Opportunities for the development of the automotive industry in Bulgaria in the second half of the XX century in terms of collaboration with the West and close cooperation with the East

Boyan Asparuhov
University of library studies and information technology, Sofia, Bulgaria[1]

b.asparuhov@unibit.bg

Abstract: *In the mid-1960s, the construction of production facilities for automobile manufacturing began in our country. After multi-million capital investments, a modern base for the production of cars and trucks, and buses, as well as assemblies and aggregates for them, is being created in our country. Licenses and technical documentation acquired by leading Western companies guarantee high quality of Bulgarian production and mark a huge growth in the export of production for the automotive industry. The cooperation opens up perspectives for the complete absorption of the samples produced in our country and cooperation in the industry with countries that are members of the COMECON. The possibility of using foreign experience and gradually preparing the necessary personnel leads to hitherto unknown concentration and specialization in the industry and to extremely high labor productivity.*

Keywords*: HISTORY, AUTOMOBILE, LICENSE, INDUSTRY, COOPERATION*

1. Introduction

The Bulgarian automobile industry is developing in attempts to organize both a complete assembly of cars and on the way of gradually mastering the production of basic units for cars and trucks and buses. The conclusion of licensing agreements with world-famous Western companies, from which the Bulgarian engineering industry receives their samples, technical documentation, technology and organization of production, has a huge influence on this development. The separation of the automotive industry in Bulgaria is carried out under the conditions of international specialization of production within the framework of COMECON. For products that are in demand on the Eastern European market, the Bulgarian auto industry cooperates in productions that are key to the general industrial growth of our country and the Eastern Bloc. The successful sale of cars under license ranks us among the technically developed societies that equip their own vehicle fleet for the needs of production, trade and consumption and participate in the international market with quality machine-building products.

2. Solutions

On March 3, 1967 in Turin, between Balkancar and Fiat, a general cooperation agreement was signed for the assembly and partial production of four models of passenger cars in Bulgaria [1] The Italian giant supplies a complete assembly line to Plant 14 in Lovech, prepares a development project and provides technical assistance for the start of production. Balkankar has been handed over the complete technical documentation for mastering the production, a project for the organization of a service base and the right to replace Fiat parts and assemblies with its own production. Cooperation with Fiat opens up broad prospects for the Bulgarian automotive industry. First of all, this is the opportunity to expand the agreement in principle already reached with USSR on cooperation in the field of automobile construction. Bulgarian mechanical engineering has agreed to produce in mass quantities several parts and assemblies for incorporation into the production of the then still under construction automobile plant in the city of Toliati. In return for their value, Balkankar agreed to receive after 1970 series of Soviet cars type Fiat 124 for installation in Bulgaria. FIAT does not object to the cooperation model with USSR [1] The assembly workshop in Balkan-Lovech began assembling four FIAT models in 1967. and until 1971 managed to produce a total of 758 cars under the name Pirin. After 1971, the license agreement was not renewed, but the trade relations between Italy and Bulgaria in the automotive industry were not interrupted. Bulgaria successfully exports electric trucks and forklifts through the mixed Bulgarian-Italian company Sibikar [2] After the 9th session of the mixed Bulgarian-Italian commission for economic, industrial and technical cooperation, held in 1976, a general long-term agreement was concluded with FIAT for the joint production and trade of wheeled tractors, trailed agricultural machines, auto components and spare parts, motorcycles and electric trucks. Ways of cooperation are also being sought with the Pirelli concern for the reconstruction and modernization of our enterprises in the field of the rubber industry.[2]

The contract with FIAT from 1967 is part of a model of development in engineering production during those years, which includes obtaining a license and technology from a Western company and gradually mastering the production of the product until the moment when we can meet our needs with our own forces and means.The desire for one's own development in this case does not contradict the decision to use Western technologies, it is even encouraged, as it enables our economy to keep pace with the general technological development. And this is not the only case in which Bulgaria cooperates with the Western countries in the conditions of close cooperation with the Eastern ones.

Another example of a license acquired by a western company and the successful implementation of production in our country is the case of the "Energy" battery plant in Targovishte. After they found that there was no production of armored traction batteries in the entire Eastern Europe, on August 2, 1965 the Council of Ministers decides to build a factory. [3] Technoimport concludes a contract with Varta. According to the contract, the West German company prepares a project of the plant, submits the technological documentation and supplies the equipment for production. The value of the complete equipment and the license amounts to 21.4 million Deutsche marks. In the general account, additional costs are foreseen for the construction of an industrial-technical school at the plant, a preventive clinic for the restoration of workers' health and for housing construction in the area. The production program of the plant for 1970. amounts to 1,000,000 batteries. The enterprise in Targovishte operates until today.

The start of production of individual parts, aggregates or the organization of a complete set of cars in our country begins because of objective needs. In 1970 The Minister of Mechanical Engineering, Mariy Ivanov, reported to the Politburo that the demand for passenger cars throughout Eastern Europe was constantly increasing.[4] From the presented statistics, it is clear that in the GDR and Czechoslovakia there is one car for every 32 people, in our country one car satisfies the needs of 70 people and according to this indicator Bulgaria is in one of the last places in Europe.In Austria and Finland there are 135-140 cars per 1000 people. By 1980 it is expected that there will be 200 cars per 1000 people.

Satisfying our needs for cars requires that in 1980 there should be 100 cars per 1000 people. This would cost between BGN 650 and 700 million per year if we rely only on imports, an amount that could hardly be covered by exporting our industrial products. On the other hand, organizing in our country the production of cars in an optimal series, according to Minister Ivanov, would lead to an unknown concentration and specialization in mechanical engineering.[4]

Experience in developed countries shows that the automotive industry is highly efficient and labor productivity is extremely high. This industry is a powerful stimulus for the development of almost all branches of industry-mining, metallurgical, chemical, electrotechnical, instrument making, etc. In 1970 Bulgaria has already developed industrial capacities for the production of automobile tires, rims, glass, artificial leather, batteries, sheet metal, paint coatings, radio industry, etc., the effective use of which requires the development of automobile manufacturing. According to American standards, the minimum profitable series for complete production of cars is about 300,000 units per year. By 1970 The USSR is building a factory for 660,000 units. annually in the city of Toliati.The Moscow plant for the production of the Moskvich 412 is being reconstructed and expanded to an annual production of 200,000 units. The plant in Izhevsk is being built for 150,000 units. Annually. The West German company BMW produces 100,000 units. cars per year. Audi – 70,000, Skoda – 130,000, with a total capacity of 150,000. [4] In the conditions of close cooperation and cooperation with other socialist countries, both passenger cars - VAZ 2101 or Moskvich 412 - are being produced in our country. In Lovech, introduced in the Balkans, an assembly plant for passenger cars with a capacity of 15,000 units is in operation. annually, together with the FIAT, from 1966, the Moskvich 408 was assembled, and until 1972, the Moskvich 412. From 1973 to 1976, it is planned to assemble Moskvich 412 and VAZ 2101 in parallel on the assembly line in Lovech, and for this purpose a new assembly plant is being designed for us in the USSR with a capacity of 60,000 units. per year, the construction of which began in 1971. The assembly of Moskvich continued until 1990. and for the entire period a little over 300,000 cars were assembled in our country. [4]

In 1970 a long-term agreement was signed with the USSR and the production of components - generator, starter, ignition coil, relay-regulator, 3 types of wires, battery, air and oil filter for the new Soviet car VAZ began in our country.[5] In the same year, all the components were mastered and put into regular production and the agreed quantities were shipped.

The production of diesel engines under an English license has been successfully implemented in our country. In 1967 the Minister of Mechanical Engineering, Mariy Ivanov, reported to the Chairman of the Council of Ministers, Todor Zhivkov, a license contract for diesel engines with the English company Perkins. [6] It is said that this will increase the efficiency of production and export of forklifts, tractors, road construction machinery, trucks, stationary plants, etc. In his report, the minister reveals that a consultation was made with the Soviet Institute of Engines and Automobiles - NAMI, which recommends the English company as the best. The minister also has the assurance of import organizations to buy machines with our diesel engines.[6]With the conclusion of the contract, opportunities are created for the production of high-speed diesel engines with a power of up to 120 hp. in the Vasil Kolarov factory, Varna, where in 1967 construction of a new production site begins for 5 different types of engines with a capacity of 40,000 units. Annually. Bulgaria receives the right and the necessary structural and technological documentation for the production of assemblies, aggregates and details such as pistons, piston rings, bearings, etc., and the fuel equipment for the engines is delivered to our country during the entire five-year term of the contract for 500,000 British pounds .

Prior to the approval of the contract, an analysis was made looking at the benefits for us under several options. The first is to continue our production of "D" family diesel engines from 20 to 60 hp, which is expensive and does not cover the range of all our needs. It is estimated that the cost of one engine of this type amounts to BGN 1,400.

The second option is the development of a new in-house engine design with a power of 30 to 120 hp, the cost of which is BGN 1,300 for 1 unit, but the development, assimilation and implementation in production would take at least 72 months, which slows down the Bulgarian production and deprives our economy of exports.

In the third option-purchase of a license-the cost price of one manufactured engine is the lowest-BGN 1,150. In addition, with the purchased parts and units for engines, an opportunity is provided to reach the required quality more quickly and the gradual assimilation of the product. [6]

The technical and economic indicators of Perkins diesel engines are among the best in the world in the 40-120 hp range. power. Perkins four-cylinder engines outperform those of MAN, Deutz, Guldner, Daimler Benz and others. companies, as well as the best representatives produced in socialist countries. The YaMZ automobile diesel engines produced in the USSR are unsuitable for Bulgarian needs in terms of their technical and dimensional parameters. Tractor diesels of the SMD type are unsuitable for forklift and automotive work, as are the needs of the Bulgarian automotive industry. Automotive diesels are not produced in Poland. The low-volume Robur produced in the GDR do not make it possible to cover our needs above 50 hp, and the Schwonebeck engines are not suitable for driving cars and forklifts. In the 1960s, work began in the GDR on the creation of a new family of universal purpose diesel engines - automotive, tractor and stationary - using a license purchased from the MAN, GFR. These engines exceed our requirements for forklift production, the weakest being 100 hp. Moreover, their production was expected to be mastered only in 1976. Of the diesel engines manufactured in the Czech Republic, those of Zetor are of interest, which are installed only in tractors and do not fully satisfy our needs. Diesel engines for Cepel heavy-duty vehicles and buses are produced in Hungary. [6]

By contracting with Perkins, we get the opportunity to master world-class construction. The start of production has been given, which places Bulgaria among the countries with an automobile industry. For the casting of the engine casing and other cast iron parts, necessary for the production of diesel engines, in 1967 construction of a foundry began at the tractor plant in Karlovo using USSR technology and equipment.[6]

The production grew and after a few years construction began on an iron foundry in Vratsa with a capacity of 30,000 tons per year, which was completed on 30.05.1979. For the first time in the country, a foundry is being built in 2.5-3 years.[7]

Veslets Cast Iron Works, Vratsa, subsequently completely took over the production of heads and blocks for 3, 4 and 6 cylinder diesel engines under the Perkins license.

In 1967, it was decided that the assemblies and details for diesel engines would be produced in a factory in Razgrad, which was designed in the USSR and started operating in 1968. The technology and equipment of the plant were supplied by the USSR and other socialist countries, and the constructive documentation for their design was provided by the English company Perkins. The production of diesel engines is promising. The license with the English company implies that the engines are built into forklifts, trucks and cars, tractors, road construction machines, power units, pumps, etc.

At the end of the 1970s, opportunities were again sought in our country to conclude new licenses limiting the quality of transport engineering only from Western companies - with the English company Perkins for the development of a new range of engines and a new fuel process, with the American Borgwerner for hydrodynamic transmitters, for stamped welding beams for trucks with UTS, Italy, for seats, pistons and armored batteries with manufacturers from Germany, for car radiators with French Chausson, etc. [8]

At the end of 1980 The Council of Ministers decides to build capacities for the production of diesel engines in the range of 240-360 hp. complete with gearboxes and clutches.[9] In the course of

the study, talks were held with representatives of partner countries in the COMECON and in 15 capitalist countries. It follows the already tried and successful formula - buying a license and industrial cooperation with a leading Western company, considering the possibility of buying the license together with another socialist country in the case of long-term cooperation and specialization in the production of engines, units and aggregates for them.

The State Committee for Science and Technical Progress suggests considering a third option – the possibility of using a self-developed engine. In 1980-1981 we have developed our own 220 hp engine design, which has given positive results in tests.The structural and technological development is based on the previously mastered Perkins license engine and is essentially its further development.This approach is in line with the positive global experience of consistent development and improvement of acquired licenses. There is a project for the production of the Mashproekt engine created in our country, which proves that this option is the most economically advantageous for the country. [9]

The successful implementation of the production of diesel engines in our country continued its development in 1985. For 18 years, since the purchase of the license, we have mastered the production of 4 types of engines in 16 modifications along with the main details. [10] In 1984 36,000 units were produced. the engine, and it is planned that in the future the production will be tripled to 100,000 pcs. Given these intentions, the Minister of Mechanical Engineering, O. Doinov, proposes that the Base for Implementation and Development of Diesel Engines grow into a Research and Design Institute for Diesel Engines as a division of Balkankar. The development of the automobile industry follows two main paths: a) through the accelerated creation of complete automobile factories for the complete production of cars and trucks and buses; and b) by gradually mastering the production of individual units and aggregates in close cooperation and cooperation with other countries.[4] The second approach, called "progressive assembly", is preferred, which enables the native industry to use the foreign experience of Western companies and gradually prepare the necessary personnel for close specialization and cooperation with other socialist countries. The most necessary for our needs are low-tonnage (less than 2 t) cars, the solution for which was found in modifications of already produced light cars, and heavy-duty vehicles, over 8-12 tons. The series and profitability of this production began to increase, as the main units - rear and front axle, gearbox, steering, etc. are used both in the production of heavy goods vehicles and in the production of buses, heavy forklifts and road construction machinery. (ibid.)

To meet the needs of transporting goods and passengers, the Ministry of Mechanical Engineering plans to have about 140,000 trucks and 145,000 buses in 1975. In 1980 their number should reach 190,000 trucks and 20,000 buses. This makes it necessary to start production of trucks and buses in our country.[4]

According to the long-term agreement signed in 1970 between Bulgaria and Czechoslovakia in the field of production of trucks, our country mastered the production of rear axles for trucks to meet the needs of both countries.[11] At the Madara Plant, Shumen, facilities are organized for the assembly of 15,000 Gas 53 A trucks per year, but the production program starts with 3,000 units.in 1971 with a tendency to reach 7,000 in the middle of the decade. In Gaz 53 the adopted English diesel engine is installed. In parallel with the production of Gaz 53, the production of a truck Skoda began. [4] Our obligations under the agreement with Czechoslovakia include the reconstruction, modernization and expansion of the Madara plant, and the development of the production of trucks and assemblies is defined as a task of primary importance.[12] By Decision of the Council of Ministers No. 230 of 1977, the task was set to complete the production of all rear axle components for Liaz-Madara trucks by the end of 1981 and to stop importing them. [13]

At the 17th session of the Bulgarian-Czechoslovak Committee for Economic and Scientific-Technical Cooperation (1976), it was agreed to deliver to our country bus chassis and aggregates for buses with the aim of concluding contracts for specialization in the production of fuel equipment for diesel engines, hydraulic units, gear pumps and axial-piston systems, electro-pneumatic distributors and shock absorbers.

The production of buses in our country dates back to before WWII. In 1924 in the wheel and iron workshop of Racho Jambazov in Botevgrad they produce bus chassis from scrapped military ambulances.[14]

In 1948 The workshop grew into the Chavdar factory and began production of bodies on Skoda chassis. The development of bus production began after the conclusion of a license agreement with the company Kesborer, West Germany, in the early 1970s. According to forecasts of the State Planning Committee, our needs for buses for 1975 amount to 2300 units. [15]

The high international price of a bus, the high labor intensity and relatively small capital investments encourage the Bulgarian engineering industry to organize bus production in our country on the basis of progressive assembly. With the acquisition of the license for the production of buses, the issue of both the modernization of body production on the Škoda chassis and the production of a modern family of buses is resolved. For the modernization of the Chavdar plant in Botevgrad, BGN 10,500,000 in capital investments are planned for the period 1971-1970. Until 1975 an additional BGN 4,000,000 is invested, mainly for machinery and equipment. Through international cooperation, we receive the main units of the buses - engine, axles, gearbox, elements of the suspension, the braking system, etc., and their production is yet to be mastered.

In 1975 it has been reported that the majority of the equipment required for bus production is produced in our country in about 50 enterprises.[16]

Gradually, imported products in the second direction decreased, and by 1983 there was a tendency to be completely replaced by local production. The production of a new model of small buses has been mastered, the main units of which are produced in our country. In 1975 the capacities at the Chavdar plant allow an annual production of 2350 pcs. Buses. By Decision of the Council of Ministers No. 210 of 21.5.1975. auxiliary enterprises were built at the plant - in Yablanitsa for the production of metal skeletons for seats; in Trudovets for upholstery of seats; in Etropole for parts and assemblies for the bodywork; in Botevgrad - for spare parts; in the village of Djurovo for bus details and aluminum locksmithing. (ibid.)

The poor results reported are the reason for initiating the modernization and reconstruction of the facilities at the Chavdar Plant. There is a proposal to acquire licenses for the acquisition of technology and equipment for the production of a self-supporting city bus and for the production of seats.

In the middle of 1978 The Ministry of Justice gives the green light for the expansion and modernization of the plant in Botevgrad. On 22.11.1979, a contract was signed for multilateral international specialization and cooperation in the production of buses, valid until 1990. [16]

Conclusion

Car manufacturing is carried out largely thanks to the efforts of Balkancar, a business association that unites 36 enterprises directly involved in the production of cars. From 1965 to 1975, Balkancar recorded the highest production growth among all associations within the Ministry of Machine Building. In 1965, the total volume of industrial production amounted to BGN 213,200,000, in 1970 – BGN 613,770,000, and in 1975 it far exceeded BGN 1,000,000,000. [18]

Although the most significant success of Balkancar is the production of electric vehicles and forklifts, the assimilation of models and technologies in automobile production shows that Bulgaria was not isolated from the general technological development in the world.

Our industry, although strongly bound by cooperation agreements with other socialist countries within the framework of the SIV, is looking for ways and realizes cooperation in which it participates in production together with the best representatives of the automotive industry from the developed countries of the West. The state leadership does not hinder this process, but encourages it and finds ways to present and use it as a positive, both for the economic development of Bulgaria and for the general development of the countries of the Eastern Bloc.

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