



# GLOBAL POLYPROPYLENE MARKET OUTLOOK

24 JANUARY 2017

### Global polypropylene market outlook

The global polypropylene (PP) market is the second largest polymer business in the world making up more than 25% of global polymer demand. Global demand growth continues to be led by emerging economies, especially China. Global demand for polypropylene is expected to increase to 120 mln tons by 2030 from 60 mln tons in 2015. However, global PP supply is projected to increase significantly in the coming years, intensifying competition among producers. Unconventional low cost feedstocks are driving new capacity investment in North America (shale gas) and China (coal) and will have significant effects on future global trade and regional competitiveness. Less competitive regions will have to adapt through supply rationalizations or with new product and process innovations.

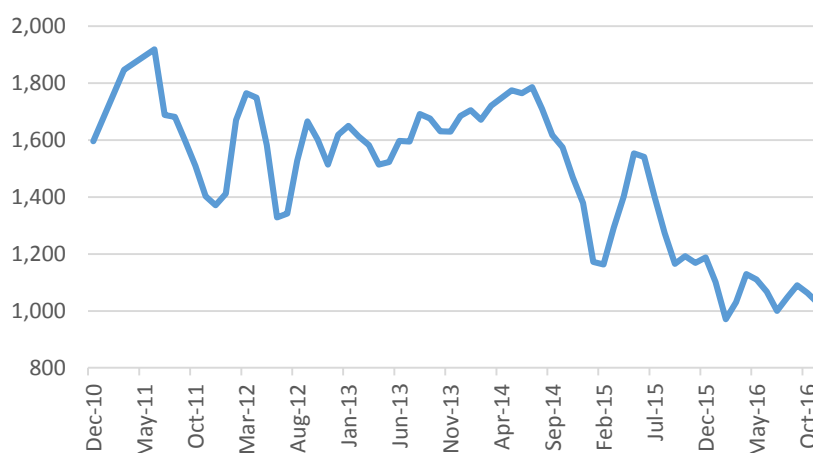
This market is highly dependent on commodity prices, and has a large number of global and regional manufacturers. Competition in this market is considered to be on one of the highest levels among other markets of polymeric materials. To succeed in the global polypropylene market, key market participants are actively investing in the modernization of production assets and R&D. Overall, the market is currently near equilibrium, with capacity utilization of 83% as of early 2015.

The industry currently experiences several significant trends, which will change the global PP market:

- Conventional petrochemical growth slows down.
- Unconventional chemicals experience high growth: coal-to-olefins (CTO), methanol-to-olefins (MTO), coal-to-mono-ethylene glycol (CTMEG), propane dehydrogenation (PDH), etc.
- Major state owned enterprises (SOEs) are losing market shares.
- Private companies expand their market share.
- Foreign investment in the industry decrease as companies invest in domestic production capacities.
- Demand remains mainly in East and South Asia.
- Capacity growth stems mainly from North America and China.

These trends continue to have a significant effect on the global PP market, especially considering the low oil price environment in the recent years. PP prices have declined significantly and amounted to just USD1,028 per ton, as of November 2016.

**Global PP prices, USD per ton (2010-2016)**

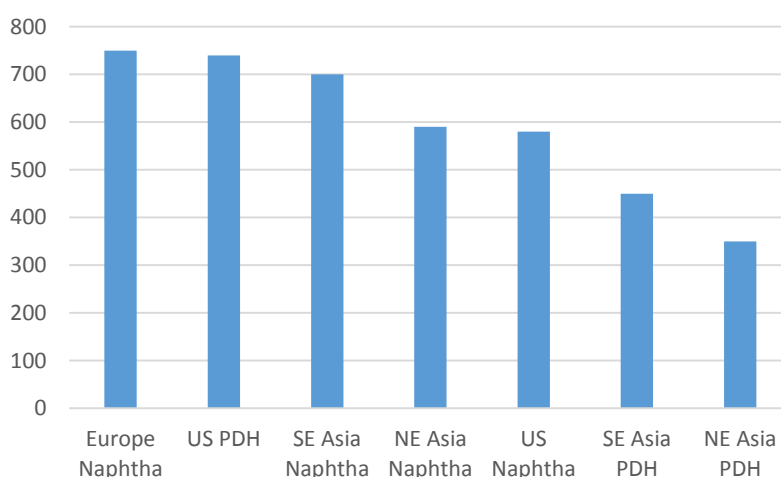


Source: Bloomberg, Samruk Kazyna

To date, the global polypropylene market leaders are such industrial giants as: BASF, Borealis AG, Braskem, Chevron Phillips Chemical Company, DuPont, ExxonMobil, Reliance Industries Limited, Sinopec, LyondellBasell Industries, SABIC, Bayer Material Science, Fulton Pacific, INEOS, Total SA, Washington Penn Plastic Company Inc., PetroChina Company Limited, Qatar Petrochemical Company and Japan Polypropylene Corporation. Taking into account a number of factors, most experts agree that these companies will retain their positions until 2022.

A surge in new polymer production capacity coming from low-cost producers in North America, the Middle East and China is driving the global PP market to oversupply, which will pressure margins for producers and change the global competitive landscape. The surge of shale gas-derived feedstock has enabled North American polypropylene producers to achieve an unprecedented level of cost-competitiveness, since the Middle East has traditionally served as the world's lowest-cost producer for these products.

**Global PP production profit margins in 2016, USD per ton**



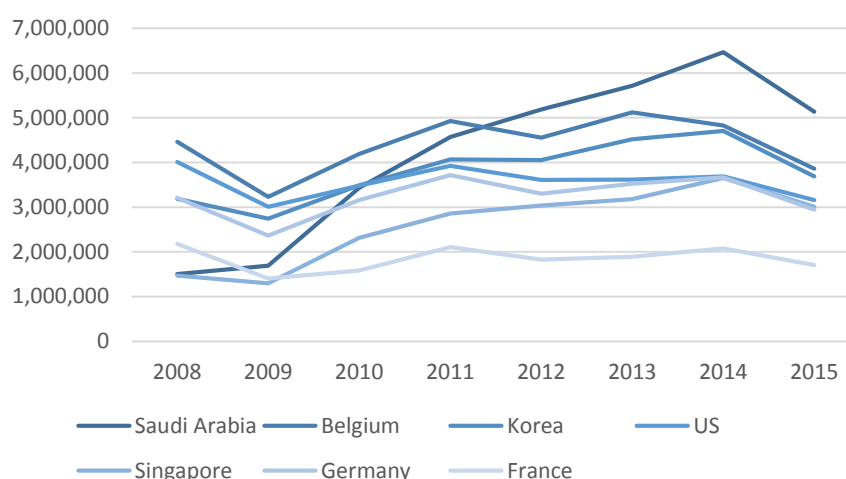
Source: IHS, Samruk Kazyna

Beyond North America, China is also growing its influence as a key, low-cost provider of PE, thanks to its production additions from new CTO technology. China is expected to add approximately 17 MMT of new PE/PP capacity during the next five years, which will drive further market volatility. Chinese government may increase domestic PP capacities even more than needed to satisfy domestic demand to promote employment in downstream manufacturing facilities.

### Supply outlook

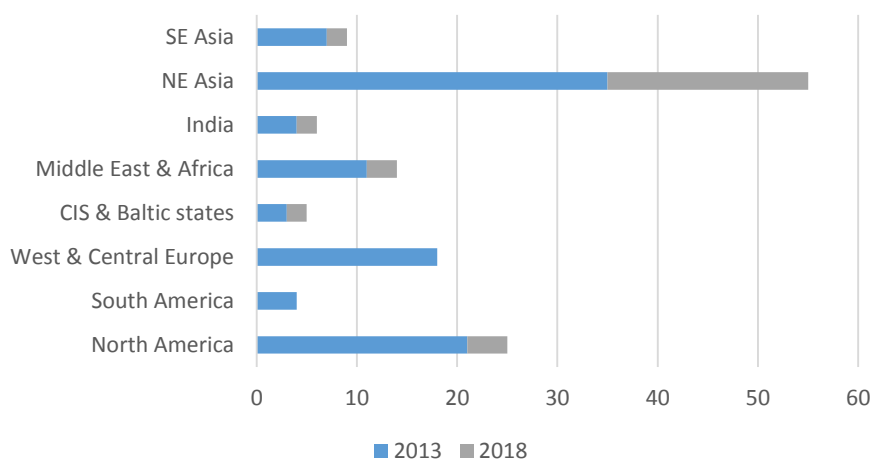
Asia-Pacific region accounts for more than half of the PP production capacity. PP production is expanding fast, especially in China, where major investments in new capacities attempt to improve China's self-sufficiency. According to projections, Chinese propylene production will increase to nearly 40 mln metric tons by 2020 to satisfy internal demand. In 2015, China produced 18 mln tons of PP, 18% more than a year earlier. 2015 and 2016 show the highest level of new PP production capacities, but additions in the medium term are projected to be near the demand growth pace. Largest exporters of PP include Saudi Arabia (12.9% of global exports), Belgium (9.7%), Korea (9.3%) and US (8%).



**Largest exporters of polymers of propylene, incl. PP, USD th. (2008-2015)**


Source: International Trade Center, Samruk Kazyna

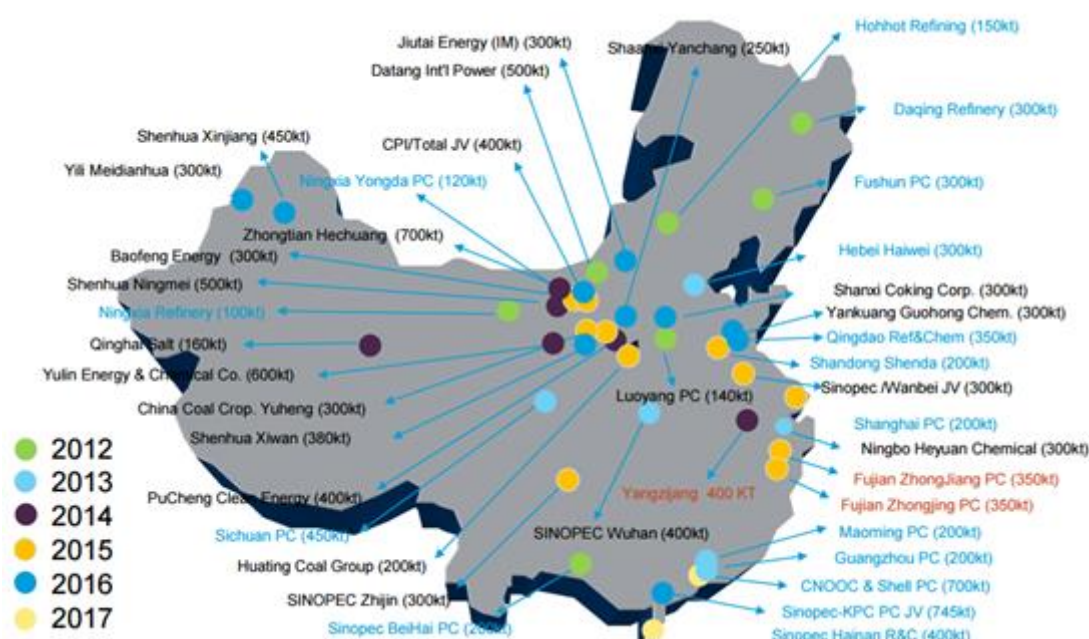
Propylene, which is the main feedstock for PP production, is produced from fossil fuels, crude oil, natural gas, and, with the introduction of new technologies, from coal. China propylene production will increase to nearly 40 million metric tons by 2020. While refinery and steam cracker capacity additions were the main source of supply growth just a few years ago, coal and methanol-based units along with PDH are set to bring ample new supplies over the next years. In fact, the total on-purpose propylene capacity additions in China over the next two years are enough to supply the total propylene demand growth for the world.

**Propylene capacity additions (2013 vs. 2018f)**


Source: IHS, Samruk Kazyna

China has long been the largest importer of propylene and propylene derivatives. By 2020, China's propylene self-sufficiency is forecasted to amount to 80%, as production will increase to nearly 40 mln metric tons, whereas demand will expand to about 45 mln metric tons. Consequently, net imports of propylene equivalents will decline from about 10 mln metric tons in 2010 to 7 mln metric tons. This reduction in imports (primarily for polypropylene) will force the global market to rebalance at a time when other regions will be expanding and seeking to increase export volumes.

## New and existing PP plants in China

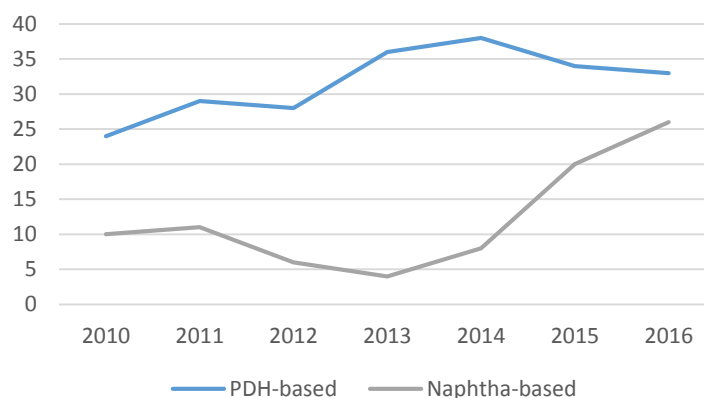


Source: IHS, Samruk Kazyna

Global on-purpose propylene production is expected to grow from 14% to 30% of total supply over the next five years as the wave of new PDH and CTO projects start production. The majority of new on-purpose propylene capacity is being built in China via both CTO and PDH. Two notable coal-to-olefins startups this year include China Coal Mengda New Energy's 300,000 mt/year plant and Shenhua Group's 300,000 mt/year CTO plant in Xinjiang.

In all, alternate sources of propylene will add over 800,000 metric tons of propylene capacity in Southeast Asia. Projects include Petron Corp (2015) in the Philippines, IRPC (2015) in Thailand, Pertamina (2015) in Indonesia, and Nghi Son PC (2017) in Vietnam. The Southeast Asian market historically has suffered from insufficient supplies of propylene. However, with the start-up of the aforementioned projects, the region will become more self-sufficient.

## US PP production profit margins, cents/lb (2010-2016)



Source: IHS, Samruk Kazyna

At the same time, North America could get at least six PP projects in 2017-2018. Companies began considering new PP plants because margins in the region have risen sharply over the past couple of years. In 2016, average US PP margins for naphtha-based production are about 25 cents/lb (USD551 per ton). While margins for PDH production have slipped this year, they have still maintained their edge against naphtha-based production. Consequently, most of the proposed PP plants will be based on PDH process and integrated with on-purpose propylene. Margins have risen in part because the US has not built any new PP plants in years. In fact, production capacities have been decreasing recently, with both Sunoco and Phillips Sumika shutting down plants. In addition, North American propylene production has increased, and this has further increased margins.

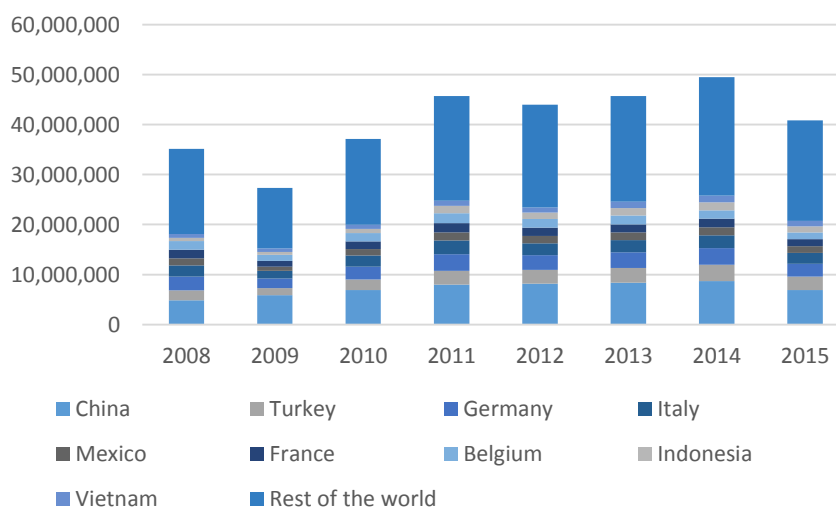
Increased supply of feedstock propylene, as a result of the US shale revolution, as well as the lack of new PP capacities, has encouraged companies to consider new production plants. So far, only one company is moving forward on a project, REXtac is restarting two small PP lines in west Texas. Production could start up in 2017. Braskem is considering a 450,000 tpa PP plant in La Porte, Texas. Investment decision will be made in 2017. Other producers, such as Formosa Plastics, ExxonMobil among others are exploring possibilities to build new PP production capacities.

In all North America might have six new PP plants in the nearest future. It is unlikely that the domestic market could absorb as much supply. As a result, North American producers will likely rely on exports to China and Europe. Much of proposed PP production relies on propylene supplied by PDH units, which gives North American producers a feedstock advantage against producers from other regions. However, some of the PP projects could fall through, since many producers have not made a final investment decision.

### Demand outlook

China remains the largest global importer of propylene and other polymers of propylene with USD6.9bln in imports. However, global demand (global imports of USD40.9bln) is more-or-less evenly distributed, since main usage of PP is for packaging (about 50%). Europe is also a big market for PP with 2.5 mln tons imported in 2015. Europe's economic growth might well remain very low, but its consumption is likely to increase, while capacity additions are unlikely due to competitive disadvantages.

Imports of polymers of propylene, incl. PP, USD th. (2008-2015)



Source: International Trade Center, Samruk Kazyina

PP demand growth in China rose about 5.5% year on year in 2016 and is expected to remain stable in 2017. Meanwhile, PP demand growth in India, seen at about 11% this year, was estimated to grow to about 12% next year. However, Asian PP capacity growth is expected to outpace demand growth by 760,000 mt in 2016. By 2020, the volume of global demand for polypropylene will reach 70.81 million tons, amounting to USD138.36bln. By 2022, the demand will reach 87.35 million tons, or about USD170bln, indicating an average annual growth rate of 5.2%.

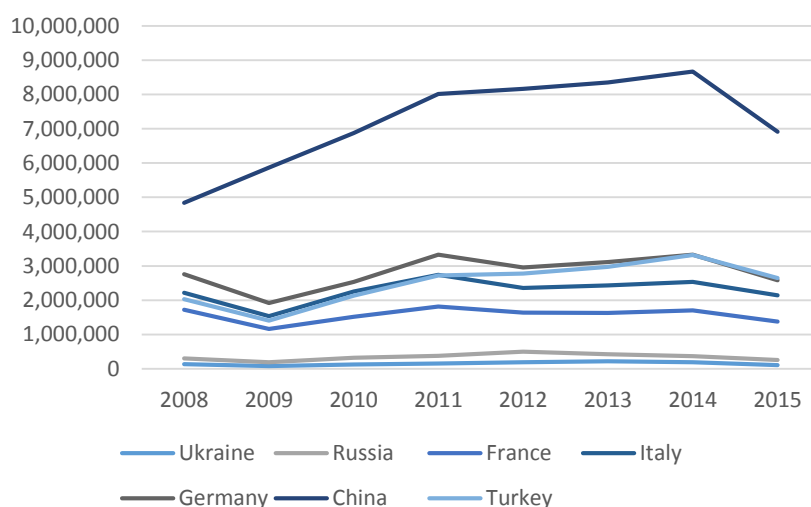
### Kazakh PP market

Currently, there is only one downstream producer of PP in Kazakhstan. In 2009, Neftehim LTD launched the first production of propylene and polypropylene, using liquefied gas supplied by Pavlodar Petrochemical Plant. The total annual capacity of the plant amounted to 20 thousand tons of methyl tertiary butyl ether (MTBE), 35 thousand tons of propylene and 30 thousand tons of polypropylene. In 2013, Neftehim launched the production of polypropylene bags.

Another project that manufactures PP products is LLC Polymer Production, which is the first major manufacturer of plastic packaging (48 million bags a year), polypropylene biaxial-oriented film (14.7 thousand tons) and polyethylene film (4.1 thousand tons). However, this project was implemented faster than the construction of Kazakhstan Petrochemical Industries (KPI) and Kazakhstan LG Polyethylene (KLPE), which were supposed to provide feedstock for the factory. Consequently, Polymer Production is currently using materials imported from Russia, Uzbekistan, Turkmenistan, and South Korea, which negatively affects its production costs.

Kazakhstan's PP exports amounted to only USD23.7mln in 2015; major export flows went to Russia, China, Turkey and Ukraine. All of the selected markets showed a decrease in imports in 2015 compared to 2014, with China showing the largest drop in absolute terms. This is due to the decrease in PP prices in line with a drop in oil prices, as well as China introducing huge production capacities to satisfy local demand. On the other hand, Turkey as one of the major importers of Kazakh PP, having no own material base continues to increase imports (continuous growth up to USD3.3bln in 2014).

**Imports of Kazakhstan's PP by selected countries, USD th. (2008-2015)**



Source: International Trade Center, Samruk Kazyna

Analysis of mutual trade with Russia shows that Kazakhstan remains a net importer of PP, however trade balance is improving with Kazakhstan increasing its own production to substitute imports from Russia. While Kazakh producers have a competitive advantage in terms of feedstock and tax incentives, they still lose to some of their competitors from Russia, which have the same competitive advantages and are exporting to the same markets.

Kazakh producers still have an opportunity to grow. Increasing demand for PP materials from various industries, such as automotive, construction materials and packaging, is going to be the main driver of growth for the polypropylene industry. For Kazakh producers, capturing a part of the growing PP market will require strategic planning, modernization of production capacities, investments in marketing and logistics to overcome regional and global competition.

Heavy competition on the global and internal PP market from China, Russia, Turkmenistan and recently Uzbekistan and Azerbaijan, is one of the major obstacles for the development of this industry. Russia has 12 facilities with a total capacity of 1.7 million tons of polyethylene and 1.8 million tons of polypropylene. In 2015, Russian polypropylene plants jointly produced 1.28 million tons of PP, demonstrating two-digit growth despite the general downturn of industrial production in the country. Russian exports of PP exceeded imports for the first time ever, due to the devaluation of ruble.

### Regional PP market outlook

In the beginning of 2016, Central Asia's petrochemicals capacities included 240,000 tpy of ethylene, 125,000 tpy of polyethylene and 120,000 tpy of polypropylene. These capacities are expected to surge over the next five years as a result of planned developments in Uzbekistan and Kazakhstan. By 2019, Central Asia is expected to have capacities of 1.33 mln tpy of polyethylene, 720,000 tpy of polypropylene and 100,000 tpy of PVC. In addition, Russia is the largest regional producer of PP.

**Largest existing and planned PP production plants**

| Company                | Owner          | Country    | Capacity (kT) | Launch    |
|------------------------|----------------|------------|---------------|-----------|
| <b>Poliom</b>          | Titan Group    | Russia     | 180           | 2005      |
| <b>Borouge</b>         | Borealis       | UAE        | 960           | 2014      |
| <b>Omsk PP</b>         | Sibur, Gazprom | Russia     | 180           | 2013      |
| <b>Tobolsk-Polymer</b> | Sibur          | Russia     | 500           | 2013      |
| <b>Uz-Kor Gas</b>      | Lotte, Samsung | Uzbekistan | 100           | 2015      |
| <b>OGPC</b>            | SOCAR          | Azerbaijan | 180           | 2016/2017 |
| <b>Angarsk PP</b>      | Rosneft        | Russia     | 250           | 2016/2017 |
| <b>ZapSibNeftekhim</b> | Sibur          | Russia     | 500           | 2019+     |
| <b>NZNK</b>            |                | Russia     | 400           | 2019+     |
| <b>FEPCO</b>           | Rosneft        | Russia     | 600           | 2019+     |
| <b>KPI</b>             | UCC            | Kazakhstan | 400           | 2020      |

Source: Industry data, Samruk Kazyna

Production of PP in Russia exceeded 1.251mln tons in 11M16, up 8% compared to the same period of 2015. November PP production in the country increased to 121,100 tons, compared with 113,110 tons in October, with Stavrolen and Tobolsk-Polymer increasing their loading capacities.

Largest producers of PP in Russia include:

- Tobolsk-Polymer (SIBUR) (415,400 tons in 11M16)



- Neftekhimiya (Kapotnya) (119,300 tons in 11M16)
- Poliom (Titan Group) (185,600 tons in 11M16)
- Nizhnekamskneftekhim (198,300 tons in 11M16)
- Stavrolen (LUKOIL) (103,400 tons in 11M16)
- Ufaorgsintez (111,700 tons in 11M16)
- Tomskneftekhim (117,700 tons in 11M16)

There are several other regional competitors, including Turkmenistan, Uzbekistan and Azerbaijan. Plants in Turkmenistan and Uzbekistan have been commissioned and are reaching planned volumes. The Turkmenbashi oil refinery produces a range of products, including unleaded gasoline, petroleum coke, road bitumen and PP among others. The plant can produce as much as 100,000 tons of polypropylene per year. According to the official reports, in 2012 the Turkmenbashi Complex of Oil Refineries increased its exports by eight percent and exported over USD3.2bln worth of products to Russia, China, Iran, Afghanistan, Turkey, Pakistan, Tajikistan and Japan.

Azerbaijan recently announced their own petrochemical project. SOCAR Polymer, the first public-private partnership in Azerbaijan's oil and gas sector, is expected to be fully operational in 2018. Investments are estimated at USD750mln, the project will have polypropylene and high density polyethylene plants. Production capacity will be 120,000 tons of polyethylene and 180,000 tons of polypropylene at the initial stage. The total capacity is expected to reach as much as 570,000 tons by 2021. The polypropylene plant is scheduled to come online in 2017.

Ustyurt Gas Chemical Complex, which is currently considered to be the largest in Central Asia, is comprised of five plants for gas, ethylene, polyethylene and polypropylene production. The complex is expected to process 4.5 billion cubic meters of natural gas, produce up to 4 billion cubic meters of marketable gas, 387,000 tons of polyethylene and up to 100,000 tons polypropylene annually. Its products will be exported to consumers in Eastern Europe, Turkey and the western regions of China. Total cost of the project amounts to USD4bln.

## **Conclusion**

Global and regional PP markets have recently faced several challenges brought by new technologies (PDH and CTO) and low oil prices, which gave a significant advantage to US producers. At the same time, China has become more self-sufficient both in terms of feedstock and PP production capacities. Moreover, regional producers have implemented their own projects with production capacities above their domestic demand.

Low oil price environment allows cheap feedstock for PP producers worldwide, which resulted in a significant decline in polypropylene and other petrochemicals prices. In this view, Kazakh producers will have to face intense competition both domestically and regionally. Capturing a part of the growing PP market will require strategic planning, modernization of production capacities, investments in marketing and logistics. Increasing demand for PP materials from various industries, such as automotive, construction materials and packaging, is going to be the main driver of growth for the polypropylene industry.

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