Actuality and Development Ways of Fujian Petrochemical Industry

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1. Actuality and Development Trend of Chinese Petrochemical Industry

Our chemical economic aggregate ranks fourth in the world, and the production of crude oil ranks fifth.

- The production of fertilizer, synthetic ammonia, soda, sulfate, phosphorite, calcium carbide, colourant, synthetic fiber, rubber shoes etc. ranks the first in the world.

- The production of pesticides, sodium hydrate, tyre etc. ranks the second in the world.

- The production of crude oil processing, ethylene, coatings etc. ranks the third in the world.

- The production of synthetic monomers, synthetic rubber, synthetic resin etc. are also leading in the world.
The petrochemical industry at home and abroad depends on oil refining as the leading role and ethylene as the core to develop the industry chain. In 2008, the production of ethylene exceeded 10 million tons in China, and there are significant changes in the regional development pattern. In the 1990s, ethylene was mainly produced in the Northeast and East China, and now Yangtze River Delta, Pearl River Delta develop rapidly. To increase the ethylene production capacity of coastal areas on a large scale is settled.

The petrochemical enterprise of Southeast Coastal Area accounts for 40% of China. And total output value is more than 1 trillion yuan, which accounts for 41% of the national total quantity.
- Baohai Bay Rim
- Yangtze River Delta
- Pearl River Delta
- West-Strait Economic Zone

- The Coastal Areas have formed a pattern, that the Pearl River Delta, Yangtze River Delta, Baohai Bay Rim and West-Strait Economic Zone take the lead in the development. It’s the prosperous economic zone determined by the Central Government.

- Fujian Petrochemical Industry will be the leading industry in the construction of West-Strait Economic Zone.
Domestic famous chemical industry Park:

- Ningbo Chemical Industry Park
- Quangang Petrochemical Industrial Park
- Shanghai (Caojing) Chemical Industrial Park
- Dongyue International Fluorin and Silicon Material Industrial Park
- Beijing Petrochemical and New Materials Industry Base
- Putian Lingang Industrial Park
- Xiamen Haicang Petrochemical Industrial Park
- Humen Chemical Industry Park
- Daya Bay Petrochemical Industrial Park
- Tianjin Economic-Technological Development Area Chemical Industry Park
- Qilu Chemical Industrial Park
- Sichuan Petrochemical Industrial Base
- Chongqing (Changshou) Chemical Industry Park
- Jiangsu Yangtze River International Chemical Industrial Park
- Zhuhai Lingang Industrial area

- There are 15 Chemical Industry Parks in total. The Pearl River Delta, Yangtze River Delta and Baohai Bay Rim have 10 Chemical Industry Parks.

- Fujian have 3 Chemical Industry Parks.
2. Actuality of Fujian Petrochemical Industry

During the 11th Five-Year Plan period, the average growth rate is 18% annually. Ten different industries, including petrochemical industry, synthetic materials, chemical raw materials, chemical fertilizers, chemical pesticides, coating pigments, specialty chemicals, rubber processing, special equipment manufacturing and chemical mining, etc. are taking shape.

There are 849 petrochemical enterprises in 2008, completing the output value of 94.5 billion yuan.
Petrochemical industry has the following characteristics:

1. The economic aggregate of enterprises with investment from foreign, Hong Kong, Macao and Taiwan accounted for over 50% of the whole industry. It’s far higher than the level 12.5% of National Petrochemical Industry. State-owned and state-controlling enterprises accounted for 26.81%, joint-equity enterprises 20.42%.

2. Petroleum processing, synthetic materials, specialty chemicals, rubber processing occupied dominant position. In 2008, total industrial output value of four different industries accounted for 75.71% of the whole industry.

3. In region, the recent development of the petrochemical industry in our province tends to concentrate in Quanzhou, Xiamen, Zhangzhou and other coastal areas.
Foreign Investment

- USA Exxon, Saudi Aramco
  The annual production of 1.2 million tons of refining and chemicals
- Eastman Kodak Films
- Degussa GmbH Silica hydrated
- Linde Group Chemical gas
- Taiwanese investment:
  - Xiamen Xianglu Petrochemicals Co., Ltd PTA
  - Xiamen Tenglong Aromatic Petrochemicals Co., Ltd PET
  - Taiwan Cheng Shin Tire Industry CO., Ltd Tire, cycle tire
  - Singapore Giti Tire Industry CO., Ltd Radial tire
- The Petrochemical Industry Association of Taiwan
  The annual production of 1 million tons of the cracked petroleum.
- Lee Chang Yung Chemical Industry Corporation
  The annual production of 400,000 metric tons polypropylene (PP).
- Garnd Pacific Petrochemical Corporation
  The annual production of 500,000 metric tons of styrene (SM).
- Donglian Chemical Corporation
  Ethylene oxide/Ethanolene glycol (EO/EG)
- Dalian Chemical Corporation
  The annual production of 350,000 metric tons of vinyl acetate (VAM)
- Nantex Chemical Industry CO., Ltd
  The annual production of 30,000 metric tons of rubber.
The Central Enterprise Investment

- Sinopec
  The annual production of 24 million tons of petroleum in Fujian Refining Base.

- CNOOC
  The annual production of 2.6 million tons of LNG

- CNPC
  The annual production of 5 million tons of storage and LNG.

- Sinochem
  The annual production of 12 million tons of refining and chemicals

- ChemChina
  The annual production of 1 million tons of CPP
Petroleum and chemical industrial enterprises in our province, leading in the world, are as follows:

<table>
<thead>
<tr>
<th>Company</th>
<th>Product</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fujian Refining&amp; Petrochemical Co., Ltd</td>
<td>Polythene, polypropylene (单个企业最大)</td>
</tr>
<tr>
<td>Shaowu Fertilizer Plant</td>
<td>Oxalic acid (No.1)</td>
</tr>
<tr>
<td>Nanping Jialiang chemical Co., Ltd</td>
<td>Sodium silicate (No.2), Silica hydrated (No.1)</td>
</tr>
<tr>
<td>Shaowu Fluorine Chemical Plant</td>
<td>Hydrofluoric acid (No.2)</td>
</tr>
<tr>
<td>Fujian Yatong Plastics Co., Ltd</td>
<td>Plastics pipe (No.2)</td>
</tr>
<tr>
<td>Xianglu Polyester Textile Fibers (Xiamen) Co., Ltd</td>
<td>Polyester fiber (No.2)</td>
</tr>
<tr>
<td>Xianglu Petrochemicals (Xiamen) Co., Ltd</td>
<td>PTA (No.2)</td>
</tr>
<tr>
<td>Company</td>
<td>Product Description</td>
</tr>
<tr>
<td>--------------------------------------------------</td>
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</tr>
<tr>
<td>Fujian Giti Tire Industry Co., Ltd</td>
<td>Radial tire (No.3)</td>
</tr>
<tr>
<td>Pucheng Zhengda Biochemistry Co., Ltd</td>
<td>Feedgrade aureomycin (No.3)</td>
</tr>
<tr>
<td>Xiameng Cheng Shin Tire Industry Co., Ltd</td>
<td>Outer tire (No.5)</td>
</tr>
<tr>
<td>Outer cycle tire (No.4)</td>
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2.1 Development Objectives

During the 11th Five-Year Plan and Three-Year Revitalization period, the key petrochemical construction project in Fujian will invest 70 billion to develop Meizhou Bay petrochemical base and Gulei petrochemical base and advance polyolefin and polyester textile fiber products for the domestic production base. The two industry clusters will be formed. And the output value will be more than 50 billion. Meanwhile, they can participate in international and domestic industrial division to achieve the output value to reach 180 billion yuan. We will Cultivate five petrochemical industry clusters which output value will reach about 5 billion.
- Quangang Petrochemical Industrial Park — Developed from 12 million tons oil refining to 24 million tons and 2 million tons of ethylene refining base.

- Quanhui Petrochemical Industrial Park — The industrial park will be built, which the annual production of 2 million tons of refining and chemical products.

- Putian Xianyou Fengting — Professional Industrial Park of Plastic Modification and Processing.

- Xiuyu: The LNG Receiving Station of the annual production of 2.6 million tons LNG.

- Fuqing Jiangyin Petrochemical Industrial Park — The annual production of 1 million tons of CPP, 300000 tons of ethylene, 250000 tons of propylene. The products such as chemical materials, sodium hydrate, calcined soda and TDI, etc. are all mainly developed.

- Gulei Petrochemical Base — The annual production of 800000 tons of PX, 1.5 million tons of PTA.
福建省湄洲湾石化基地发展规划（2006-2020）
——规划区域图

图例
- 规划期内用地面积：X.XXkm²
- 规划发展备选用地面积：X.XXkm²

石油和化学工业规划院 福建省城乡规划设计研究院 2007.03
The total layout area of Meizhou Bay Petrochemical Base 79.7 km²
Quangang Petrochemical Industrial Park 24.5 km²
Quanhui Petrochemical Industrial Park 32 km²
Putian Dongwu Petrochemical Industrial Park 23 km²
This includes:
Dongpu 8 km²
Dongqiao 12 km²
Xianyou Fengting 3.2 km²
The total layout area of Gulei Petrochemical Base 13.3 km²
The Promoter area 3.3 km²
2.2 The Main Development Layout

(1) To develop the strategic chemical industry clusters near the sea

The petrochemical industry clusters of Meizhou Bay and Gulei are mainly developed.

Meizhou Bay petrochemical base developed with refining-chemical integration as the leading role, timely enlarging the scale of refining-chemical integration and ethylene. The main industrial layout include the industry chains with oil refining, heavy oil processing, ethylene, arene series, polyolefin series such as polyethylene, polypropylene, styrene series of ethylene as material, ethylene glycol series, acetic acid series, phenol / acetone series of propylene as material, butanol and octanol series, epoxy propane series, four-carbon series, arene series, salt chemical industry series, etc. and port, storage facilities.

Zhangzhou Guolei petrochemical industry base will focus on the development of arene and synthetic fibre.
Planning Layout

Fuzhou Jiangyin chemical industrial park adjust the planning layout in Fuzhou by exceptional natural port advantage. The new chemical materials are developed by strategic move, driving the development of warehousing, petroleum, chemical industry, soda ash and caustic soda, plastics and other related industries.

Zhangzhou Gulei chemical industry park use naphtha to prepare arene in the beginning, mainly developing refining-chemical industry and marine chemical industry.

Ningde Xinan Port has exceptional natural port and regional advantages to planning crude oil reserves. To use imported gas condensate as raw materials is developing the mixed aromatics processing of Sanduao Xinan Port. It form the chemical industry that characterized by port processing and warehouse logistics.
(2) Cultivating five petrochemical industry clusters of output value will reach about 5 billion.

Five petrochemical industry clusters

- Nanping Fine Chemical Clusters
- Inorganic Salt Products Clusters
- Chlor-alkali Industry Clusters
- The clusters of polyolefin downstream products processing of Quanzhou petrochemical
- Rubber Tire Clusters
(3) **Insist on innovating, developing conventional industries harmonically**

**Synthetic Materials**

The main point is that it promote the complement of existing industry chains and the construction of arene.

**Basic Chemical Materials**

The main point is continue to promote technological innovation and expand the development of series inorganic products. Especially, the technical content and brand construction of product will be improved. Organic chemicals actively will be developed with petrochemical as the leading role and the existing coal-chemical industry as the base.
**Speciality Chemicals**

The main point is that to develop silica hydrated, oxalic acid, fluorine chemicals, AC foaming agent, etc. actively with the market as the orientation. Introduced advanced technology and improved processes and equipment level develop for specialization and fineness. The fluorine chemicals, oxalic acid and other products downstream fine chemicals will be enlarging development, establishing and fostering 2 to 3 industry clusters.

**Rubber**

The main point is to develop the raw material of synthetic rubber actively. To introduce foreign capital will construct synthetic rubber project, and increasing raw material self-sufficiency rate. Various rubber and plastics will be developed, especially specialty rubber such as silicone rubber, etc.
4. With refining-chemical integration as the leading role, to promote the development of plastics, textiles and extend industrial chains.

- The increasing production by New devices put into production in 2009.

There are annual production of 800,000 tons of polyethylene, 400,000 tons of polypropylene. And now there are 120,000 tons of polystyrene, 120,000 tons of polyvinyl chloride.

The industry chains extend from upstream products of ethylene, propylene, mid-stream products of polyethylene, polyvinyl chloride, polypropylene, polystyrene to the downstream products of membrane, building materials, packaging materials, etc.
The increasing production by New projects put into production

There are annual production of 700,000 tons of para-xylene (PX), then Zhangzhou Gulei will build newly 800,000 tons of PX annually. The annual production of PX will reach 1.5 million tons, purified terephthalic acid (PTA) will reach 2.1 million tons.

Shishi Jialong will build newly 600000 tons of PTA.
Plastic processing and chemical fiber are the competitive industries in our province

In 2005, the production of plastic is 860,000 tons.

In 2010, the production of plastic will reach 1.8 million tons.

In 2005, the production of chemical fiber is 1.2 million tons.

In 2010, the production of chemical fiber will reach 2 million tons.
Plastic

The modification of polyolefin products is required to strengthen R&D to make general plastics engineering, engineering plastics high-performance and low cost, as the primary direction of modified plastics for future. Focus will be placed on the development of new kind of functional plastic master batch and special materials. Developing functional plastic products and high-performance plastic products actively will enhance the industry skills and form industrial chains.

The projects can be extended and docked

- Polyethylene series products
- Polypropylene series products
- Polyvinyl chloride (PVC) series products
- Polystyrene series products
Fibertex

The petrochemical industrial clusters set up industrial chains with PX, PTA, PET, terylene and synthetic fibre. To provide raw materials for the textile and garment industry.
It’s necessary to strengthen and speed up the development of polyolefin products of special materials to raise the proportion of special materials. The special rubber and plastic developed from downstream products, and study on the modification of plastic such as PP, PU, PVC, ABS, PA, etc. Then, it extend the product chains and the level of deep processing.

The deep processing of fluoride salt
The development of new varieties of fluorine fine chemicals

Development and application of high-grade, specialty silica hydrated, oxalic acid and the downstream products of chlorate.
☆ Fine chemicals and specialty chemicals in new field
New chemical materials, automotive chemicals, construction chemicals, function materials used in electronics and information, speciality chemicals and function materials.

☆ Developed energy saving, environmental protection, processing and products of new energy. The focus is clean production processes of chemical industry, functional coatings (such as high-performance water-based coatings, powder coatings, radiation curing coatings, organic silicon, organic fluorine modified acrylic coatings, fluorocarbon coatings, etc.), bio-chemical energy.

☆ A new generation of coal-chemical technology and extension products of methanol series will develop, and it will enhance the R & D of olefin synthesized with methanol as materials.
The Application of novel catalyst and all kinds of membrane materials.

The technology of DCC, CPP, MTO, which have been domestic developed and industrialized experimented, are actively tracked.
Thank you