

## EDITOR'S PAGE

### THE DEVELOPMENTS OF CHINESE OIL SHALE ACTIVITIES

In China, there are always new activities regarding the oil shale. The shale oil production increases year by year. In 2011, estimated shale oil production was about 650,000 tonnes, which is equivalent to about 13,000 bbl/d. There are 7 oil shale retorting plants, involving Fushun, Huadian, Wangqing, Beipiao, Longkou, Yaojie and Dongning, located in 5 provinces. Oil shale in Longkou mine has the highest oil content; making about 14%, while Beipiao oil shale has the lowest oil content, which remains below 5%. Fushun retort (or modified Fushun retort) is the most often used for oil shale processing in China.



There are two oil shale retorting plants in Fushun, including 220 retorts with the daily capacity of 100 t of oil shale per each retort. The annual shale oil production in Fushun is about 350,000 t. The total annual amount of oil shale processed is about 10 million t. Oil shale will also be mined from the Fushun East Open Pit mine. According to the Fischer Assay the oil content of the Fushun East Open Pit oil shale is 5.5%. The ATP (Alberta Taciuk Process) unit was imported by Fushun Coal Mining Group and it has been actuated for the cold testing.

In Longkou Coal Mining Group Company there is an oil shale retorting plant. The plant has 40 Fushun retorts in two blocks. The first block (20 retorts) was actuated in 2009. The second block (20 retorts) was put into operation in May, 2011. The total shale oil production is about 120,000 t per year. The plant is located near the sea. So, shale oil is sold as marine fuel oil. Longkou Coal Mining Group Company plans to import Enefit-280 technology from Estonia.

40 Fushun retorts have been built to produce about 50,000 t of shale oil each year by Longteng Energy Company in Wangqing, Jilin province. An oil shale power plant was also constructed in 2009. There are 2 circulating fluidized bed boilers with the vapor generation capacity of 35 t/h (6000 kW of electricity). The oil shale with particle size of less than 10 mm is used for electricity generation.

Yaojie Coal & Electricity Company in Gansu province, cooperating with Sanjiang Coal Chemical Company, has installed 8 oil shale retorts. The plant has been successfully operated since the end of July 2010. This retort is the square-shaped gas combustion retort. The retorting gas, mixed with air, enters

the bottom of the retort and combustion of the gas provides retorting process with heat. The retort has the capacity of 500 tonnes of oil shale per day. Compared with the Fischer Assay the shale oil yield of the retort is above 80%. The advantages of such type of retort are: simple structure, less capital costs, and easy operation.

In Huadian, Jilin province, a power station has been operating for 14 years. There are three circulating fluidized bed boilers (CFB) for oil shale combustion. The vapor generation capacity of each CFB is 65 t/h. In Huadian, there are 3 private companies. 30 Fushun retorts produce 50,000 t of shale oil each year. Hong Sheng Energy Company finished the construction and installation of 12 modified Fushun retorts by the end of July 2010. Each retort has the capacity to process 300 tonnes of oil shale per day. In this retort, there are two sections: upper one is cylindrical (like in Fushun retort) and it is used for oil shale retorting; lower one is a square section used for semi-coke cooling. Retorting gas is indirectly heated in the tubular furnace and recycled into upper section to heat oil shale. Semi-coke is used as the feedstock for the power station. Oil shale ash is used for producing building materials.

In Beipiao, Liaoning province, 60 Fushun retorts, with the daily capacity of 100 t have been operated since August 2011. Another 24 Fushun retorts, with the capacity of 200 t/d, will be put into operation this year. Because of low oil content (approximately 5%), the only suitable technology for Beipiao oil shale is Fushun retort technology. The plant is economically feasible only because of open-cast mining.

In Jimsar County, Xinjiang province, 62 modified Fushun type retorts with the daily capacity of 300 t of oil shale, will be established by Liaoning Chengda Company Ltd. Construction will be finished by the end of this year and retorts will be put into operation.

In Suiyuan, Guangdong province, one circulating fluidized-bed boiler was constructed in 2008 for combusting Maoming oil shale. Vapor generation capacity of this boiler is 65t/h. In Maoming, Guangdong province, Guangdong Electricity Company plans to build a large power station. Daqing Oil Company, which belongs to CNPC (China National Petroleum Corporation), is constructing a commercial plant with the daily capacity of 2000 tonnes of oil shale using solid heat carrier retort technology. In Harbin, Heilongjiang province, China National Coal Corporation has finished pilot tests with fluidized bed retort with the capacity of 50 t of oil shale per day. The Luoyang Petrochemical Engineering Company has undertaken the design work to build a demonstration fluidized retorting unit with the capacity of 2000 t of oil shale per day.

The shale oil production increases every year in China. New retort technologies, for example fluidized bed retorting, are being developed. Advanced retorting technologies will be imported from abroad. There are three aspects that should be improved in the future, including further survey of oil shale, exploration of deposits and estimation of minable reserves.

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