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CONSOLIDATION AS A ROUTE TO **TRANSFORMATION**

CONTENTS

Executive Summary

Growth is a key driver for value and a primary contributor to the long term Total Shareholder Return. But not all growth is value creating: in fact, a growth strategy that lacks coherence with the overall portfolio of the company and its long term business-specific value drivers can also destroy value. Several chemical companies have used consolidation time and again as one of the available levers to achieve accelerated revenue growth.

Consolidation can support growth and value generation in multiple ways. Some companies grow by consolidating existing segments to become market leaders, and translating this into value — not only in terms of increased market and application coverage, but also with respect to optimization of site network, cost structure and supplier eco-system. Companies consolidate to integrate further down the value chain and capture more value; and as is the case with most value chains, the "value gates" tend to migrate upstream or downstream, and an increased coverage of the value chain provides higher margin stability over time. Another alternative for companies is to turn to M&A to diversify growth into completely new platforms, including consolidation, and then subsequently carve out businesses to make their portfolios more coherent. Since the global financial crisis, the M&A in the chemicals industry has risen from a low of $38B deals in 2009 to a record of $166 B in 2017. Segment consolidation contributed to over 50% M&A deals during this period.

Accelerated global consolidation in the chemicals sector has increased the competitiveness of GCC's competitors. In addition, multiple market developments (both external and internal) are reshaping the Middle East's petrochemical industry. On the external front, the continued low oil price environment, the rise of shale fueled US competition, and increasing self sufficiency in China are all challenging GCC producers. On the other hand, regional factors like reduced availability of advantaged ethane and the removal of subsidies on feedstock and utilities are further increasing the cost of production of chemicals in the GCC.

In light of these challenges, we see consolidation as a route to transformation for GCC producers. Industry consolidation will help GCC producers to build strategic, operational and capability-based foundations. It will allow them to build market leadership in certain segments, achieve portfolio coherence, increase their cost competitiveness (incuding better intergration of site networks) and support accelerated development of capabitlites. Additionally, consolidation will support the national agenda for several GCC countries, by diversifying their economy and developing industrial clusters.

However, M&As are inherently risky and BCG research shows that over 50% of M&As don't create any value for the acquirer. GCC producers should keep this in mind and define a rationale for each M&A to avoid succumbing to this average. Additionally, they should carefully evaluate not only the stand-alone attractiveness of the target, but also the strategic fit with their portfolio. This needs to be followed through with rigorous due diligence and post-merger integration to achieve consolidation goals.

Section I: Consolidation in the global petrochemical business

A. Introduction – the role of consolidation in value creation

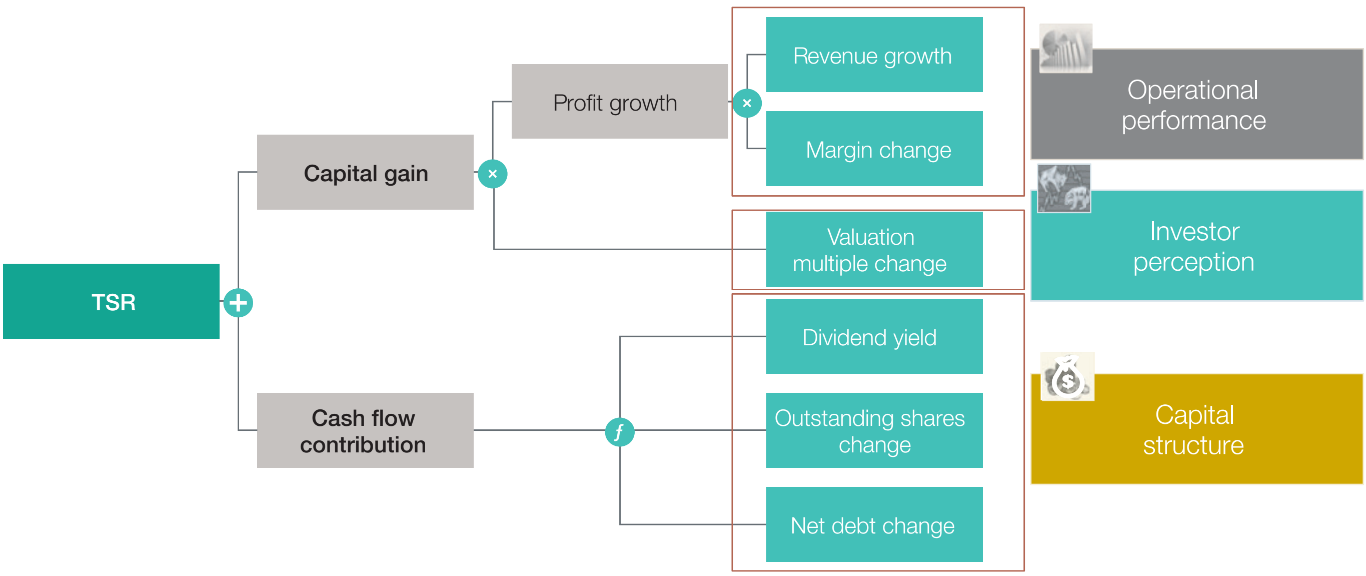
Every company aspires to achieve high value creation for its shareholders; but sustaining high value creation over extended periods is an even greater challenge. It requires the continuous evolution of the company's value creating strategy and adaptation to the ever-changing external business environment. Total Shareholder Return (TSR) has proven to be the most comprehensive metric for value creation and measuring the share's true value. Measuring average annual TSR over a long period of time allows zeroing in on value creating champions and the factors that allowed these champions to sustainably create value.

TSR is an analytical product being composed of three different factors: change in the fundamental value (operational performance), change of multiples (investor perception) and change in the free cash flow (capital structure).We use a combination of 'revenue growth' and 'margin change' as a performance indicator of a company's fundamental value. The change in a company's 'valuation multiple' also impacts investor expectations on TSR. These three factors together determine the change in a company's market capitalization whilst the company's 'free cash-flow' tracks dividend payouts, share repurchases and debt repayments.

Our analysis indicates that of all TSR drivers, revenue growth is the most important, as it contributes almost 64% towards long term TSR growth (10 year growth). We maintain that growth is the key driver for value, but not all growth is value creating. A growth strategy that lacks coherence with the overall portfolio of the company and its long term value creating strategy can also destroy value.

Several chemical companies have used consolidation time and again as one of the available levers to achieve accelerated revenue growth. Consolidation can support growth in multiple ways: some companies grow by consolidation of existing segments to become market leaders, while others consolidate to integrate further down the value chain to capture more value. On the other hand, companies also turn to M&A to diversify growth into completely new platforms.

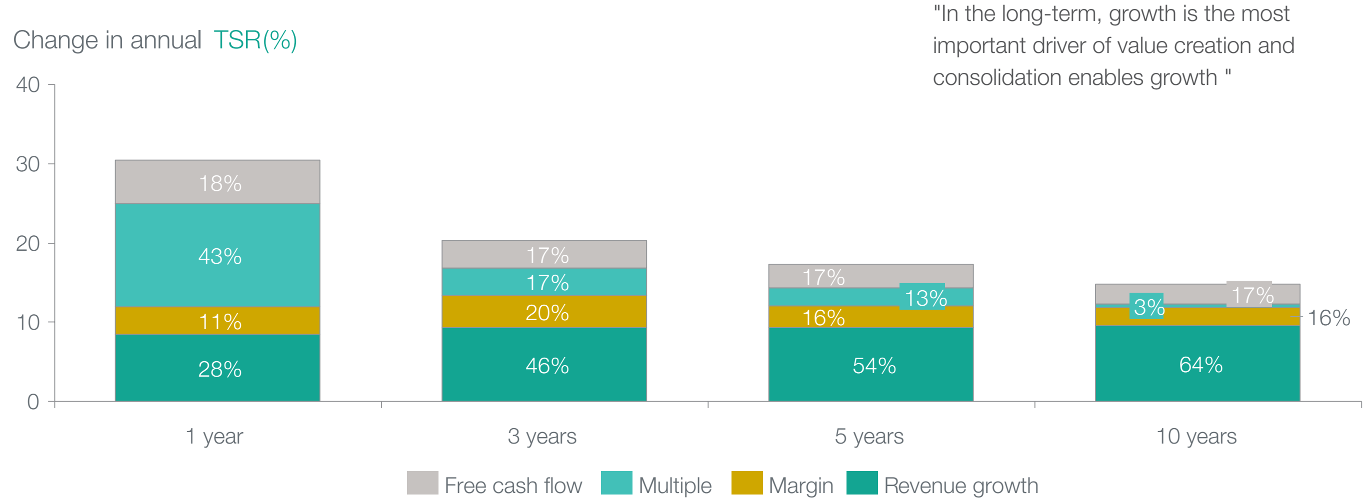
TSR Is the product of multiple factors



Source: BCG

Sources of TSR for top-quartile performers (S&P Global 1200, 1996–2016)

"In the long-term, growth is the most important driver of value creation and consolidation enables growth "



Note: The rolling analysis covers one-, three-, five-, and 10-year time frames from 1996 through 2016. Shows the average of performers in the 65th to 85th percentile to illustrate approximate cutoffs for the top quartile. ie., not the average of the top quartile (which would be equivalent to the 88th percentile)
Source: S&P Capital IQ; BCG ValueScience Center

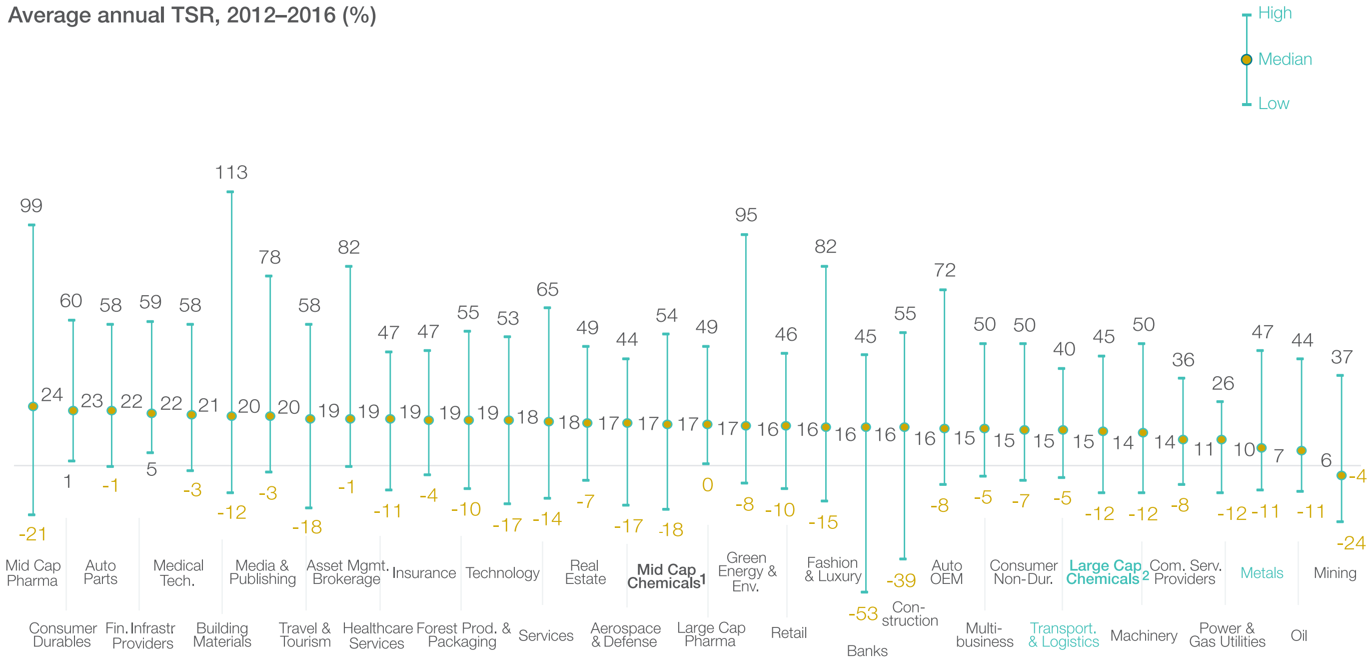
B. Value creations in the chemicals sector

The chemical industry was once a top value creator, but in recent years the situation has reversed. Chemical companies as a whole generated a median TSR of 16% through 2012-2016, which is equal to the median 5-year TSR of all 33 industries tracked by BCG in its annual Value Creators Report. This is distinctly low in comparison to champion industries like mid-cap Pharma, generating a median TSR of 24%, Consumer durable at 23%, and Auto parts at 22% for the same period.

When we closely examine the chemical industry TSR champions of the past two decades, there is clear dominance by players from Asia. Amongst chemical companies, India holds one-third of all top TSR spots when looking at the 5, 10 and 20-year rankings. If we diverge from geographies and analyze TSR by industry sub-sectors, focused specialties companies generated the maximum 10-year TSR of 12%, followed closely by base chemicals and plastics companies at 11%. However, there is a high degree of variance in value creation within the sub-clusters of base chemicals and plastics. Vinyls and PVC lead the pack with 11.2% 10-year TSR followed closely behind by inorganic commodities and fibers. Petrochemicals and polymers lag behind all other sub-clusters, having generated only 7.7% 10-year TSR and 6.1% over 5-year TSR.

5-year high, low, and median TSR per sector

Average annual TSR, 2012–2016 (%)



Note: n=2,348 1. Companies $1-5B in market cap 2. Companies >$5B in market capitalization. Large Cap companies are most comparable to other industries
Source: S&P Global Market Intelligence; Thomson Reuters Eikon; Bloomberg; company disclosures; BCG Value Creators Report 2017; BCG analysis

Companies from Asia have led the chemical industry in value creation

Rank	10-year (2007–2016)	TSR	20-year (1997–2016)	TSR
1	asianpaints	29.8%	LOTTE CHEMICAL	23.0%
2	LG Chem	21.9%	asianpaints	22.9%
3	NIPPON PAINT	19.4%	Reliance Industries Limited	20.6%
4	LOTTE CHEMICAL	19.1%	Sika	17.4%
5	EMS	18.6%	Braskem	16.0%

Source: S&P Capital IQ; BCG value creators report (2017); BCG analysis

C. The state of the global M&A landscape in petrochemicals

Following the global financial crisis, the M&A in the chemicals industry sank to a record low of $38B in 2009. As the world economy gradually recovered, deal value in the industry also recovered from this slump, achieving a high of $86B in 2011, but it dropped again in 2012 and 2013 ($50B each in both years). Since 2014, M&A activity in chemicals has picked up significantly, with several mega-deals like Dow-Dupont, Bayer-Monsanto, Cytec-Solvay, and Airgas-Air Liquide concluded in the last few years. A key driver for global M&A has been low growth in mature economies and cheap financing. With organic growth being tough to come by, shareholders are now realizing that M&A offers one possible avenue to higher earnings and margins. While slow growth might persist for a while, the situation around cheap financing might change with the US already raising interest rates.

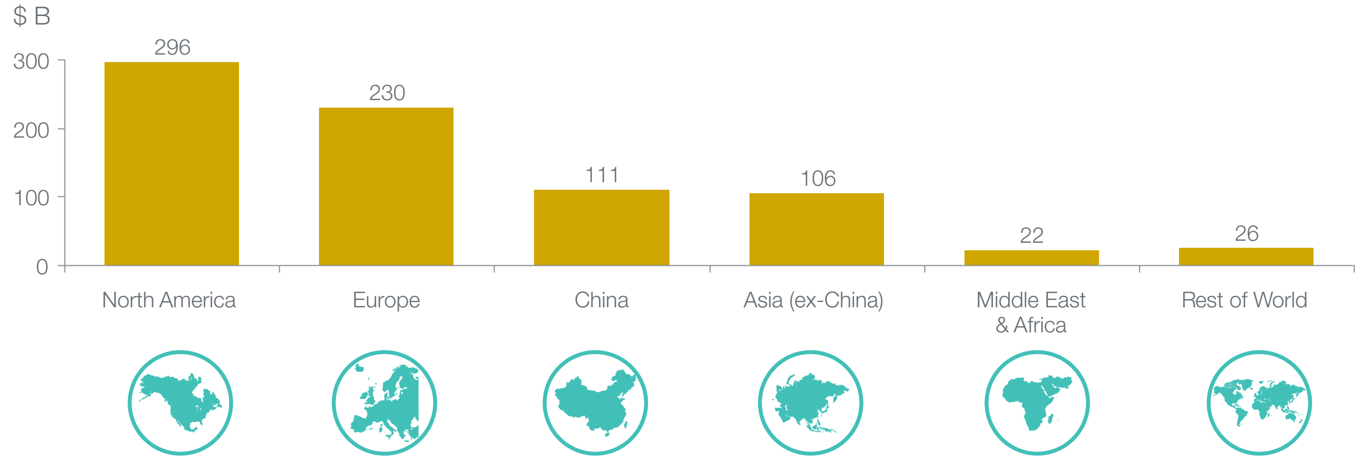
Significant changes have been witnessed in 2017, with a record $166B of M&A activity in chemicals with over 75% of deal volume being contributed by deals of over $10B. The actual number of deals declined since 2016, but mega deals such as Dow-DuPont, ChemChina-Syngenta and Sherwin Williams-Valspar have elevated the value of M&A activity to new highs. The pipeline for 2018 looks robust with deals, including Bayer-Monsanto, expected to close next year and potentially make 2018 another record year.

North America, Europe and China dominate the consolidation landscape with over 80% of all deals originating out of these regions. While deals in America and Europe have been focused more around consolidation, deals from China have focused more on geographic expansion for Chinese companies (e.g. ChemChina and Syngenta). We have also witnessed deals taking place across all key segments of the industry, such as in base chemicals and polymers, specialty segment, agrochemicals and industrial gases.

Looking back at chemicals M&A activity within the last 10 years, we see segment consolidation as a key rationale with 50% M&A deals happening when companies aim to achieve market leadership within specific segments of the industry. Recent deals such as Bayer-Monsanto, Lanxess-Chemtura, Evonik-Huber Materials, and Sherwin Williams-Valspar are key examples of deals where companies have attempted to establish segment leadership through consolidation. In fact, the more mature a product segment becomes, the more cost and scale are relevant to achieving competitive advantage. Some companies also use consolidation as a way to expand and acquire complementary portfolios. In our view, this is the second key reason for acquisition (accounting for 40% of the deals). The acquisitions of Chemetall by BASF and Axiall by Westlake are clear cases where acquisition complemented the existing target portfolio and led to client and/or regional diversification as a result.

North America, Europe and China dominate the consolidation landscape with ~ 80% of all deals

Value of consolidation by geography [1] ($ M, 2007-2017)



1. Region is allocated on the basis of region of headquarters of the acquirer company Note: Announced M&A worldwide deals from January 1, 2005, to YTD Q3 2017, with a chemical company involved as buyer, seller, or target
Source: Thomson One deal Database; BCG Analysis

Companies from Asia have led the chemical industry in value creation

Recent deal examples

Key M&A rationales – % of deals		Acquirer	Target	Deal value
Segment Consolidation [1]	47%	Bayer	Monsanto	$66 B
Portfolio Expansion/ Complementary Portfolio	37%	Westlake Chemical	axiall	$2.3 B
Financially motivated	24%	The Carlyle Group Global Alternative Asset Management	DuPont coatings	$4.9 B
Geographic Expansion	22%	Braskem	Dow Polypropylene	$0.4 B
Feedstock Access	8%	Olin	Dow Chlor alkali	$5.0 B

1. Achieve (global) leadership position within certain Chemicals segment
Note: Share of top deals > 2bn. USD (N=51) announced between 2007 and YTD 2017; Several rationales can apply for each deal
Source: Thomson ONE; BCG analysis

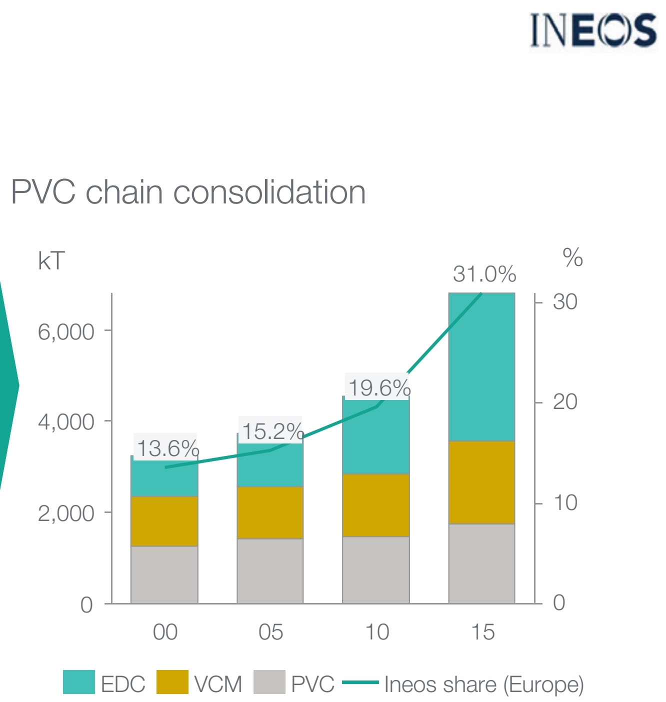
In a low growth, post-financial crisis economy with compressed margins, segment consolidation has allowed companies to improve profitability and compete better in the market place. Segment consolidation not only gives companies scale to compete better in the market, it also allows them to drive efficiency programs to lower the cost base through synergies.

For example, companies like Ineos have used consolidation as a key strategy to build regional and global leadership in vinyls and styrenics value chains. Ineos started its vinyls journey in 2001 by acquiring a minority share in EVC, but has since consolidated its European leadership in vinyls through the successful acquisition of Norsk Hydro ('07), Tessenderlo Chemie ('12), Inovyn JV with Solvay in 2015 and the full stake purchase of Inovyn in 2016. Today, Ineos owns 31% of the vinyls capacity in Europe. The story is similar with Styrenics, where the company's Styrenics capacity has grown to achieve a 9% share of total global Styrenics capacity.

Some companies have taken a slightly different approach by trying to consolidate and then subsequently carve out businesses to make their portfolios more coherent. The best example of this is the recently closed merger of The Dow Chemical Company and DuPont. The two companies first agreed to merge all of their business, realize cost savings for synergies, and ultimately over a period of 18-24 months carve out their organizations into to three very different businesses in agrosciences, material sciences (largely comprised of commodity polymer and their derivatives) and specialty products.

INEOS has used consolidation to build leadership in the PVC segment

- Minority stake in EVC ('01); full share purchased ('05)
- Other vinyl unit purchases from Norsk Hydro ('07), Tessenderlo Chemie ('12)
- Inovyn JV with Solvay ('15); full purchase of Inovyn ('16)

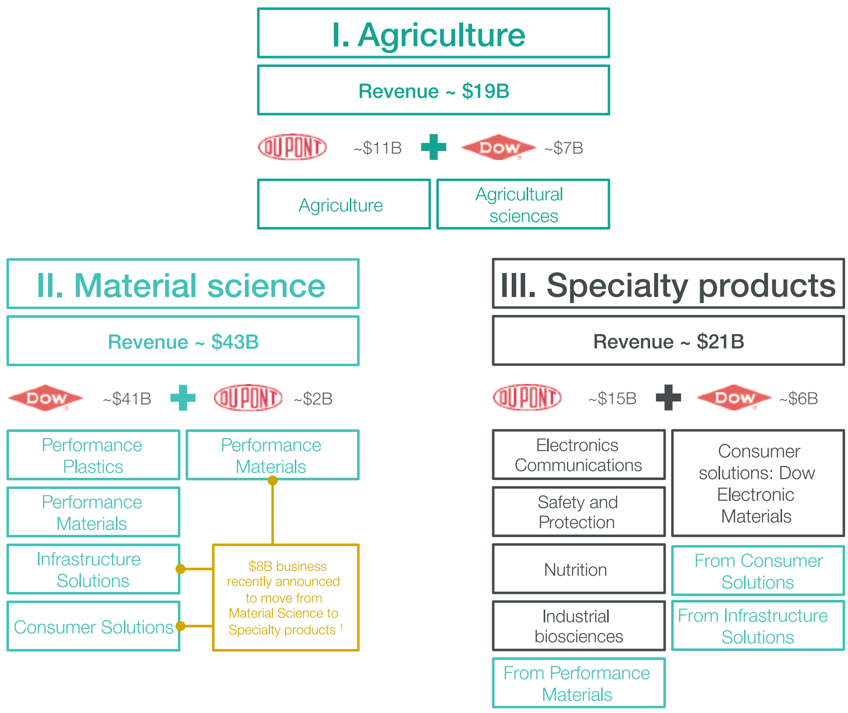


Source: BCGChemcom 2.0; Nexant; Thomson One Deal database; BCG Analysis

Some companies are using consolidation and subsequent "carve-outs" to create '<u>coherent portfolios</u>'

Dow + DuPont =

50/50 merger creating a global leader in agriculture, material science and specialty products



1. $2 B from Consumer Solution, $2 B from Infrastructure Solutions and $4B from Performance materials to be moved. Revenue numbers include changes from Split; Source: DOW – DuPONT Investor Communication; BCG analysis

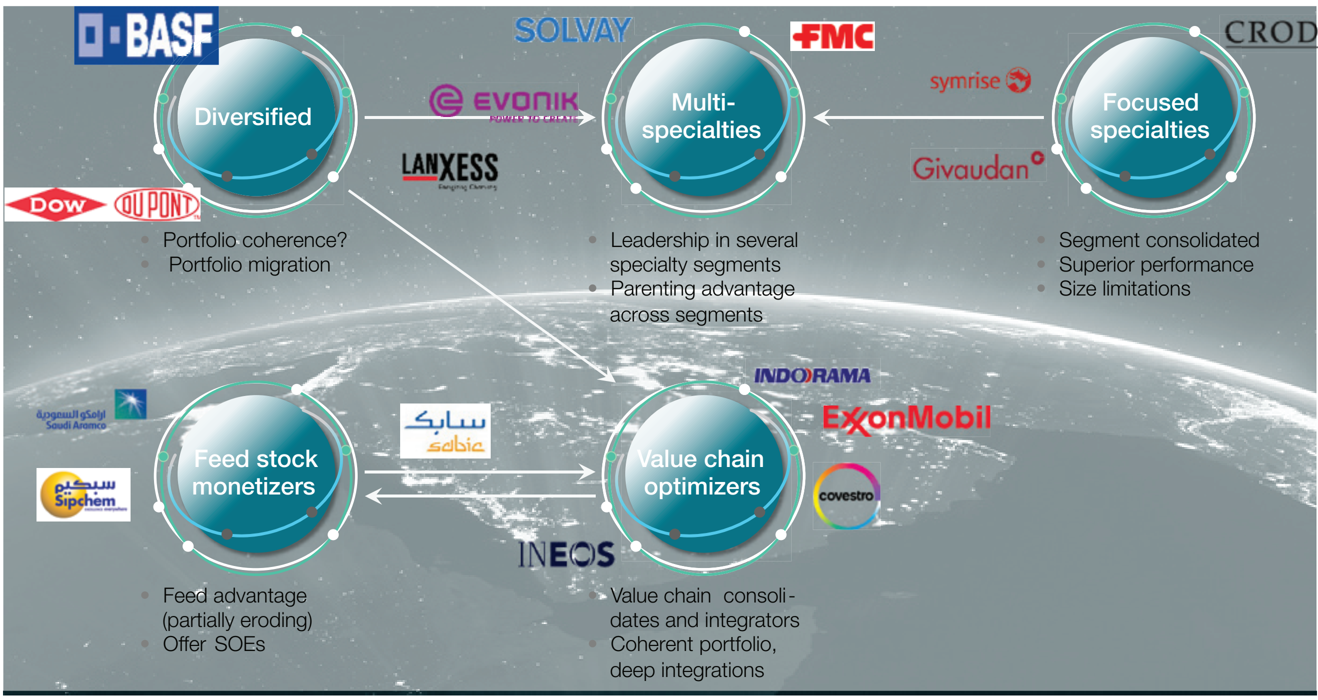
D. Consolidation as a catalyst for transformation

We are currently witnessing a major shift in the competitive landscape within the global chemical industry, particularly as players from Asia join the ranks of global leaders. Transformation is also evident from a value chain perspective, as several oil-gas players tend to move into downstream industries. This paradigm shift further prompts multi-specialty chemical players to move into more specific niches. The advent of new players, value chain shifts and the ever-increasing pressure from oil price volatility together suggest that business models are not as durable as they once were. We are increasingly witnessing the following four successful business models. Furthermore, the secular changes in the feedstock diversity and the different avenues which the C2 and C3 value chain are taking - C2 being largely impacted by geography and the availability of cheep feed whereas C3 cost postions are largely technology and asset-integration driven - may lead to further value chain specific consolidation moves.

Chemical companies have frequently been using consolidation as a tool to transform their business model. Pure play 'feedstock monetizer' could look at consolidation as an outlet to access advantaged feedstock (e.g. the recent announcement by PIC to JV with Pembina to secure propane in Canada). Similarly, an acquisition of a downstream specialty player could mean that the previous 'feedstock monetizer' now harnesses its integration and raw material cost advantage to sell within niche and previously unexplored markets (e.g. the SABIC acquisition of GE plastics). On the other hand, large diversified companies like BASF and Dow have looked at consolidation to create more coherent portfolios. They have actively acquired and divested assets to become market leaders in segments where they have a competitive advantage. In addition, consolidation also provides an opportunity for companies to look beyond the obvious into business models like distribution, formulation and end-industry solutions.

Overall, companies have used consolidation to not only transform their business models, but to improve competitiveness through cost and scale levers like site-consolidatoin and the like. They have also leveraged economies of scope with respect to market coverage. Consolidation can take place along several dimensions – the most common being the 'product' and 'value chain' axis, but also consolidation of customer demand baskets (i.e. more comprehensive product offering to specific end industries).

Ultimately, consolidation can lead to different 'winning business models'



Section II: Implication of consolidation on GCC producers

E. Challenges facing GCC petrochemical producers

Multiple market developments, both external and internal, are reshaping the Middle East's petrochemical industry.

On the external front, the continued low oil price environment has reduced the margin advantage that Middle East producers enjoyed over their naphtha-based peers in Europe and Asia. The shale gas renaissance in the United States is further changing the competitiveness of NA peers. While ethane-based producers in the GCC continue to be the most competitive in the world, North American producers are catching up fast. In addition, a capacity expansion drive in China is threatening to shrink the most significant export market for regional players. For example, in the C3 value chain, China may slash its polypropylene imports by 1 MM units over the next 10 years due to increased coal to olefins projects as well purposeful propane dehydrogenation (PDH) units.

On the other hand, regional factors are putting further pressure on the competitiveness of industry players. For example, reduced availability of advantaged ethane feedstock in the region is forcing companies to consider more heavy-liquid feedstock (e.g. Sadara project in Saudi Arabia, or proposed expansion by Borouge with Borouge IV). Additionally, the removal of subsidies on feedstock and utilities is further increasing the cost of production of chemicals; as seen with the price of ethane, which was increased by Saudi Arabia in Dec 2015 from $0.75/ MMbtu to $1.75/ MMbtu. These price increases are essential to promote the most efficient use of the country's natural resources and represent a key step forward towards the sustainable development of the economy. Nonetheless, in the short term, these measures have eroded the competitive power of producers in the region, putting additional pressure on their margins. In addition, the limited demand for local chemicals makes it more challenging to develop the downstream value chain (specialties typically need to be produced in close proximity to the demand markets, closely linked to the final users), and forces companies to develop an export-led strategy for all the products. This also deprives companies from having a close relationship with their end customers, as they often have to rely on off-takers and distributors to serve distant export markets.

Finally, the accelerated consolidation in the global petrochemicals landscape is further increasing competitiveness of global peers in relation to GCC producers. Responding to these threats will require action on multiple levels, such as portfolio optimization, commercial excellence, operations excellence, innovation and capability building. These actions take time and therefore GCC producers should act now to regain their standing as market leaders in the global petrochemical landscape.

F. Imperative for consolidation in GCC

We see consolidation as a route to the transformation of GCC producers and shoring-up their competitiveness. Industry consolidation will help GCC producers build strategic, operational and capability based foundations. Specifically, we see five key benefits of consolidation for GCC producers:

a. **Create marketing leadership** – Consolidation can enable building scale in certain products where GCC producers are sub-scale and help develop a strong position in marketing. For instance, through consolidation (even only of their marketing units), GCC companies could further establish themselves as global polyolefin champions. The increased scale would allow to improve marketing outreach to final customers, justyfing setting up a true international marketing organization, ultimately allowing the capture of more value that is currently lost to off-takers and distributors.

b. **Achieve portfolio coherence** – GCC producers can also use consolidation as a route to focus their portfolio and specialize. The capabilities needed to manage different portfolios can be quite varied; therefore, a focused approach can help develop capabilities more easily and effectively.

c. **Increase cost competitiveness** – Consolidation may help to build scale for smaller stand-alone companies and can reduce costs and improve efficiency.

d. **Enhance capabilities** – Consolidation will also bring different companies together, which will allow them to leverage complementary capabilities and scale to invest in innovation.

e. **Increase attractiveness to potential partners** – Consolidation allows for increased competitiveness and scale to increase attractiveness to other partners. This will become critical when GCC producers seek global targets to diversify their feedstock, when looking to enter new markets or when seeking to further add downstream derivatives to their portfolio.

Additionally, consolidation will also support the national agenda for several GCC countries. For example, Saudi Arabia is now looking at diversifying its economy by developing industrial clusters as part of the Vision 2030. Some examples on how consolidation can support the national agenda are:

- **Increase competitiveness and sustainability of small and medium size players.** Consolidation would improve sustainability of companies that can contribute to the economic development of the region. Also, better competing with global peers would command higher market price and capture higher value from chemicals, contributing more to local GDP and jobs.

- **Increasing the competitive advantage of production clusters** (e.g. large sites like Jubail, Yanbu) by consolidation of smaller companies as well as consolidation of services and better integration of feedstock. Consolidation also in the conversion industry would contribute to the competitiveness of the production clusters and industrial ecosystem.

- **Laying the foundation for value chain integration** by developing derivatives linked to core production. This will enable the support of downstream industries. For example, developing downstream derivatives like Nylon and Polyurethane to support development of an automotive cluster in KSA.

G. Scenarios for potential consolidation

Consolidation doesn't have to be the full merger of two companies; in reality, it can happen on multiple levels. Some examples of consolidation without needing merger of the two companies include:

- Simple **consolidation of procurement** where few companies come together for joint procurement and seek benefits from scale. This type of consolidation is already observed in certain industries. For example, in the Telecommunications industry, Deutsche Telekom and Orange created a JV called 'Buyin' to specifically focus on negotiated sourcing of telco network equipment.

- Companies may also decide to take an outsourced **'Shared Services'** approach, which handles non-strategic activities like payroll processing, administrative activities, call center etc.

- Companies may cooperate within a **production cluster** to share utilities, maintenance services, exchange products and intermediates, and services (e.g. healthcare, training…). This could be particularly relevant for large industrial clusters like Jubail and Yanbu.

- Companies may decide to pool together **market resources** to create a joint marketing unit which takes care of all commercial activities for both organizations. This will be particularly attractive for companies lacking the scale to sell directly to their export markets but wanting to avoid losing business to traders and off-takers.

The above consolidation practices can happen between multiple companies coming together to form an alliance or between just two companies.

Beyond the above part-consolidation methods, GCC companies can explore JVs and M&A, with the ambition to create true 'champions'. For example:

» **Commodity champions** (e.g. polyolefins) - More value captured from markets through better pricing and better Marketing & Sales networks and product portfolio

» **GCC based 'semi-specialty' player** - More value from consolidation of coherent semi-specialty product portfolios and specialization

» **GCC based 'downstream integrated player'** - More value from integration and economies of scale

In terms of geographies, we see three different levels where M&A can happen. Within a country, it can realistically happen only in KSA, where multiple chemical companies exist. Regional acquisitions in GCC may be difficult to execute due to the presence of State-Owned Companies; at a regional level, other forms of cooperation or JVs for specific business lines are more likely. Looking more globally, companies could also consider M&A to build 'product champions' for specific portfolios where GCC players already have relevant global shares, through M&A activities with international players.

H. Tips for successful consolidation

M&As are inherently risky and BCG research shows that greater than 50% of M&As don't create any value for the acquirer. GCC players should keep this in mind and define a rationale for each M&A to avoid succumbing to this average. However, the success rate of M&A also varies by players. Typically, the one-time buyer has the lowest success rate of 43%. In contrast, a portfolio builder who periodically embraces M&A achieves a success rate of 56 %.

Ultimately, we recommend 6 key components to watch out for before GPCA members begin their consolidation process.

» **Stand-alone attractiveness** – Business should not be fundamentally unattractive (although it may be challenged due to lack of scale and resources), as consolidation would not solve all problems!

» **Portfolio coherence** – The resulting product portfolio should be focused and coherent, to allow strengthening of market positioning in specific value chains.

» **Synergies** – Marketing synergies or cost efficiencies should have a significant impact on the bottom line; nevertheless, companies should be conservative and avoid over-estimating synergies.

» **Additional strategic value option** – Careful attention should also be paid to the evaluation of the strategic advantage of consolidation (e.g. preempt competitor moves). The impact of consolidation on the competitive landscape is often either overlooked (focusing only on the typical cost efficiencies from mergers) or utilized to justify audacious moves that otherwise would not be economically viable. A strategic rationale would always need to be quantified in terms of bottom line impact (under prudent assumptions)

» **Transaction feasibility** – Several transactions which look very attractive theoretically fail to materialize due to execution risks (e.g. valuation, legal/financial risk, integration risk). In case of the Middle East, regulatory constraints to M&A should be taken into consideration and addressed early in the process.

» **Successful post-merger integration** – Even if the consolidation target is right, it requires successful post merger integration to ensure the consolidation goals are realized.

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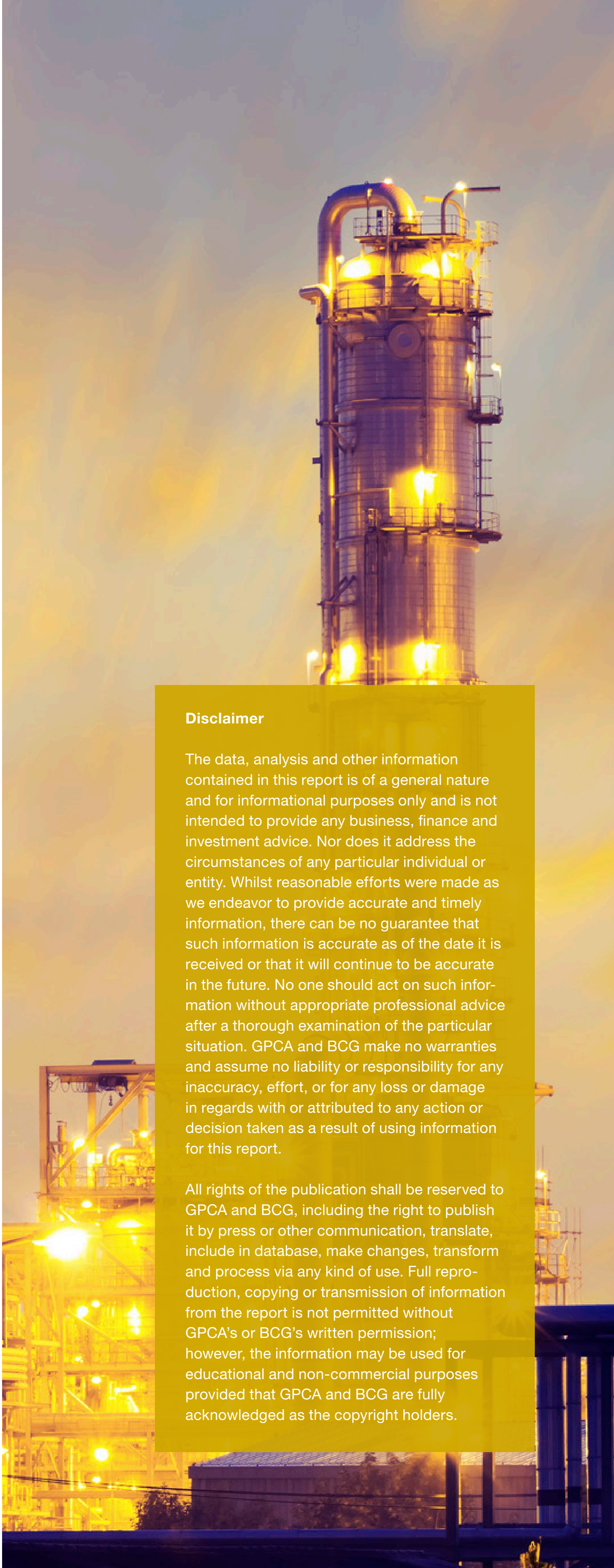

The Gulf Petrochemicals and Chemicals Association (GPCA) represents the downstream hydrocarbon industry in the Arabian Gulf. Established in 2006, the association voices the common interests of more than 250 member companies from the chemical and allied industries, accounting for over 95% of chemical output by volume in the Gulf region. The industry makes up the second largest manufacturing sector in the region, producing over US$ 108 billion's worth of products a year.

The association supports the region's petrochemical and chemical industry through advocacy, networking and thought leadership initiatives that help member companies to connect, to share and advance knowledge, to contribute to international dialogue, and to become prime influencers in shaping the future of the global petrochemicals industry.

Committed to providing a regional platform for stakeholders from across the industry, the GPCA manages six working committees - Plastics, Supply Chain, Fertilizers, International Trade, Research and Innovation and Responsible Care - and organizes six world-class events each year. The association also publishes an annual report, regular newsletters and reports.

For more information, please visit www.gpca.org.ae

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