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# ACTIVITIES FOR THE SUSTAINABLE DEVELOPMENT OF THE POLISH STEEL INDUSTRY AT THE TURN OF THE 20TH AND 21ST CENTURIES: THE CASE OF THE KRAKÓW STEELWORKS

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**Abstract**: The aim of this article is to present the changes undergone by the steelworks in Kraków Nowa Huta during the economic transformation of the Polish economy in the 1990s and the early 21st century. The content of the article demonstrates that the changes taking place were actions aimed at achieving sustainable development. The metallurgical complex established in Nowa Huta in the 1950s was a flagship symbol of the "socialist modernization" carried out by the communist authorities. By the late 1980s, the steelworks was on the brink of bankruptcy. The plant operated with outdated technology and archaic equipment, and thus required rapid modernization. The recovery process began in the 1990s but took a very long time. The measures undertaken sought to achieve sustainable development in Kraków's steel industry. In addressing the issue of transformations within Kraków's steel sector, particular consideration is given to the aspects of technological, economic and social sustainable development, as well as efforts to protect the environment, areas which had previously been entirely neglected (including air and water pollution, impact on residents' health, nature, and the city's historic fabric). The starting point for further action was the decentralization of the plant's management, restructuring by converting individual organizational units into independent enterprises, and regulating the ownership structure of the steelworks. After several years of preparatory activities, this process was effectively implemented only from 2004, following the takeover of the plant by the group later known as ArcelorMittal Poland S.A. Modernization measures were undertaken regarding the plant's equipment and the introduction of the latest technologies. As a result, the most environmentally damaging departments were closed, and production was halted in others. The transformations that occurred have had a positive impact on Kraków's climate and the health of its residents. Post-industrial areas have undergone revitalization, and the authorities of Kraków are now obliged to manage the post-industrial space for new purposes. Due to the current relevance of the issues described, there remains

a lack of comprehensive studies covering all the topics discussed. Most information is scattered across press articles and online sources.

**Keywords**: Nowa Huta; steelworks; sustainable development; modernization; restructuring; environmental protection

## INTRODUCTION

When analyzing the actions aimed at achieving sustainable development in Kraków's steel industry during the economic transformation of the Polish economy at the turn of the 20th and 21st centuries, it is necessary to take into account the economic, technological and social aspects of the measures undertaken—such as the protection of jobs, environmental protection, the health of residents, as well as the preservation of the city's historic fabric. At the beginning of the economic transformation process, it was expected that the Kraków steelworks would be transformed into a modern industrial complex with a strong strategic investor, capable of performing well in a market economy, competing on global markets with its products, and simultaneously meeting demanding environmental requirements. Such were the hopes of both the central authorities and the local community. On one hand, these were efforts undertaken by the Sejm, passing the relevant laws, and the work of the respective ministries; on the other, they were the actions of the Krakow City Council and the authorities of the then Lenin Steelworks (HiL), and subsequently the Tadeusz Sendzimir Steelworks (HTS). The actions taken were determined by the situation in which the Kraków steelworks found itself at the turn of the 20th and 21st centuries. In turn, this situation was shaped by the preceding half-century, and therefore these considerations should be preceded by a presentation of the historical background.

## HISTORICAL BACKGROUND

At the beginning of 1949, Soviet specialists selected two villages near Kraków—Mogiła and Pleszów—as the site for the construction of a major steelworks in Poland. The location was soon approved by the government, which established the Committee for the Construction of Nowa Huta on

20 July (Salwiński, 1999: 86–94). The steelworks were to be the flagship investment of the Six-Year Plan, known as the "plan for building the foundations of socialism" implemented in the years 1950–1955. Construction of the metallurgical complex, which was named after Vladimir Lenin, progressed rapidly. In April 1952, the iron foundry was launched, and in October of that year, the first electric steel foundry furnace was put into operation. The highlight of this construction period was the commissioning of the first blast furnace, which took place on 21 July 1954. In 1955, four open-hearth furnaces were put into operation, and subsequently, the hot strip mill was built between 1953 and 1957 (Klaś and Konior, 2025: 276, 282).

Thanks to these investments, the steelworks had become the largest steel producer in Poland and one of the largest producers of pig iron and coke. In 1957, the steelworks produced 900,000 tons of steel, which accounted for more than half of the total production of all Polish steelworks before the outbreak of the Second World War. The following year saw the opening of the cold rolling mill, the largest department of the complex. In 1959, the first stage of construction of the plant was completed, giving an output of 1.6 million tons of steel per year. The steelworks operated eight open-hearth furnaces, four blast furnaces, and in January 1967, a fifth blast furnace was commissioned. The plant became one of the largest in the world, producing around 1 million tons of pig iron annually, and its steel production capacity reached 3.7 million tons per year (Franaszek, 2022: 273–274). The only source of iron ore for the complex was imports from the Soviet Union (Bodnar, 1967: 46).

At the turn of the 1970s and 1980s, the steelworks consisted of 12 departments. There was a gradual move away from outdated Soviet technology. New equipment was imported from Germany, the United States, Austria, Sweden, Italy, France, Switzerland and Japan. The plant reached the peak of its production capacity in 1978, when it produced 6.5 million tons of steel, which accounted for about 33.3% of the steel produced by all Polish steelworks. The complex became the only producer in Poland of high-quality cold-rolled, galvanized, transformer and generator sheets, as well as the main supplier of hot-rolled plates.

The highest level of employment in the complex was reached in 1979, when nearly 39,000 people worked at the Lenin Steelworks. Subsequently, employment began to decline systematically. The first significant reduction in employment, expressed in absolute terms, was recorded in 1982 (a decrease of almost 4,000) (Franaszek, 2002). In December 1982, the steelworks was short of over 5 thousand employees to reach full staffing levels (*Huta im. Tadeusza Sendzimira…*, 1999: 94).

However, at the turn of the 1970s and 1980s, a decline in production began, due to the "overheating of the plant's production capacities" and the country's general socio-economic crisis. At the end of April 1988, a strike broke out at the Lenin Steelworks. The protest began at the Compactor Division and expanded to other divisions and plants of the combine on the first day. The members of the Strike Committee were Stanisław Handzlik, Edward Nowak, Maciej Mach, and Andrzej Szewczuwaniec, who headed the Committee. In the demands submitted to the HiL directorate, there were calls for wage increases and the reinstatement of dismissed "Solidarity" activists: Stanisław Handzlik, Witold Bawolski, Edward Nowak, and Andrzej Rus. Steelworkers were demanding fair financial compensation for employees throughout Poland. Despite negotiations conducted with the HiL management, the strike was suppressed by militia units on the night of 4 to 5 May (Paczkowski, 1996: 564; Roszkowski, 2003: 93). On the evening of May 5, members of the Strike Committee in hiding issued a communiqué calling on steelworkers to engage in a stay-away strike. This appeal did not go unanswered. The protest, if continued in this form, would disorganize the steelworks' operations to a much greater extent than the previous wildcat strike. According to the consensus of opposition activists, the events of the spring of 1988 were one of the significant factors which—in view of the country's dire socio-economic situation and failed reform attempts—forced the communist authorities to enter into talks with representatives of the Church and the democratic opposition (Skórzyński, 2009: 113–131).

The May strike at the steelworks contributed to a complete change in the country's political situation and initiated the collapse of the communist system in Poland. The symbol of this transformation at the plant was the rejection, on 4 May 1990, of Lenin as patron and the naming of the steelworks after Tadeusz Sendzimir (Tadeusz Sendzimir Steelworks—HTS), an outstanding specialist in steelmaking technologies (Kasprzycki, 2003: 33–69).

During the communist era, the authorities of the time took no significant actions regarding environmental protection. Due to the level of air pollution, the US press and leaflets from Scandinavian travel agencies warned against visiting Krakow. In the 1970s, awareness among Krakow residents grew of the harmful impact of the metallurgical plant on human health and the climate, as well as its destructive effects on Krakow's monuments. However, even then, the authorities took no significant actions in this regard (Szpak, 2018: 241).

## FIRST ATTEMPTS AT MODERNIZING THE METALLURGICAL COMPLEX IN THE 1980S

As early as the 1970s, the residents of Kraków became increasingly aware of the harmful impact of the steelworks not only on human health but also on the destructive effect on Kraków's historical monuments. At the turn of the 1970s and 1980s, amid a deepening nationwide crisis, the situation at the steelworks grew ever more difficult. The average wear and tear of machinery and equipment was 70 per cent. In addition, the steelworks faced staffing difficulties, as there was a shortage of over 5,000 workers to fully staff positions. Excessive exploitation of blast furnaces and rolling mills, outdated equipment, and shortages of electricity and material supplies led to a collapse in production, leaving the company without funds for further development and modernisation aimed at reducing emissions of substances harmful to the natural environment. The plant sold its products at official prices, i.e., those imposed "from above" by the central authorities, without taking basic economic conditions into account. On the other hand, she was forced to purchase a significant portion of raw materials at contract prices, meaning those set by the market in accordance with the law of supply and demand. Such a situation led to very serious financial losses for the steelworks.

The economic condition of the complex quickly deteriorated, and in 1984 the plant lost profitability (Franaszek, 2022: 275). In this situation, plans were made to transform the steelworks into a modern plant, operating according to economic principles and functioning under market economy conditions (Franaszek, 2021: 121). A program was developed that envisaged the modernization of the hot strip mill, construction of a sinter line and completion of the construction of oxygen block No. 4 between 1984 and 1992. Moreover, in the interest of environmental protection, a sum of 5 billion zlotys was allocated for dust extraction and waste disposal equipment. These plans could not be realized, due to the crisis affecting the entire country and serious breakdowns that increasingly afflicted the complex. The crisis deepened, as did the dissatisfaction of employees (Franaszek, 2022: 275).

# THE SITUATION OF THE TADEUSZ SENDZIMIR STEELWORKS AGAINST THE BACKGROUND OF POLISH STEEL INDUSTRY AT THE BEGINNING OF THE 1990S

The 1980s in Polish history were marked by a deep socio-economic crisis. The backwardness of Polish industry worsened year by year, especially in the face of dynamic technical and technological progress in Western countries. The collapse of communism made it possible to restore a market economy, although this process, often called transformation, was associated with serious economic and social problems. Its beginnings saw a sharp collapse in industrial production, which started in the consumer goods industry and then spread to other sectors. Demand for products from the metallurgical, mineral, chemical and light industries dropped rapidly (Kaliński, 2009: 95–96). With the fall of communism, work began on a program to stabilize the economy and implement fundamental changes to bring Poland onto the path of a market economy. One of the key elements of this reform was the privatization of industrial and commercial enterprises.

After 1989, the privatization process proceeded along multiple tracks. The first of these paths was capital privatization—indirect. It was a commercialization process involving the transformation of state-owned enterprises into single-shareholder companies owned by the State Treasury. In the second stage of privatization, shares or stakes were sold to a strategic investor. The buyers could be both domestic and foreign entrepreneurs, as well as companies owned by natural persons. There was also the possibility of increasing the share capital through the issuance of new shares and the subscription of these shares by third parties. As a result of such actions, enterprises ceased to be single-member State Treasury companies (Piątek, 2010: 686–690; Morawski, 2024: 666–667).

Direct privatization, applied in the case of small and medium-sized enterprises, consisted of selling the enterprise or leasing it for a fee. These actions concerned companies in good financial condition. Furthermore, the Act on the Privatization of State-Owned Enterprises guaranteed employees of the privatized plant a 20% equity stake on preferential terms (Rachwał, 2015: 581).

State-owned enterprises in poor financial and organizational condition were liquidated. The giant, unwieldy state-owned enterprises were

divided into smaller companies and sold off. Large state-owned companies underwent restructuring. Unfortunately, during this process not only unprofitable and environmentally hazardous enterprises were closed, but also many economically strong, well-organized companies using the latest technological solutions (Bożyk, 2014: 46–47).

At the beginning of the 1990s, most Polish steelworks were on the verge of bankruptcy. Their situation was catastrophic, equipment in their departments was outdated, the average age of blast furnaces was 26 years, and steelworks 53 years. Open-hearth furnaces were over 60 years old and extremely energy- and material-consuming, while developed countries had long abandoned this technology in favor of continuous steel casting. In Western countries, about 90 per cent of steel was produced using this process, while in Poland only 7 per cent. In this situation, several firms were commissioned to develop recovery programs for Polish steelmaking.

The adopted studies envisaged a major reduction in employment in the steel industry—from 120,000 employed in Polish steelmaking at the beginning of the 21st century, only 40,000 were expected to remain. The closure of six steelworks was anticipated, as well as the merger of the production potential of HTS and the Katowice steelworks. The total production of all Polish steelworks was to be less than 12 million tons of steel (Kałuża, 1999a: 72–76).

## STRUCTURAL AND OWNERSHIP TRANSFORMATIONS OF THE TADEUSZ SENDZIMIR STEELWORKS

At the beginning of 1990, the financial condition of the steelworks was catastrophic. Massive payment backlogs had arisen. Customers for metallurgical products were not fulfilling their financial obligations, and the steelworks itself owed vast sums to its suppliers. As a result, by the end of 1993, the steelworks had lost financial liquidity (Kałuża, 1999b: 54–55, 64). In this situation, in order to avoid bankruptcy, the management of HTS applied to the District Court for Kraków Śródmieście to initiate arrangement proceedings. It turned out that the steelworks had over 1,500 creditors. In some cases, the steelworks' debt to individual companies amounted to several billion zlotys. Direct negotiations with all the cred-

itors lasted until September 1994. Ultimately, 96% of all creditors, representing 93% of the liabilities, accepted debt reduction on the terms proposed by the steelworks, and by 1998 the steelworks had paid off all its debts. On a nationwide scale, it was the largest arrangement proceeding in terms of both the number of creditors and the total amount of debt (Kałuża, 1999b: 64–65).

The fundamental task conditioning the functioning of the Kraków steelworks in the new economic reality was the decentralization of management, its restructuring, and the regulation of the steelworks' ownership relations. Individual organizational units of the plant, especially those providing auxiliary services for the technological process, were to be transformed into independent enterprises. At the end of 1990, in accordance with the Act on State Enterprises, a decision was made to transform the steelworks into a holding company (Dz.U. 1981, No. 24, item 122). The existing HTS plants were to be transformed into joint-stock companies linked by economic ties. The management of the holding was to ensure influence over the newly established enterprises through the participation of holding representatives in the supervisory boards of individual companies. In addition, HTS secured stakes of between 20% and 100% in the share capital of the companies created. The first company established in this way was "Complex", spun off in September 1990. Over time, new companies were formed, and the entire process lasted nearly four years. The companies created became separate economic entities with legal personality, and appropriate agreements regulated their relationship with HTS.

The Kraków City Council became involved in efforts to modernize the Kraków plant. Although the matter was formally beyond the competence of the local government body, due to the significance of the issue, on 15 March 1991 the City Council adopted a resolution "on the program of modernization and restructuring of the Tadeusz Sendzimir Steelworks" (Barczyk, 2020). The Council expected a reduction in steel production in Kraków from 7.5 to 1.5 million tons per year, with the gradual transformation of the raw materials plant into a processing plant, cooperating with the nearby Katowice Steelworks, equipped with modern steelmaking furnaces. Another resolution concerning the steelworks was adopted by the City Council in March 1992. It recommended that the City Board cooperate with the Provincial Office and the Tadeusz Sendzimir Steelworks to reduce emissions of dust and toxic substances, as well as to use, in an environmentally friendly way, the sites and facilities withdrawn from use

under the restructuring and modernization program of the steelworks, to create new jobs and redevelop non-productive facilities and equipment (Barczyk, 2020: 106).

At the beginning of 1992, the Ministry of Industry and Trade and the Ministry of Finance introduced a receivership in the plant. In March that year, the receiver of HTS, Jerzy Knapik, presented a recovery program for the steelworks to the Ministry of Industry and Trade. Its implementation was planned for completion by 1994. It included the construction of a continuous casting line and an installation for injecting coal dust into the blast furnaces. These investments were to reduce production costs, improve product quality, and be very environmentally friendly. Structural and organizational transformations were also planned, which were intended to lead to the creation of a holding company. For the successful completion of this plan, government support was essential, including deferred payments to the state budget without interest and the granting of a low-interest loan to rebuild the steelworks' working capital.

However, in 1993, a series of obstacles arose that prevented the planned implementation of the recovery program. There has been a significant increase in coal prices and railway tariffs, VAT has been introduced, and a sudden devaluation of the zloty has occurred. Furthermore, the production plan was not met due to the downtime of blast furnace No. 4 and difficulties in purchasing charge at Huta Katowice. Furthermore, the steelworks' debt was increasing due to payment arrears on the part of its customers. As a result, by the end of 1993, The steelworks lost its liquidity again (Kałuża, 1999b: 54–55, 64). As a result of these measures, by the end of 1994 the steelworks returned to profitability. Consequently, the receivership was lifted, and the former receiver, Jerzy Knapik, became its general director from 1 January 1995.

A tender for the task, which included preparing a strategic plan, a business plan, and multi-year development programs for the steelworks, was won by the British company Beddows and Company. The project provided for the development of ownership, organizational and legal transformations, the creation of new systems for production planning, cost and financial management, etc. As a result of the undertaken actions, on 1 May 1997 HTS was transformed into a joint-stock company, which was intended to allow for its privatization (Kałuża, 1999a: 79).

In February 1998, it was announced that talks had begun regarding participation in the privatization of the steelworks. Many companies were among the potential investors, but after the required legal proce-

dures were completed, in October 1998 a consortium of two steel industry giants—"Voest Alpine Stahl" and "Koninklijke Hoogovens"—was admitted to final negotiations. However, in January the following year, the consortium withdrew from further talks, citing the lack of a coherent, ministerial concept for the privatization of the entire Polish steel industry (Kałuża, 1999a: 79, 82–86). As a result, privatization of the enterprise was not achieved by the end of the twentieth century.

Given this situation, in August 2001 the parliament passed an act on the restructuring of the entire Polish iron and steel industry. The act defined the principles of organizational and financial restructuring of the steelworks, professional activation of employees on the labor market, asset restructuring, rules for managing assets, and supervising the implementation of restructuring (Dz.U. 2001, No. 111, item 1196). In December 2001, a joint management was established for the Katowice Steelworks and the Tadeusz Sendzimir Steelworks. In May 2002, the Deputy Minister of Economy, on behalf of the State Treasury, signed the founding act of a new company called Polskie Huty Stali (PHS). The company, being a conglomerate, included four steelworks: Katowice Steelworks, Tadeusz Sendzimir Steelworks, Florian Steelworks in Świętochłowice, and Cedler Steelworks in Sosnowiec. These consolidation activities were intended to enable these plants to be debt-free, restore profitability, and facilitate privatization. The State Treasury contributed to the conglomerate shares in Katowice Steelworks (worth PLN 150 million), shares in Tadeusz Sendzimir Steelworks (PLN 593 million), Cedler Steelworks (PLN 80 million), and Florian Steelworks (over PLN 76 million). PHS controlled 70% of domestic steel production and employed around 16,000 people in the steelworks and over 30,000 in subsidiaries previously spun off from each steelworks. This completed the consolidation of the main steel producers in Poland, paving the way for their privatization ('Skarb Państwa…', 2002).

In October 2003, the British-Indian group LNM Holdings signed an agreement with the Ministry of State Treasury (MSP) to acquire about 22 per cent of Polskie Huty Stali shares in the first stage of privatization. The expansion of PHS planned by the LNM Group, aimed at strengthening the company's position in European markets, was necessary in view of ongoing consolidation processes in the steel sector and the globalization of world steel production. The privatization of PHS, which began in 2003, was finalized in March 2004. The LNM Holdings Group then took over nearly 70 per cent of the PHS conglomerate's shares. In May of that

year, the legal successor of LNM became Ispat Polska Stal S.A., whose name was changed in January 2005 to Mittal Steel Poland S.A. Thus, the name of the steelworks no longer included its original patron, Tadeusz Sendzimir ('Polskie Huty Stali…', 2003). Since 2007, the company has been known as ArcelorMittal Poland S.A. The takeover of PHS occurred at a very favorable moment for the investor, as the price of steel rose from 300 to 600 dollars per ton.

## TECHNICAL AND TECHNOLOGICAL MODERNIZATION OF THE TADEUSZ SENDZIMIR STEELWORKS IN THE FIRST HALF OF THE 1990S

In addition to debt relief, financial restructuring, and structural and ownership transformations, modernizing the Nowa Huta enterprise required extensive technical and technological upgrades. The initiative to modernize the plant was first undertaken by the steelworks' employees themselves. As early as the beginning of 1990, the operation of one open-hearth furnace, one battery of coke ovens, and the sintering strand was halted. By mid-year, one of the agglomeration plants ceased operations, and in July, blast furnace No. 3 was shut down. In June 1991, yet another blast furnace—No. 2—and the open-hearth steelworks were closed. Between 1990 and 1992, two further blast furnaces were modernized, and a dust-extraction electrostatic precipitator was installed on blast furnace No. 5 (Kałuża, 1999b: 59).

At the start of the 1990s, the key elements of technical and technological modernization at the steelworks were the construction of a continuous casting facility, the modernization of the rolling mill, and the construction of an electrolytic galvanizing line. Although there were plans to implement the first of these investments as early as the late 1980s and early 1990s, it was the third project that was realized first, as a series of obstacles in 1993 prevented the modernization program from being delivered as planned. There was a significant increase in coal prices and railway tariffs, the introduction of VAT, and a sharp devaluation of the zloty. Moreover, production targets were not met due to the standstill of blast furnace No. 4 and difficulties in sourcing input from the Katowice Steelworks. Thanks to financial support from a consortium

of Western European banks, especially Mitteleuropeische Handelsbank from Frankfurt am Main, a contract was signed with the Italian company Italimpianti, which installed and launched an electrolytic galvanizing line in August 1993. This was the first installation of its kind in Central and Eastern Europe, supplying thin, highly corrosion-resistant sheet steel widely used in the automotive industry, domestic appliance production, electrical equipment, and office and shop furniture (Kałuża, 1999b: 59).

The continuous casting machine was commissioned only in mid-1996. The lack of financing significantly delayed the completion of this project. Ultimately, environmentally friendly equipment was purchased from Schloemann-Siemag, which allowed for substantial raw material savings and a considerable reduction in costs. The introduction of this installation required the modernization of the converter steelworks and the implementation of new steel refining processes. In 1995, modernization of the hot strip mill began, a process which was still ongoing at the beginning of the 21st century. Plans included the construction of another oxygen unit, the start of work on a coal dust injection system for the blast furnaces, and continued construction of the "Kujawy" wastewater treatment plant. Three blast furnaces remained in operation at the steelworks, with steel production not exceeding 3 million tons (Kałuża, 1999b: 58–59).

## MODERNIZATION OF THE KRAKÓW STEELWORKS WITHIN ARCELORMITTAL POLAND S.A.

The takeover of the Kraków steelworks by ArcelorMittal was accompanied by high expectations. Over the following ten years, the company implemented numerous changes at the Kraków plant, which were of significant importance both for production activities and for improving environmental indicators. One of the most expensive investments was the construction of the hot strip rolling mill. It was completed in 2007, with the construction cost amounting to as much as 381 million US dollars. The width of the rolled steel strip was set at 2,100 mm. This steel was intended for the production of bodywork for luxury and off-road vehicles. The rolling mill became the most modern facility of its kind in

Europe ('W Krakowie…', 2005). In November 2009, for nearly 100 million zlotys, the cold rolling mill was modernized. The investment was based on the latest technologies, which contributed to improving the quality parameters of cold-rolled sheets ('ArcelorMittal Poland kontynuuje…', 2025).

At the end of 2011, a project began to build new hot-blast stoves for the blast furnace, replacing the older type stoves, at a cost of 50 million zlotys. In January 2012, the construction of a coke oven gas cleaning installation, generated during coke production, was completed. The new hermetic installation, worth over 100 million zlotys, significantly contributed to reducing electricity consumption. For 40 million zlotys, new closed ladles were installed to transport pig iron from the blast furnace to the steelworks. This solution significantly reduced heat losses during the transport of raw material ('Ponad 220 mln zł…' 2012).

The future of the plant was to be guaranteed by major investments carried out at the Nowa Huta complex from April 2016 to May of the following year. During this year, the ArcelorMittal group invested 500 million zlotys in Kraków. The most important investment was the overhaul of blast furnace No. 5, costing over 175 million zlotys. The works included replacing the furnace's "hearth" (i.e., the carbon lining), installing 1,700 tons of new coolers and 24 new tuyere sets, as well as modernizing the furnace's automation and control system, building a new closed cooling system for the furnace, and upgrading the dedusting system and replacing and overhauling the hot-blast stoves. Thanks to the closed system, water for cooling the blast furnace was no longer drawn from the Vistula River. Moreover, the replacement and overhaul of the stoves made it possible to increase the temperature of the hot blast by about 100 degrees Celsius, thereby reducing coke consumption. In addition to the blast furnace overhaul, the oxygen converter in the steelworks was modernized, and investments were made in the hot and cold rolling mills (Rogozik, 2016; 'Z końcem miesiąca…', 2016).

In the middle of the second decade of the 21st century, ArcelorMittal was the world's largest steel producer. The company had six branches in the Małopolskie, Opolskie, and Śląskie voivodeships. In Poland, the group employed over 11,000 people, and, together with subsidiaries, more than 14,000 ('ArcelorMittal ukończył inwestycje…', 2017). However, in early May 2019, ArcelorMittal Poland announced the temporary suspension of the blast furnace and steelworks operations in Nowa Huta. The reason given for these actions was the global decrease in demand

for steel combined with a rise in the price of carbon emission allowances. According to the company's representatives, Polish steelworks could not count on compensation for indirect CO2 costs, which steel producers in other EU countries receive. Furthermore, high electricity prices in Poland and insufficient means to protect the European market were highlighted, contributing to a huge increase in steel imports from Asian countries. In response to protests from the workforce, in July, the company's management announced the postponement of the shutdown of the raw materials section at the Kraków steelworks ('ArcelorMittal: Koks…', 2019; 'ArcelorMittal odkłada w czasie…', 2019).

In November 2019, the president of ArcelorMittal Poland, Geert Verbeeck, published a statement in which it was said:

> Our three blast furnaces (two in Dąbrowa Górnicza and one in Kraków — editor's note) are currently operating at the technological minimum, which means that further reduction of production is not an option. The market situation continues to deteriorate, and forecasts are not optimistic, so we have no choice — unfortunately, we have to temporarily shut down the blast furnace at our Kraków steelworks. In many countries, production in the manufacturing sector is declining, especially in the automotive industry — in Germany, car production has decreased by as much as 11%. The downturn and global oversupply in the steel industry are increasing pressure on finished goods prices, whilst raw material prices, particularly iron ore, remain high" ('ArcelorMittal Poland rozpocznie postój…', 2019).

At the same time, in an attempt to calm staff sentiment, assurances were given about restarting production when it became economically viable (Ogórek, 2019a). In October 2020, a decision was made to dismantle and scrap the last blast furnace at the Kraków complex. This decision was largely accelerated by the Covid-19 pandemic and the economic crisis it triggered. The last blast furnace at the Nowa Huta complex was shut down, this time for good. At the end of 2023, the operation of the only remaining coke oven battery was suspended, which was fully decommissioned in July 2024 (Nowak, 2020).

## SOCIAL ASPECT OF SUSTAINABLE DEVELOPMENT ACTIONS AT THE STEELWORKS: EFFORTS TO PRESERVE JOBS AND ENVIRONMENTAL PROTECTION INITIATIVES

Measures taken in the early 1990s to transform raw material plants into processing enterprises caused employees to fear for the retention of existing jobs. They expressed their discontent during numerous demonstrations organized in front of the Kraków City Council building (Barczyk, 2020: 106).

With the organizational and technical changes occurring at the complex, the main priority became ensuring employees retained their current or alternative jobs. As previously mentioned, the vast organizational entity that was the complex began to be divided, forming new companies based on the steelworks. By the end of the 1990s, more than 7,200 former steelworks employees were employed in these newly established companies. The dynamic development of the plant allowed jobs to be maintained not only in the Kraków branch, but also among numerous subcontractors and sectors related to the steel industry, such as mining, gas, energy, and transport.

The takeover of the Kraków steelworks by ArcelorMittal was positively received by many politicians and economists. The new owner committed to repaying a significant portion of the debt and to signing a favorable social package for employees, which was especially important in the context of redundancies in 2007, when the entire holding laid off around 7,000 employees. As a result of negotiations with trade unions, a compromise was reached securing employees' interests. Most were offered positions in other areas of the steelworks or in its subsidiaries. Employees offered jobs outside Kraków were provided with free transport. They also received additional financial benefits to compensate for longer commuting times. During this period, some employees participated in specialist training, allowing them to gain new qualifications required by the company. Others made use of overdue holidays (Ogórek, 2019b). An example of such positive actions was the coke plant, where 129 employees found work in other ArcelorMittal plants, and around 100 performed maintenance work at the coke plant during its downtime. The actions undertaken as part of the modernization of the Nowa Huta complex helped to mitigate the social effects of industrial restructuring through an active labor

market policy, retraining programs, and the creation of new employment opportunities, with particular emphasis on social equality and improving the living standards of affected social groups. As a result of restructuring, the steel complex employs only about 4,000 people in the middle of the second decade of the 21st century. This is a marked contrast compared to employment levels in previous decades. The decline reflects global structural changes in the steel industry, changes in production technologies, and the effects of economic liberalization and privatization policies (Warszawski, 2014).

Industrial planning and activity must take environmental aspects into account, particularly regarding air and water pollution. Actions should focus on minimizing the negative impact on public health, biodiversity, and the preservation of Kraków's natural environment and historical heritage. This includes implementing strict environmental standards and creating monitoring systems. As a result, at the beginning of the 1990s, the steelworks complex brought Kraków to the point of ecological disaster, and the city became one of the most polluted in Europe. Pollution caused devastation to the city's historic buildings, jewels of Polish architecture. The "Restructuring and Modernization Program for the T. Sendzimir Steelworks," developed in November 1991, envisaged systematically reducing emissions. The actions taken were aimed at reducing emissions of dust and toxic substances. In June 1991, blast furnace No. 2 and the open-hearth steelworks were closed. Between 1990 and 1992, two further blast furnaces were modernized and an electrostatic precipitator was installed on furnace No. 5. As a result of these measures, in 1994 compared to 1985, emissions of dust were reduced by 84%, nitrogen dioxide by 54%, carbon monoxide by 62%, and hydrocarbons by 88% (Kałuża, 1999b: 59). Modernization works were conducted to upgrade the plant's equipment and introduce the latest technologies. As a result, the most environmentally harmful departments were closed, and production levels were reduced in others.

Limiting dust and toxic substance emissions thanks to the construction of a dry coke quenching installation was crucial for air quality in the region. Serious financial problems meant that this investment, started in 1986, was only completed in 1999. As part of the modernization, a thorough overhaul of blast furnace No. 5 was carried out, involving the demolition of the previous structure and construction of a new unit, which cost about 55 million US dollars. This allowed world standards of production quality and working conditions to be achieved (Kałuża, 1999b: 59–60).

Positive modernization measures, beneficial for the plant and its surroundings, continued into the second decade of the 21st century. The problem was especially important, as since 2012, the air monitoring station in Nowa Huta recorded an increase in benzo(a)pyrene concentrations to such an extent that the prosecutor's office started an investigation, with suspicions directed at the steelworks (Wantuch, 2016). In 2012, the implementation of a new method for cleaning gas allowed the elimination of numerous hazardous substances. At the same time, the construction of a biological treatment plant with a capacity of 40 $m^3$ of sewage per hour began. The cost of this investment was 24 million zlotys ('Ponad 220 mln zł…', 2012). For 310 million zlotys, the combined heat and power plant located at the steelworks was modernized. Works carried out until 2018 included the construction of two new gas boilers and the adaptation of existing coal boiler No. 8 to burn gaseous fuels, i.e. blast furnace gas, coke oven gas, and natural gas. The cooling water system was modernized and emissions to air were reduced: dust by 90%, nitrogen oxides by 83%, sulfur dioxide by 80%, carbon monoxide by 40%, and carbon dioxide by 20% ('Elektrociepłownia…', 2016; 'Kolejny krok…', 2025). All undertaken measures significantly limited the impact of the Kraków steelworks on the natural environment. Continuous investment in technology enabled the modernization of production processes and the installation of advanced pollution control systems. Investments made by ArcelorMittal Poland had far-reaching implications, not only for increasing production and competitiveness but also for achieving significant improvements in environmental efficiency, thus contributing to the broader goal of sustainable industrial development. Thanks to these actions, the plant complied with the requirements of the European Union Industrial Emissions Directive, placing it among the most environmentally advanced steel manufacturing facilities in Europe. Thanks to these investments, the steelworks had installations belonging to the best in the European steel industry, contributing to improved environmental impact. The changes that have taken place undoubtedly have a positive impact on the climate of Kraków. Post-industrial areas have been revitalized, and the city authorities have been tasked with redeveloping post-industrial space for new purposes. Improvements in air and water quality have brought measurable health benefits to the inhabitants of Kraków and improved the ecological condition of the Vistula River. Reducing the levels of acid rain and dust pollution has played an important role in protecting the city's architectural heritage, especially its monuments and buildings, many of which are considered national cultural treasures ('Kolejny krok…', 2025).

In June 2025, ArcelorMittal Poland officially launched new hydrogen furnaces in the annealing plant of the Kraków steelworks. This is one of the investments in a package worth 100 million zlotys. The second is the implementation of a new galvanizing coating. ArcelorMittal has already started investments worth an additional 100 million zlotys. According to Wojciech Koszuta, General Manager and President of the Management Board of ArcelorMittal Poland, this investment allows for greater cleanliness of sheet metal, resulting in higher product quality. The environmental aspect of the undertaking is also important. In this process, the use of ammonia for creating a protective atmosphere has been discontinued. Now, the protective atmosphere is fully hydrogen-based, and the annealing time has been halved. This has reduced the consumption of utilities, and as a result, CO2 emissions on this production line have been reduced by 50 percent. The new furnaces use hydrogen only as a source of protective atmosphere. Natural gas remains the fuel, but there are plans to use hydrogen as the primary fuel in the future. Therefore, Linde Gaz Polska, in cooperation with ArcelorMittal Poland, has started construction of a hydrogen production plant, which is due for completion at the end of 2026. This will allow hydrogen to be used as fuel for two galvanizing lines operating in the Kraków branch. The cost of this project is an additional 100 million zlotys ('Huta w Krakowie…', 2025; Myszor, 2025).

## CONCLUSION

The steelworks complex in Nowa Huta was the main investment of the Six-Year Plan. More than 70 years have passed since the decision to build it. For many years, the steelworks increased its production capacity, with employment steadily rising. However, from the turn of the 1970s and 1980s onwards, production regularly declined. Outdated technology and archaic equipment at the plant necessitated swift modernization. This process, however, proved to be much more prolonged, especially as climate issues—previously entirely ignored—began to emerge. Systemic changes at the turn of the 1980s and 1990s accelerated these transformations, albeit still at a pace that was decidedly too slow. In the Nowa Huta complex, the rejection of Lenin's patronage in December 1989 and the naming of the steelworks after Tadeusz Sendzimir, an outstanding Polish specialist in metallurgical technology, became a symbol of political and

economic transformation. Another significant step was the conversion of the steelworks into a joint-stock company, which, however, only took place on 1 May 1997. In parallel, modernization activities were carried out to upgrade the plant's equipment and introduce the latest technologies. As a result of these measures, the plant's most environmentally harmful departments were closed, and production was reduced in others. The final act of these actions was the decommissioning of the last blast furnace and the closure of the steel plant. For many, this was tantamount to the collapse of the steelworks. There were concerns about a chain reaction leading to the bankruptcy of many larger and smaller subcontractors. The plan from the end of the 20th century was not fully implemented. The transformation of the Krakow steelworks into a modern industrial complex that performs excellently in a market economy and competes with its products on global markets. Although ArcelorMittal acquired the plant as a strategic investor, the steelworks as a complex consisting of many plants has ceased to exist. When the coke plant was shut down in 2023, only the still-operating hot and cold rolling mills remained after the large industrial complex, while the steel is delivered from Huta Katowice. (Klaś and Konior, 2025: 273). On the other hand, the transformations that occurred have had a positive impact on Kraków's climate and the health of its residents. Post-industrial areas have been revitalized, and the authorities of Kraków have been tasked with redeveloping post-industrial spaces for new purposes.

In November 2014, the Municipality of Kraków and the Lesser Poland Voivodeship established a joint-stock company aimed at implementing a project named "Kraków Nowa Huta of the Future." Its primary task was to undertake effective actions to accelerate the economic development of the eastern part of Kraków at the infrastructural, functional, and social levels. The main objective is to develop the area in a way that increases the attractiveness of Nowa Huta for investors, the community of the city and municipality of Kraków, the entire region, and tourists. During the company's 10 years of operation, two Economic Activity Zones were built in this area, and the Przylasek Rusiecki area was developed for recreational purposes, enjoying interest from residents and tourists from neighboring municipalities. Over the next 5 years, the company plans to build 230,000 square meters of halls intended for a production and logistics center. A huge asset of this area that could attract potential investors is the long railway sidings, which are capable of servicing an entire train set. These areas are being prepared with ready-to-use sidings and industrial roads

to allow investors to commence operations immediately. Together with ArcelorMittal, the company intends to repurpose two historic buildings of the Administrative Center near the main entrance to the steelworks—known by Kraków residents as the "Doge's Palace" due to their architecture. Plans include creating office spaces there, as well as making the existing theater and large plenary hall available to residents and tourists for exhibition and cultural purposes ('Nowe wyzwania…', 2025).

In the actions being undertaken, the size of the area that ArcelorMittal was to hand over to the city became a serious problem. Initially, it was assumed that it would be approximately 100 ha. By the end of 2025, the Nowa Huta industrial complex proposed an area three times larger. At the end of 2025, discussions were held regarding the location of the plots proposed by ArcelorMittal and the costs associated with their remediation. These 300 hectares consist of post-industrial lands which, according to experts, are contaminated with heavy metals and highly toxic dioxins (chemical compounds). To date, it has not been determined what kind of contamination it is, where it occurs, or how much its removal will cost. The Krakow authorities plan to appoint a team of experts, likely consisting of scientists from Krakow universities, whose task will be to estimate the remediation costs. The analyses obtained will make it possible to determine whether it is even worthwhile to clean the plots selected by the officials. They will also serve the Krakow authorities in negotiations with the corporation regarding who will pay for the removal of the consequences of heavy industry activities. According to city officials, the costs could reach several hundred million zlotys (Kubiak, 2025).

An interesting aspect of the actions taken toward a sustainable solution to the problems generated by the liquidation of the Krakow steelworks is the effort to preserve its industrial heritage as a monument of technology and engineering. As the largest and—for many years—the most modern metallurgical complex in the country, it represents the history of Polish metallurgy in the second half of the 20th century well. It has become a kind of unique object on a national scale. The most valuable objects were the oldest and most important production plants as well as the administrative buildings. Due to its age, state of preservation, and connection to the strikes in the 1980s. In the 20th century, the most valuable asset was the rolling mill crusher, which was however demolished in 2005. Concepts of using the industrial complex for tourism purposes and ideas of creating a museum first emerged in the 1970s. 20th century and intensified during the period of economic transformation in the 90s.

However, as time passed, ideas for protecting the metallurgical heritage increasingly lost their significance due to the deteriorating condition of the plant's equipment and successive demolitions of its facilities. Only a slight semblance of their realization was the 2005 opening of a branch of the Historical Museum of the City of Kraków, named the History of Nowa Huta. In 2019, this branch was merged with the Museum of the PRL, and the Museum of Nowa Huta was established, which is currently a branch of the Museum of Krakow (Klaś and Konior, 2025: 274, 276, 283). The ties between the city and its residents and the steelworks have been gradually loosening and continue to do so, as the plant slowly fades from the collective consciousness.

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## REFERENCES

**Literature**

Barczyk, K. (2020) 'Refleksje w 30. rocznicę odrodzenia samorządu gminnego w Polsce i I kadencji Rady Stołecznego Królewskiego Miasta Krakowa po wyborach 27 maja 1990 r.', *Casus*, 96/97, pp. 105–106.

Bodnar, A. (1967) *Polska–ZSRR. Współpraca gospodarcza. W 50 rocznicę Wielkiej Socjalistycznej Rewolucji Październikowej*. Warszawa: Państwowe Wydawnictwo Ekonomiczne.

Bożyk, P. (2014) 'Rola przemysłu w fazie postindustrialnej', *Kwartalnik Naukowy Uczelni Vistula*, 3(41), pp. 45–53.

Dz.U. 1981, No. 24, item 122—Journal of Laws of the Republic of Poland of 1981: *Ustawa o przedsiębiorstwach państwowych z 25 IX 1981 r.*

Dz.U. 2001, No. 111, item 1196—Journal of Laws of the Republic of Poland of 1981: *Ustawa z dnia 24 sierpnia 2001 r. o restrukturyzacji hutnictwa żelaza i stali.*

Franaszek, P. (2002) 'Nowa Huta w systemie gospodarczym PRL', in Terlecki, R., Lasota, M. and Szarek, J. (eds) *Nowa Huta – miasto walki i pracy*, Kraków: Instytut Pamięci Narodowej, pp. 34–41.

Franaszek, P. (2021) 'Nowa Huta – sztandarowy symbol „socjalistycznej modernizacji" gospodarki i społeczeństwa', in Grata, P. (ed.) *Modernizacja bez suwerenności. Przemiany gospodarcze i społeczne w Polsce Ludowej*. Rzeszów: Wydawnictwo Uniwersytetu Rzeszowskiego, pp. 115–134.

Franaszek, P. (2022) 'Modernizacja kombinatu metalurgicznego w Nowej Hucie na przełomie XX i XXI w.', in Grata, P. (ed.) *Modernizacja gospodarcza czasów transformacji ustrojowej*. Rzeszów: Wydawnictwo Uniwersytetu Rzeszowskiego, pp. 273–294.

*Huta im. Tadeusza Sendzimira S.A. w Krakowie 1949–1999* (1999) Kraków: Wydawnictwo Trans-Krak.

Kaliński, J. (2009) *Transformacja gospodarki polskiej w latach 1989–2004*. Warszawa: Szkoła Główna Handlowa, Oficyna Wydawnicza.

Kałuża, V. (1999a) 'Restrukturyzacja i prywatyzacja HTS S.A.', in *Huta im. Tadeusza Sendzimira S.A w Krakowie 1949–1999*. Kraków: Wydawnictwo Trans-Krak, pp. 70–92.

Kałuża, V. (1999b) 'Z nowym patronem', in *Huta im. Tadeusza Sendzimira S.A w Krakowie 1949–1999*. Kraków: Wydawnictwo Trans-Krak, pp. 45–68.

Kasprzycki, R. (2003) *Opozycja polityczna w Krakowie w latach 1988–1989*. Kraków: Księgarnia Akademicka.

Klaś, J. and Konior, A. (2025) 'Dziedzictwo przemysłowe kombinatu metalurgicznego w Nowej Hucie w kontekście zarządzania dziedzictwem hut żelaza i stali w Polsce i Europie', *Ochrona Zabytków*, 2, pp. 265–286.

Morawski, W. (2024) 'Plan Balcerowicz – anatomia przełomu', in Kuklo, C. and Walczak, W. (eds) *Człowiek twórcą historii*. Białystok: Uniwersytet w Białymstoku, pp. 657–675.

Paczkowski, A. (1996) *Pół wieku dziejów Polski 1939–1989*. Warszawa: Wydawnictwo Naukowe PWN.

Piątek, D. (2010) 'Metody i wyniki prywatyzacji przedsiębiorstw państwowych w Polsce w okresie transformacji gospodarczej', *Prace Naukowe Uniwersytetu Ekonomicznego we Wrocławiu*, 113, pp. 684–695.

Rachwał, T. (2015) 'Structural changes in Polish industry after 1989', *Geographia Polonica*, 88 (4), pp. 575–605.

Roszkowski, W. (2003) *Najnowsza historia Polski 1980–2002*, t. 3. Warszawa: Świat Książki.

Salwiński, J. (1999) 'Decyzje o lokalizacji Nowej Huty pod Krakowem. Stan wiedzy', in *Narodziny Nowej Huty*, Kraków: Towarzystwo Miłośników Historii i Zabytków Krakowa, pp. 77–94.

Skórzyński, J. (2009) *Rewolucja okrągłego stołu*. Kraków: Wydawnictwo Znak.

Szpak, E. (2018) 'Uprzemysłowienie – przyrodniczy koniec starego Krakowa?', in *Ekobiografia Krakowa*. Kraków: Znak Horyzont, pp. 231–254.

**Internet sources**

'ArcelorMittal: Koks niewykorzystany w Krakowie może być wykorzystany w grupie' (2019) *wyborcza.biz*, 13 May, https://wyborcza.biz/Gieldy/1,132329,24781132,arcelormittal-koks-niewykorzystany-w-krakowie-moze-byc-wykorzystany.html. Accessed 15 August 2025.

'ArcelorMittal odkłada w czasie tymczasowe wstrzymanie pracy w części surowcowej w Krakowie' (2019) *poland.arcelormittal.com*, 25 July, https://poland.arcelormittal.com/media/artykuly/artykul/arcelormittal-poland-odklada-w-czasie-tymczasowe-wstrzymanie-pracy-czesci-surowcowej-w-krakowie. Accessed 15 October 2025.

'ArcelorMittal Poland kontynuuje inwestycje w Krakowie' (2025) *investmap*, 17 January, https://investmap.pl/arcelormittal-poland-kontynuuje-inwestycje-w-krakowie.a311833. Accessed 13 September 2025.

'ArcelorMittal Poland rozpocznie postój wielkiego pieca w Krakowie 23 XI' (2019) *money.pl*, 12 November, https://www.money.pl/gielda/arcelormittal-poland-rozpocznie-postoj-wielkiego-pieca-w-krakowie-23-xi-6445336934840449a.html. Accessed 6 September 2025.

'ArcelorMittal ukończył inwestycje w krakowskiej hucie, warte 0,5 mld zł w 2016r.' (2017) *wyborcza.biz*, 10 May, https://wyborcza.biz/Gieldy/1,132329,21790582,arcelormittal--ukonczyl-inwestycje-w-krakowskiej-hucie-warte.html. Accessed 6 April 2021.

'Elektrociepłownia w krakowskiej hucie przejdzie modernizację' (2016) *energetykacieplna.pl*, 19 December, https://www.energetykacieplna.pl/wiadomosci-i-komunikaty/elektrocieplownia-w-krakowskiej-hucie-przejdzie-modernizacje-120229-10. Accessed 15 August 2025.

'Huta w Krakowie uruchomiła piece wodorowe' (2025) *kresy.pl*, 10 July, https://kresy.pl/wydarzenia/regiony/polska-regiony/huta-w-krakowie-uruchomila-piece-wodorowe/. Accessed 21 July 2025.

'Kolejny krok do zakończenia modernizacji elektrociepłowni TAMEH Polska w krakowskiej hucie' (2025), *poland.arcelormittal.com*, https://poland.arcelormittal.com/en/sustainability/our-support/article?tx_news_pi1%5Baction%5D=detail&tx_news_pi1%5Bcontroller%5D=News&tx_news_pi1%5Bnews%5D=574&cHash=0aa3477d5f9f498b2b4f9b9452f72bfc. Accessed 13 September 2025.

'Nowe wyzwania przed Nową Hutą Przyszłości. Przemysł, miejsca pracy i przestrzeń dla mieszkańców' (2025) *nhp Kraków Nowa Huta Przyszłości S.A*, 16 December, https://knhp.com.pl/aktualnosci/nowe-wyzwania-przed-nowa-huta-przyszlosci-przemysl--miejsca-pracy-i-przestrzen-dla-mieszkancow/. Accessed 10 April 2026.

'Polskie Huty Stali już nie polskie' (2003) *Wirtualna Polska Wiadomości*, 27 October, https://wiadomosci.wp.pl/polskie-huty-stali-juz-nie-polskie-6036351634637953a. Accessed 25 June 2025.

'Ponad 220 mln zł inwestycji ArcelorMittal Poland w krakowskiej hucie' (2012) *Bankier.pl*, 30 January, https://www.bankier.pl/wiadomosc/Ponad-220-mln-zl-na-inwestycje-w--hucie-ArcelorMittal-Poland-w-Krakowie-2478467.html. Accessed 13 September 2025.

'Skarb Państwa powołał spółkę Polskie Huty Stali SA' (2002) *Parkiet*, 6 May, https://www.parkiet.com/gospodarka/art25881841-skarb-panstwa-powolal-spolke-polskie-huty--stali-sa. Accessed 25 June 2025.

'W Krakowie powstanie najnowocześniejsza walcownia w Europie' (2005) *NAM, Kraków naszemiasto.pl*, 19 July, https://krakow.naszemiasto.pl/w-krakowie-powstanie-najnowoczesniejsza-walcownia-w-europie/ar/c3-6193279. Accessed 31 March 2025.

'Z końcem miesiąca rusza remont wielkiego pieca w krakowskiej hucie ArcelorMittal' (2016) *Radio Kraków*, 15 April, https://www.radiokrakow.pl/wiadomosci/krakow/z-koncem-miesiaca-rusza-remont-wielkiego-pieca-w-krakowskiej-hucie-arcerolmittal/. Accessed 6 April 2025.

Kubiak, P.(2025) 'Nawet 300 hektarów w nowohuckim kombinacie może przejąć Kraków', *Radio Kraków*, 10 January, https://www.radiokrakow.pl/aktualnosci/krakow/nawet-300-hektarow-w-nowohuckim-kombinacie-moze-przejac-krakow-rozmawiamy-o-trzy-razy-wiekszym-terenie-niz-planowano/#:~:text=Nawet%20300%20hektar%C3%B3w%20nowohuckiego%20kombinatu%20ArcelorMittal%20chce,stali%20o%20przej%C4%99ciu%20trzykrotnie%20wi%C4%99kszego%20terenu%20ni%C5%BC. Accessed 6 April 2026.

Myszor, P. (2025) 'ArcelorMittal Poland uruchomił piece wodorowe w krakowskiej walcowni. To część pakietu za 100 mln zł', *wnp.pl*, 26 June, https://www.wnp.pl/przemysl/arcelormittal-poland-uruchomil-piece-wodorowe-w-krakowskiej-walcowni-to-czesc-pakietu-za-100-mln-zl,959053.html. Accessed 8 July 2025.

Nowak, R. (2020) 'Definitywny koniec wielkiego pieca i stalowni w Nowej Hucie', *Life in Kraków*, 8 October, https://lifeinkrakow.pl/w-miescie/1587,definitywny-koniec--wielkiego-pieca-i-stalowni-w-nowej-hucie. Accessed 10 April 2025.

Ogórek, P. (2019a) 'Kraków. ArcelorMittal wyłącza wielki piec w krakowskiej hucie! To krok w kierunku zamknięcia huty?', *Gazeta Krakowska*, 6 May, https://gazetakrakowska.pl/krakow-arcelormittal-wylacza-wielki-piec-w-krakowskiej-hucie-to-krok-w-kierunku-zamkniecia-huty/ar/c3-14102331. Accessed 6 April 2021.

Ogórek, P. (2019b) 'Nawet 40 mln zł może stracić Kraków na wygaszeniu wielkiego pieca w hucie', *Gazeta Krakowska*, 20 November, https://gazetakrakowska.pl/nawet-40-mln-zl-moze-stracic-krakow-na-wygaszeniu-wielkiego-pieca-w-hucie/ar/c3-14594553. Accessed 21 July 2026.

Rogozik, M. (2016) 'Wielki piec nr 5: skontrolowaliśmy jak idzie remont w środku gara', *Dziennik Polski*, 25 June, https://dziennikpolski24.pl/wielki-piec-nr-5-skontrolowalismy-jak-idzie-remont-w-srodku-gara-zdjecia-wideo/ar/10313216. Accessed 6 April 2025.

Wantuch, D. (2016) 'Wzrasta zanieczyszczenie rakotwórczymi substancjami w Nowej Hucie', *Wyborcza.pl Kraków*, 26 April, https://wyborcza.biz/biznes/1,149543,19977477,wzrasta-zanieczyszczenie-rakotworczymi-substancjami-w-nowej.html. Accessed 6 June 2025.

Warszawski, M. (2014) 'Hucie nie grozi zamknięcie', *Dziennik Polski*, 5 July, https://dziennikpolski24.pl/hucie-nie-grozi-zamkniecie-zdjecia/ar/c3-3496079. Accessed 13 September 2025.