

LOCATIONAL ASPECTS OF THE CHEMICAL INDUSTRY IN LITHUANIA: 1960-1970

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The rapid development of the chemical industry in Lithuania between 1960 and 1970 made important changes in the industrial geography of the country. Prior to 1960, the chemical industry consisted of several small and primitive factories making rubber goods, paint, and household chemicals. Only 0.7 per cent (1,773) of the total industrial labor force was employed in the chemical industry.¹ By 1970, the chemical industry employed 4.3 per cent (18,000) of the total labor force and accounted for 7.5 per cent of the value of the total fixed industrial assets of the republic.²

The chemical industry, for all practical purposes, was created during the decade of the sixties. The two largest cities of the republic, Vilnius and Kaunas, became centers for the production of plastic products, artificial fiber, and household chemicals. Dramatic changes took place in the periphery regions of the republic. Small rural towns received the bulk of the new investments made in the chemical industry. Jonava and Kėdainiai were developed as centers of the chemical fertilizer industry. The small town of Plungė became a major producer of synthetic polymeric material used in the manufacture of consumer goods. Mažeikiai was selected as a site for a major oil refinery.

With the completion of the first stage of the oil refinery at Mažeikiai during the current Ninth Five—Year Plan, the period of rapid expansion of the chemical industry, characterized by the construction of large new chemical plants, will come to an end. The Lithuanian republic will possess a well-rounded chemical industry, satisfying local needs, as well as the needs of neighboring regions, for fuel, oil, chemical fertilizers, artificial fiber and other chemical production.

Locations! Factors Involved in the Development of the Chemical Industry

The development of a chemical industry in Lithuania, from the standpoint of Soviet industrial location theory, reflects the principle of specialization and integrated development of the economies of the Union republics and economic regions. The concept of economic specialization has a dual significance. From an ideological framework, it provides the rationale explaining the participation of a Union republic or economic region in the territorial division of labor; on a more operational level, it emphasizes the necessity to develop the most favorable conditions and resources within a given area. A corollary to the idea of regional economic specialization is the concept of integrated regional development. This concept provides for the development of non-specialized industries within individual Union republics and economic regions in order to create a degree of regional self-sufficiency.³

Within the framework of the Soviet industrial location theory, it is obvious that, the chemical industry could not have been developed as a specialized sector of the economy of Lithuania as has been the case with the machine tool and metal fabricating industry.⁴ Lack of raw materials, a poorly developed energy and fuel base, and an uneven regional distribution of water resources placed serious location constraints on the further expansion of the industry.⁵ Nevertheless, the principle of integrated economic development, justified theoretically, if not economically, the location of certain types of chemical production within the republic.

Since the chemical industry in Lithuania is diversified, the location considerations of each component part of the industry should be examined.

1. Oil Refining and Petrochemicals. The decision to locate a major oil refinery in Lithuania precipitated a major controversy regarding the rationality of its original site — the town of Jurbarkas on the Nemunas River. On March 22, 1966, a memorandum signed by twenty-one leading scientists, economists and writers, critical of the Jurbarkas site, was submitted to A. Sniečkus, the Secretary of the Central Committee of the Lithuanian Communist Party, and M. Šumauskas, the Chairman of the Council of Ministers of the Lithuanian SSR. The main argument against the construction of an oil refinery at Jurbarkas was that it would: (1) pollute the shallow waters of the Baltic Coast — an area which had become an important resort zone stretching from Latvia to Poland, and (2) cause severe damage to the fishing industry in the Nemunas River Delta and the Courish Bay.⁶

The furor caused by the decision to construct an oil refinery at Jurbarkas caused the local Party leadership to ask the central planning organs in Moscow to reconsider the Jurbarkas site. The request of the Lithuanian leadership, based on economic and environmental arguments, resulted in the relocation of the oil refinery site. Mažeikiai, a small town in the northwestern part of the country, was selected as the site of the oil refinery in 1970.⁷ By the end of the current Ninth Five-Year Plan (1975), it is expected that the first stage of the Mažeikiai Oil Refinery will be in operation.

The design of the Mažeikiai Oil Refinery is geared toward the production of mazut, a heavy fuel oil, using high - sulfur crude oil from the Povolzh'ye Economic Region. Small quantities of diesel oil, 98 octane gasoline, and liquefied petroleum gas will also be produced. At a future date, with the addition of hydro-cracking facilities, it will be possible to increase the production of gasoline and diesel oil.⁸

The location of a major oil refinery in Lithuania has been motivated by the fact that the country is deficient in energy resources.⁹ The only local fossil fuel resource having an industrial significance is peat. In 1958, for example, 60 per cent of all the electrical power generated in the republic was produced in peat-fueled power stations.¹⁰

The extension of a natural gas pipeline into Lithuania in 1961, making available natural gas from the Da-shava fields in the Ukraine, did not have a major impact on the fuel balance of the republic. The power stations of the country in 1970 were still dependent on long haul coal and mazut, which accounted for 53.6 per cent of the fuel balance of the republic.¹¹ In fact, with the decrease of natural gas reserves at Dashava, it has become mandatory to connect the Baltic Region with the natural gas deposits in the Komi ASSR and Tyumen Oblast. Until this is accomplished, it is planned to limit the use of natural gas as a fuel and give priority to its use as a gaseous feedstock for the chemical industry.¹²

With the decrease in the importance of natural gas in the fuel balance of the republic, mazut will become the most important fuel used to generate electrical power. Since the viscid state of mazut rules out the use of pipelines, transportation of the fuel is limited to rail tank cars. This form of transportation not only is expensive, but it also puts a severe strain on the rail network — especially in the winter.¹³ In 1969, for example, 8.6 million tons of mazut were brought into the republic by tank cars.¹⁴ It is estimated that in 1975, the Lithuanian Regional Electrical Power Station at Elektrėnai, by itself, will use 3 million tons of mazut. Transportation of such quantity of fuel will involve the use of approximately 43,000 tank cars.¹⁵

The decision to locate a major oil refinery at Mažeikiai, specializing in the production of mazut, can be viewed as an attempt to abolish an antiquated and expensive system of supplying fuel oil to the republic.

2. Artificial Fiber. The production of artificial fiber in Lithuania is limited to the Kaunas Artificial Fiber Factory (Kauno Spalio 50-mečio Dirbtinio Pluošto Gamykla), which specializes in the manufacture of triacetate and diacetate yarn.¹⁶ The factory, which is the first and largest enterprise of this kind in the Soviet Union, began operations in 1965.¹⁷ In 1970, it produced 13,700 tons of artificial fiber.¹⁸ Approximately 70 per cent of the output is shipped outside the republic, the remainder is utilized by the local textile industry.¹⁹

The basic raw material used in the production of acetate fiber is acetylcellulose — a complex acetic cellulose ester. It is produced by the reaction of acetic anhydride on purified cotton fluff or refined wood cellulose. Since acetylcellulose is fully transportable, it can be 'produced at distant sites. At the present time, acetylcellulose is shipped to Kaunas from Valdimir and Yerevan.²⁰

From a cost - minimizing point of view, the location of an acetate fiber plant in Lithuania is far from optimal. A. Petronis, an economist associated with the Lithuanian State Plan Commission, points out that on basis of production costs, the most suitable location for an acetate yarn plant would be in the North Caucasus or the Povolzh'ye regions of the Soviet Union. Nevertheless, a number of factors above and beyond the immediate production costs play an important role in determining the location of an artificial fiber plant in Lithuania. The Kaunas Artificial Fiber Factory, for example, by having direct production ties with nearby textile factories, insures a reliable flow of raw materials to the textile plants within the republic — an important consideration in a system where work stoppage due to deficiencies in the supply and distribution network are common.²¹

On basis of purely economic indicators, the location of an artificial fiber factory in Lithuania is not ideal; from the standpoint of integrated economic development, its location in the republic is rational.

3. Chemical Fertilizers. The location of major chemical fertilizer production facilities in Lithuania is dictated by the fact that a large proportion (61 per cent) of the total agricultural area of the country is composed of turfy podzol, turfy gley podzol, and turfy gleyed podzol soils.²² These soils, characterized by high acidity and low natural productivity, require the use of substantial amounts of chemical fertilizers.

Most of the chemical fertilizers used in the republic come from the Kėdainiai Chemical Combine, which produces superphosphate fertilizers, and the Jonava Nitrogenous Fertilizer Factory. The production of superphosphate and nitrogenous fertilizer is market-oriented,— i.e., raw materials can be assembled more cheaply at the place of consumption than in the area of raw material production. The rapid growth of the natural gas industry in the Soviet Union, together with the expansion of its distribution network, has made it possible to locate nitrogen fertilizer plants in agricultural regions such as Lithuania, where the demand for chemical fertilizer is great.²³ The Kėdainiai Chemical Combine, which began operation in 1963, specializes in the production of superphosphate fertilizers. The two basic raw materials are sulfur from Rodzol in western Ukraine, and apatite from the Kola Peninsula.²⁴ After completion of all the stages, the Kėdainiai Chemical Combine will produce 500,000 tons of superphosphate (of which 220,000 will be double superphosphate), 97,000 of ammophos, and about 75,000 of blended fertilizers. The total production, in terms of standard units, will amount to 776,000 tons of phosphate fertilizers.²⁵

In 1965, the Jonava Nitrogenous Fertilizer Factory began operations. Nitrogenous fertilizers are produced on basis of a synthetic ammonia process which combines nitrogen from the air with hydrogen from the natural gas piped from Dashava. At the present time, the factory has two major stages. The first stage, constructed in 1965, produces ammonia water. The second, completed in 1972, produces granulated nitrogenous fertilizer — urea and ammonium nitrate. Plans are being made to construct a third stage which would specialize in the production of nitrophoska (a blended granulated fertilizer containing nitrogen, phosphorus pentoxide, and potassium oxide).²⁶

4. Plastics, Resins and Polymeric Material. An important branch of the chemical industry in the republic is the manufacture of plastic products, as well as the production of synthetic urea resins and fabric-reinforced polymeric soft "leather" goods. The highly developed machinery, electrical equipment, and precision instrument industry has created a large local market for plastic products. Synthetic urea is used as a joinery compound in the production of wood-chip board, plywood and furniture. Soft polymeric "leather" material is utilized in the manufacture of a wide range of consumer goods, ranging from gloves to interior appointments in automobiles.

Although the manufacture of plastic products takes place in 33 factories and shops, the bulk of the production is concentrated in the Vilnius Plastic Products Factory and the Vilnius Experimental Polymer Material Factory. The remaining factories and shops are small, poorly equipped, and inefficient producers of plastic goods.²⁷

The Vilnius Plastic Products Factory specializes in the production of polyethylene pipes and wraps. In 1970, the plant produced 3,200 tons of plastic pipe which accounted for 21 per cent of the total production of this kind in the Soviet Union.²⁸ Other plastic products produced in the plant are geared toward the needs of local industry — especially plastic details fabricated for the Alytus Refrigerator Factory, the Šiauliai Television Factory, and the Vilnius Electronic Computing Machinery Factory.²⁹ The basic raw material utilized by the plant is polyethylene, produced by the Polotsk Oil Refinery in Belyorussia, and polystyrene from the Volga - Vyatka and Povolzh'ye regions.³⁰

The second leading plastic fabricating plant is the Vilnius Experimental Polymer Material Factory. In 1965, the plant began the first production in the Soviet Union of linoleum and tiles from polyvinyl chloride (PVC).³¹ In 1969, the plant produced 938,000 square meters of this product.³²

The fabrication of plastics in Lithuania, which takes place in plants and shops under the jurisdiction of four ministries, is hampered by poor organization. There is no single authority which coordinates the production of plastic products. Specialized enterprises, like the Vilnius Plastic Products Factory, refuse to accept small lot orders from plants within the republic, thereby encouraging the proliferation of small primitive shops. Other enterprises are forced to place orders in Moscow, Riga and Tallinn for plastic details which could be produced within Lithuania.³³

Since the chemical industry in Lithuania is not a specialized sector of the economy, the existence of a highly specialized plant like the Vilnius Plastic Products Factory is questionable. At the present time, the great distance between raw material source regions and the plastic fabricating plants within the republic precludes any additional growth of the industry. Only after the construction of the second stage of the Mažeikiai Oil Refinery will the necessary hydrocarbon feedstocks be available for a major expansion of the plastic fabricating industry within the republic.

The newest addition to the chemical industry in Lithuania is the Plungė Polymeric Material Factory. The factory, which began operations in 1970, specializes in the production of soft "artificial" leather. This synthetic material is manufactured from polyvinyl chloride and is reinforced with a fabric backing. Approximately 600 workers are employed in the plant which annually produces 20 million square meters of polymeric materials.

The bulk of its production is exported to Leningrad, Moscow, Riazan and other cities.³⁴

Conclusions

Notwithstanding its rapid growth, the chemical industry in Lithuania is and will remain an ancillary branch of the economy, overshadowed by the machine tool construction and metal fabricating industries. The present development of the chemical industry in a location which is deficient in fuel resources and distant from raw material sources is theoretically justified by the concept of integrated economic development of economic regions and Union republics. This concept explains the location of the Mažeikiai Oil Refinery and the chemical fertilizer plants at Kėdainiai and Jonava — the output of these enterprises is market-orientated (the bulk is or will be consumed within the republic). The location of artificial fiber polymeric material, and polyethylene pipe production within the republic is open to question. First of all, plants engaged in this type of production are located at a considerable distance from the sources of raw materials and markets. Secondly, while these enterprises are specialized, the chemical industry, as a whole, has only ancillary functions within the total economy of the republic.

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- 2 Lithuanian SSR, Tsentral'noe Statisticheskoe Upravlenie, *Pro-myshlennost' Litovskoy SSR: Statistichesky Sbornik (The Industry of Lithuanian SSR: A Statistical Compilation)*, (Vilnius: Izdatel'stvo „Mintis“, 1973), pp. 38-39.
- 3 For a detailed account of the application of the Soviet industrial location theory, see Augustine Idzelis, "Industrialization of the Lithuanian SSR: A Case Study in Soviet Industrial Location Theory" (unpublished Master's theses, Dept. of Geography, Kent State University, 1971).
- 4 For a comprehensive account of the location characteristics of the machine tool and metal fabricating industry in Lithuania, see P. Kulvietis, *Mašinų gamybos vystymas ir ekonomika (The Development and the Economics of Machine Building)* (Vilnius: Leidykla „Mintis“, 1969).
- 5 The negative locational factors are stressed by a number of Soviet Lithuanian specialists. A frank statement regarding the poor prospects for the development of the chemical industry is made by A. Skupeika, and economists and location analyst. A. Skupeika, "Lietuvos chemijos pramonė ir jos vystymo perspektyvos" (The Lithuanian Chemical Industry and its Developmental Perspectives), in Lietuvos TSR Mokslų Akademija, Geografijos Skyrius, *Geografinis Metraštis*, XI (1971), pp. 98-99. See also A. Jablonskis, *Tarybų Lietuvos ekonomika ir jos ryšiai (The Economy of Soviet Lithuania and its Links)* (Vilnius: Leidykla „Mintis“, 1968), pp. 77.
- 6 "Protest Against Soviet Industrialization Ills in Lithuania", *The Baltic Review*, No. 33 (January, 1967), pp. 23-31.
- 7 "Naftos perdūrimo gamykla — Mažeikiuose" (Oil Refinery — at Mažeikiai), *Tiesa*, May 23, 1970.
- 8 A. Petronis, "Mažeikiu milžinas" (The Mažeikiai Giant), *Mokslas ir Technika*, No. 4 (1971), p. 13.
- 9 A number of Lithuanian economists have made this assertion. For a representative statement see A. Drobnyš, "Tarybų Lietuvos ekonomikos perspektyva" (The Economic Perspective of Soviet Lithuania), *Liaudies Ūkis*, No. 4 (1970), p. 106.
- 10 P. Stanikas, "Tarybų Lietuvos durpių pramonės išvystymas" (The Development of the Peat Industry in Soviet Lithuania), *Lietuvos TSR Mokslų Akademijos Darbai*, SERIJA A, No. 2 (1959), pp. 3-4.
- 11 G. Chorosevskis, "Struktūriniai pakitimai kuro balanse" (Structural Changes in the Fuel Balance), *Liaudies Ūkis*, No. 3 (1972), p. 70.
- 12 *Ibid.*
- 13 A. Stumbras, "Lietuvos energetikos ateitis" (The Future of the Lithuanian Power Industry), *Mokslas ir Technika*, No. 12 (1971), p. 10. See also G. Chorosevskis, *Liaudies Ūkis*, No. 3 (1972), p. 71.
- 14 A. Petronis, *Mokslas ir Technika*, No. 4 (1971), p. 6.
- 15 A. Stumbras, *Mokslas ir Technika*, No. 12 (1971), p. 10.
- 16 *Kauno Spalio 50-mečio Dirbtinio Pluošto Gamykla*, (Kaunas: Eksperimentinis Meninio Konstravimo Biuras, 1971), pp. 8-10.
- 17 *Ibid.*
- 18 *Promyshlennost' Litovskoy SSR: Statistichesky Sbornik*, 127p.
- 19 A. Ramanauskas and A. Skupeika, "Chemijos pramonės vystymo kryptis" (The Direction of the Development of the Chemical Industry), *Liaudies Ūkis*, No. 9 (1966), p. 258.
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- 21 A. Petronis, "Didžiosios chemijos ateitis" (The Future of Heavy Chemistry), *Liaudies Ūkis*, No. 9 (1967), p. 262.
- 22 Lietuvos TSR Mokslų Akademijos Ekonomikos Institutas, *Lietuvos TSR žemės kadastras (The Land Cadaster of the Lithuanian SSR)* (Vilnius: Leidykla „Mintis“, 1970), p. 21.
- 23 Leslie Dienes, *Locational Factors and Locational Developments in the Soviet Chemical Industry*, Department of Geography Research Paper No. 119 (Chicago: The University of Chicago Press, 1969), pp. 128-129.
- 24 A. Ramanauskas and A. Skupeika, *Liaudies Ūkis*, No. 9 (1966) p. 258.
- 25 *Ibid.*
- 26 *Ibid.* See also Jonas Kriaučūnas, "Kaip tobulinta trąšų gamyba" (How Production of Fertilizers can be improved), *Mokslas ir Technika*, No. 10 (1972), p. 28.
- 27 R. Minalga, "Kai devyni amatai..." (When There are Nine Trades...), *Mokslas ir Technika*, No. 11 (1971), p. 28.
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