US\$1 billion¹⁹, and MBK's US\$981 million purchase of Daesung Industrial Gases²⁰. Available investment equity in North American and European PE funds was US\$738.7 billion as of year-end 2016, surpassing the levels of capital overhang at the end of the last fundraising cycle in 2007 and 2008²¹. This increase in available capital, however, does not appear to have translated into an increase in chemical M&A market share by private equity. As shown in Figure 3, private equity accounted for 55 of the 637 announced transactions in 2017 (8.6 percent) compared with 9.3 percent of transactions in 2016 and 11.6 percent in 2015.

Figure 3. Global chemical M&A activity - private equity buyers (2010 to 2017)



Source: Deloitte Touche Tohmatsu Limited analysis of data from S&P Capital IQ, January 2018. Data is from 1 January 2010 to 31 December 2017.

2013 guidance from US regulators on lenders' ability to finance transactions where borrowings exceed six times EBITDA has likely impacted the ability of some financial buyers to achieve desired returns in platform chemical industry investments, due to the absence of synergies. However, there have been reports that these leverage metrics may be revisited by the current US administration²². Relaxation or repeal of these regulations may allow some financial buyers to be more aggressive in competitive auction processes in the chemical industry. Yet, even with these regulations relaxed or removed, private equity would continue to face challenges competing with strategic buyers, who are often aggressive in seeking growth and can leverage their elevated share prices and their ability to monetize synergies in order to outbid private equity buyers.

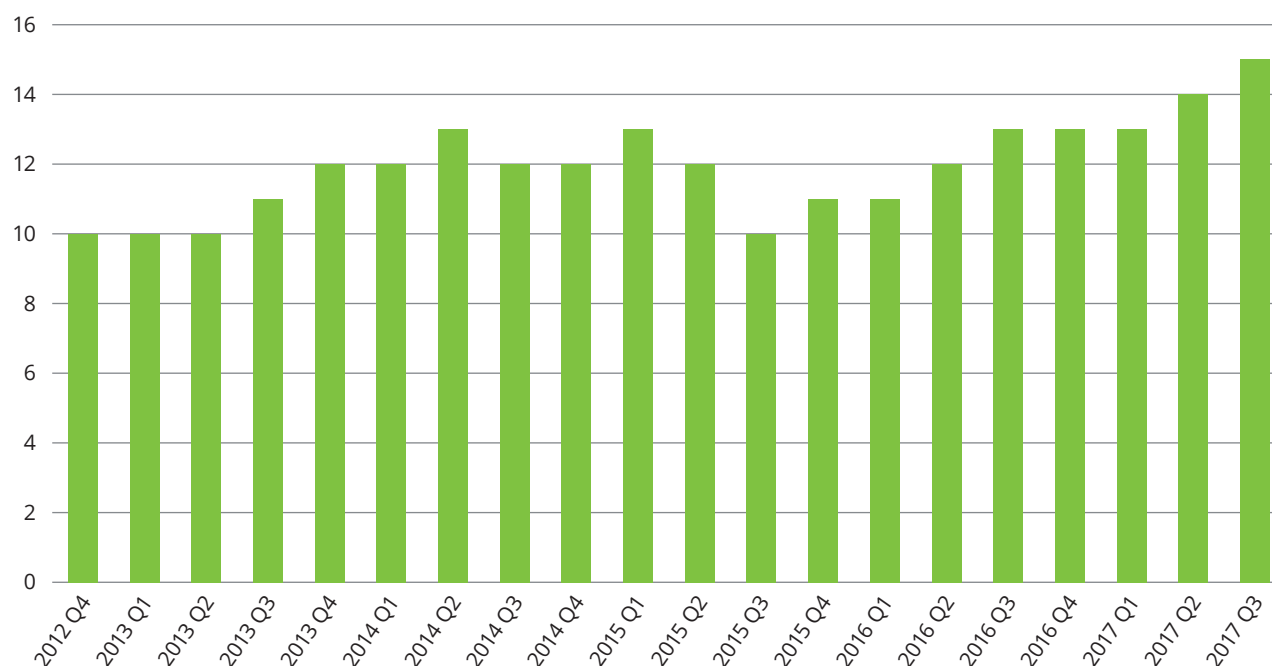
Financial buyers often find more success with niche assets that may not attract much interest from strategic bidders, or they may be able to acquire assets from regulatory-required divestitures where other well-heeled strategic bidders face the same regulatory concerns as sellers. These more favorable situations often involve some form of complexity, such as corporate divestitures or operations that are challenged or in flux. In these cases private equity can sometimes understand and quantify the issues more quickly during the deal process. There are also many private equity firms that have a focus on

the chemical industry and often have platforms that can leverage synergies or may bring a certain expertise or knowledge of unique end markets or supply chain complexities to make them more competitive in the M&A market.

While the nature of M&A makes analysis of deal value multiples an art rather than a science, the trend in EV / EBITDA in the S&P 500 Chemicals Index can serve as a good indicator of overall valuations in the market. As shown in Figure 4, multiples have been steadily rising since mid-2015 to a level not seen in the last five years. At elevated multiples, it becomes harder for financial buyers to achieve desired rates of return on investment. Many private equity firms are competing in the specialty chemicals sector where competition from strategic buyers and valuations tends to be even higher²³. Against the backdrop of rising valuations, we have observed many instances in 2017 of aggressive strategic buyers using available synergies to outbid financial buyers and, in some cases, to pre-empt the auction process to negotiate with the sellers in exclusivity.

While it is not expected that financial buyers will become the dominant player in the chemical M&A market, it is expected that they will continue to participate actively in the market in 2018 as they look to deploy their capital.

Figure 4. Average EV/TTM EBITDA, S&P 500 Chemicals Index (2012 to 2017)



Source: Deloitte Touche Tohmatsu Limited analysis of data from S&P Capital IQ, January 2018. Data is from 1 January 2010 to 31 December 2017.

EV/TTM = Enterprise Value/Trailing Twelve Months of operations

Activist investors: Taking an active role in portfolio optimization

The 2017 Outlook asked whether shareholder activists had left the industry after a relatively quiet year in 2016. Now looking back at 2017, that question has clearly been answered as activists re-emerged to make a big impact on some of the largest deals²⁴.

While activist investors are not new to the chemical industry and have been discussed in previous M&A Outlooks, 2017 again saw several high-profile cases of activist investors impacting the chemical M&A market. Elliott Management's efforts to get the Board of Directors of AkzoNobel to engage in merger discussions with PPG was one of many that played out publicly. While Elliott was not successful in its lawsuits against AkzoNobel's Board, AkzoNobel announced a special dividend to shareholders in advance of expected proceeds from the separation²⁵ of its specialty chemicals division²⁶. AkzoNobel subsequently entered into merger discussions with Axalta that have since been discontinued²⁷.

Activist investors also managed to influence one of the largest mergers announced in 2017. White Tale Holdings increased their stake in Clariant to pressure the board into abandoning plans to merge with Huntsman¹⁰. However, as noted above, Clariant may yet be involved in M&A in 2018: its CEO stated that Clariant has various options, including a "merger of equals... [or] to make a large transformational transaction... [or] to continue to stand alone". In a later communication the CEO, Mr. Kottmann, stated that "to be more profitable and more innovative, to grow faster... this of course includes portfolio measures such as acquisitions or divestments"²⁸.

Continuing their previous involvement with both Dow Chemical and DuPont, some investors, including Trian Fund Management and Third Point, have been publicly involved in the recently closed merger. During 2017, Third Point sought to reshape the post-merger split of the combined DowDuPont into six businesses instead of three²⁹. Ultimately, the merged corporation has announced that it will still separate into three public companies, but with a transfer of products representing approximately US\$8 billion of revenues from the materials products business into the specialty products business³⁰.

While these are not the only examples of activists making an impact in the M&A market, they are all driven by the same underlying focus on creating value for shareholders by exerting pressure on management teams and boards to challenge their value hypotheses. It is expected that this trend will continue as activist investors look to achieve additional returns on top of historically high valuations by trying to persuade management towards transactions, including additional mergers and acquisitions, as well as spin-offs or sales of non-core assets.

Mergers and acquisitions activity by chemical sector

As stated previously, M&A activity remained high in 2017, as deal volumes exceeded those achieved in years 2012 to 2015. Commodities, fertilizers and agricultural chemicals saw the largest increases in M&A volumes over 2016.

Intermediates and specialty materials also experienced strong M&A volume in 2017, although slightly less than in 2016. This section analyses M&A activity in each chemical sector and highlights recent trends and transactions.

Figure 5. Total deal volume by target sector (2010 to 2017)

	2010	2011	2012	2013	2014	2015	2016	2017
Commodities	356	376	350	340	383	372	382	387
Intermediates and specialty materials	145	174	171	132	159	147	185	172
Fertilizers and agricultural chemicals	64	69	66	43	67	72	61	65
Industrial gases	9	12	14	16	15	14	13	10
Diversified	5	15	8	6	11	7	9	3
Total	579	646	609	537	635	612	650	637

Source: Deloitte Touche Tohmatsu Limited analysis of data from S&P Capital IQ, January 2018. Data is from 1 January 2010 to 31 December 2017.

Commodity chemicals: Emergence of SOEs and traditional oil and gas companies will continue to drive portfolio rebalancing and M&A activity

Many commodity chemical companies faced rising feedstock costs in 2017 as oil prices experienced another year of increases, with the average daily price of Brent Crude higher by 24.0 percent and West Texas Intermediate by 17.3 percent³¹. This has put pressure on margins until companies are able to pass along these higher feedstock costs to their customers. US Gulf Coast-based petrochemical plants were also challenged in 2017 by Hurricane Harvey, which temporarily disrupted the market as it brought down a significant amount of US petrochemical production in the third quarter of the year.

Producers that are able to tap the robust US shale gas reserves rather than oil-based feedstocks can gain a structural advantage that can help them be low-cost producers. Commodity chemicals companies have been spending a significant amount of cash flow on capital expenditures in recent years, trying to benefit from the shale gas feedstock advantage. This has contributed to a revitalization of the US Gulf Coast petrochemical production. This heavy capital spending has likely diverted at least some cash flow away from M&A. According to the American Chemistry Council, since 2010 there

have been nearly 320 new US chemical production projects valued at over US\$185 billion, of which 62 percent include some kind of foreign investment³². ExxonMobil recently announced plans to invest more than US\$50 billion on expanding its US operations in the next five years³³.

Despite these challenges from rising feedstocks and Hurricane Harvey³⁴, the commodity chemical sector experienced another active year of M&A in 2017. As previously noted, there has been continued interest in the sector from SOEs and traditional oil and gas companies going downstream to capture more of the chemical value chain³⁵. These trends were evidenced in some of the largest announced commodity chemical deals of 2017, including:

- The acquisition by Nova Chemicals of Williams Partners' Louisiana olefins plant for US\$2.1 billion: (Nova Chemicals is a wholly-owned subsidiary of Abu Dhabi sovereign wealth fund International Petroleum Investment Company)³⁶
- ExxonMobil's US\$1.8 billion acquisition of the Jurong Aromatics Corporation plant in Singapore³⁷
- SABIC's US\$820 million acquisition of the remaining 50 percent of Saudi Petrochemical Company (SADAF) owned by Shell³⁸

The continuing emergence of SOEs and traditional oil and gas companies is likely to propel scale and synergy-driven M&A plays as well as portfolio rebalancing amongst traditional commodity chemical players to stay competitive. This and other factors will likely drive another active year in M&A in 2018 in the commodity chemicals sector.

Intermediates and specialty materials: Further adhesives and coatings consolidation may drive 2018 activity

It was another busy year in M&A for the intermediates and specialty materials sector, despite the fact that certain mega-deals in the sector could not quite reach the finish line. There was continued consolidation in the adhesives and sealants sub-sector. H.B. Fuller announced three deals, the largest being the US\$1.6 billion acquisition of Royal Adhesives & Sealants³⁹, and Henkel announced its US\$1.05 billion acquisition of the Darex Packaging Technologies business from GCP Applied Technologies⁴⁰. With the adhesive and sealants sub-sector still relatively fragmented, consolidation is likely to continue in 2018.

There was also a flurry of activity in the coatings sub-sector, but with little to show for it by way of announced deals during the year. In March, PPG made an unsolicited offer to acquire AkzoNobel in its entirety, which AkzoNobel rejected⁴¹. AkzoNobel then proceeded to hold potential merger discussions with Axalta⁴² which ended when Nippon Paint entered into negotiations with Axalta about a potential acquisition⁴³. Though these companies created much news and activity, they all ended ultimately without any significant M&A deals, apart from the previously-announced separation of AkzoNobel's specialty chemicals business. However, this activity highlights the strong M&A appetite amongst some of the largest players in the coatings sub-sector, with efforts to bolster their global leadership positions in a sub-sector that is already comparatively consolidated. It is likely that 2018 will see further M&A activity in coatings, possibly with involvement from private equity.

Fertilizers and agricultural chemicals: Regulatory driven dispositions drive M&A activity

The 2017 Outlook predicted that M&A in the fertilizer and agricultural chemical sector would likely be driven by regulatory dispositions stemming from the mega-deals announced in 2015 and 2016. This prediction ultimately proved correct, and there were several announced deals in 2017. These announced deals included:

- BASF's US\$7 billion acquisition of significant parts of Bayer's seed and non-selective herbicide business⁴⁴

- FMC's acquisition of the portion of the DuPont Crop Protection business required to be divested to comply with the European Commission ruling relating to its merger with Dow Chemical⁴⁵
- Nufarm's US\$490 million acquisition of a crop protection product portfolio from Adama and Syngenta⁴⁶ and their US\$85 million acquisition of FMC's European cereal broadleaf herbicide portfolio⁴⁷

While the fertilizer and agricultural chemical sector is largely consolidated, 2018 is likely to see continued regulator-mandated divestitures and portfolio realignment resulting from past mega-deals, and perhaps further M&A among the off-patent generics producers. However, further mega-deals similar to those experienced in 2015 and 2016 in the sector are likely to be limited in number.

Industrial gases: Consolidation continues but regulatory divestitures likely to create deals

The industrial gases sector has seen significant consolidation over the past two years with the Air Liquide/Airgas and Praxair/Linde transactions hitting the headlines in 2015 and 2016, respectively⁴⁸. Much of the Praxair / Linde merger continued to unfold throughout 2017 with a definitive agreement signed in June and shareholder approvals also taking place⁴⁹. This trend of consolidation continued with Air Products submitting a preliminary, non-binding indication of interest to acquire Yingde, China's largest industrial gas producer⁵⁰. However, the deal never came to fruition as PAG Capital Asia ended up acquiring a controlling interest in Yingde¹⁹. Looking forward, 2018 will likely be a fairly quiet year in terms of any significant M&A plays in industrial gases, with the exception of some potentially significant regulatory-driven divestitures coming out of the Praxair / Linde transaction, and perhaps some regional consolidation plays.

Diversified: Failed 2017 deal attempts may spur future transactions

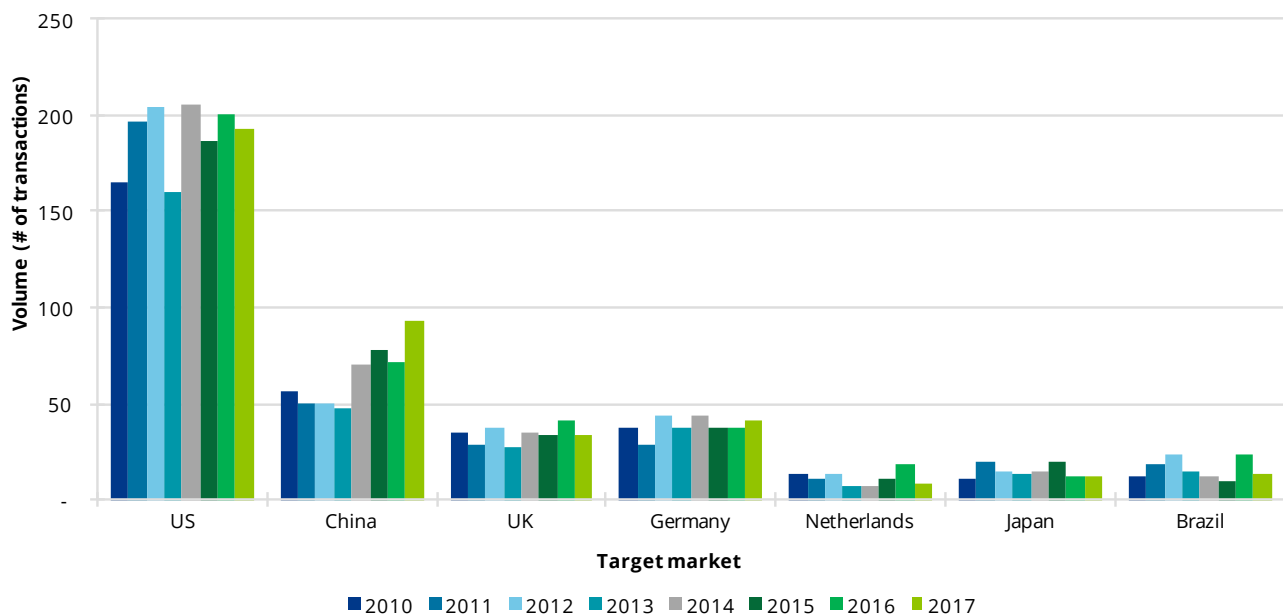
M&A activity in the diversified chemicals sub-sector experienced some significant shareholder activist disruption in 2017 with White Tale Holdings intervening in the Clariant and Huntsman merger. Clariant and Huntsman announced the transaction in May 2017, only then to abandon the planned US\$20 billion merger in November following continued opposition by White Tale to the planned merger¹⁰. This was the first mega-deal in the diversified chemical sub-sector since the announcement of the Dow/DuPont merger in 2015. With more chemical companies narrowing where they focus in the chemical value chain, there are fewer true diversified chemical companies remaining, so it is unlikely there will be a significant deal in this sub-sector in 2018. However, Clariant and Huntsman have both shown their willingness to tackle large M&A transactions, so there could be future M&A activity coming from them.

Mergers and acquisitions activity by geography

In 2017, M&A activity remained strong in many key markets. Slight decreases in activity in some markets such as the US and UK were mostly offset by an increase in acquisitions of Chinese

assets, and German companies shedding non-core assets associated with previous mega-deals. This section examines M&A activity by geographic location of the target.

Figure 6. Global chemical merger and acquisitions activity by target market (2010 to 2017)



Source: Deloitte Touche Tohmatsu Limited analysis of data from S&P Capital IQ, January 2018. Data is from 1 January 2010 to 31 December 2017.



US: Tax reform may drive significant investment in 2018 and beyond

The most notable feature of 2017 in the US M&A chemical market may have been the absence of any mega-deals, raising questions about where the investment dollars have gone instead. While overall M&A activity was down slightly in 2017 compared with prior years, the value of transactions fell from US\$94 billion in 2016 to just US\$20 billion, in the absence of mega-deal transactions such as the acquisition of Monsanto (US\$62 billion⁵¹) by Bayer and the acquisition of Valspar by Sherwin Williams

(US\$11 billion⁵²), both announced in 2016. The largest transaction in the US in 2017 was the announced acquisition of Signode Industrial Group by Crown Holdings, Inc. for US\$3.9 billion.

Looking forward, a key factor driving 2018 M&A activity may be the major US tax reform enacted at the end of 2017. Among other taxpayer friendly provisions, it lowers US corporate tax rates, allows for faster expensing of capital improvements, and provides tax rate incentives for export sales and services. On the other hand, base broadeners included interest expense limitations, loss

utilization limitations, anti-deferral provisions, and effectively a new minimum tax on global earnings. Amidst this complex new tax regime will be winners and losers, but certainly some US-based companies should see higher after-tax cash flow. The new legislation also included a deemed repatriation "transition tax", which serves to free up significant overseas cash for more tax efficient domestic deployment. Accordingly, US chemical producers may have increased funds available for investment in capital projects or in M&A. While this may favor more activity domestically, the changes in how foreign dividends are taxed may spur investment by US companies abroad. Additionally, while many companies have looked to divest certain assets by way of spin-off rather than sale, lower taxes on potential gains may factor into decision making by companies looking to optimize their portfolios. Though companies with strong balance sheets may not be impacted as much as financial buyers or others looking

to leverage transactions, limits on deductibility of interest as well as the decreased tax benefit of interest expense attributable to lower tax rates will impact the post-tax cash flows used by many to measure internal rates of return. To what extent this offsets the more favorable tax rates will be deal-specific; however, this could further impact private equity buyers' ability to compete with strategic buyers in the current market. Lastly, the tax efficiency gap between foreign and US parented multinationals has narrowed, reducing the incentive for US corporates to offshore companies and operations.

Overall, it is expected that this tax legislation will be welcomed by US-based chemical companies and provide them with additional cash flow and flexibility for investment or other purposes which should contribute to a robust M&A market in the US chemical industry in the coming year.

Figure 7. Acquisitions by Chinese buyers

Value (US\$M)	2015		2016		2017	
	Value	Volume	Value	Volume	Value	Volume
Domestic (Target in China)	9,519	42	4,864	51	4,999	77
Out-Bound (Target outside China)	210	4	46,817	9	31	1
Total	9,729	46	51,681	60	5,030	78

Source: Deloitte Touche Tohmatsu Limited analysis of data from S&P Capital IQ, January 2018. Data is from 1 January 2010 to 31 December 2017.



China: Belt & Road initiative expected to lead to M&A activity amid regulatory restrictions on capital outflow

The most significant change in the 2017 China chemical M&A market compared to 2016 is the substantially lower value and number of Chinese acquisitions overseas. The number of outbound deals fell from nine in 2016 down to just one in 2017 as shown in Figure 7. This was driven largely by increased scrutiny of the Chinese regulators on major capital outflows which was announced at the end of 2016.

For 2018, it is expected that overseas acquisitions by Chinese buyers will be approved by the regulators if there is a strong business rationale.

Consolidation plays to optimize cost competitiveness are the main driver for business combinations among local players. Since the catastrophic explosion of a chemicals storage facility in Tianjin in 2015, the authorities have significantly tightened safety regulations⁵³ by closing certain plants and facilities and through stricter requirements for production and

transportation. As a result, costs have increased substantially and forced small and medium players to combine with competitors to survive.

From the perspective of foreign buyers acquiring Chinese assets (not included in Figure 7), both the value and volume of transactions declined from 2016. The disclosed value of these inbound M&A deals fell below US\$500 million for the first time since 2013, and just 12 inbound transactions were announced.

Combinations took place in all sectors, particularly in commodities and other basic chemicals, industrial gases, agricultural chemicals and petrochemicals. We understand through discussions with clients and other market participants that margins of Chinese-based chemical companies continue to be under pressure because of falling selling prices driven by lower non-petroleum-based feedstock costs and overcapacity in the market.

In terms of sectors, it is expected that the main Chinese M&A activity will continue to be in agricultural chemicals and petrochemicals. In recent months, there has also been increased deal activity in chemicals related to the surface and construction end markets. Besides major infrastructure projects which drive

this trend, the Chinese 'Belt & Road' initiative may contribute to additional activity in the industry. This massive Chinese initiative aims to build out the infrastructure, both on land and at sea, to enhance trade routes from the Eastern hemisphere to the West and potentially involves more than 60 countries.

Unless there is another major and unexpected transaction (such as the ChemChina/Syngenta deal), it is expected that the overall outbound activity for 2018 in the chemicals industry will remain at 2017 levels with support to move even higher as the 'Belt & Road' initiative of the Chinese government creates additional opportunities. Domestic transactions will remain strong as smaller players are acquired in efforts to reduce capacity and increase profitability.



UK: Lower sterling and favorable macroeconomic factors sustain M&A activity

UK chemical M&A activity pulled back slightly in 2017; however, foreign acquirers continued their search for growth in the UK. This was spurred on by relative weakness in sterling, a broadly positive global economic outlook, favorable equity markets and continued liquidity in the debt markets. Over 30 transactions were announced in the UK during 2017, with non-UK-based companies representing the majority of the successful buyers⁵⁴.

Activity in 2017 was characterized by acquirers seeking to obtain new technology and new products to complement existing offerings, expand their geographic footprint and, in the process, gain access to European markets, disregarding the challenges posed by Brexit. Acquisitions in the UK market primarily involved privately-owned targets, with particular focus on the specialty chemicals sector (including construction chemicals, coatings, flavors & fragrances, agrochemicals and fine chemicals)⁵⁴.

US companies were particularly active in the UK market in 2017, representing the majority of corporate cross-border inbound deals, with European and Asian buyers also involved. Private equity's appetite also remained strong, with funding of buy-outs and acquiring bolt-ons for existing portfolio companies.

While the impact on UK M&A activity from the uncertainty of access to the European market caused by Brexit is not yet clear, it is expected that the UK will remain an attractive market for both corporate and financial buyers in the near term. It is expected that this will be driven by continued UK economic growth, strong capital markets and continued interest from private equity, as well as the trickle-down impact of past global mega-deals as these businesses seek to optimize portfolios of the newly-combined businesses.



Germany: Strong company performance supports further M&A activity

The chemical industry in Germany enjoyed another strong year, providing its companies with the financial strength to look at acquisitions that could improve their future competitiveness. The focus for German chemical M&A players continued on specialty chemicals, where margins are attractive. In some cases, such as the acquisition of Solvay's polyamide business by BASF⁵⁵, the acquisition is intended primarily to improve scale in an attractive sub-sector. In other cases, the focus is on expanding into adjacent areas by closing portfolio or technology gaps or into new customer groups.

While being active on the buy-side in 2017, German chemical companies also sold non-strategic assets. Most of the divestitures were rather small in comparison to the size of the seller and were mostly driven by portfolio optimization. However, other divestitures were driven by prior acquisitions, either due to a lack of fit in the new company or to meet the requirements of regulatory agencies such as the European Commission, the US Federal Trade Commission and the Department of Justice. Meeting regulatory conditions can be observed especially in recent mega-deals with German participation, such as BASF's acquisition of a portion of Bayer's seed and herbicide portfolio in 2017⁵⁶ following Bayer's announced merger with Monsanto⁵⁷.

It is expected that the 2018 deal volume for German chemical companies will continue at a high level.



The Netherlands: Various deals are expected

M&A activity in the Netherlands was lower in 2017 than in 2016, in both volume and value terms, although a notable transaction in 2016 was the acquisition by Carlyle Group of the specialty chemicals division of Total S.A. for US\$3.2 billion⁵⁸.

Activity in the Netherlands was fueled by the same underlying factors as are being seen in the rest of Europe and around the world: companies have available cash and capacity for cheap debt, while earnings have been driven higher by growing demand in many end markets and the benefit of lower feedstock costs in certain sectors. Although feedstock costs are showing signs of turning around, including the increase in crude oil and naphtha prices, it is not expected that this will significantly impact the appetite for growth through acquisitions and seeking to gain scale.

2018 may be an active year for some larger transactions, including a spin-off or sale of AkzoNobel's specialty chemicals business⁵⁹ and the potential for a tie-up between the remaining coatings business and other potential partners such as Axalta, which had previously been in negotiations with AkzoNobel. Royal DSM⁶⁰ has recently discussed monetizing its investments in two of its JVs⁶¹: DSM Sinochem Pharmaceuticals (a Singapore-based JV with Sinochem Group)⁶² and DSM Chemicainvest (a Netherlands-based JV with CVC).



Japan: Increasing profitability generating higher appetite for M&A

Japanese chemical manufacturers performed well in 2017. Profitability of major commodity companies continued to improve because of restructuring their

businesses and the continuing trend of low cost naphtha and other feedstocks. Against this background, chemical manufacturers are showing interest in M&A. A few trends driving M&A activity in Japan's chemical sector in 2017 are expected to continue into 2018.

First, Japanese chemical manufacturers have been moving into downstream businesses in an effort to provide top-line growth and capture value by expanding the range or products offered, including base chemicals, parts, equipment, and service for several end markets. Toray⁶³ and Mitsui Chemical (Mitsui)⁶⁴ have both done this by way of acquisitions or investment in downstream businesses in 2017.

Also, in a trend that is consistent with what is happening in other established markets such as Germany and the US, Japanese chemical companies are restructuring or selling non-core businesses. During 2017, Asahi Kasei sold its thermoplastic styrene elastomer business to Mitsui Chemical⁶⁴, and Nippon Shokubai sold its friction-cutting construction material business⁶⁵.

Finally, in 2017 we observed companies with established advantages over competitors leveraging their advantage by acquiring bolt-on acquisitions to supplement existing products or platforms. Examples were the acquisition of a plant growth regulator business and an acquisition of a pyrethrum-derived insecticidal compounds business by Sumitomo Chemical⁶⁶ and the acquisition of an electronics material business by Sekisui Chemical⁶⁷.

Despite uncertainties such as the entry of shale gas-based chemical products and businesses into the Japanese market, high levels of M&A activity are expected to continue among Japanese chemical manufacturers in 2018. Many companies in this industry view M&A as a key tactic for achieving growth and enhancing their corporate value in their mid-term business plans. It is expected that these companies will continue to search for potential acquisition targets in line with the recent historical trends, and supported by increased profitability.



Brazil: Economic and political uncertainty makes investors cautious

M&A activity in the Brazilian chemical market is still depressed, and 2017 saw the lowest number of deals since 2010. Economic and political uncertainty

are likely to have kept some foreign buyers from investing in Brazil. The upcoming 2018 elections, continuing political uncertainty in Brazil and economic contraction in the economy have all weighed heavily on M&A volume, while low tax rates, a favorable exchange rate for key currencies and the easing of inflation in Brazil have been the key drivers of deal activity. Deal activity in 2017 was led by domestic buyers, though some US and European buyers also made investments.

Despite uncertainty in the political environment, Brazil's economy is slowly recovering. The Brazilian Central Bank has increased the GDP annual growth forecast from 2 percent for 2018 to 2.1 percent⁶⁸. While only a modest improvement over prior projections, the overall growth forecast is contributing to a rekindling of investor interest in the long-term potential of Brazil, including its vast domestic consumer market and ample natural resources.

Expectations of continuing weakness of the Brazilian Real against the US Dollar⁶⁹, compared to pre-2015 exchange rates, higher infrastructure investments and favorable tax rates will continue to attract foreign multinationals to invest in Brazil, though caution may be exercised.

Summary outlook for 2018 mergers and acquisitions activity

After two years of huge mega-deals that caused M&A deal values to spike, 2017 returned closer to historical levels. Even with another year of near-record volumes, 2017 might be remembered as the year that might have been. It started with the rejection by AkzoNobel of PPG's US\$26 billion merger proposal⁷⁰, followed by the cancellation of the Clariant/Huntsman merger due to shareholder pressure⁷¹, and concluded with the flurry of activity around potential deals involving Axalta, AkzoNobel⁷² and Nippon Paint⁴³. Rumors of potential mega-deals abounded as well. There were rumors of a SinoChem/ChemChina⁷³ merger at the start of the year and of a potential acquisition of Braskem by LyondellBasell at the year end⁸. But what will 2018 hold for the M&A in the chemical industry? Will any of the speculation become reality?

Private equity has continued to be a meaningful player in the chemical M&A market. Private equity is reportedly involved with all potential acquirers of AkzoNobel's specialty chemicals business (with an estimated value of roughly US\$10.8 billion)⁷⁴ and this may portend a larger role for private equity in 2018. It may also be the first mega-deal of 2018.

China began 2017 with capital outflow restrictions that dampened activity, but with the new 'Belt & Road' initiative, might we see China, including its SOEs, take a more prominent role again in chemical M&A activity?

In the US, following historic tax reform players are scrambling to assess the impact of lower domestic tax rates on their companies and assessing how the prospect of increased domestic cash positions from repatriation of international cash reserves can be used to further corporate goals. Will this result in more investment, including M&A?

Due in part to the lack of significant announcements in 2017 of mega-deals, whose regulatory divestitures fuel further subsequent M&A activity, 2018 deal volumes may not eclipse the record volumes achieved in 2016, nor the robust 2017 volumes. However, in the absence of a major global economic or geopolitical event, M&A volumes in 2018 are expected to remain strong, as higher valuations continue to be offset by improving global economic activity and continued inexpensive financing and total deal values are expected to remain consistent with pre-2015/2016 levels. We look forward to seeing what 2018 will bring in the M&A market as the chemical industry continues to search for growth.

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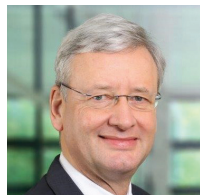
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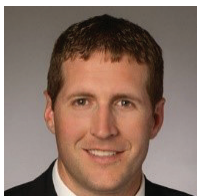


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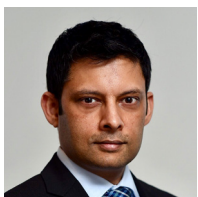
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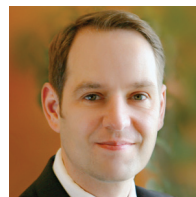
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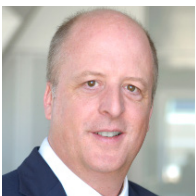


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