



The History of Tungsram started in 1862 with its predecessor company founded by Bela Egger and Bernát in Vienna. Initially, the company constructed telephones and telegraphs and the profile expanded with carbon filament lamps after Edison's notable inventions. In 1896 they formed the stock company in Budapest. This date is considered as the founding year of Tungsram.

The company - as its name suggests - from the beginning was dealing with lighting technology. Already in the first years of production, by the arc- lamps made by the sites in Vienna lit the downtown of Vienna and in 1883 they made 1500 carbon-filament lamp per day. The breakthrough in the development was brought upon by the Hungarian Government's industrial development policy, which provided significant benefits to businesses that "are equipped with the latest technical achievements". Thus an opportunity opened up for Eggers to start domestic carbon filament lamp production at its site in district 7, located at Huszár street 7. By using this technology the facility was far ahead of British, French and Swiss companies, for example Philips only started the production of incandescent lamps in 1891 in Eindhoven.

Although the Huszár street's lamp manufacturing site turned into Villanyos Izzólámpagyár Rt (Electric Incandescent Lamp Factory Co.) on 1 February 1889, the real transformation came on 1 August 1896 when Bernát Egger founded the Egyesült Izzó (United Electric Co.) company by leveraging a major bank loan and his Hungarian subsidiaries.



Just and Hanaman invent the tungsten filament light bulb

The carbon filament light bulb brought a simple to handle and safe light source into the lives of its users. The carbon filament however, had a number of undesirable features as well; it was fragile, it blackened the glass, its relatively low luminous efficacy and the reddish glow of the light of the bulb. The patent filed by Sándor Just and Ferenc Hanaman was of exceptional importance exactly because of these reasons, introduced with the title "Procedure to produce glowing bodies made of tungsten or molybdenum for light bulbs".

According to their procedure, by reducing a gaseous tungsten compound on the surface of a solid body, then the tungsten will deposit in the place of the surface atoms of the solid body, taking up its shape. The Just- Hanaman metal filament could be heated to a temperature of $2077\text{ }^{\circ}\text{C}$ at a 600 hour lifespan and an initial luminous efficacy of 7.5 lm/W . The evaporation of the tungsten filament was slower even at this temperature than that of the carbon, glowing at a lower temperature, and the time of bulb blackening was also extended by far thanks to using getters.

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WOLFRAMLÁMPA.
75% ÁRANYSZÁRÍTÁS.



Lipót Aschner

Lipót Aschner was born to Ármin Aschner, a tapster and merchant and to Emanuella Wertheimer, on 27th January 1872 in the municipality of Assakürt (Nové Sady, Slovakia) in Nyitra County. The boy from the family of 14 conducted commercial studies and at the very young age of 15 – in June 1887 – began work at János Gonda's private enterprise in Szeged.

After some smaller jobs Aschner had ended up as an apprentice on June 1st 1892 at Villanyos Izzólámpagyár (Electric Light Bulb Factory) according to his employment card. He climbed the corporate ladder. After a series of junior positions he had become assistant director in 1904 - at the age of 32 - light bulb sales director in 1908, commercial director in 1918 and CEO in 1921, his talent being the driving force behind his rise to leadership.

His son Pál, born in 1908 from his marriage with Anna Czettel worked later at the company as well. Under his management, nearly twenty million light bulbs and two and a half million electron tubes were manufactured at the facility in Újpest in 1936. Tungstam implemented the unification of research and production: the production of parts, product development, production of the final products and sales were all controlled in one hand.

He was deported by the Gestapo to Dachau on 19th March 1944. He was bailed out with a ransom of one hundred thousand francs by the owners of Tungstam Rt. In 1945 he moved to Geneva, where he continued to take charge of the factory's activities. He had returned to Hungary with Soviet guarantee in June 1947. Following this, he was managing director of the factory until 1952. Despite his increasingly serious illness, he continued to stay in Újpest almost every day until his death.

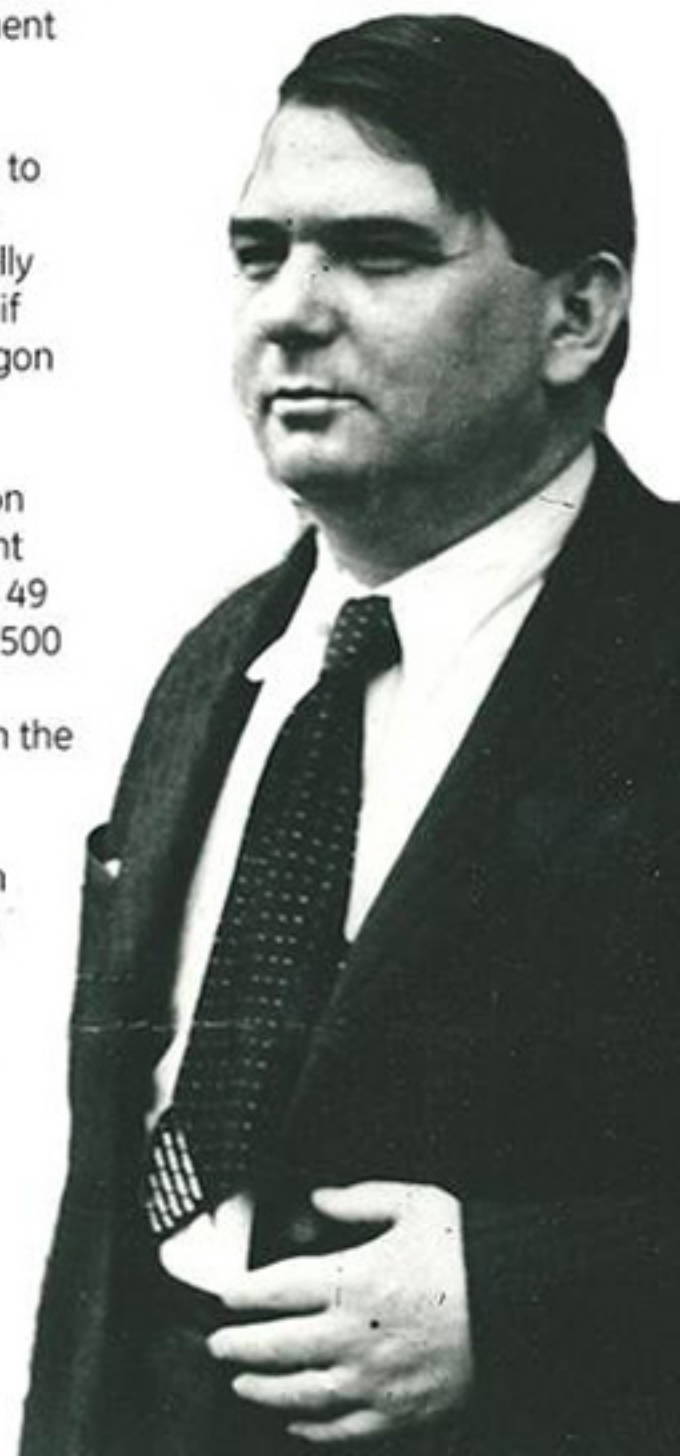


Imre Bródy invents the krypton light bulb

The researches commenced in 1929 in the Research Laboratory of Egyszült Izzó under the leadership of Imre Bródy (1891-1944) were aimed at further improving the quality of light bulbs. Bródy was primarily interested in the quality of the filling gas, experimenting with a number of gases. The idea of using krypton occurred to him first at this stage. The main idea behind his discovery was that due to krypton's lower thermal conductivity than that of argon the temperature of the tungsten filament and thereby the luminous efficacy of the bulb could be increased.

In February 1929 Bródy discovered that in bulbs filled with gas, thermal diffusion accelerates the evaporation of the filament, leading to the blackening of the bulb and the reduction of luminous efficacy. He proved with experiments that this disadvantageous feature – especially with the application of a double spiral – can be considerably reduced if the bulbs are filled with krypton gas of greater atomic weight than argon of smaller atomic weight.

Krypton filled bulbs were first introduced at the Budapest International Trade fair in 1936. Far from being a market failure, it soon turned into a global success product with its attractive shape, pleasant white light and its resulting decorative effect. By the summer of 1936, 49 thousand units had been produced. In September of the same year, 3500 units were sold in Paris and to the rest of the French market. The advantage of the krypton bulb emerged especially in comparison with the vacuum bulbs (decorative candle shaped bulbs and spherical bulbs) produced in the same presentation. Considering that the luminous efficacy was about 1-3% more favourable than that of the mushroom shaped variants, the plum shaped, ellipsoidal krypton filled bulbs also appeared on the market.



The factory in World War II.

Germany attacked Poland on 1st September 1939, the date marking the beginning of World War II. Germany and its allies had spent a considerable portion of their budget on war and army investments from the mid 30s. As a result of its product portfolio, Egyesült Izzó was not one of the large war ammunition firms and was in fact in a rather disadvantageous position as a result of the isolation-driven war politics that dominated the era. The situation deteriorated further with Hungary's Nazi occupation on 19th March 1944. Lipót Aschner was deported on the same day from his own flat by the SS, first being taken to the City's High Command and after a week's time, along with other industrialists and bankers to Oberlanzendorf near Vienna. Aschner was taken to the Mauthausen Concentration Camp on 5th May, 1944. With the deportation of its vice-president and CEO, Egyesült Izzó was left without a leader.

In order to avoid an appointed military leader, Zoltán Bay undertook the technical management while Dénes Jankovich stepped in charge of the factory's commercial and administrative management. The company received a new military commander in 1944 in the person of Colonel Dezső Papp, who immediately began to prepare plans to evacuate the factory from Újpest. Countless machines were evacuated to Kőbánya district in the south-east of Budapest, which did not yet jeopardize the factory's existence, contrary to the authorities' wish after the Arrow Cross Party assumed power to relocate the entire factory to Germany. Difficult times followed. The Arrow Cross Factory Council was formed on 23rd October 1944, demanding supervisory and control rights beside the board of directors. It took great caution and careful maneuvering from the factory's management to avoid fulfillment of these requests. Although few sympathized with the Arrow Cross Party among the employees of Egyesült Izzó, these few were able to cause damage beyond repair nonetheless. The

Újpest factory escaped destruction by bombardment with remarkable luck – only an equipment conveying light bulbs between two factory buildings had been hit. Far more serious were the extent human casualties in the factory's personnel: more than 500 of Egyesült Izzó's employees, representing almost 10% of the personnel were killed fighting at the fronts or in the concentration camps.

The first Soviet officers who stepped into the factory liberated from Nazi and Arrow Cross rule brought promising news: They gave an order to manufacture radio tubes. While the Siege of Buda was still raging on, the restart of the production activity filled leaders and workers alike with unmatched optimism, especially those living within the premises, for whom this meant a measure of protection. Life had hardly started over when it was obstructed again; ice had piled up around the wreckage of the bridges of the Danube blown up by the retreating Nazis during the Siege of Budapest, sending an icy flood over Újpest, breaking into the factory on 9th February 1945. On the evening of 28th March 500 Soviet soldiers invaded the factory, lead by a colonel Galdin, briefly informing the management of the decommissioning of the factory, starting one of the darkest chapters of its history.

The socialist "big business"

Following the war, as a result of nationalization Egyesült Izzó had lost its western markets, its talented professionals were forced to resign and leave, its subsidiaries in the countries which were now also people's republics were nationalized, the factory itself as an enterprise with a majority state stake hold also lost its domestic business interests, which had also been mostly nationalised, while it had been deprived of its independence and independent philosophy, too. The long term perspective program worked out in 1942, based on which the factory's post war future was based on never materialized.

In the subsequent atmosphere of terror, the factory became a leading workshop on a number of occasions and gave Stakhanovites to the country as a profitable state company. Based on several national level economic policies and scenarios, the bureaucratic system of multiple level industrial management had been modified starting in 1962. A new wave of economic reorganization commenced, although the domestic manufacturing industry was then highly centralized and organized. The integrations implemented at this time resulted in more than doubling the number of workers per factory. Egyesült Izzó soon started its own way down the path of the transformation into a so-called large socialist enterprise, still bearing its original form of enterprise in its name and legal status of its operation, i.e. a corporation.

The reorganization of the company took place with the date of 1st January 1963. As a result of the significant development in the "large enterprise decade" that followed, the company's gross production value grew nearly to a treble of its previous output. The company was again transformed in 1982, as the previous setup did not allow fast and flexible adaptation to changes of the global market, being over organized and far too bureaucratic. Due to their rigid structures, the factories generally did not sense changes. This was also topped by the factory possessed no strategic outlooks known to everyone. Neither did the control system in use adapt to the conditions required by procurement, production, sales or the special relations between factory units. The growth in the output volume was not followed by appropriate changes in control methodology and techniques. The elements of an obsolete control establishment centered in Budapest remained.



GE
Lighting

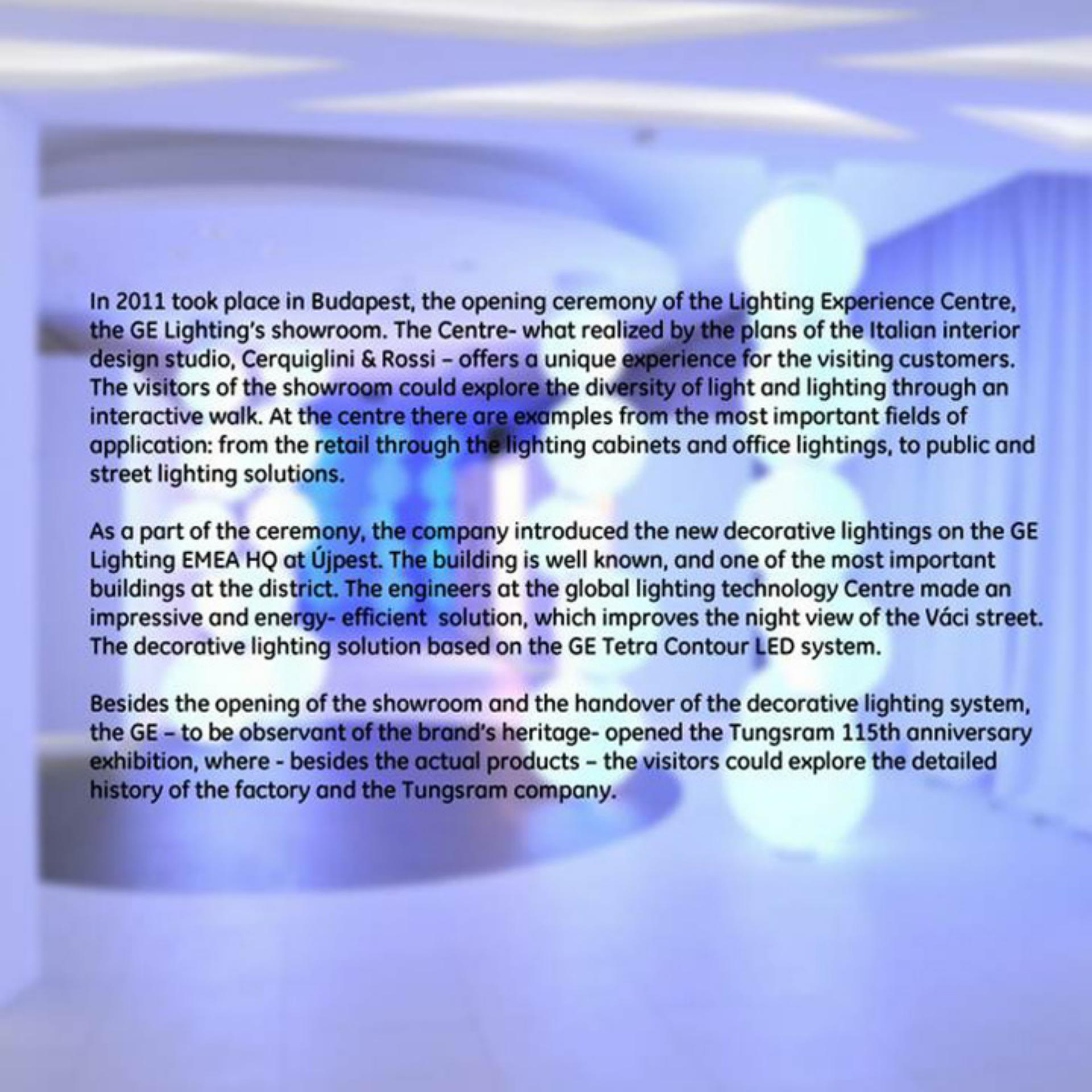
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The 80s and 90s: The marriage of GE and Tungsram

Within a solution scheme worked out to solve the financial problems of Tungsram Rt. in 1988, the registered capital established in 1946 as 42 million HUF was raised to 6 billion HUF, this latter materializing in 30 021 000 shares of nominal value of 200 HUF. Following the increase of the registered capital, the search for an appropriate foreign investor began. As a result, with the mediation of the company Continental Industry, registered in the USA, headquartered in Vienna, Austria, the „Consortium of Western European Banks“ (CWEB) made of 14 western European banks, led by the Austrian Girozentrale purchased 49.65% of the shares of Tungsram Rt. for an amount of deutschmarks equivalent to 110 million USD at the end of April 1989. The transaction allowed preservation of the integrity of the group of companies.

Soon after the establishment of the deal with Girozentrale, Tungsram Rt.'s management was already in possession of new business plans. To follow the changes of the market a well capitalized and technologically strong partner was needed. Tungsram Rt. found General Electric Lighting an appropriate partner from these aspects. On 15th November 1989 it was announced simultaneously in Budapest and Cleveland that the largest capital investment since the end of World War II. is about to take place in Hungary; General Electric will purchase 50% + one share of Tungsram Rt. in the value of 150 million USD.

On 1st January 1990 the reorganization of Tungsram to suit the requirements of a market economy according to GE's experience started. Mr. András Gábor, chairman and CEO had been appointed chairman of the board of directors of Tungsram Rt. and Mr. György Varga became the new CEO, also being a member of the board of directors. With exhaustive planning, the management of Tungsram Rt. formed the future perspective of the company by the end of 1991: Tungsram Rt. should be one of the best performing companies of the World, a company that unifies the best features of both GE and Tungsram Rt. What to achieve and how to get there had been carefully determined, with fewer, but better paid employees. Workforce, customer orientation, traditions and managements have all been delegated significant roles in the new future perspective.



In 2011 took place in Budapest, the opening ceremony of the Lighting Experience Centre, the GE Lighting's showroom. The Centre- what realized by the plans of the Italian interior design studio, Cerquiglini & Rossi – offers a unique experience for the visiting customers. The visitors of the showroom could explore the diversity of light and lighting through an interactive walk. At the centre there are examples from the most important fields of application: from the retail through the lighting cabinets and office lightings, to public and street lighting solutions.

As a part of the ceremony, the company introduced the new decorative lightings on the GE Lighting EMEA HQ at Újpest. The building is well known, and one of the most important buildings at the district. The engineers at the global lighting technology Centre made an impressive and energy- efficient solution, which improves the night view of the Váci street. The decorative lighting solution based on the GE Tetra Contour LED system.

Besides the opening of the showroom and the handover of the decorative lighting system, the GE – to be observant of the brand's heritage- opened the Tungsram 115th anniversary exhibition, where - besides the actual products – the visitors could explore the detailed history of the factory and the Tungsram company.