Positioning for growth
Investor presentation
October 9, 2018
Positioning for growth

Investment highlights of new 500kt world-scale MDI plant in USA

1. Attractive MDI industry with above GDP growth requires new world-scale capacities

2. Satisfy global demand and accompany industry growth by increasing Covestro global MDI nameplate capacity of 1,470kt by 2018e to 2,230kt by 2024e

3. Extend leadership positions in the industry to become global #2 and USA #1 by 2024e

4. Improve cash cost position worldwide for long-term competitiveness by investing in full chemical chain including precursors and operating world-scale units on existing sites

5. Deliver attractive returns with mid-term debottlenecking and world-scale investment into long-running assets

Notes:
(a) Based on total nameplate capacity at year end 2024 relative to competitors
Source: Covestro estimates, based on announced capacities
Diverse end-markets in all regions support robust growth

Global MDI industry demand

<table>
<thead>
<tr>
<th>Demand (mt)</th>
<th>CAGR in %</th>
</tr>
</thead>
<tbody>
<tr>
<td>NAFTA</td>
<td>5.5%</td>
</tr>
<tr>
<td>EMEA</td>
<td>4%</td>
</tr>
<tr>
<td>LATAM</td>
<td>3%</td>
</tr>
<tr>
<td>APAC</td>
<td>6%</td>
</tr>
</tbody>
</table>

**MDI demand by region**

**CAGR 2017 – 2022e**

**Underlying application growth driver**

<table>
<thead>
<tr>
<th>Application</th>
<th>Growth (CAGR)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CASE(b)</td>
<td>4%</td>
</tr>
<tr>
<td>Apparel</td>
<td>7%</td>
</tr>
<tr>
<td>Appliance</td>
<td>4-5%</td>
</tr>
<tr>
<td>Construction</td>
<td>5%</td>
</tr>
<tr>
<td>Automotive</td>
<td>4%</td>
</tr>
<tr>
<td>Diverse industries</td>
<td>4%</td>
</tr>
</tbody>
</table>

- Growing demand for insulation foam to comply with regional energy efficiency directives, particularly in developed economies
- Increase in global construction activity
  - broader macro upturn
  - high growth in emerging economies
- Higher consumption of appliances (refrigerators)
- Steady GDP-driven growth in other applications, e.g. CASE(b), textiles and footwear

Notes:

(a) Figures represent CAGR 2017-2022e; assumes global GDP CAGR 2017–2022e of ~3%
(b) CASE: Coatings, adhesives, sealants and elastomers
Source: IHS, Covestro estimates
Demand growth to outpace forecasted supply additions

MDI industry demand and supply

MDI demand development (2017 – 2027e)

- Structurally sound demand for the foreseeable future, driven by solid GDP growth and substitution trends
- Budgeted demand growth of ~5% rather conservative in historic growth context and given strong demand trends

MDI supply development (2017 – 2027e)

- Major additions expected until 2022e: BASF, Covestro, Dow/Sadara, MCNS, SLIC, Wanhua
- Major additions expected between 2022e and 2027e: Covestro, BASF, Wanhua
- CAGR 2017-2027e at 3.5%, thus still new capacities missing to cover demand

Notes:
- (a) Assumes global GDP CAGR 2017–2027e of ~3%
- (b) Based on announced future nameplate capacities
- Source: Covestro estimates
Regional demand growth requires new world-scale plants
MDI imports to be substituted by local production

**MDI industry in NAFTA: domestic production compared to demand development**

- **Supply gap without new Covestro plant**
- **Supply gap with new Covestro plant**

**Covestro industry assumptions**

- MDI demand: above GDP growth rate at CAGR ~5%
- NAFTA region is currently net MDI importer with further increasing supply gap
- Announced capacity addition by BASF expected to start 2021 and ramp up until 2025
- Announced capacity addition by Wanhua expected to start in 2022 and ramp up until 2023
- As of 2024, a new supply gap would build up without another local world-scale plant
- Covestro world-scale plant with net capacity addition of +410kt expected to start in 2024 and to be quickly absorbed soon thereafter

Notes:
(a) acc. to Louisiana Economic Development press release dated October 4, 2017
(b) acc. to ICIS press article dated April 10, 2017
(c) Covestro estimates, MDI supply calculated at 85% of nameplate capacity. Global GDP CAGR 2017–2027 at ~3%.
# Growth through debottlenecking projects and world-scale plant

## Covestro planned MDI capacity additions

<table>
<thead>
<tr>
<th>Year</th>
<th>Project</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>2019e</td>
<td>Chlorine plant</td>
<td>Tarragona, Spain</td>
</tr>
<tr>
<td>2019e</td>
<td>Aniline plant</td>
<td>Antwerp, Belgium</td>
</tr>
<tr>
<td>2020e</td>
<td>MDI +100kt</td>
<td>Caojing, PRC</td>
</tr>
<tr>
<td>2021e</td>
<td>MDI +100kt</td>
<td>Tarragona, Spain</td>
</tr>
<tr>
<td>2022e</td>
<td>MDI +50kt</td>
<td>Tarragona, Spain</td>
</tr>
<tr>
<td>2023e</td>
<td>MDI +410kt</td>
<td>Baytown, USA</td>
</tr>
<tr>
<td>2024e</td>
<td>MDI +200kt</td>
<td>Brunsbuettel, Germany</td>
</tr>
</tbody>
</table>

**Notes:** Magenta color indicates newly announced investments.
Newly announced Covestro MDI investment projects

New world-scale MDI plant in Baytown and aniline plant in Antwerp

**New world-scale MDI plant of 500kt p.a., including complete chemical backbone**
- Investment of around €1.5bn in new, highly efficient world-scale 500kt MDI plant on existing Baytown site, USA
- New plant to expand Covestro’s Baytown capacity from currently 330kt p.a. to 740kt p.a. by 2024e
- Replacement of 90kt sub-scale plant, in operation since 1974, to extend leading cash cost position in NAFTA

**Tailored aniline supply ex Antwerp for Tarragona**
- Investment of around €0.3bn in aniline production in Antwerp, Belgium, by 2022e
- Ensuring a highly efficient, sustainable and independent supply for the Tarragona operations
- Design and process technology based on the newest comparable facility in Caojing, China.

- **+410kt** Net capacity addition
- **740kt** Covestro capacity in USA by 2024e
- **#1** MDI producer in USA
- Above WACC

**Notes:** (a) Based on total nameplate capacity at year end 2024e, relative to competitors
Covestro expanding its leadership position
MDI production capacities and industry positions

Notes:
(a) Based on total nameplate capacity at year end 2017 relative to competitors
(b) Based on total nameplate capacity at year end 2024e relative to competitors
Source: Covestro estimates, based on announced capacities
Investments into full chemical chain for best synergies in scale

MDI Baytown: infrastructure, precursors and full MDI train, including monomeric splitter

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**Infrastructure**
- Premises
- Site development
- Streets
- Pipeline bridges
- Storage tanks
- Jetties
- Power supply & distribution
- Waste management
- Safety

**Raw Materials**
- Nitric Acid (HNO₃)
- Benzene
- e.g. via reformer
  - Hydrogen (H₂)
  - Carbon Monoxide (CO)
- Chlorine
  - Cl₂
- NaOH
- Formaldehyde

**Core Units / Technology**
- MNB (Mono-Nitrobenzene)
- Aniline
- MDA (Methylene Dianiline)

**Final Product**
- MDI
- mMDI

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**Highlights**
- Comprehensive investment program with set-up of 7 new production elements and infrastructure improvements
- State-of-the-art new asset with leading process technology
- New world-scale production facility including splitter for monomeric MDI
- Critical raw materials sourced internally
- Synergies at all steps along the value chain

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Notes: Chart contains key feedstock only
(a) via Chloralkali Electrolysis, (b) produced from CO and Cl₂

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Positioning for growth │ MDI

- Purchased raw materials
- Covestro activities
- Planned new elements
Further improving the leading cost positions in all regions

MDI industry cost curves per region

### North America

- **Cash cost**
- **A** New world-scale plant

- **B** Covestro Baytown
- **C** North American follower
- **D** North American laggard

**Notes:**
- (a) Cost of production based on total raw material costs less co-product credits, variable and fixed conversion costs at 100% utilization based on nameplate capacity for FY 2017
- (b) ODC: oxygen-depolarized cathode

### EMEA

- **Cash cost**
- **A** European leader
- **B** Covestro Uerdingen
- **C** Covestro Tarragona
- **D** Covestro Brunsbuettel

- **E** European laggard
- **F** ME player (landed WE)

**Notes:**
- (a) Cost of production based on total raw material costs less co-product credits, variable and fixed conversion costs at 100% utilization based on nameplate capacity for FY 2017

### Asia

- **Cash cost**
- **A** Chinese leader
- **B** Covestro Caojing
- **C** Chinese laggard
- **D** Asian laggard
- **E** ME player (landed China)

**Notes:**
- (a) Cost of production based on total raw material costs less co-product credits, variable and fixed conversion costs at 100% utilization based on nameplate capacity for FY 2017
- (b) ODC: oxygen-depolarized cathode

**Source:** Covestro estimates

**Benefits from low energy and natural gas prices, suffers from high investment level and required costly HCl recycling via ODC**

**Additional Notes:**
- (a) Cost of production based on total raw material costs less co-product credits, variable and fixed conversion costs at 100% utilization based on nameplate capacity for FY 2017
- (b) ODC: oxygen-depolarized cathode

**Source:** Covestro estimates

**Extension of Covestro cost leadership through highly efficient world-scale plant and backward integration**

**European leader with large and energy-efficient MDI capacity plus cost-efficient raw material supply**

**Uerdingen more cost efficient relative to other Covestro facilities in Europe due to level of backward integration; expansion projects for BRU and TAR**

**Chinese leader with very strong backward integration including energy supply**

**Covestro ahead due to larger MDI train capacity and energy efficiency - further specific cost reduction through expansion projects**

**Benefits from low energy and natural gas prices, suffers from high investment level and required costly HCl recycling via ODC (no benefit from caustic soda by-product sales); plus estimated 90-140 $/t bulk freight plus 6.5% import duty to WE and China**
Investment into organic growth to deliver attractive returns

Covestro Group capex\(^{(a)}\) development 2018e-2024e

<table>
<thead>
<tr>
<th>Budgeted capex(^{(a)})</th>
<th>Long-term capex(^{(a)}) indication</th>
<th>Highlights</th>
</tr>
</thead>
<tbody>
<tr>
<td>in € billion</td>
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<td></td>
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<tr>
<td>Upper end</td>
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<tr>
<td>~0.7</td>
<td></td>
<td></td>
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<tr>
<td>2018e</td>
<td>2019e</td>
<td></td>
</tr>
<tr>
<td>~0.2bn</td>
<td>0.3bn</td>
<td></td>
</tr>
<tr>
<td>chlorine plant and debottlenecking Tarragona</td>
<td></td>
<td></td>
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<tr>
<td>2019e-2022e: ~€0.3bn for aniline plant Antwerp</td>
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<td>2021e-2024e: ~€1.5bn for fully integrated MDI train Baytown</td>
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<tr>
<td>Growth capex for PCS, Polyols and TDI</td>
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<td>Accompany industry growth by adding new capacity</td>
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<tr>
<td>Maintenance capex at ~€250-300 p.a.</td>
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<tr>
<td>Based on risk assessment</td>
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</tbody>
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Notes: (a) Cash-relevant capex, prior to initial application of new accounting standard IFRS 16 Leases, effective January 1\(^{st}\), 2019

Phasing of capex for MDI and precursors
- 2018e-2022e: ~€0.2bn for chlorine plant and debottlenecking Tarragona
- 2019e-2022e: ~€0.3bn for aniline plant Antwerp
- 2021e-2024e: ~€1.5bn for fully integrated MDI train Baytown

Growth capex for PCS, Polyols and TDI
- Accompany industry growth by adding new capacity

Maintenance capex at ~€250-300 p.a.
- Based on risk assessment
Solid underlying MDI global demand growth

Balanced supply-demand outlook

New world-scale MDI train by 2024e

Capex on existing site with attractive ROCE

MDI producer in USA with 740kt by 2024e

~5%

500kt

€1.5bn

#1
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