

# *Analysis on Qianwei Tar Plant of National Government Resources Committee (1940-1946)*

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**Abstract:** After the all-out Sino-Japanese War broke out in 1937, based on the national strength comparison between China and Japan at that time, at the beginning of the war, the National Government retreated steadily, and decided to move to the west in order to plan the overall situation and adhere to the War of Resistance Against Japan, and then a large number of factories poured into the “secondary capital” Chongqing and Sichuan, including Leshan and Qianwei areas in the Minjiang River basin, which have become one of the important bases for inward relocation of factories. In order to alleviate the problem of producing fuel and power in Sichuan rear area in wartime, the National Government, relying on the abundant hydropower and coal resources of Minjiang River, prepared to establish the Qianwei Tar Plant, one of the most important chemical energy industries in the rear area. This paper takes Qianwei Tar Plant as the research object, and discusses from the aspects of organization setup, personnel composition, business situation and contribution limitation, in order to help the related research.

## 1. Introduction

The National People's Government Resources Committee was founded in November 1932, formerly known as the National Defense Design Committee. It mainly focused on domestic resource investigation and national defense design. Since 1936, it started to establish and develop national defense heavy industries, especially "focusing on the National defense area in Central China"<sup>[1]</sup>. In October 1937, after the government moved its capital to Chongqing, it focused on the industrial construction, electric power, heavy metals and other metals in rear area, which were in urgent need of industry during the war. Especially after 1940, international transportation became more and more difficult, domestic production became more important, and the construction of oil, mining, steel and other factories became more active. In order to solve the problem of increasingly scarce fuel power problem, in 1940, the National Government sent a group of experts mainly returned from the United States to Qianwei County for investigation. Through field survey and investigation, it was found that the quality of coal mines near Qianwei was mostly bituminous coal, which was quite suitable for the preparation of liquid fuel. In addition, the Minjiang River was rich in water. On this basis, “proposed plant plan”<sup>[2]</sup>.

In May 1940, the Resources Committee formally prepared for the establishment of Qianwei Tar Plant, which was set up in Xiba, Qianwei, with a capital of 8.5 million yuan. It planned to distill coal tar and substitute gasoline and other by-products by low-temperature distillation of nearby bituminous coal. In March 1941, the main plant and distillation equipment were basically completed. In April 1941, partial shipment was started. In June, the main products were “coal gas, coal paste, semi-coke, etc. Raw materials for fertilizers. The coal paste can be gasoline, kerosene, diesel oil, asphalt, higher alcohols, etc.”<sup>[3]</sup> Most of the products are chemical raw materials, which provide fuel for automobiles and aviation at that time and provide kinetic energy for the production of rear military enterprises. On October 1, 1941, Wong Wen-Hao, then chairman of the Resources Committee, discussed with Feng Xianfan, an employee of Qianwei Tar Plant, “The plant produces 1000 gallons of high-grade gasoline, 2,000 gallons of diesel oil, 1,000 gallons of lamp oil and 300 tons of coke each month. In addition, there are 15 tons of asphalt and sanitary water and tap water.”<sup>[4]</sup> By the beginning of 1943, the preliminary plan of “processing 50 metric tons of bituminous coal per day” has been completed. The Plant had produced as many as 13 kinds of products, which was the first of its kind in the coking and refining industry in China. It can be seen from the above that from the survey in 1940 to the formal commencement in 1941, Qianwei Tar Plant has begun to take shape through the concerted efforts of all staff.

To sum up, the Qianwei Tar Plant came into being under the background of the relocation of the state capital to the west, the departure of shipping, the rise of industrial production in the rear area and the eagerness of power energy. It is one of the most important chemical energy industries in Sichuan in modern China.

## **2. Organization and Personnel Composition of Qianwei Tar Plant**

With the expansion of the production scale, the personnel stipulated in the original articles of association became insufficient. “The Resources Commission, issued the General Rules of Organization for the Amendment of Subsidiary Organs on September 23, 1941, and proposed to amend the articles of association of the affiliated plant according to the needs of the facts.”<sup>[5]</sup> According to the provisions of the revised Articles of Association in July 1943, “the establishment organization has one Plant director and one chief engineer, all of whom are assigned by the Resource Committee; there are four sections of General Affairs Department, Business Department, Accounting Department and Public Works Department, each of which has one director, each of which is divided into a stock office according to the work needs, with one head of each section; one secretary, 1-2 commissioners, 2-4 engineers, 4-6 deputy engineers, one researcher and 2-4 associate researchers; 8-12 assistant engineers, 12-16 section staff, several engineering clerks, clerks and engineering affairs students, and employees and interns as necessary; Medical staff should be established according to the facts. “According to the charter, the Plant director, chief engineer and the fourth section chief constitute the leadership of the tar plant.”

It can be seen from the table1 that most of the leaders of the tar plant have received higher education, among which the plant director and the deputy plant director are all talents returned from studying in the United States and have obtained the master's degree in chemical engineering from top foreign universities. Although he has not gone abroad to study abroad, he has graduated from such domestic first-class universities as Sun Yat-Sen University and Tsinghua University. The overall academic qualifications of the whole leadership are relatively high, and they all have the experience of serving in national departments or teaching in national universities. In addition to the leadership, most of the engineers, associate engineers and assistant

engineers in the tar plant graduated from the chemical engineering departments of national universities such as Wuhan University and Hunan University. It should be noted that during the construction and development of the tar plant, the student interns from all schools were widely absorbed, and the interns became one of the important personnel of the plant.

Table 1: Overview resume of key staff of Qianwei Tar Plant

Level of Position	Name	Resume	Education background
Plant Director	Huang Renjie	Sichuan Qianwei Tar Plant Director, Yunnan Alcohol Plant Director	Master of Chemistry from California Institute of Technology and Massachusetts Institute of Technology
Acting Plant Director	Ziqing Chen	Chief Engineer of Industrial Test of Guangdong Provincial Construction Department	National Tsinghua University, Studying abroad in Department of Chemical Engineering of Massachusetts Institute of Technology
Engineer	Yuan Yanji	Engineer of Sichuan Qianwei Tar Plant and Chief Engineer of Taiwan Sugar Industry Company	Department of Chemical Engineering, Sun Yat-sen University
Chief of Business Section	Pan Zaisheng	Staff of Guangxi Bureau of Statistics	National Tsinghua University
Chief of Accounting Section	Xiao Mingzhu	Director of Accounting Office of Shijingshan Iron and Steel Plant of North China Iron and Steel Company	
Chief of Works Section	Mengxiong Fu	Resource Committee Specialist, Deputy Engineer of Department of Posts in India	Department of Electrical Engineering, Nankai University

Table 2: Apprentices of Qianwei Tar Plant

Name	Education background	Native place	Age
Lei Tianwei	Hunan Provincial Advanced Industrial School	Hunan Yiyang	27
□Xuan	Department of Chemistry, National Central University	Jiangsu Wujin	23
□Mo	Graduated from Zhaoqing High School, Guangdong Province	Guangdong Gaoyao	26
Luo Dazhi	Hubei Provincial Union Secondary School, Bannong Branch	Hubei Songzi	20
Zhu Zhonggan	Department of Accounting Statistics, National Business School	Hunan Changsha	26
Gong Lange	Henan Provincial Zhen County Industrial Vocational School Senior Department Chemical Engineering Department	Henan Tanghe	27
Li Chengxun	Pharmaceutical Science of National Shanghai Medical College	Shangdong Tengxian	32
Chen Rongti	Department of Chemistry, National Sichuan University	Sichuan Dianjiang	22

According to the Table2, under the background of large-scale migration of domestic

universities to the west at that time, it provided a bonus for the cooperation between universities and enterprises at that time. “Our chemical engineering case and every summer to introduce advanced class students to industrial institutions internship to improve the technical efficiency and research interest.” The tar plant has established cooperative relations with a number of schools such as Jinling University, National Sichuan University, Zhenhua Middle School, etc. so that interested college students can come to the tar Plant for internship. During the construction and development of the tar plant, a group of apprentices with different school levels and widely distributed specialties have been absorbed. After completing the internship period, a group of interns can become the formal employees of Qianwei Tar Plant by virtue of the excellent assessment sheet and the internship report and enjoy the treatment of the formal employees. Interns are an important part of the personnel composition in the tar plant, which not only relieves the shortage of human resources, but also cultivates a large number of oil refinery workers.

To sum up, the personnel of Qianwei Tar Plant have received different degrees of education, including engineers who have returned from abroad and graduated from China's first-class chemical universities, as well as teachers and interns working at the grass-roots level. Although they are not graduated from top schools, they have also received professional education at all levels or high school graduates. Different levels of talent together constitute Qianwei Tar Plant.

### 3. Manufacturing Products and Purchase Requisition with Bulk Users

The main products of Qianwei Tar Plant were liquid fuels such as gasoline, diesel oil and kerosene produced by low-temperature coking of bituminous coal, to provide motive materials for production of rear factories and automobiles and aviation appliances. In addition, coking produces byproducts such as semi-coke, gas and coal paste, among which semi-coke (coal-to-gas) can be used as industrial fuel, but also for civil use due to economic and health conditions. "Because of its economic and health conditions, urban residents of Western countries are happier to use this fuel. <sup>[6]</sup> Apart from semi-coke, the most important by-product is asphalt (asphalt), which can produce more than 300 metric tons of asphalt every year. It can be used as carbon electrode of dry battery, insulating material in storage battery, paving road, etc. and is the best anti-corrosion and anti-rust coating.

Table 3: List of units signing purchase contract for Qianwei Tar Plant

Name of Plant	Purchase Matters
Military Administration Department of Chengdu Aviation Committee	Purchased 10,000 gallons of premium gasoline in 1941
General Office of the Military Commission	Purchased asphalt 23 kg in June 1942
Sixth Operations Office of the Aviation Commission Leshan Agency	Purchased 650 gallon of gasoline in 1943
Yuxin Iron and Steel Works	Purchased 6 metric tons of asphalt in December 1943
The 30th Plant of the Department of Arms Industry	Purchased 3 metric tons of asphalt in 1943

After the Qianwei Tar Plant was officially shipped in 1942, it began to provide a steady supply of fuel for military and civilian production in the rear area. At that time, the Ministry of Economy of the National People's Government stipulated that the gasoline and diesel produced by Qianwei Tar Plant were not allowed to be sold and sold freely by the plant according to the special sales method. Therefore, the requisition for purchase by the government became one of

the most important ways of fuel sales at that time.

In addition to the above units, the tar factory also signed the purchase request contract with Minjiang Power Plant, Ordnance Industry Department 21 Factory, Neijiang Liquor Factory, Yibin Central electric porcelain Factory, Ziliujing Power Plant, and other military enterprises. According to the table3, it can be seen from the form and the company that signed the requisition contract that the Tar Plant signed was mostly the factories closely related to the defense industry. By providing fuel and asphalt, the normal operation of the wartime defense industry is effectively guaranteed. At the same time, Qianwei Tar Plant also adhered to the principle of giving priority to the importance of the War of Resistance against Japanese Aggression in the selection of contracts. In 1943, the China Industrial Gas Refining Company "failed to supply tar raw materials as scheduled, and there was a fear of shutdown within a month, which affected national defense and people's livelihood."<sup>[7]</sup> The tar Plant managed to supply 10 metric tons of tar to China's industrial refinery. The by-products produced by the tar plant other than fuel can be directly sold by the plant to the private or various factories. In order to expand the sales channel of their own products, Qianwei Tar Plant published an advertisement in the central daily newspaper in May 1942.<sup>[8]</sup> From the advertisement, it can be seen that Qianwei Tar Plant provides a large amount of tar, kerosene, Laishaer and other chemical raw materials. The registered address is Qianwei Tar Plant Chongqing Office. The negotiation location is at No. 206, Linsen Road, Chongqing. At that time, Linsen Road was the central street of Chongqing. It can be seen from this. Qianwei Tar Plant was very concerned with the business of the "Capital" area with the most developed industry and people's livelihood.

In conclusion, the Qianwei Tar Plant produced 2,000 gallons of liquid fuel per month from the official shipment in July 1941 to the addition of new equipment in October 1942. During the five-year production period until it was accepted by the Minjiang Power Plant in 1946, it provided a large number of chemical and transportation raw materials for the production of the defense industry enterprises in the Southwest rear area. At the same time, it provided power raw materials for people's livelihood industry in Qianle area to support the victory of the War of Resistance, making a great contribution.

#### 4. Specific Historical Contributions

Qianwei Tar Plant was a chemical plant set up under the background of a large number of industries moving to Sichuan from the occupied area. Especially after the Pacific war, the sea transportation condition became more difficult, so the military and civil production in the rear of China was in urgent need of fuel. During its existence, Qianwei Tar Plant produced industrial products that made great contributions to the anti-Japanese war cause and social development in the rear, mainly reflected in several aspects.

First, it promoted the economic and social development of Qianwei-Leshan area. Before the Anti-Japanese War, the industrial foundation of Qianwei-Leshan area was mainly sugaring, medical material processing, salt making and small coal mining. After the relocation of the state capital, Qianwei County "is an industrial area with the increase of population, and it is an industrial area".<sup>[9]</sup>

According to the table4, in addition to the traditional sugar and salt production, Qianwei County's villages and towns have many factories, such as power, coal, lead, aluminum, glass, textile, matches and other industries have specialized factories. Among them, Minjiang Power Plant and Yongli Company, which are the most important in scale and influence, have signed purchase requisition contracts with Qianwei Tar Plant to obtain fuel, tar and other raw materials from the tar plant for normal production. By 1944, Qianwei-Leshan area has established a

variety of emerging wartime industries such as coking, salting, alkali making, coal, textile, cement and wood distillation. The establishment of Qianwei Tar Plant directly promoted the industrial development of Qianwei-Leshan area, and then the industrial development promoted the development of economy, population and society.

Second, it has promoted the progress of China's low-temperature coking industry. Coal tar industry rose rapidly after World War I. Low-temperature coking began in the United States. In 1920, low-temperature coal of 400-500 °C in Illinois replaced high temperature of 900 °C to produce semi-coke, which marked that the low-temperature coking was successful. China's low-temperature coking industry began with the establishment of the mining laboratory in 1933 to study the method of low-temperature coking and oil extraction. In 1936, the low-temperature coking experiment report of Huainan Coal Mine “England Cocoa Coking Company was entrusted for the experiment. It can be seen that the theory was mature at this time, but there was no production capacity. In 1941, Qianwei Tar Plant officially produced 600 °C low-temperature coking products. From theoretical practice to successful production, it was still the first in Sichuan and even in China. By 1942, Qianwei Tar Plant produced more than 13 kinds of products with excellent quality. Compared with imported products, it was superior. It is worth mentioning that in 1944, the Resources Committee hosted the Industrial and Mineral Products Exhibition. Qianwei Tar Plant was selected as an exhibition unit of the chemical industry. The low-temperature dry distillation coal produced by the Company was listed in the Chemical Industry Pavilion. It was noted that there was a leader in domestic technology.

At the same time, Qianwei Tar Plant has reserved a large number of talents for the low-temperature coking industry of New China and Taiwan. Wu Zilu and Zhang Guoshi, who were engineers of Qianwei Tar Plant at that time, became chemical experts of New China. Yuan Yanji and Fu Mengxiong also became chemical talents after Kuomintang retreated to Taiwan in 1949, making their own contributions to the development of Taiwan’s chemical industry.

Table 4: Table of Factories in Qianwei County, 1944

Name	Exclusive business	Location
Minjiang Power Plant	Electric power	Laolong Plain
Wynn	Chemistry	Laolong Plain
Jiayang Company	Coal mine	Bajiaogou
South Sichuan Aluminum Mine Company	Aluminum ore	Qingshuixi
Yuji Matches Plant	Match	Qingshuixi
Glass Plant	Glass	Shibanxi

## 5. Conclusion

In 1946, Qianwei Tar Plant, under the unified arrangement of the Resources Committee, handed over all the fixed assets, creditor's rights and debts, such as land, houses and appliances, to Minjiang Power Plant, ending its six-year career and supporting and witnessing the victory of the Anti-Japanese War. The Qianwei Tar Plant made many achievements in six years from its official establishment in 1940 to its acceptance in 1946. From the perspective of technique, Qianwei Tar Plant was a breakthrough from theoretical achievement to practical achievement in domestic low-temperature coking at that time. It was a pioneering initiative, which made full use of sufficient and cheap coal resources in China. Such comprehensive utilization of coal was technologically advanced in China at that time. From the perspective of production itself, the liquid fuels and by-products produced from coal-coke oil refining are of little help to the

prosperity of Qianle regional economy, national defense resources and people's livelihood resources.

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