



# Following the customers and trends

Value added chemicals investments in China on the upswing

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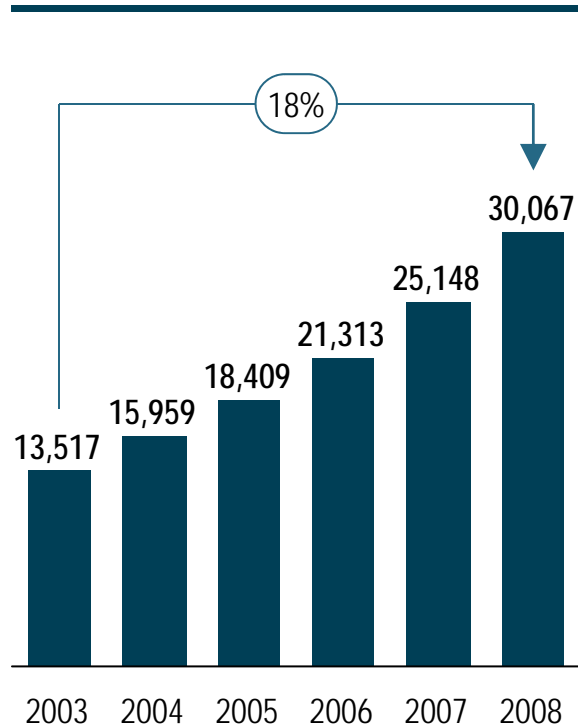


# Four hypotheses on chemicals investments in China

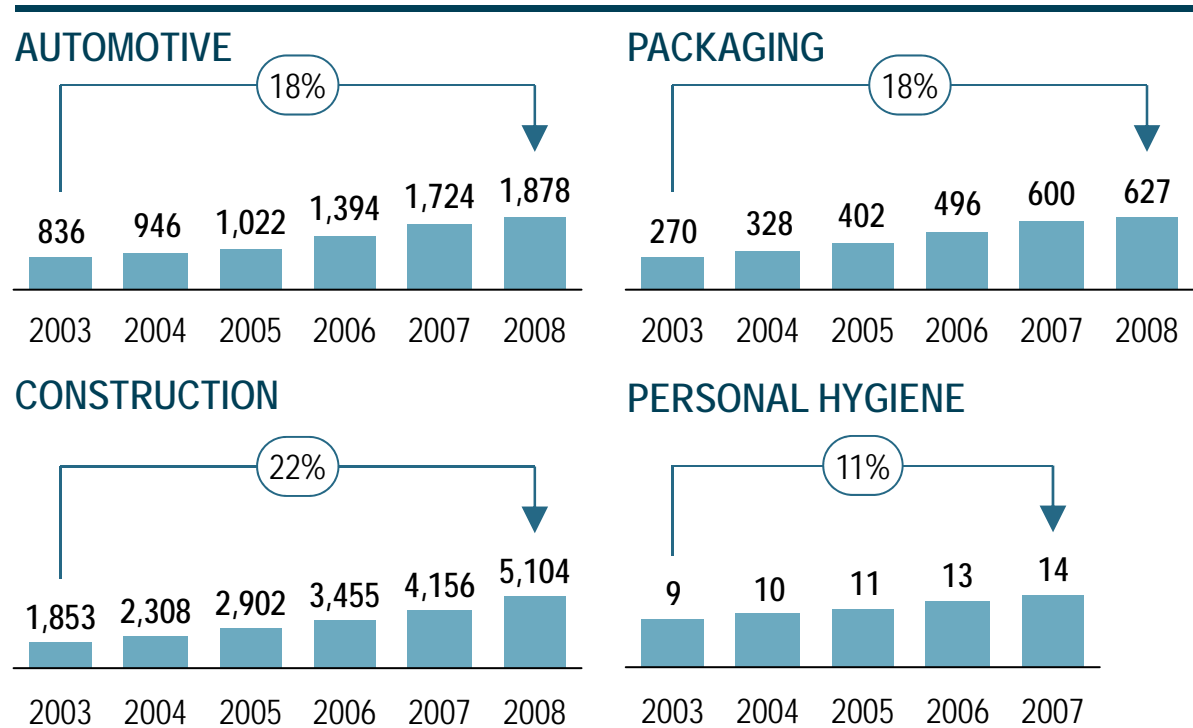
1. China's chemicals demand is growing, domestic markets reaching critical size
2. Value added chemicals production will come to China
3. Localization of production will reshape global trade flows
4. Value added chemicals offer excellent investment opportunities in China

# China is experiencing robust and even accelerated growth – Driving chemicals demand into new dimensions

03-08 China GDP Statistics  
[RMB bn]

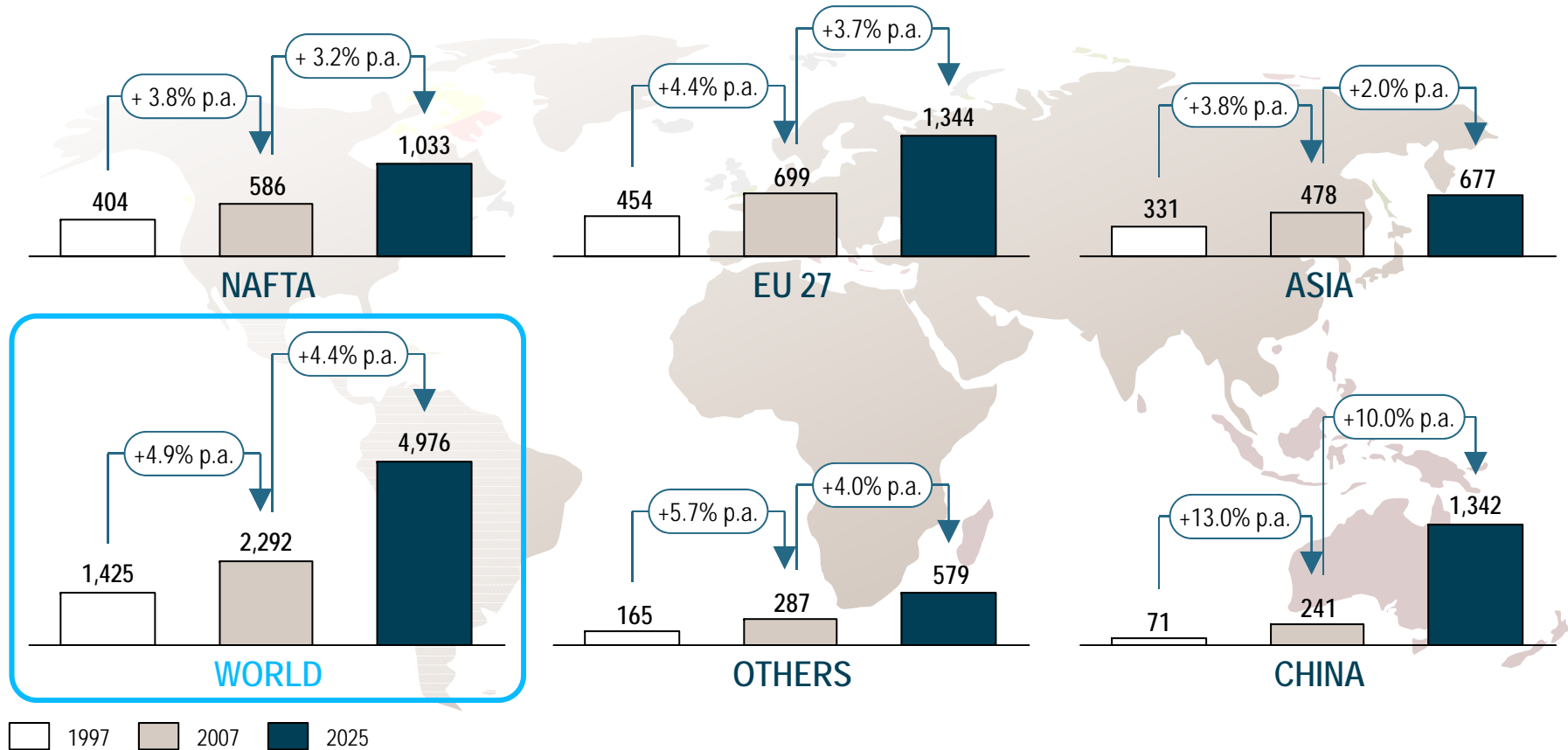


03-08 Output Value of Selected Customer Industry  
[RMB bn]



# Logically, China is becoming the # 1 chemicals market in 2025, equal size as Europe

Sales in chemical industry (excluding pharma) [EUR bn]



# Chinese government is targeting the development of an advanced and efficient domestic chemical industry

## Guidance by Chinese Government to the Chemical Industry

- 1 | PETROCHEMICALS** – Expand the equipments of ethylene and decrease the energy consumption; Prioritize to develop special synthetic material with high performance, technology and added value
- 2 | FERTILIZER** – Prioritize the technology of ammonia manufacturing with low energy consumption; Develop larger scale technology and circular technology for phosphate and compound fertilizer manufacturing
- 3 | PESTICIDE** – Eliminate products with high energy consumption and protect the environment; Extend clean technology
- 4 | RUBBER** – Develop the environment-friendly tires and rubbers with high added value for the cars and mining machinery; Prioritize automated production of tires
- 5 | NEW CHEMICAL MATERIALS** – Popularize melted fluoropolymer production; Develop key intermediate manufacturing technology
- 6 | FINE CHEMICAL** – Target products with environment-friendly, high performance, specialty and high value; Develop the catalysts technology, process intensifying technology, fine processing technology and bio-chemical technology
- 7 | ENERGY SAVING AND ENVIRONMENT PROTECTION** – Develop advanced new technology and equipment, such as **energy saving ammonia synthesis** technology
- 8 | NEW-STYLE COAL CHEMICAL INDUSTRY** – Such as chemical production technology with coal gasification

# Recently announced mega-deals in petrochemicals – But "silent revolution" in value added chemicals

**Basic Information**



**BASF-Sinopec**

- > Investment: 1.4 billion \$
- > Operating time: 2011
- > Location: Nan Jing

**Sinopec-SABIC**

- > Investment: 2.7 billion \$
- > Shareholder structure: 50%/50%
- > Location: Tian Jin

**DOW Chemicals-Shenhua**

- > Investment: 10 billion \$
- > Location: Yu Lin

**Production Information**



- > Products: Special chemicals for construction, electronics, pharmacy, automotive industries
- > Equipment: 10 new chemical installations and 3 extended installations to increase the capacity of steam cracking unit

- > Product: 3.2 million ton chemical products including ethylene, polythene, glycol, polypropylene, butadiene. etc per year

- > Product: Basic chemicals, such as ethylene, propylene. etc, and down-stream chemicals
- > Equipment: 23 large scale installations, including one with capacity of 3.32 million ton methanol per year



**Cooperation between Foreign chemical giants and Chinese giants becomes a trend in China**

# Definition of value-added chemicals – Three major segments



## Specialty chemicals



- > Characterized by performance/impact
- > Seller acting as solution provider
- > Wide range of different applications and customer industries with specific requirements



## Fine chemicals



- > Characterized by 'molecule' with defined purity and quality
- > Buyer selecting the chemical
- > Ranging from simple intermediates to complex APIs



## Performance plastics



- > Plastics with dedicated performance characteristics, often in engineering applications
- > Sold by performance, not by grade
- > Often in competition to other materials, in particular steel

# Three arguments for value-added chemicals being the next investment wave

1. Critical size of home markets achieved through further growth of domestic demand of major customer industries



2. New, innovative sectors are arising in China

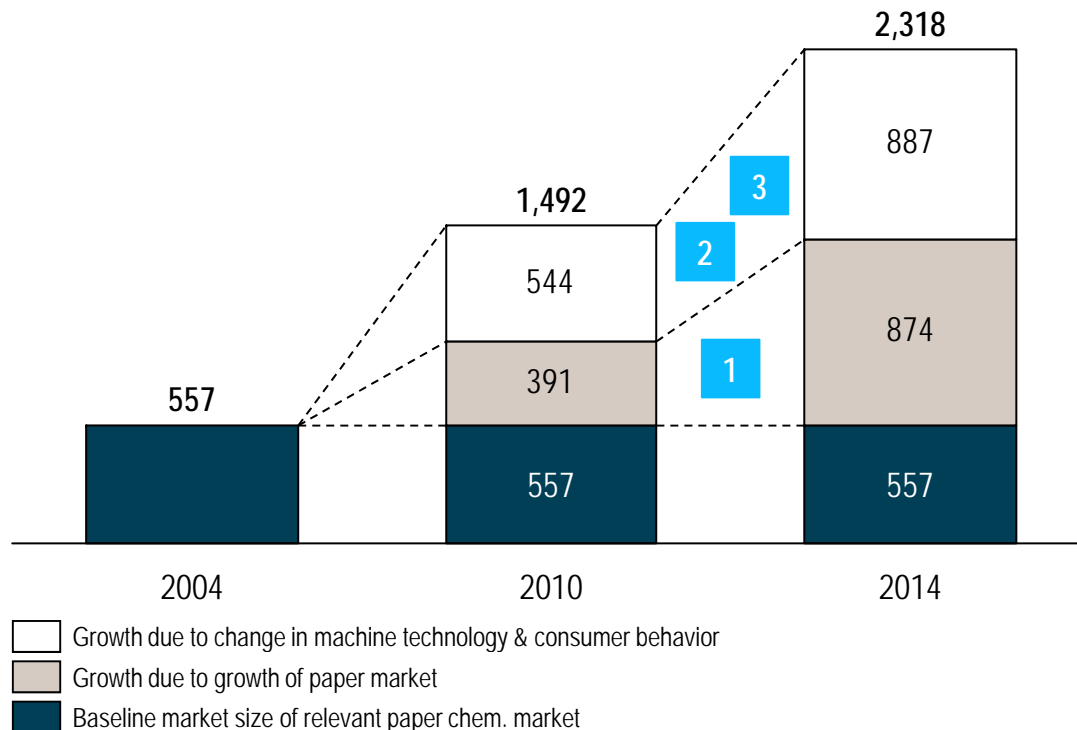


3. Supply chain structures and local marketing requirements favor local production



# For example, growth in the paper chemical consumption market will be driven by these three factors

Market growth over time from 2004 to 2014 [USD m]

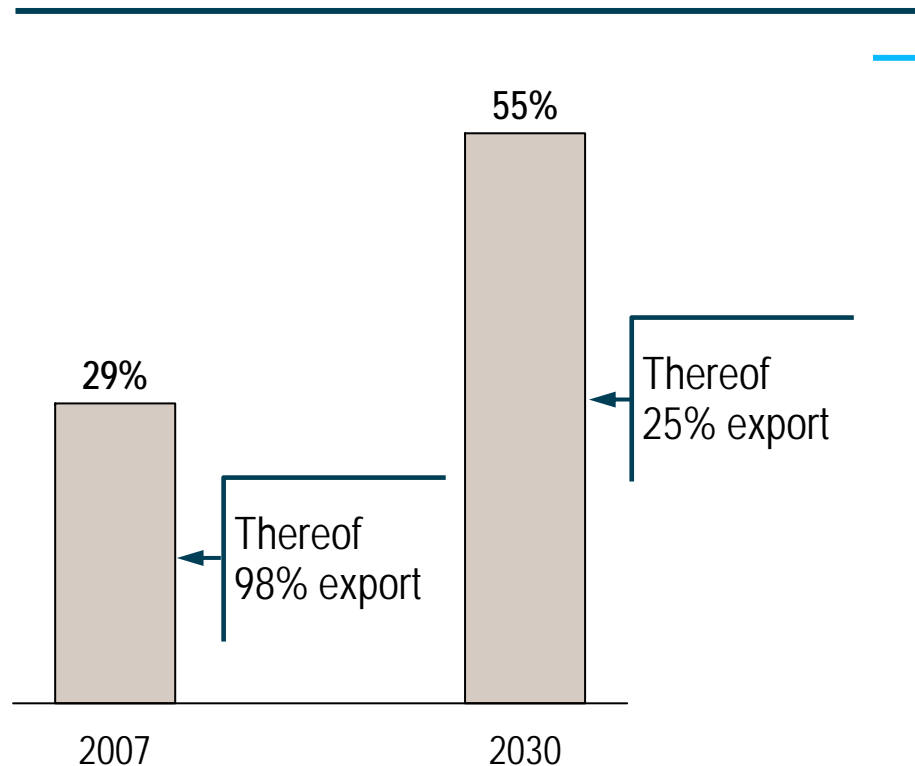


Drivers of growth

- 1 **Fast growth** of China's paper industry will lead to almost parallel growth rates for paper chemicals
- 2 Intense **structural change in the paper machines' technology** calls for usage of an **increased proportion** of processed paper chemicals
- 3 **Consumer behavior** related to the capabilities of new machines will lead to an **increased level of quality** in paper, resulting in a **higher proportion of high-value paper chemicals**

# The Chinese photovoltaic industry growth is requiring dedicated suppliers on the chemicals side as well

Production of PV cells – Market share China [%]



- > In the 11<sup>th</sup> 5-year plan, China intends to spend EUR 3.2 bn to supply 2 m households with photovoltaic systems
- > Growing thin film technology share further drivers chemical demand
- > Total demand of chemicals for photovoltaic could reach more than EUR 5 bn in 2030

# Starting point is different by chemicals segment

## Specialty chemicals

- > Fragmented domestic competition
- > Growing import share
- > Selective foreign investments for domestic demand



**Opening of Stahl's Suzhou plant in September 2008**

## Fine chemicals

- > Mixed picture with world-scale production as well as fragmented non-competitive one
- > Consistent product quality and reliability still issue on export markets



**Akzo Nobel perceiving MCA<sup>1)</sup> as key product in China in world-scale unit**

## Performance plastics

- > Major markets (e.g. automotive) expected to grow significantly
- > Global players (e.g. BASF, Bayer) building up local capacities
- > Local producers manage to capture selective prominent market positions



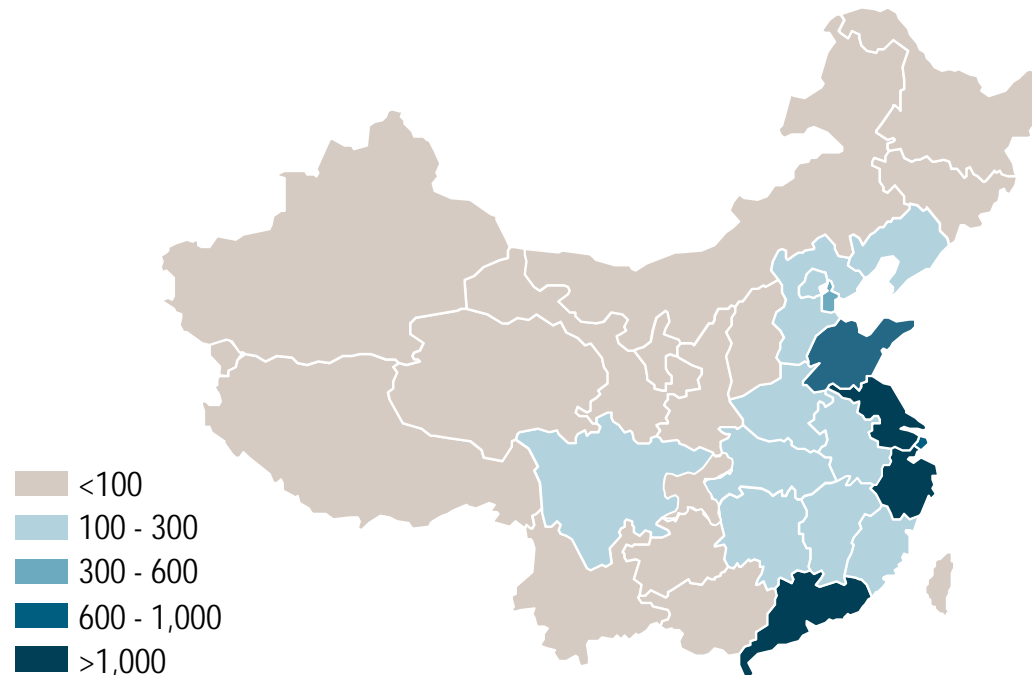
**Sichuan Deyang Chemicals with 30,000 tons PPS capacity in global leading position**

1) Mono chlor acetic acid

# Specialty Chemicals markets are highly fragmented with more than 8,000 players

## Domestic players

### Specialty chemicals -domestic players<sup>1)</sup> (2007)



1) Including Active Pharmaceutical Ingredients, Pesticides, Specialty coatings, Specialty surfactants, Food additives, Flavors and fragrances, Plastics additives, Textile chemicals, Printing inks, Cosmetic chemicals, etc.

### Comments

- > There are **more than 8,000 local specialty chemical players** with revenues of RMB >5 m
- > Most **local players are small** and manufacture just **one or two products**, preventing economies of scale and R&D investment
- > In the long term, **consolidation** is likely

# Different impact of trade flows and value chains by segment (1)



**Specialty chemicals**



Localize production replacing imports



**Fine chemicals**



Becoming a global player



**Performance plastics**



Potential front-runner for industry innovations

# Different impact of trade flows and value chains by segment (2)

Localized production of specialty chemicals replacing imports



- > Currently approx. 80% of higher-end specialty chemicals are imported
- > Fragmental structure of local producers with only narrow product range
- > Local consolidation and overseas, M&A of large players will reshape industry structures

Becoming a global player in fine chemicals



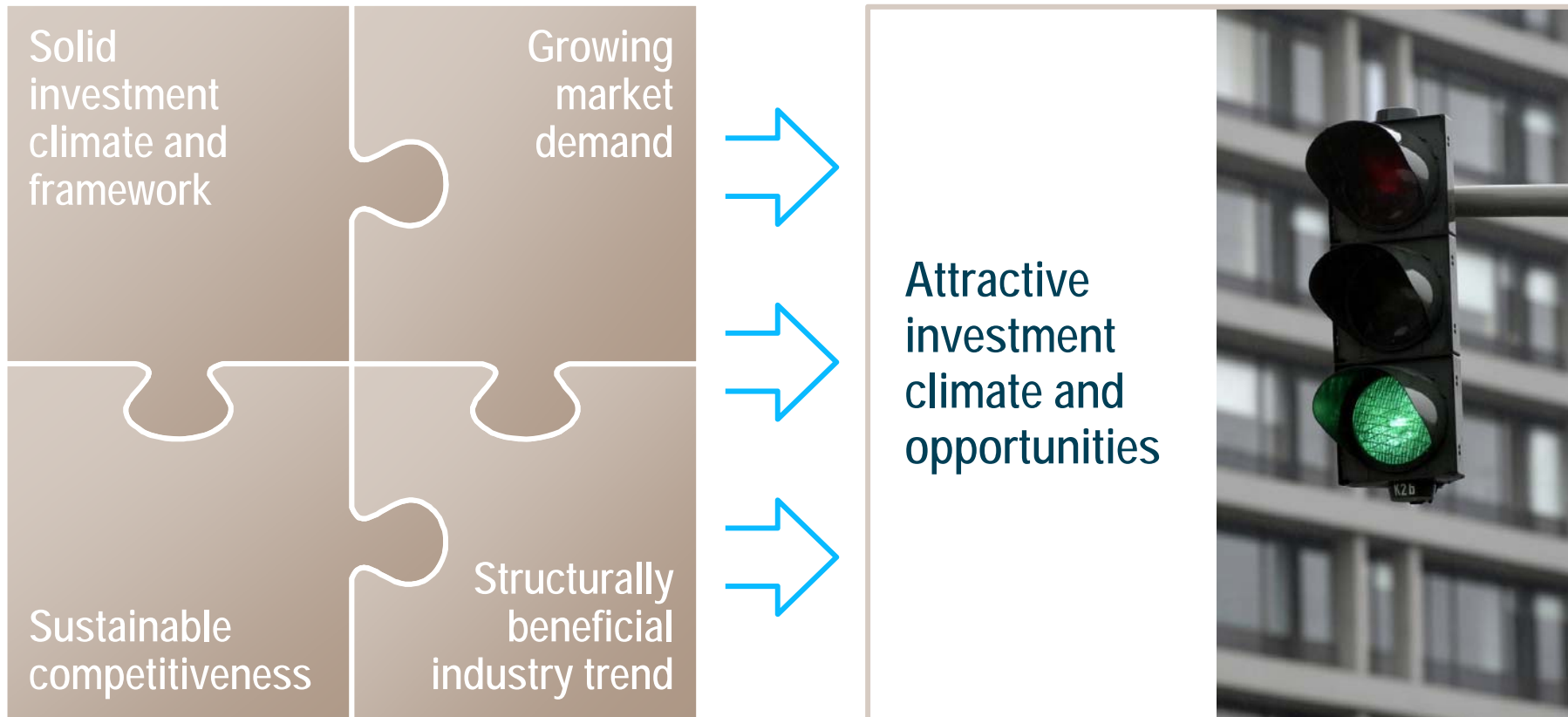
- > Strong local demand will drive set-up of capacities on world-scale, also serving for exports
- > Reliabilities and quality, also in cooperation with MNC's improving
- > Public subsidies and embedding in industry parks

Potenital front-runner in performance plastics applications



- > Imports already about to be replaced by local production
- > Large-scale production capacities also with export potential
- > Sophistication of local customer industries allows stand-alone developments

# Consequently, investment opportunities are solidly backed up by four major factors offering attractive returns



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