Success factors for the European chemical business

Chemicals Vision 2030

Summit of chemical, pharmaceutical, plastics and rubber industries of Slovenia

A.T. Kearney used the text and charts compiled in this report in a presentation; they do not represent a complete documentation of the presentation.

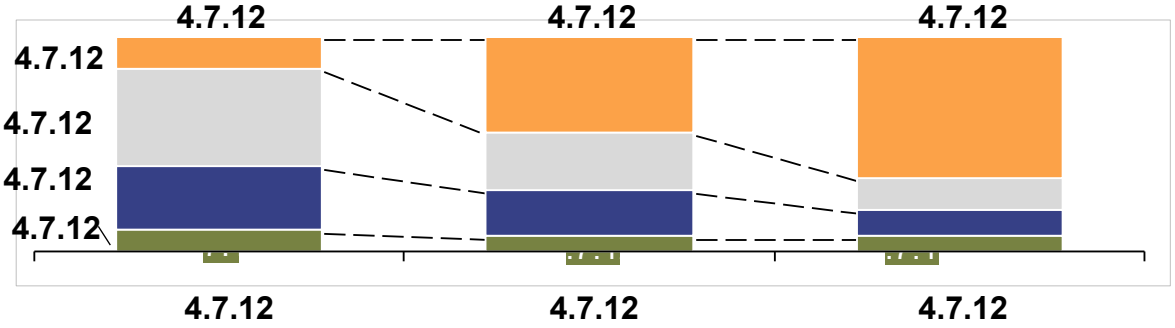
Chemicals Vision 2030

- **"Ruler Strategy"**
- Competitive Environment 2030
- Target Position of European chemical industry 2030
- Call for Action

ATKearney

Center of gravity of the chemical industry will shift towards Asia

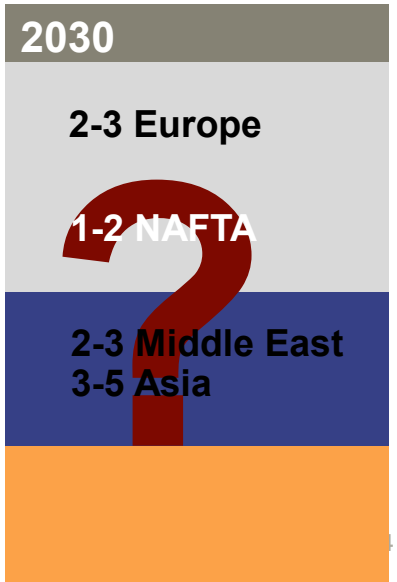
Regional split
(€ bn, at 2009 prices and exchange rates)



Top Chemicals Players (Turnover € bn, market share in %)

1985			
1	Bayer	14	2.8%
2	BASF	13	2.8%
3	Hoechst	13	2.6%
4	ICI	10	2.1%
5	Dow Chemicals	8	1.7%
6	DuPont	8	1.7%
7	Ciba-Geigy	7	1.5%
8	Montedison	7	1.4%
9	Rhone-Poul.	6	1.2%
10	Monsanto	5	1.0%

2009			
1	BASF	39	2.1%
2	Dow Chemicals	32	1.7%
3	ExxonMobil	29	1.6%
4	Sinopec	23	1.2%
5	SABIC	22	1.2%
6	Ineos Group	21	1.1%
7	Royal Dutch Shell	20	1.1%
8	DuPont	19	1.0%
9	LyondellBasell	16	0.9%
10	Total SA	15	0.8%



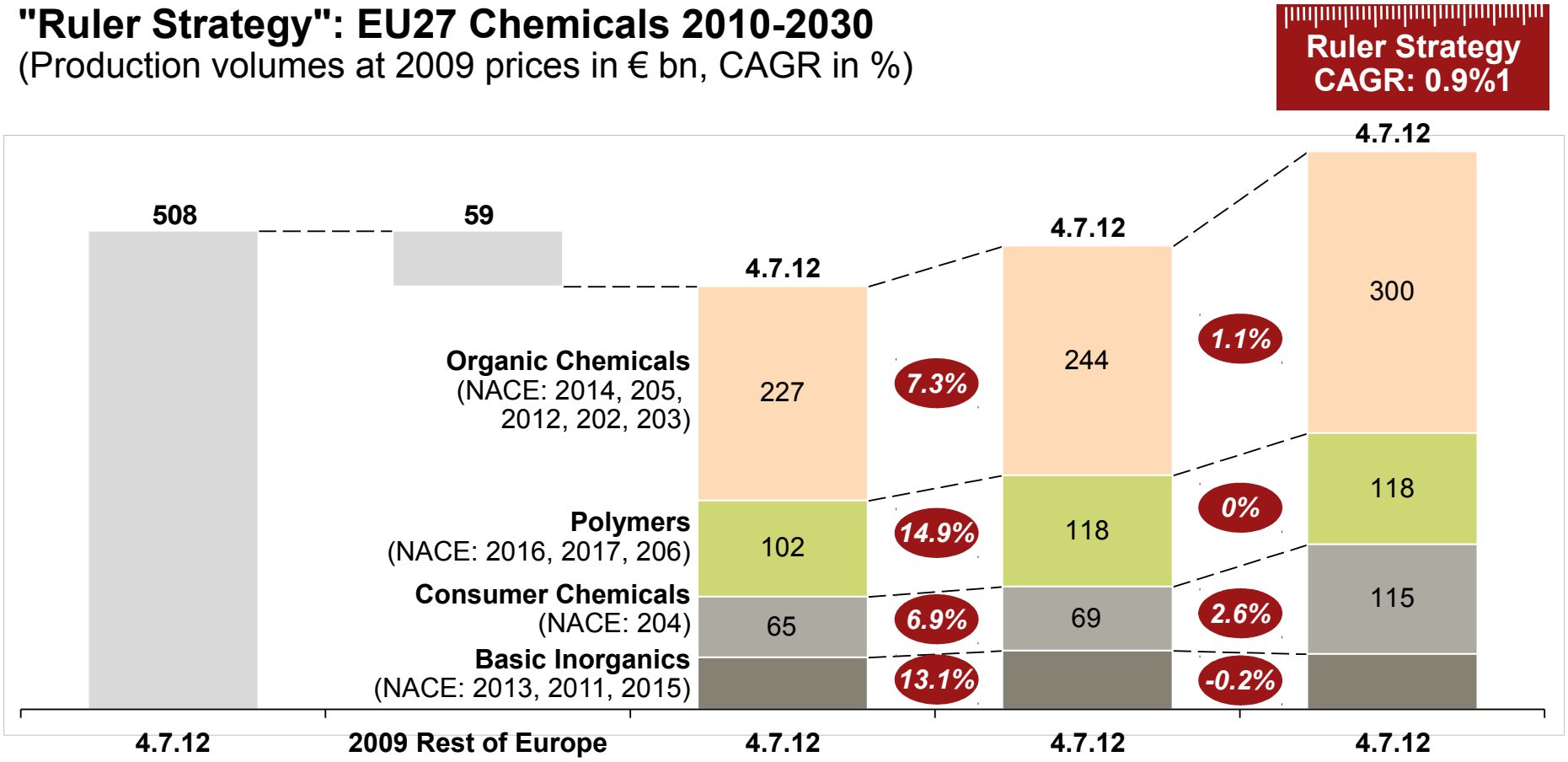
1. 2009 assumed exchange rate USD/€ : 1,39 USD/€
2. Assumed growth rates 2010-'30: Asia: 6%, NAFTA: 1,2%, Europe: 1%, RoW: 4%; 2010 growth of 10% assumed across all regions

Source: CEFIC, Chemical Week, VCI, Chemical & Engineering News, annual reports, A.T. Kearney

For Europe moderate production growth prevails with consumer chemicals standing out

"Ruler Strategy": EU27 Chemicals 2010-2030

(Production volumes at 2009 prices in € bn, CAGR in %)



1. Petrochemicals and Specialty Chemicals combined into Organic Chemicals to avoid term Specialty Chemicals, which is commonly used for chemicals also found in other categories and is also used e.g. by analysts to describe certain market conditions. Conversely we expect some products in the former "Specialties" category to be "Commodities"
2. Ruler Strategy: Production volume CAGR 2000-'10 extrapolated to '30. Value and weighting refers to prices 2009

Source: CEFIC, A.T. Kearney

ATKearney

We think that even for the next 19 years, the "Ruler Strategy" will largely apply

"Ruler Strategy" rational

Stable shifts in the global economy	• Asian growth as consequence of globalization is key trend changing global economy • With bulk of global population and therefore talent and consumers in Asia, this trend will be sustained
Chemistry largely focused at basic needs	• Chemicals largely used for basic needs, e.g. construction, agriculture, clothing which will remain stable • Specialty trends, e.g. batteries, nanotech, will change specific chains, but not overall picture
No major break-through in recent past and none expected	• Chemical revolutions, e.g. new molecule classes have not happened in the recent past and are not expected • Progress is expected more in specialty and application niches
19 years only compare to a few relevant life cycles	• All grown ups of 2030 have already been born • Assets and sites have been and are expect to remain sticky • 19 years equal: 1 asset life time, 2 chemical Ph.D.s, 4 car generations
Old hopes still alive	• Innovation in Europe continues at historic speed • Hopes in white bio tech, fuel cells, etc. will still be relevant, but will not be game-changing for the overall chemical market

Source: CEFIC, A.T. Kearney

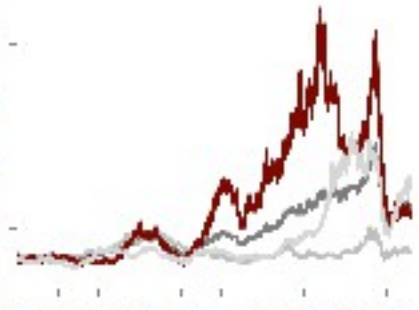
Vision 2030

- "Ruler Strategy"
- **Competitive Environment 2030**
- Target Position of European chemical industry 2030
- Call for Action

ATKearney

Changes in competition, shifts in value networks, increasing volatility shape the competitive environment 2030

Overview global competitive environment 2030

Competitive environment 2030		
1 Competition changes	• Asia as center of gravity • State controlled players • Chemical giants > €120bn in sales	
	• Dominance of Western demand characteristics ends • Multiple regions and new players with specific demand patterns and significant size	**2 Value networks move East**
3 Increasing volatility	• Shorter boom/bust cycles in the economy • Bust phases more severe due to state controlled players • High volatility of feedstock prices • Oversupply in Europe	

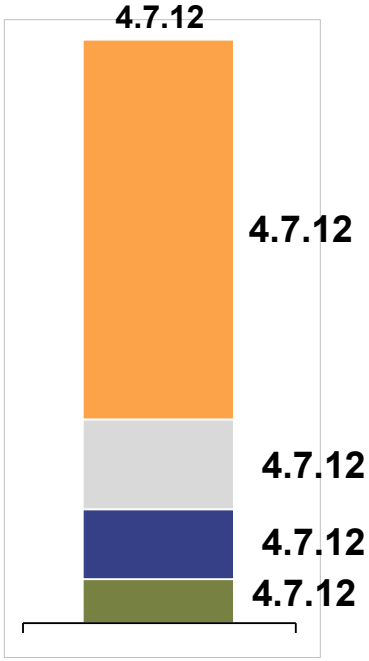
Source: CEFIC, A.T. Kearney

ATKearney

In 2030 the majority of the chemical market is in Asia with state controlled companies playing an increasing role

1 Competition changes

Sales 2030E



Asia dominates markets…

2009 top chemical players in China	Type	Sales CN (bn €)
Sinopec	SOE	23.0
ChemChina	SOE	13.4
PetroChina	SOE	12.1
SinoChem	SOE	4.6
BCIG2	SOE	4.4
BASF	MNC	4.1
Huayi	SOE	3.9
DOW	MNC	3.3
Bayer	MNC	2.1
CNOOC	SOE	1.0

… and Asian, often state owned / controlled enterprises will play an increasing role, also globally…

- The rise of emerging players especially in Asia and the Middle East has led to deconsolidation of the chemical industry
- To regain concentration levels the average top 3 chemical player is expected to have >€120bn in sales
- This will also include acquisition of Western chemical players by companies from emerging countries

…which we expect to drive significant, cross regional consolidation

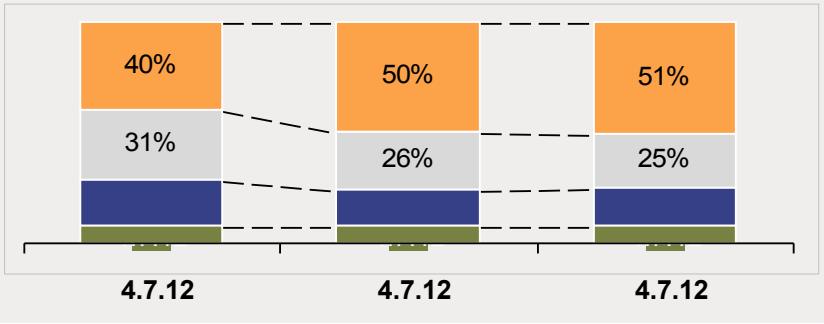
1. Focus on Chemical Sales only; 2. BCIG: Tianjin Bohai Chemical Industry Group Co.
Source: Annual report; press research

ATKearney

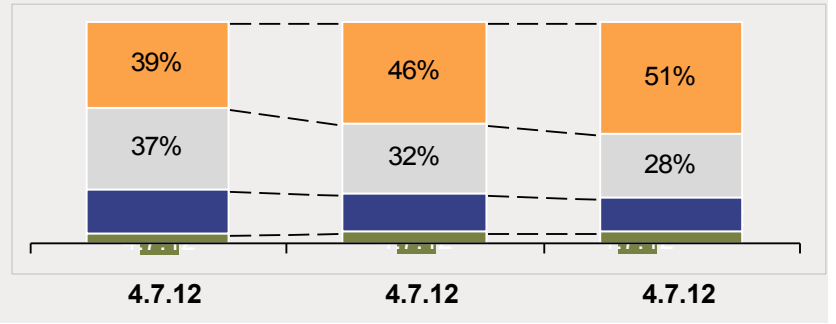
Customer industries are shifting production to the East - players from emerging countries challenge incumbents

2 Value networks move East: Customer Industries

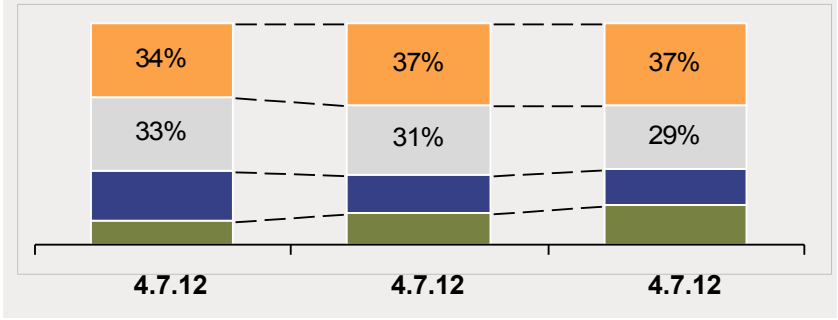
Automotive Production



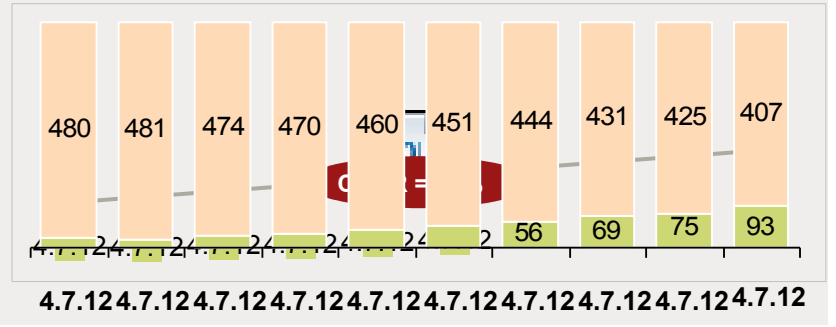
Pulp Production



Construction



New players emerging in Fortune 500



Note: Automotive data above is in no. of units produced and the construction data is in USD Billions, Asia for Pulp consists of Asia/Africa, Japan & Oceania
Source: Global Insight, IHS Global Insight Construction Data 2008, JP Morgan, Fortune 500

ATKearney

Customer purchasing decisions are significantly influenced by R&D, which increasingly moves to developing countries

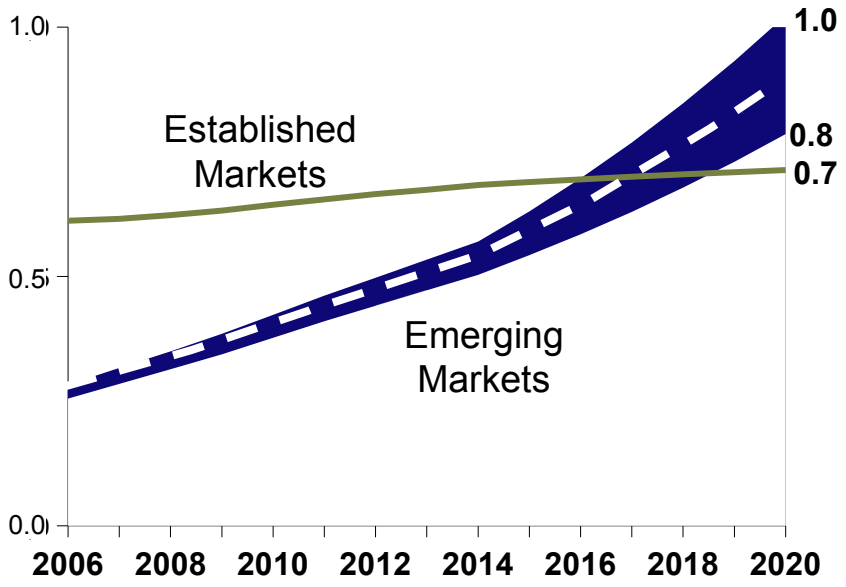
2 Value networks move East: Increasing value creation

Examples of R&D in China and India

Company	Location	Employees	R
GE	Bangalore, Shanghai	~4000 scientists, researchers & engineers	• 1 • E f
GM	Bangalore, Shanghai	~1200 70% PhD's (and rest with adv. degrees)	• C c • R
BOEING	Bangalore	1500 technologists	• Ae • Er
Texas Instruments	Bangalore Chennai	900 2 locations	• So infr
SIEMENS	Bangalore, Beijing, Nanjing, Shanghai	> 2000 innovators	• CT, • Sig
HP	Bangalore	600 researchers	• Dc

Example: Global Automotive R&D resources

(FTE mn.)1



Global players shift R&D east, both for customer proximity and availability of talent …

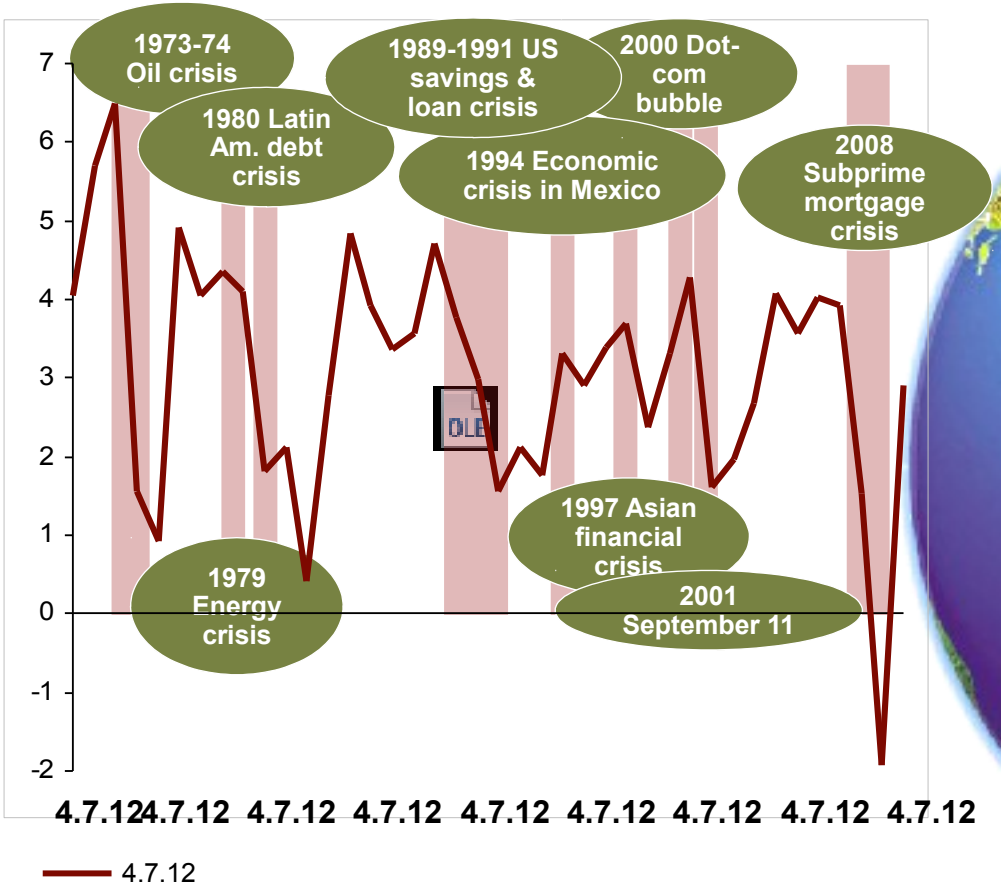
… for example, by 2015 there will be more automotive R&D done in emerging countries than in the traditional Western economies

1. Gross demand not considering substitution effects between Established and Emerging Markets.
Source: A.T. Kearney

A.T. Kearney

As the world becomes ever more intertwined the global economy becomes more susceptible to crises

3 Volatility: More frequent boom/bust cycles
(Annual GDP growth %)



Source: The World Bank – Data, IMF, US Bureau of Economic Analysis

ATKearney

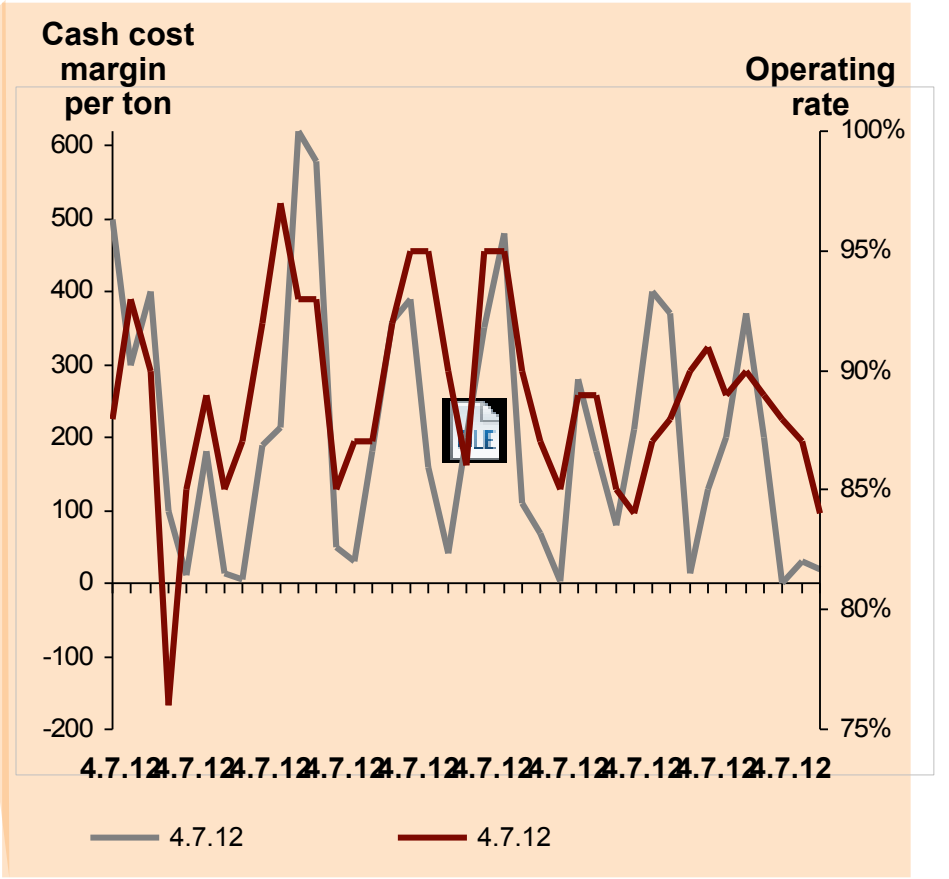
Increasing importance of state controlled companies can lead to lower prices in oversupplied markets

3 Volatility: Amplifying role of state controlled players

Client example

Explanation

- **According to commodity pricing theory industry operating rate correlates with cash cost margins**
- State controlled companies may follow other objectives than profit maximizing objectives
- Thus, they may grow their market shares to maintain certain employment or to strengthen the domestic cluster
- As market shares of state controlled companies increase prices in oversupplied markets will fall below cash cost of marginal producer in oversupplied markets



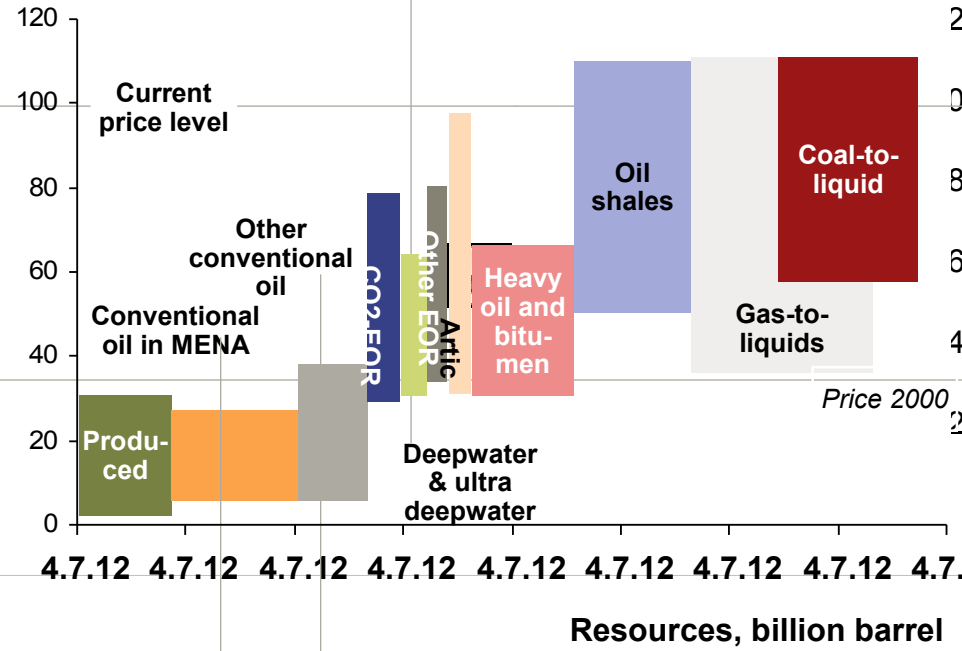
Source: A.T. Kearney

ATKearney

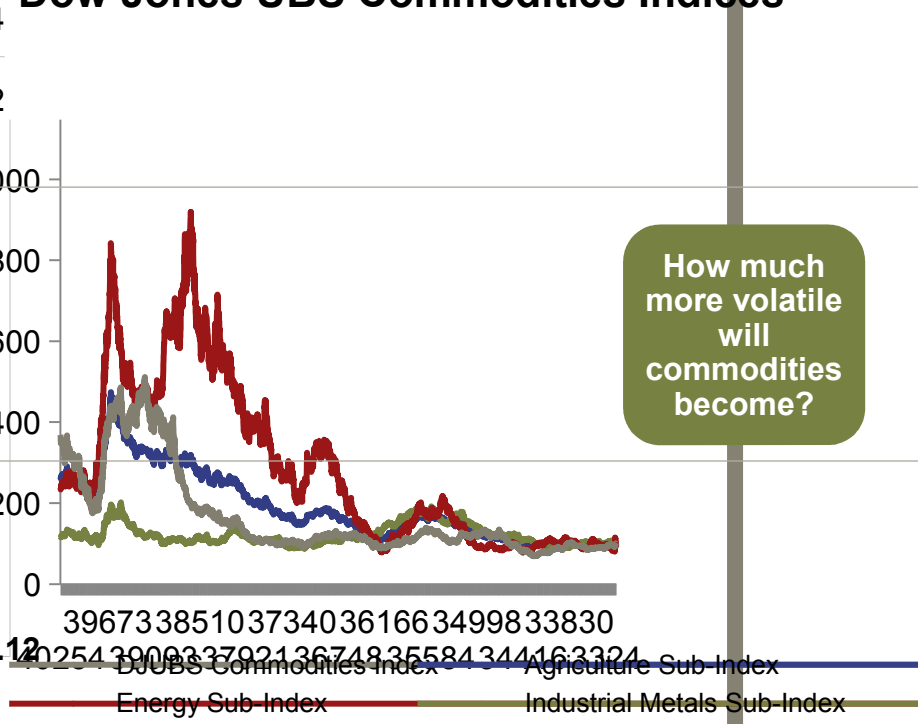
No general feedstock shortage, however, price volatility will remain high as stakeholders interests diverge

3 Volatility: Feedstock price volatility

Oil resources and production costs



Dow Jones UBS Commodities Indices



How much more volatile will commodities become?

There is enough oil and (unconventional) Gas plus realistic hopes in bio feedstock and algae…

…short term fluctuations, uncertainties, speculation and decoupling of oil & gas prices make commodity prices more volatile

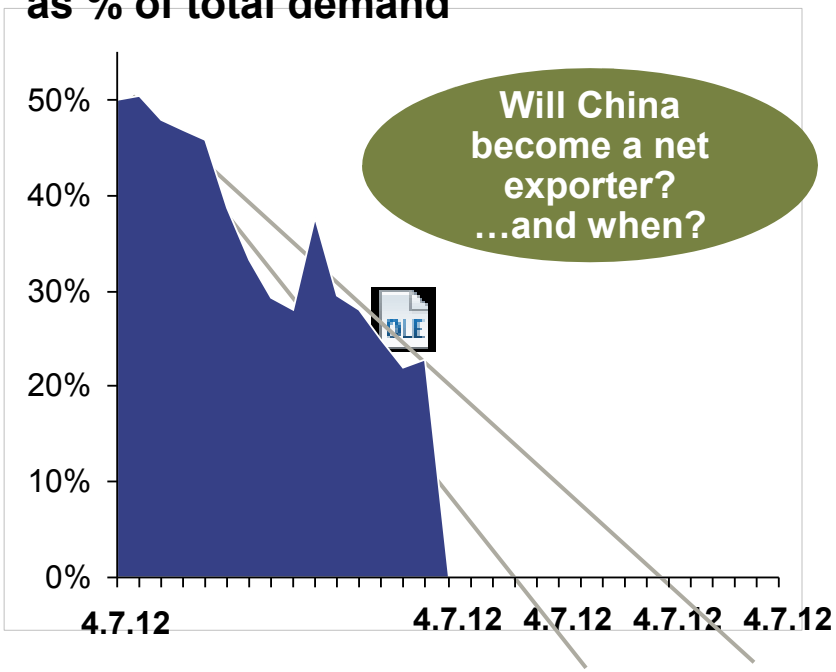
Source: International Energy Agency, U.S. Energy Information Administration, BP, A.T. Kearney

ATKearney

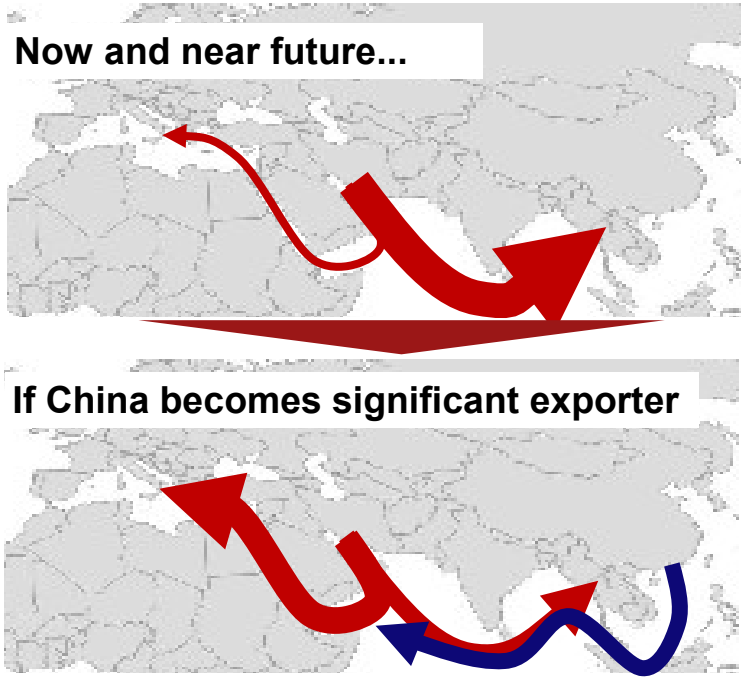
As China strives for autarky in key chemicals, Middle East volumes will increasingly target European markets

3 Volatility: Changing trade flows

Chinese Polymer net imports as % of total demand



Schematic chemicals trade flows1



Ties between Middle Eastern and Chinese players could close out Europeans

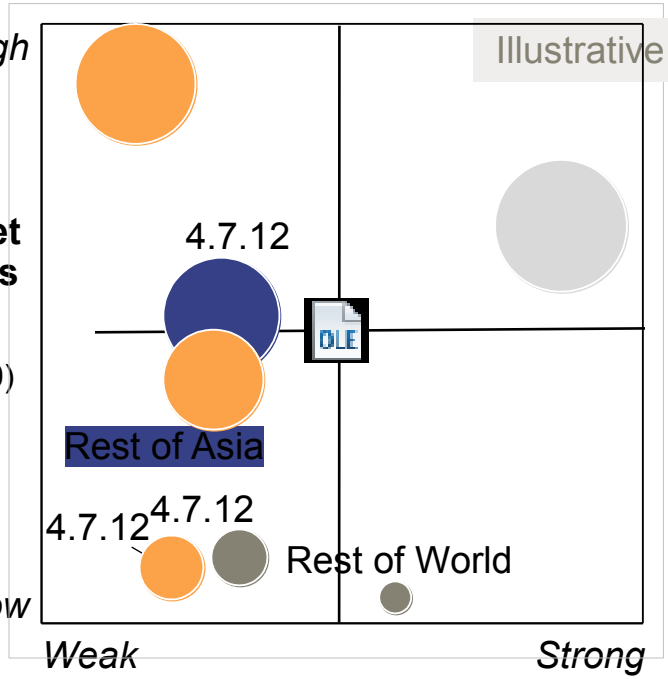
1. Will be different depending on product groups
Source: CMAI, Shell, Chemical Week, A.T. Kearney

Vision 2030

- "Ruler Strategy"
- Competitive Environment 2030
- **Target Position of European chemical industry 2030**
- Call for Action

European companies typically have strong positions in home markets but significant opportunities/gaps overseas

Current regional positioning of European chemical industry



Overall Market Attractiveness

- Size (2010)
- Growth ('10-'30)
- Price levels
- Ease of doing business

European chemical companies "generic" positioning

- Market Share
- Customer access
- Profitability

- **Europe still core market**
- **China with most potentials**
- **NAFTA remains interesting**
- **Rest of Asia also attractive**
- **Japan, Latin America, either with limited size or growth**
- **Overall, a number of "second line" countries of interest**

Source: CEFIC, A.T. Kearney

ATKearney

Market attractiveness of China is superior, but Europe remains relatively attractive

Rationale for positioning

Illustrative

Overall Market Attractiveness

China:
+ Large market; Fast growing
- Highly competitive, plays power game even with MNCs

Europe:
+ Largest market; Fair competition
- Slow growth

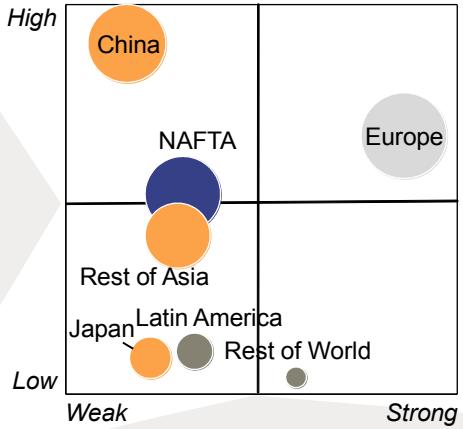
NAFTA:
+ Large, homogeneous market
+ Fair competition
- Slow growth

Rest of Asia:
+ Large market, fast growth
- Fragmented, competitive

Latin America:
+ Good growth and market climate
- Fairly small, fragmented

Japan:
+ Reasonable size
- Slow growth, hard to enter

Rest of World
- Small, fragmented
+ Good growth rates



European chemical companies "generic" positioning

- **Europe**: Clear home market advantage
- **Overseas:** Limited market shares (except Rest of World)
- **China**: Small shares, generally limited profitability
- **Japan**: Challenges to integrate in Japanese networks
- **Rest of Asia**: Very fragmented, often government backed competition
- **Latin America**: Good competitive position, but small shares
- **NAFTA**: Shares and profitability with improvement potential

Source: CEFIC, A.T. Kearney

Vision 2030

- "Ruler Strategy"
- Competitive Environment 2030
- Target Position of European chemical industry 2030
- **Call for Action**

A.T. Kearney

European companies remain significant players in the chemical industry if they are highly innovative and global

Top levers for European chemical companies

1 Defend European market

- Keep overall scale by defending position in slow growing market segments which will not relocate from Europe (e.g. agriculture)
- Focus on efficient sites with necessary scale and leverage complexity, customer proximity against overseas competitors
- Integrity of value chains is core

2 Develop platform for growth

- Develop highly innovative products to participate in or even drive the development of innovative industries in Europe
- Focus on innovations aligned with global mega trends, e.g. clean tech
- Capture value beyond €/t

3 Participate in Asian growth

- Strongly engage in Asia to participate in these growth markets
- Develop dedicated strategies to transfer proven skills into the Asian environment
- Don’t bet on China (and other BRICs) alone

4 Build needed skills and scale

- Build differentiated skills profile per region/market
- Overall, even stronger innovation and customer focus will require a fierce competition for rare high potential employees with technical, commercial and cross-cultural skills

Source: A.T. Kearney

A.T. Kearney

The chemical industry needs to carefully select their partners in stable value chains

1 Stable and migrating customer industry value chains

Customer industry attractiveness

- Health care
- Food
- Clean tech
- Agriculture

- Detergents
- Automotive
- Construction
- Electrical

- Consumer Goods
- Plastics
- Pulp & Paper
- Textiles

Stability

Industry value chains stay in Europe if…

…customer industries stay in Europe (e.g. agro)

…production is cost competitive

…value chains remain intact

…relocation requires high investments and/or write offs in existing assets

…regional production offers advantages (e.g. customer proximity, logistics costs, agility)

…Europe provides competitive skills (e.g. innovation, complexity management skills)

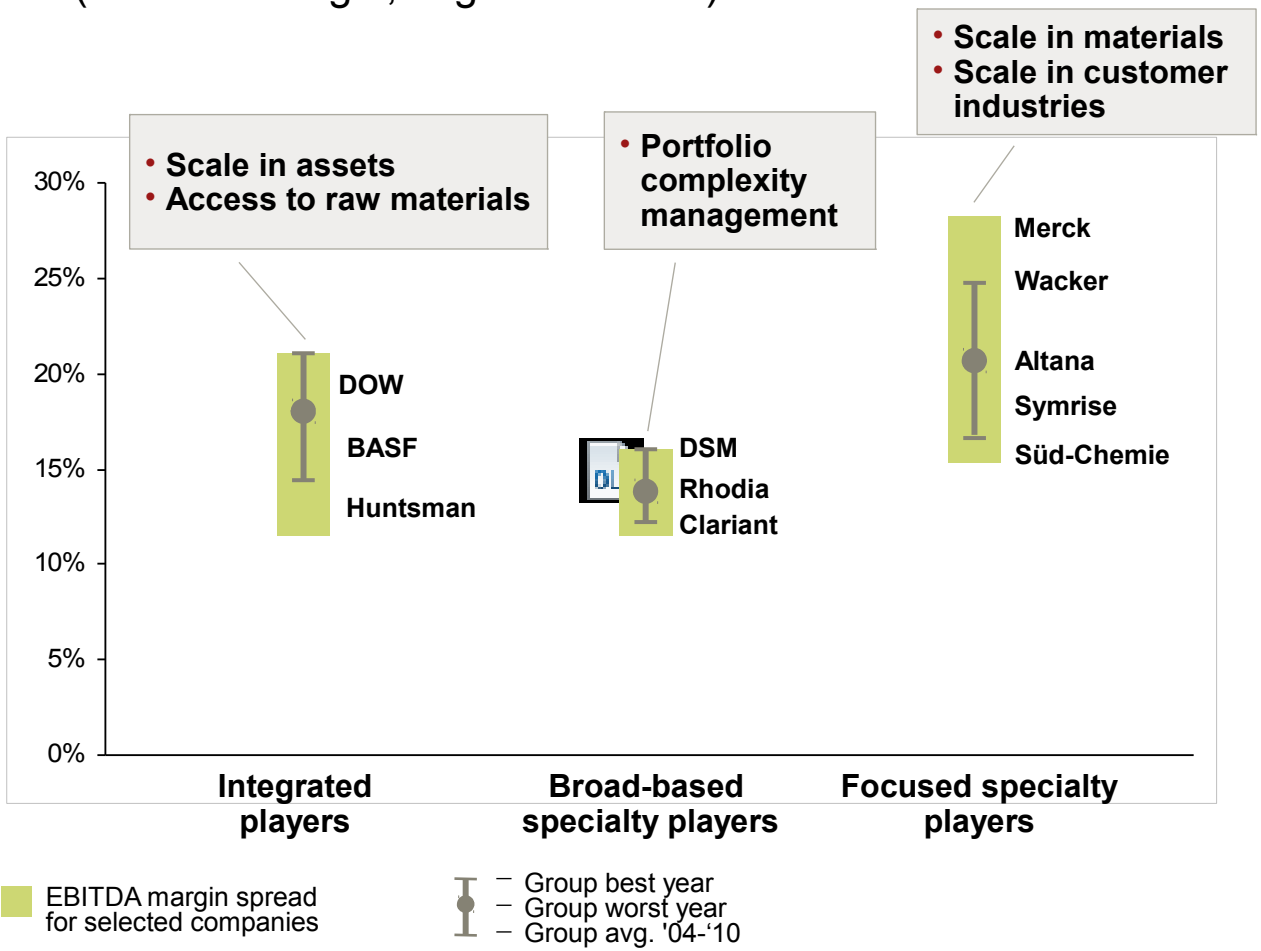
…there is a supportive environment (e.g. public acceptance, regulation, subsidiaries)

Source: A.T. Kearney

To defend competitiveness, we expect European players to continue consolidating to strengthen success factors

1 Success factors and profitability by chemical player group

(EBITDA-margin, avg. 2004-2010)



- Further consolidation to strengthen the European chemical industry expected
- We expect the drivers to be scale in materials/ customer industries for specialties players or
- Scale in assets for integrated players

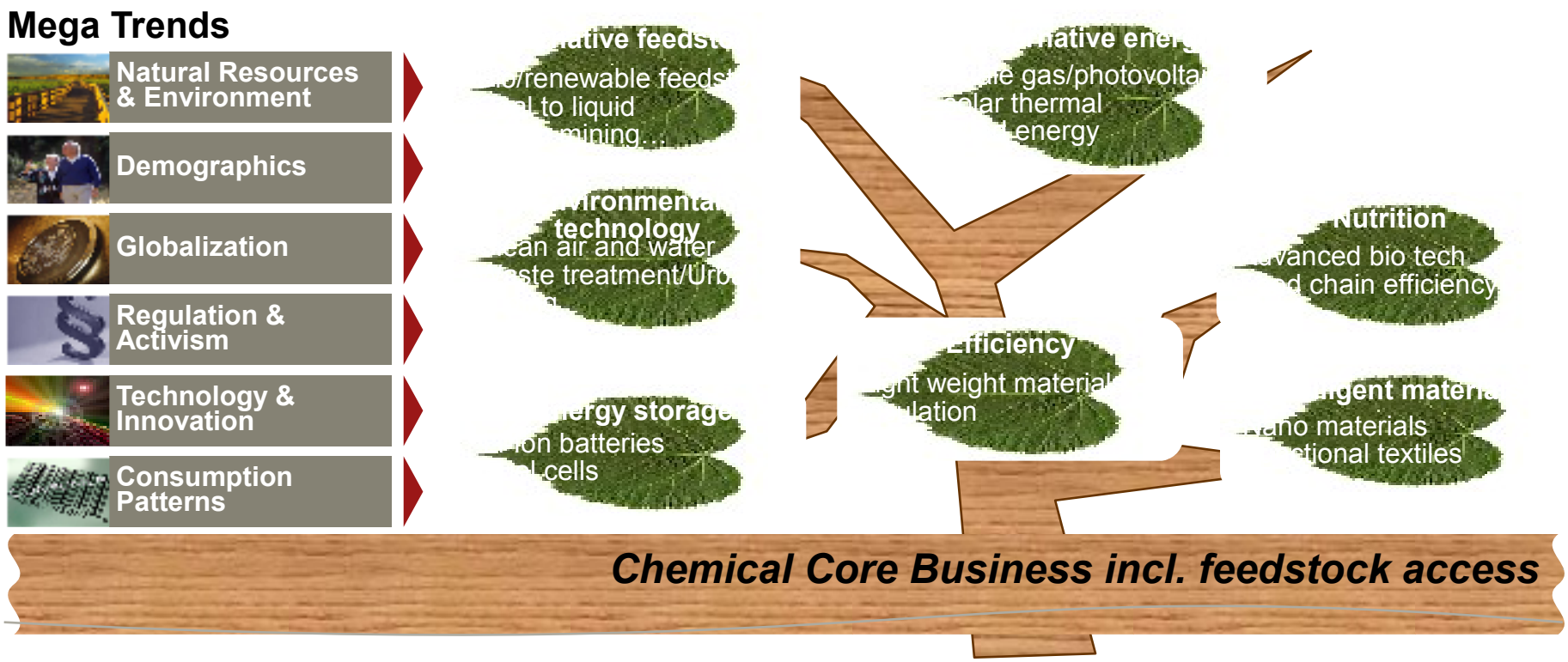
Source: Reuters, Annual Reports, A.T. Kearney

ATKearney

In Europe, growth opportunities are primarily in highly innovative products which are related to global megatrends

2 Capture future growth platforms

Examples



What are most promising "Hypes" for European chemical industry?

Source: A.T. Kearney

ATKearney

For example, the chemical industry can be part of the solution in clean tech related value chains …

2 Capture future growth platforms: Example Clean Tech

Examples for new growth, which will be enabled by chemical innovations

Solar

- In first generation cell manufacturing, chemicals played the key role in raw materials supply. New technologies require different materials and might require different models

Automotive batteries

- Battery performance, cost and safety is strongly driven by chemical components

Bio fuels

- Second generation requires a combination of chemical and biochemical knowledge for pre-treatment and sugar/starch extraction

Examples for growth areas, which require existing chemical solutions

Weight reduction

- Weight reduction is a key trend in all mobile solutions, the chemical industry has significant offerings already in this field and might contribute more, e.g. with carbon fiber solutions

Insulation

- Reduction of CO2 footprint of buildings will be needed to fight global warming, the solutions are in chemicals

Urban mining

- Recuperation of valuable raw materials, e.g. from used electronics, will be of increasing importance

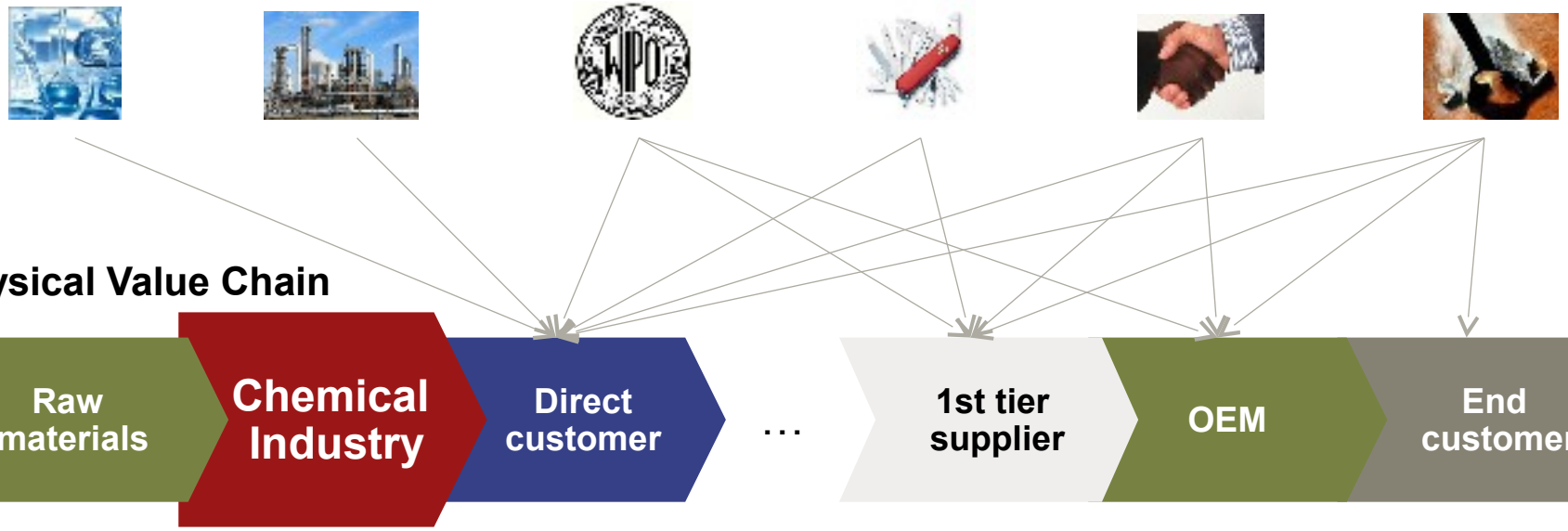
Source: A.T. Kearney

ATKearney

… these innovative solutions help the chemical industry generate value beyond traditional €/t supplier roles …

2 Levers to control value generation by innovative chemical solutions

Levers to create value beyond €/t at direct customer



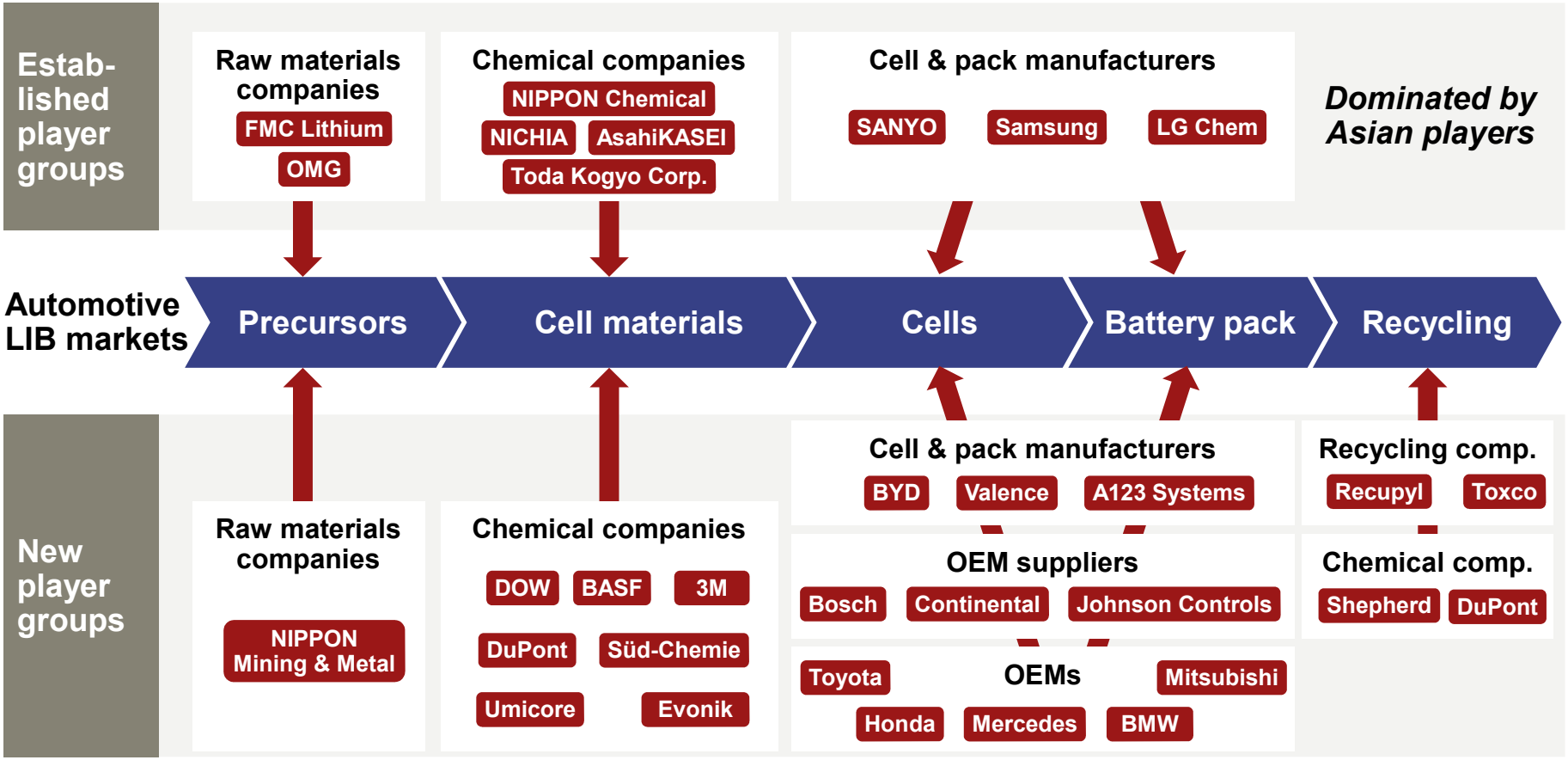
Additional value capture is a growth potential if chemical players improve on the value levers

Source: A.T. Kearney

ATKearney

…and to play a more important and less replaceable role in the new value chains

2 Example: Key player groups are active in the automotive LIB market



Source: A.T. Kearney

ATKearney

Growing in the world's manufacturing hub in Asia requires regional adaptation plus differentiation from competition

3 Participate in Asian growth

Illustrative

Drivers of Asian growth

- Manufacturing hub for the (western) world
- Development of infrastructure and assets
- Increasing wealth of own (growing) population

Typical customer industries

- Consumer goods textile automotive …
- Construction industrial equipment …
- Consumer goods food agriculture construction …

Chemical industry profitable growth options

Leverage existing products and relationships to supply out of Asia or Europe (depending on product & cost competitiveness)

+ Develop local products
+ Collaboration with Eastern players
+ Transfer of knowhow etc.
+ Develop specific sales approaches
+ Local development of suitable offers

Source: A.T. Kearney

ATKearney

Each regional market will require specific skill sets, which need to be managed

4 The new required skill profile

Highly illustrative

Skills

Excellent brand position

Focus on (end) customer needs

Prices for value

Flexible supply to unstable demand

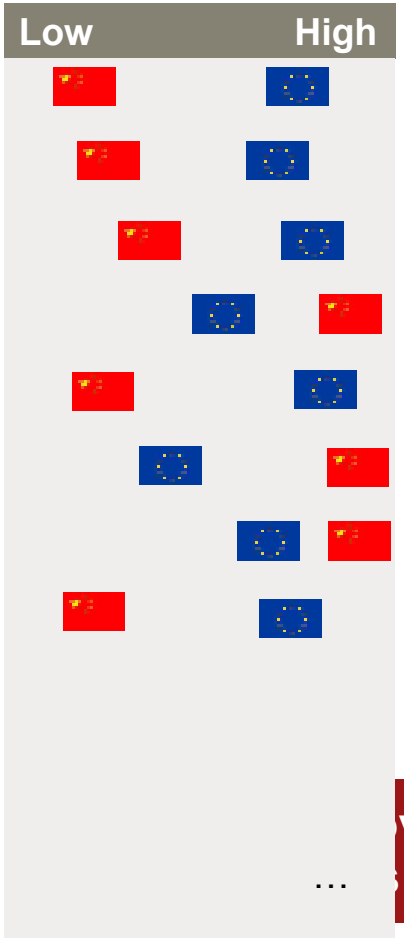
Highly innovative

Regional specific application development

Cost competitive

Production technology advantage

....



Explanation

… to defend against overseas imports

… to gain and defend customer access

… to get beyond €/t business model

… to navigate through the cycle

… to build for the future

… to capture local needs

… to remain in the business

… to compensate higher labor costs

…vernance structures to manage differing …

Source: A.T. Kearney

ATKearney

The European chemical industry needs also a supportive environment

Call for Action to external Stakeholders

Supportive environment for science and industry

- Broader public acceptance of producing industries in Europe
- Value networks with customer industries for joint development
- Increasing openness to innovation and new technologies

Create a level playing field

- Competitive incentives/support for research in new growth industries, e.g. in clean tech
- Comparable CO2 and other environmental regulations/cost in Europe and with key competing regions
- Reasonable approval requirements, processes and timelines

Close education gaps

- Strengthen education in chemistry, engineering and other sciences
- Start from high school and go all the way to post-graduate levels

Source: A.T. Kearney

Thank you for your attention!

Dr. Tobias Lewe
Partner

A.T. Kearney GmbH

Kaistraße 16a

40221 Düsseldorf

Tel.: + 49 (211) 1377 2768

Mobile: + 49 (175) 2659 768

tobias.lewe@atkearney.com

Source: A.T. Kearney

A.T. Kearney

A.T. Kearney is a global team of forward-thinking, collaborative partners that delivers immediate, meaningful results and long-term transformative advantage to clients.

Since 1926, we have been trusted advisors on CEO-agenda issues to the world's leading organizations across all major industries and sectors. A.T. Kearney's offices are located in major business centers in 39 countries.

Americas	Atlanta	Chicago	Detroit	Mexico City	San Francisco	Toronto	
	Calgary	Dallas	Houston	New York	São Paulo	Washington, D.C.	
Asia Pacific	Bangkok	Hong Kong	Kuala Lumpur	Mumbai	Seoul	Singapore	Tokyo
	Beijing	Jakarta	Melbourne	New Delhi	Shanghai	Sydney	
Europe	Amsterdam	Budapest	Helsinki	Ljubljana	Moscow	Prague	Vienna
	Berlin	Copenhagen	Istanbul	London	Munich	Rome	Warsaw
	Brussels	Düsseldorf	Kiev	Madrid	Oslo	Stockholm	Zurich
	Bucharest	Frankfurt	Lisbon	Milan	Paris	Stuttgart	
Middle East and Africa	Abu Dhabi	Johannesburg	Riyadh				
	Dubai	Manama