Belkommunmash: Contemporary History

Belarus' Belkommunmash, the biggest trolleybus and tram manufacturer, seeks to become a Union State leader in designing and producing electric vehicles

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The Minsk-based plant Belkommunmash is Belarus' biggest producer of trolleybuses and trams. In late summer 2007 a new Belkommunmash product created a real furore at the international exhibition Interavto-2007 in Moscow. A G4 trolleybus, the Belkommunmash 42003A, which embodied the most progressive ideas of the contemporary motor industry, became a highlight of this prestigious salon.
This is an elegant electric vehicle with the unusual compartment layout fitted with the state-of-the-art electronic equipment and a hybrid propulsion system, which combines an engine generator with on-board storage batteries. Moscow intends to purchase ten such trolley coaches, which mass production will be launched in summer 2008.
The Belarusian company has plans to design a unique European-style tram, unmatched in Russia and the entire CIS.

Catch Us If You Can

Few people could imagine 25 years ago that a company, set up to carry out major repairs of urban electric vehicles, would turn into a large manufacturer – a manufacturer that aspires to become the leader not only in its own country but throughout the former Soviet Union.

Founded in Minsk in 1973, Tram and Trolleybus Overhaul Plant repaired its first trolleybus (aka a 'horned' vehicle) in 1974. The plant repaired vehicles from around the USSR as well as from the countries of the former Socialist camp (for example, Skoda vehicles from the Czech Republic).

The history of the trolleybus or trolley coach dates back to April 29, 1882, when Dr. Ernst Werner von Siemens ran his Elektromote to connect Berlin with Halensee Suburb. However, this mode of transport did not become much popular in the West, as it was powered by two overhead wires, was not mobile enough and was too power-intensive. To make the matters for trolleybuses worse, the European car boom of the beginning of the 20th century made many believe the future of the trolleybus was quite uncertain.

The European trolleybus was developing in the wake of general motor industry tendencies. The electrical equipment, gear and bodies of trolleybuses in Europe have been designed by the leading manufacturers of electrical equipment and world famous motor concerns.

In the Soviet Union trolleybus construction became an independent industrial sector, as the country gave preference to public transport rather than to private transportation means. The first electric vehicles appeared in Moscow streets in 1933. At first the Soviet authorities were going to purchase trolley coaches from Germany but they stumbled at the money problem. That was why the Soviet auto makers were tasked to design and to launch the production of indigenously-made electric vehicles in the shortest possible time. Lazar Kaganovich personally supervised the project, and his initials appeared on the first two machines assembled in Yaroslavl.

In the Soviet Union trolleybuses were manufactured by several companies located in the RSFSR (Russian Soviet Federative Socialist Republic) and other Soviet republics (for example, in

G4 trolleybus

Latvia). But the biggest producer was the Uritsky Plant (the town of Engels, the Saratov oblast). Trademarked ZiU, its trolley coaches, which came in various modifications, were running along Minsk streets for a long time. There was no need for Belarus to develop its own trolleybus industry then. The Tram and Trolleybus Overhaul Plant was successfully coping with its major task – since 1997 it has been annually repairing up to 400 machines.

Contemporary history of the company dates back to 1993, when the Council of Ministers of the Republic of Belarus approved a programme on developing urban electric transport industry. The programme was aimed at launching the production of trolleybuses at Belkommunmash – the new name of the Tram and Trolleybus Overhaul Plant.

Belkommunmash was all in arms for the mission as the company had recently completed a major overhaul and employed new technologies. In early 1995 Belkommunmash launched the mass production of the first-generation Belarusian trolley coaches of the 101 series with a rheostatic propulsion engine control system. The trolleybuses of the 101 series were fitted with the same component parts, which were used to assemble ZiU electric vehicles. They even looked similar.

A year later Belkommunmash started the production of a new trolleybus with an improved control system and a propulsion engine saving up to 30% of electric power consumed for traction. A year later the company commenced the manufacture of new third generation electric vehicles – low-floor machines with the advanced trolleybus load. The novelty had better technical specifications, greater comfort and a stylish design. In 1999 one of its modifications was awarded a diploma of the Russian Association of Designers at the Moscow International Motor Show.

Belkommunmash General Director Vladimir Korol shows a new trolleybus to Prime Minister of Belarus Sergei Sidorsky and Governor of St. Petersburg Valentina Matvienko

Meeting all international requirements, Belkommunmash electric vehicles have become rather popular in the international market. By the early 21st century Belkommunmash trolleybuses were operating in 32 cities of Russia, Mongolia, Latvia, Kazakhstan and Yugoslavia.

Word of Honour

Russia has been the major sales market for Belkommunmash. In 2003, every third trolleybus exported by Belkommunmash was bound for Russia. Moscow has been Belkommunmash's major customer. Priority is given to Belkommunmash products not only because Moscow is happy with the price/quality ratio of the Belarusian trolleybuses.

Belkommunmash participates in tenders organised in the Russian capital. In spring 2007 a trolleybus of the 321 model successfully passed all tests in

COMPANY BRIEF

Founded in 1973, the former Minsk Tram and Trolleybus Overhaul Plant – today the Minsk-based state unitary company Belkommunmash – repaired the first electric vehicle in 1974.

In 1985-1987 the company upgraded and reconstructed all production facilities, reformed the labour management system, employed new production technologies and techniques.

This helped the company to step up the output of overhauled machines to 400 units a year and to launch the manufacture of trolley coaches. The first Minsk-made trolleybus left the company's shops in 1995.

Today Belkommunmash is Belarus' leading manufacturer and repairer of trolleybuses and trams. A third-generation model – a Belkommunmash 32102 – was named the best product of 2006 in the nomination "Best Products of the Year".

Belkommunmash chief designer Oleg Bytsko behind the wheel of a G4 trolleybus

Moscow to win the relevant tender. This is a low-floor G3 vehicle with a conditioned driver's cab, an improved heating system and a special ground for wheelchair users. Following the order placed by the customer, Belkommunmash equipped all 20 trolleybuses with the engines and gears from the Czech Skoda.

Simultaneously the company started to design a new trolleybus. An official delegation from Moscow, including Mayor Yuri Luzhkov and Leonid Lipsits, the chief of the transport department of the Russian capital, arrived in Minsk to partake in the Days of Moscow in Minsk and paid a visit to Belkommunmash. However, the new trolleybus was still partially on the drawing board. "I gave the Moscow officials a promise that they would see a prototype of the vehicle in August," says Vladimir Korol. "I also promised that we would launch the mass production of the new vehicle within 12 months," he added.

Vladimir Korol kept his word. In August the new Belarusian trolleybus made a hit at the Moscow International Motor Show. It is really an unusual and beautiful model with many windows and a casing made of modern composite materials. The trolleybus has two doors; the wheels are located as far from each other as possible along the sides of the undercarriage to make the floor level low throughout the whole passenger compartment. The compartment is roomy and comfortable. It has 29 seats with oval handles (including six convertible seats). During the rush hours the trolleybus can carry up to 100 passengers.

The vehicle has a pullout ramp for wheelchair users and can bend downward due to a special pneumatic mechanism. It is done for the convenience of people with limited physical capabilities. The compartment has also a climate-control system.

All trolleybus systems are controlled by 14 processors, which send information to an electronic screen installed in front of the driver. This electronic indicator panel informs the driver about all malfunctions and current leaks. The trolleybus also has a so-called "black box" analogous to a flight recorder. It will preserve the information about an incident. To call a dispatcher the driver will use a modern GSM-transmitter and the GPS system will quickly show the exact location of the vehicle on the computer screen in the dispatching office.

The main thing is that the new Belkommunmash trolleybuses have a hybrid propulsion system combining an engine generator with storage batteries. It means the vehicle can transform into an original electrobus and cover up to five kilometers even being disconnected from two overhead wires. Those who got stuck in traffic jams on board of ordinary trolleybuses will undoubtedly appreciate the advantages of the new machines.

Belkommunmash is confident the new vehicles will occupy their market niche. These machines are not cheap as they are fitted with expensive mechanisms and equipment made by the leading German and Czech companies. However, potential customers have already shown interest in the G4 trolleybuses.

Cost-Effective Manufacturing

"To produce what can be sold, rather than to sell what is produced" – it is not just a showy motto but a briefly formulated concept of the philosophy of cost-effective manufacturing. New director of the company Vladimir Korol offered the concept as a business plan in autumn 2007. The main secret of this philosophy is not that much of a secret, actually. Anyway, this is preference for small batches of goods instead of big ones.

INVESTMENT PROJECT

Upgrading the production of cord and capron threads Grodno Khimvolokno

Total cost of the project: $100.9 million.
Project initiator: Grodno Khimvolokno
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Designers of the system of cost-effective manufacturing say it may be used in any economic sector, though it is especially efficient in metallurgy and mechanical engineering, where operating costs are extremely high. "Cost-effective production gives a company an opportunity to double the output while the consumption of manpower and material resources remains at the same level. Or, vice versa, to considerably cut operating costs never reducing the output figures," Vladimir Korol says. "No revolutionary reforms are required for this purpose. A company only needs to change management schemes and to set up a powerful marketing service," he says.

Belkommunmash proffesionals – from foremen to top managers – were adopting the experience of using the system from their Russian colleagues from PAZ and GAZ companies. The new strategy has produced the desired outcome quite rapidly. If in March Belkommunmash produced only ten trolleybuses, in October it manufactured 42 electric vehicles. The output also increases due to a stable stock of orders. Apart from Belarus the new machines will be used in Moscow, Khabarovsk and other Russian cities. For the first time they will appear in St. Petersburg. Not long ago Belkommunmash sent an upgraded G3 trolleybus to Russia's northern capital for marketing tests. A good order may come from Ukraine. Ukraine wants Belkommunmash to produce trolleybuses for the line Simferopol-Yalta (by the way, the world's longest and highest-altitude route). The Belarusian company will invite the Czech Skoda to fulfill the order.

An aggressive marketing policy, an in-depth analysis of market segments and consumers' tastes help the company both to successfully promote its products and to choose investment areas. The G4 trolleybus, designed and produced in record-breaking time, is not the only project of Belkommunmash. Today the company is working on the upgrade of the G3 vehicles, on creating a new bus equipped with a hybrid engine combined with diesel generator and batteries, fire-engines and specialized vehicles for the needs of the Interior and Emergencies Ministries of Belarus as well as on municipal machines, unmatched in Belarus.

The order put in by the Moscow Government to design and manufacture a new double-articulated tram meeting all European standards may be called one more Belkommunmash investment project. The first such tram or LRV (light rail vehicle) is expected to appear in 2008. LRV production is both a complex and promising area. The fact is that, in contrast to trolleybuses, the development of trams in the West was gradual and dynamic. The tram production boom of the late 1980s saw the European countries focusing on ecology rather than economy. Today various types of LRVs (urban and intercity, ground and underground tramcars) are produced by such famous companies as Siemens (Germany), Bombardier (Canada), Alstom (France).

The more demanding the task is, the more fascinating it is to cope with it (Belarus will be the first country in the former Soviet Union to embark on such a mission). The most intricate and expensive LRV detail is a tram truck. Today a multiplex tram made by a leading manufacturer costs up to €1.5 million and the truck alone between €250,000 and €270,000. Most of the CIS cities cannot afford such vehicles. But the Russian capital placed an order with Belkommunmash for a new double-articulated, low-floor and noiseless European-style tram able to reach a speed of 120 kilometers an hour. The new tram will have independent power supply sources, so it can run several kilometers being disconnected from the direct power supply system.

The first Belarus-made tram truck will be an international product – Belkommunmash will assemble it jointly with several leading European manufacturers it has already signed relevant agreements with. Belkommunmash has ambitious investment plans. Firstly, Belkommunmash seeks to involve domestic producers into the manufacturing of several complex tram component parts. Secondly, Belkommunmash wants to team up with Ust-Katav Wagon Works (the Chelyabinsk oblast) to start the manufacture of modern tram trucks for the CIS market. ■

A trolleybus made half a century ago is at the head of a parade of new and retro vehicles