Big events along the MDI value chain in 2018

▲ Situation and policy

1. In 2018, chemical manufacturers speed up their efforts to relocate to industrial parks as the campaign of environmental inspection in China continues to gain momentum. Companies in the petrochemical industry make continued progress in improving their product quality, production efficiency and technology upgrading. Many local governments introduce policies on the environment, rectification, improvement and relocation of chemical industry parks. These policies impact the upstream and downstream players along the PU value chain. Specifically, some downstream manufacturers without complete environmental licenses were forced to carry out rectification within a time limit or shut down their facilities temporarily.

2. On July 28, the Ministry of Ecology and Environment began to carry out the special action on the enforcement of law on ODS (Ozone-Depleting Substances). The illegal use of CFC-11 (trichlorofluoromethane), the blowing agent for rigid PU foam, is the focus of the action. Consequently, the price of HCFC-141b (Dichlorofluoroethane) for a time rose from RMB 15,000/ton to RMB 22,000/ton.

On October 24, in accordance with the relevant provisions of the Regulation on the Administration of Ozone Depleting Substances and the requirements of the phase-out plan for HCFCs developed by China's polyurethane foam industry, the Ministry of Ecology and Environment required that from
January 1, 2019, all manufacturers shall not use HCFC-141b as the blowing agent to produce refrigerators, freezers, refrigerated containers and electric water heaters.

3. On May 7, after two years of investigation and survey, the national mandatory standard for plastic runways Synthetic Surfaced Athletic Ground in Primary and Secondary Schools GB 36246-36246 (hereinafter referred to as 2018 GB) was officially published on the website of Standardization Administration of China. The new standard lays down more stringent requirements for the contents of TDI, MDI, HDI and MOCA.

4. The trade war between China and the United States has been escalating since March. On September 18, Donald Trump, the president of the United States announced that starting from September 24th, the U.S. government would impose a 10% additional tariff on about $200 billion worth of Chinese imports. He further threatened that if the two countries fail to reach an agreement, the additional tariff would be raised to 25% at the start of next year. PMDI is found on the list of tariffs.

PUdaily interpretation: The survival of small manufacturers is facing an increasingly big threat due to the environmental inspection and special action on ODS. The distribution market sees declining demand as downstream manufacturers failing to meet the environmental regulations are cracked down. After the 2018 GB is published, the consumption of TDI by the runway sector will further decrease. In contrast, MDI-500 as an alternative material for TDI will be used more extensively. The consumption of this product by plastic runways is expected to increase substantially in 2018. The exports of PMDI for the January-August period rise. The export volumes in July and August are also within the normal range. Thus, so far the trade war has had a limited impact on the exports of PMDI. But whether this will change in the remaining months remains unknown. How big is the impact similar events have on MDI market? What changes have happened to the MDI market? Suntower Consulting will give you the answers in our annual report.

⚠️ Big events in the raw material sector

1. Plans for expansion of MDI capacity and price trend

1) In January, Shanghai Lianheng Isocyanate’s Phase II 240k t/a mother liquor facility and the ancillary Phase II 240k t/a rectifier unit owned by Huntsman were commissioned. currently, the operation is
2) Covestro plans to expand the capacity of its MDI plant in China from 500k tons/year to 600k tons/year through two phases. The project will be built in two phases. The Phase I project aims to expand the capacity from 500k tons/year to 550k tons/year by extending the length of operation time. It is expected to begin production in the fourth quarter of 2018. The Phase II project aims to expand the capacity from 550k tons/year to 600k tons/year by increasing the capacity per unit time. It is expected to begin production in the first quarter of 2021.

3) In March, Wanhua Chemical announced that over the next three years, it would expand its current MDI capacity through technological transformation. Wanhua Ningbo will increase the capacity from 1.2 million tons per year to 1.5 million tons per year, and capacity of facilities in Yantai Wanhua Industrial Park will increase from 600,000 tons/year to 1.1 million tons/year.

4) On October 19, the Fujian Development and Reform Commission issued the Reply on Approving Fujian Connell Polyurethane’s 400k t/a MDI Project, approving the construction of Fujian Connell Polyurethane’s 400k t/a MDI project. The project will be built in two phases. In the first phase, a 400k t/a MDI project will be constructed, with an ancillary 55k t/a formaldehyde plant and 100k t/a hydrogen chloride processing plant (based on 100% Cl2). In the second phase, a 480k t/a nitrobenzene, 360k t/a aniline and 270k t/a nitric acid facility as well as ancillary facilities will be built.

5) Shanghai Huntsman Polyurethane plans to expand the capacity of its 100k t/a MDI prepolymer plant in Shanghai Chemical Industry Park to 200k tons/year through technological improvement, construction of modern ancillary facilities and improvement of solvent additives. With a construction period of 8 months, the project is scheduled to start construction in June 2019 and be completed in January 2020.

6) In October, Covestro announced that it would invest 1.5 billion euros to build a world-class MDI plant in Baytown, the United States. The new 500k t/a production line is expected to begin production in 2024. Meanwhile, the old 90k t/a production line will be closed. Thus, Covestro’s MDI capacity in the United States will amount to 740k tons/year by 2024.

7) The PMDI price has dropped from 26,000 yuan/tons at the start of the year to 12,800 yuan/tons, or
over 50%. Meanwhile, the pure MDI price has declined from 31,000 yuan/ton at the beginning of the year to 22,000 yuan/ton, or about 50%.

**PUdaily interpretation:** From 2019 to 2022, China’s MDI production capacity will increase by 1.3 million tons/year, achieving a CAGR of 10% for the next three years. But it is hard for the growth in demand to reach 10%. Thus, the problem of excess capacity in domestic market will exacerbate, and the market competition will become fiercer. Against this backdrop, exports will play a more important role. How is the performance of the manufacturers in 2018? What is the landscape of trade like? Suntower Consulting will give you the answers in our annual report.

2. Big events in downstream industries

1) According to the government statistics, from January to September, a total of 60.167 million refrigerators were produced in China, falling by 19% year on year. In the first half, exports remained the major driver of growth in the refrigerator industry. The volume of refrigerator exports totalled 15.855 million units, up 17.2% from a year earlier. Meanwhile, 23.157 million units were sold at home, down 7.7%.

2) According to the statistics of China Association of Automobile Manufactures, for the first 9 months, China’s car output and sales total 20.4913 million and 20.4906 million units, up 0.87% and 1.49% year over year, 1.90 and 2.04 percentage points lower than the growth rates for the January-August period. Among them, 17.3507 million passenger cars were produced and 17.2597 million sold, up 0.13% and 0.64% year on year. And 3.1407 million commercial vehicles were produced and 3.2309 million sold, up 5.17% and 6.31% year over year, down significantly from the same period last year.

**PUdaily interpretation:** The output of refrigerators and freezers decreased significantly, the auto production increased slightly, and the cold chain industry experienced more rapid growth. In addition, the growth in synthetic leather resin and sole resin sectors slowed whereas the spandex and TPU sectors grew rapidly. Therefore, the structure of demands from downstream sectors is different from last year’s. Cars, cold chain, spandex, TPU industries will become the main driver of MDI demand. Please refer to our 2018 China's MDI Market Report to learn about the specific consumption by downstream sectors. Next, Suntower Consulting will present you some of the highlights of the report.
Additional highlights for 2018

1. Relevant policies and data on economic growth for 2018 are combined with the interpretation of the MDI market.

2. A more detailed analysis of the imports and exports will be carried out. The share of different trade modes and the export destinations for different manufacturers are new contents.

Chart example

▲ Supply

2018 China Distillation Facility MDI Finished Products Outputs (Unit: kt)

<table>
<thead>
<tr>
<th>Output</th>
<th>Wanhua</th>
<th>BASF(Shanghai)</th>
<th>BASF(Chongqing)</th>
<th>Huntsman</th>
<th>Covestro</th>
<th>Tosoh(NPU)</th>
<th>Total</th>
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▲ Demand Sides

2014-2018 China Polymeric / Pure MDI Consumption

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<tr>
<th>Year</th>
<th>2014</th>
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<th>2016</th>
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## Export data

Export destinations for different manufacturers

<table>
<thead>
<tr>
<th>Export destinations</th>
<th>Wanhua</th>
<th>Covestro</th>
<th>Huntsman</th>
<th>Others</th>
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## Downstream applications

2018 China Polymeric MDI Consumption Data in Various Sectors (Unit: kt)

<table>
<thead>
<tr>
<th>Sectors</th>
<th>2017 Consumption Amount</th>
<th>2018 Consumption Amount</th>
<th>Growth Rate</th>
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<tbody>
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<td>Household Refrigerator</td>
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<tr>
<td>PU Wood</td>
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</tbody>
</table>
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2018 China MDI Yearly Report

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