ASIACHEM：China CTO Industry – New Opportunities for Polyolefin Process & Equipment Suppliers

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According to the data published by the China Customs, China imported over 200Mt of crude oil in 2009. Net import of polyolefin in same period was 11.47Mt, including 7.35Mt of PE and 4.12Mt of PP.

Use coal instead of oil to produce olefins is an important way to realize China's energy strategy, and protect the nation's energy security. Huge demand on olefins, price advantage of coal and tight supply of oil make CTO (coal-to-olefins) projects competitive and attracting.

A series of CTO units of commercial capacity have been built for process demonstration in line with the state industry policy. In addition there are more than 20 such projects are at planning stage or having inauguration ceremony held for part of these projects. As stated by the National Development & Reform Commission, total capacity of CTO projects proposed by investors has aggregated up to 20Mt/a up to the end of 2009.

Booming Chinese CTO industry has brought great business growth for suppliers in the fields of coal gasification, air separation, methanol synthesis and MTO/MTP methanol-to-olefins/propylene etc. Benefited suppliers are not limited in above named industries. Most CTO projects are designed to produce polyolefin as final product; produced ethylene and propylene need purification, polymerization and extrusion/pelletizing steps to obtain the market sellable plastic beads. Thus the process licensors and equipment vendors in polyolefin field will also enjoy the great business opportunities.

Shenhua Baotou coal-based 300kt/a PE and 300kt/a PP projects usedd a gaseous phase polyethylene process from US Univation and UNIPOL gaseous phase fluidized bed polypropylene process from Dow Chemical respectively. The whole project was completed on the date of May 31st 2010 and got ready to start commissioning.

Datang Duolun 460kt/a PP project also use Dow's UNIPOL PP process. By outsourced propylene, the PP unit in the project was started up with success in November 2009 and the whole process is scheduled to start up before end of 2010.

Shenhua Ningxia Coal Croup's 520kt/a PP project is designed to use Novolen gaseous phase PP process licensed from ABB-Lummus. Extrusion/pelletizing line in the project's

PP unit passed trial running test in May 2010. The whole process commissioning is also expected to start within the year.

As predicted by ASIACHEM, China will establish 1.58Mt/a of coal-based polyolefin capacity by the end of 2010, including 300kt/a of PE and 1.28Mt/a of PP, accounting around 7% of the nation's total polyolefin capacity at the time. Over 20 coal based polyolefin projects are currently at the planning stage. Listed in following table are those having started construction and those announced to start construction before 2012 (including polyolefin projects based on outsourced methanol).

Location	Company	Products &Capacities	Status
Manzhouli, Inner Mongolia	Huaneng Hulunbeier Energy Development Co Ltd	600kt/a methanol and 200kt/a MTO	construction underway
Jingbian County, Yulin, Shaanxi	Shaanxi Yanchang Zhongmei Yulin Energy Chemical Co., Ltd	1,800kt/a methanol, 600kt/a MTO, 1,500kt/a heavy residue oil pyrolysis, 600kt/a PE, 600kt/a PP	planned
Yanan, Shaanxi	Yanchang Petroleum Group	1,800kt/a methanol, 600kt/a MTO, 400kt/a Light Oil pyrolysis, 450kt/a PE, 250kt/a PP	planned
Weinan, Shaanxi	Pucheng Clean Energy Chemical Company Ltd	1,800kt/a methanol and 680kt/a MTO	construction underway
NingDong Energy Chemical Base, Ningxia	Shenhua Ningmei Group	1,800 kt/a methanol to 600kt/a olefins	planned
Huainan, Anhui	Anhui Huainan Chemical Group	1,700kt/a methanol, 490kt/a MTP	planned
Puyang, Henan	Sinopec	600kt/a methanol to 200kt/a olefin	construction underway
Hebi, Henan	Sinopec / Henan Coal Chemical Industry Group	1,800kt/a methanol to 600kt/a olefins	planned
Ningbo, Zhejiang	Ningbo Heyuan Chemical	1,800kt/a methanol to 500kt/a MEG, 300kt/a PP	planned

Source: ASIACHEM

For these projects, the project owners are contacting with the potential process and equipment suppliers, some have made decisions. For instance, Univation announced in November 2009 that Yulin Energy Chemical Co Ltd, a subsidiary under Shaanxi Yanchang Oil Group, had selected Univation PE process to construct a 300kt/a PE plant.

Three major projects (Shenhua Baotou, Shenhua Ningmei & Datang) are expected to be on-stream by the end of 2010 will demonstrate technical and economic feasibility of coal-to-polyolefin processes. Ministry of Industry & Information Technology has started a

study on CTO project layout and, after successful process demonstration, shall propose a national CTO capacity planning based upon general consideration of coal and water resources, environmental volume and transportation conditions etc. To discuss CTO projects update and outlook, the **2nd Coal-to-Olefins Conference** will be held in Beijing, November 2010.

In general, Chinese coal based Polyolefin industry will deliver good market opportunities for suppliers in the fields of olefin separation and polyolefin processes/catalysts as well as the extrusion/pelletizing system etc, and will become a principal supplement of petroleum based polyolefin supply on Chinese market, as well as a focused developing direction of coal chemicals and methanol derivatives. Polyolefin process licensors and equipment vendors shall pay close attention to catch up the business opportunities.

ASIACHEMTM – The Coal Chemical Consultancy

Kindly Notice:

The **2nd China Coal to Olefins Conference** will be held in Nov. 2010 in Beijing, China. The upcoming conference will focus on the update of three world scale Coal based Olefins project (Shenhua Baotou, Shenhua Ningmei & Datang Duolun) and the Technology & Economics of methanol to olefins comparing the naphtha crackers.

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