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Management of post-industrial sites in Cracow

Key words

mineral industries, post-industrial land management, sustainable development

Abstract

Cracow is a historical, medieval town and former capital of Poland. It has a thousands' year long tradition as a centre of science, culture and art, placed on the UNESCO list in 1978. But Cracow is also ranked as the fourth industrial city in Poland. The historical development of the town is connected, among other things, with medieval mining activities in the area of Cracow (e.g. salt and zinc and lead mining), and development of e.g. copper and an iron ore smelter. In the beginning of the 20th century, industries moved closer to Cracow center, e.g. Liban — Soda Factory Solvay, Liban lime quarry in Krzemionki for Liban cement factory, superphosphate factory in Bonarka, or Lenin Steel Works.

In the paper the environmental, social and financial aspects of rehabilitated Solvay soda factory are presented. The physical and financial scope of the decommissioning of Solvay was dictated primarily by environmental considerations. This fact was significant in selecting the decommissioning procedure, therefore the primary objective was to eliminate pollution of the area, rehabilitate the land, develop it again in full compliance with environmental protection requirements. The others objectives which were achieved were restoration of the former level of employment, and the preservation of historical buildings.

Introduction

Cracow lies in the southern part of Poland on the Vistula River in a valley at the foot of the Carpathian Plateau, 219 meters above sea level. The city covers an area of 327 km². The

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landscape and its geological structure is very diversified, both in Cracow and its vicinity. In many areas one may come across picturesque karst formations that evolved from Jurassic limestone. Fertile loess clays are located in the north east. South of the Vistula River are undulating areas of loamy sandstone, and in the south east lie layers of salt.

Cracow is a historical, medieval town and former capital of Poland. It has a thousands' year long tradition as a centre of science, culture and art, placed on the UNESCO list in 1978. But Cracow is also ranked as the fourth industrial city in the country, the dominating industries being metallurgic, tobacco, and pharmaceutical ones (www.krakow.pl). The historical development of the town is connected, among other things, with medieval mining activities in the area of Cracow — for example — in Wieliczka and Bochnia (salt mines, south-east), zinc and lead mines (north-west) which started in the 14th and 15th centuries (Sławków and Olkusz, and later Trzebinia and Chrzanów), finally, not far away from the said zinc mines, hard coal mining works were opened, respectively, in the 17th and 19th centuries (Siersza and Jaworzno). Moreover, the industrialization in the area mentioned led to the development of new works, e.g. a Mogiła village copper smelter (1469) (nowadays: Nowa Huta), and an iron ore smelter (1895) (Jeżewski 1971). In the beginning of the 20th century, mineral industries (both based on domestic or imported raw materials) moved closer to Cracow center, e.g. Liban — Soda Factory Solvay — 1901, Liban lime quarry in Krzemionki for Liban cement factory — at the end of the 19th century (since 1961 — Bonarka geological nature reserve of 2,29 ha), superphosphate factory in Bonarka 1948 or Lenin Steel Works — 1949—1959 (Gawel 1986).

The area of the decommissioned Solvay soda factory has already been rehabilitated, and it is one of the largest achievements in the field of post-industrial land reclamation in Cracow.

1. History of the solvay soda factory in Cracow

On 16 April 1901, the local government of the town of Podgórze made a decision of historic importance for that locality — at that time a separate town, later a district of Cracow. The permit issued on that day led to the first industrial undertaking on a vast area in that part of the city: construction of a soda factory.

Five years later, on 1 June 1906, the production began at the factory called the B&W Liban Chemical Products Factory in Podgórze, which several months later was renamed into the First Galician Stockholders' Ammonia Soda Factory in Podgórze. The methods of soda manufacture used at that time were increasingly replaced by a modern process devised by Ernest Solvay, a chemist, whose concern monopolized the soda industry in Europe.

After a two-year lease, as early as January 1909, the prosperous factory in Podgórze became the property of Solvay. Its production was modernized and the factory changed its name again to become the Austrian Solvay Works — Soda Factory in Podgórze. Soon afterwards, the factory became part of the Solvay concern. The factory, which at the outset was located on the very fringe of the town, was absorbed along with the town of Podgórze by

the expanding city of Cracow. In 1952 the factory was once again renamed into the Cracow Soda Works but among the tradition-loving residents of Cracow the factory was and still is called Solvay.

From the moment it was established, the factory was a successful investment — vigorously expanding, profitable and providing jobs for an increasing number of local residents. The factory owed its success to both skilful implementation of new production processes and a convenient location, ensuring the availability and proximity of raw materials, such as lime supplied from a quarry in Zakrzówek, salt from Wieliczka, and the required amount of water from the nearby Wilga River. The output and the range of products steadily increased. Initially, the factory produced 5 tons of raw soda per day, soon reaching 33 tons per day; in the period of the peak production in the 1960s, its output reached 600 tons per day. The increased output was accompanied by systematic improvements in technology, and the introduction of new products, such as salt soda, caustic soda, baking soda, industrial and pharmaceutical salammoniac, carbon dioxide, and also calcium carbonate obtained from waste and used in farming to neutralize acid soils. In subsequent decades, despite clear benefits for the economy, the Solvay factory began to have an increasingly harmful impact on the environment. The Solvay process, although successively modernized and improved, from the beginning had been producing large amounts of waste. In the 1930s, the management found it necessary to build large settling ponds for waste, which came to be known as „white seas“. Although they prevented uncontrolled dispersion of waste and made further land reclamation easier, the ponds posed a risk to surface and ground water for many years, due to insufficient sealing and unfavorable hydrogeological conditions. Not to mention the ponds' ugliness, shared with the Solvay factory buildings. Waste management was accompanied by planting and reclamation of the devastated areas. In the late 1930s, several hectares of wasteland were forested, creating thus a park close to the factory — nowadays the popular Solvay Park. There were, however, few similar environmentally oriented efforts. After World War II, an important undertaking was the establishment of a waste utilization department; however, the pressure from above to achieve a high production quota put environmental needs in second place, reducing the funds allocated to environmental protection. Due to many years of neglect, the environment was heavily polluted. Following detailed studies that revealed the disastrous condition of the area, and with the protests of thousands of local residents intensifying, a decision was made to begin the decommissioning of the company on 1 October 1989 (Poda 1999).

2. Environmental and legal problems during the decommissioning phase

The physical and financial scope of the decommissioning was dictated primarily by environmental considerations; those concerns, and not economic results, were the direct cause of the decommissioning. This fact was significant in selecting the decommissioning procedure, which was different from those employed up to that time and in many ways

experimental. The basic difference was that the primary objective was to eliminate pollution of the area, rehabilitate the land, develop it again in full compliance with environmental protection requirements, and provide a useful new project for the city. The Governor of Cracow Province contracted the decommissioning process, which after 1993 was implemented by the Cracow Regional Development Agency S.A.

One difficulty the liquidator faced was the lack of a detailed legal framework pertaining to decommissioning of state-owned industrial enterprises. The only thing one could rely on was common sense and correct identification of the primary objectives. Among these objectives, it was considered important to:

- prevent depreciation of the assets of the decommissioned company intended for further use,
- maintain the value of the land and buildings during demolition (e.g., to furnish buildings with new technical infrastructure to maintain uninterrupted supplies of utilities),
- completely reclaim and clean up the area,
- prepare the area for new development, technically and in terms of marketing,

When decommissioning began, the Cracow Soda Works managed three areas totaling about 170 hectares. These were:

- the main production area at Podgorze (about 30 ha),
- the adjacent area with settling ponds, the so-called white seas (about 80 ha),
- Zakrzówek lime quarry (about 60 ha).

There were also about 60 hectares of land classified as „other land“, located in various parts of the city.

In the first stage of decommissioning, the buildings' condition was thoroughly examined to classify them as historic buildings (under the supervision of conservation authorities), buildings fit to be reused, and buildings and structures due for demolition. Demolition was carried out from 1993 through 1995 in part by using standard methods, and in part by employing explosives. As it was decided to eliminate the factory's boiler house, which also supplied heat to the neighbouring housing estate, the district heating system had to be modernised. The housing estate and the remaining industrial facilities earmarked for further use had to be connected to the municipal district heating system. This is an example of the comprehensiveness of the liquidator's task; it shows that the undertaking incorporated social aspects, exceeding the liquidator's legal responsibilities.

The rehabilitation of the vast areas of the settling ponds was one of the most important tasks under the comprehensive plan to decommission the factory. The process, which began in 1989, was completed in June 1995. The work included leveling the pond embankments, reshaping and protecting the waste heaps, placing topsoil and preparing the land for sowing grass. The rehabilitation also included laying drains to remove water from the waste heaps. Finally, an area of about 80 hectares was reclaimed and made fit to be adapted for recreation purposes. At the same time, the Zakrzówek Quarry was reclaimed to extend the existing recreation area of the Twardowski Cliff Park located near the city centre; the park gained new green areas and a lake with clean, clear water.

The environmental part of the decommissioning cost 10,207,000 Polish zloty, of which 68.2% was financed by the company under decommissioning, 23.3% by the National Fund for Environmental Protection and Water Management, and the remaining 8.5% by the Provincial Fund for Environmental Protection and Water Management (Poda, 1999).

3. Methods of developing post-industrial site

In contrast to the “white seas” and the Zakrzówek Quarry, whose further use as recreation areas was obvious, the area nearby the ex-works directly associated with its production was the subject of discussion, and various concepts of its future development were put forward. Among them, of particular importance were the studies and projects on Cracow Soda Works, commissioned by the Cracow Provincial Office, Department of Regional and Urban Planning Policy to the DDJM Architectural Office. The most favorable solution to managing this area would be selecting a strategic investor whose primary tasks would be to:

- assume full control of the land development process,
- ensure that the plans approved are closely coordinated,
- ensure high intensity of investment to enhance the value of the area,
- restrict public investment projects so as to minimize risks to the public budget.

Parallely, a physical development plan was prepared for the areas left by the Cracow Soda Works. The plan, which was ordered by the liquidator and approved by the City Council in 1994, identified the following land use areas: UC — commercial services, PU — production and storage, KP — transportation and parking facilities, and ZP — green parks. The fact that these studies were completed during the factory’s decommissioning made it possible to select an optimal transformation variant, and contributed to complete success of this highly complex and unprecedented undertaking. The decommissioning of the Cracow Soda Works was officially closed on 19 July 1996. In the final phase of its activity, i.e., in the fourth quarter of 1995, the decommissioning team was transformed into the Cracow-South Investment Zone, an autonomous division of the Cracow Regional Development Agency S.A., whose primary task was to ensure a smooth transition from the decommissioning phase to the phase of comprehensive development of the reclaimed land and restored buildings.

In 1996, an international tender was bidden and it stipulated that the only form of using the land should be through lease, whose period would depend on the value of the investment planned. The chief criteria for evaluation were:

- the magnitude and type of the planned project,
- compliance with the existing land development plan,
- the architectural merits of the planned facilities and infrastructure,
- the number of jobs guaranteed,
- the project’s environmental impact,
- the proposed lease terms and conditions,
- the project’s usefulness to the Cracow urban area and region.

The winning proposal came from the French company Carrefour, which acted together with local Polish investors, and the facilities were sited on 17 hectares; they consist of three main buildings totaling about 50,000 sq. m., a system of car parks with 2,000 spaces, a service station, etc. The work began with a detailed study of hydrogeological conditions and soil. Due to unfavorable hydrogeological conditions, especially the high level of very chemically active ground water, and the occurrence of non-native soil, the ground was compacted by the Menard method, more effective and more economical than commonly used pilings.

The preserved group of the factory's oldest buildings, a monument of industrial architecture, has been skillfully incorporated in the new structures of the Shopping Centre and, in addition to its commercial functions, will be used as exhibition space presenting the history of the soda manufacturing in Cracow. The adaptation and restoration of these buildings were done under the supervision of the Provincial Heritage Conservator in Cracow. An additional component of the landscape around the commercial facilities is a historic Burchard compressor, easily seen even from far away, recalling the industrial tradition of the area, an unquestionable attraction in its new setting. One of the greatest achievements of the continuing development of the former Cracow Soda Works area is that it has restored the former level of employment. In its peak prosperity period, the Cracow Soda Works had 1,500 employees; today, the companies operating there are already giving employment to 2,000 people (Poda 1999).

The method of developing the former Cracow Soda Works area combined all the strategic goals of development in Cracow Province, i.e., labor market expansion, protection of the natural environment, modernization and expansion of the technical infrastructure associated with effective physical planning, and also promotion of Cracow and the region.

Conclusions

After World War II, the industrial development in Cracow became very active — some plants were modernised, some others were built, and many of them established a new industrial area through spatial expansion. In the longer period that caused a negative influence on natural environment, so Local Development Plans had to be prepared with consideration of proecological solutions as a priority.

Cracow has about a 4% potential of domestic industry; here still are located the biggest one Steel Works (Huta Tadeusza Sendzimira, HTS) established in the 1950s as a nucleus for heavy industry in this region, and many other plants, and eventually, this caused a great number of technical, technological and ecological threats. The scale of environment degradation is significant, taking into consideration only 1,000 ha area of direct influence of Steel Works and 3,000 ha in its protective zone. One of the solutions for that area is establishing of Special Economic Zones which, after necessary rehabilitation, are designed for technological parks and attract foreign investors. Currently, three Zones operate within

the city, its area totaling up to 101 ha, of which 35 ha is located on the site of former HTS Department of Fertilizers Production. This mostly rehabilitated area (there are some left buildings) is currently partly used by R.R. Donnelly, but still expects new investments.

The introduction of heavy industry to Cracow unbalanced its urban natural shape — created the district of Nowa Huta (New Steel Works), and this moved the development axis of the city. To sustain the urban core, the space between Cracow and Nowa Huta (as in North and South directions) started to fill up, but also surroundings the former industrial plants. The experience from Solvay development including the idea to design features an innovative combination of modern and traditional forms, with several old industrial buildings is a good example for creating a new interesting and unique town planning scheme, with a new quality on the Cracow landscape.

Moreover, there are also a lot of advantages convincing to invest in Cracow — its location, communication access, permanent development and a great potential of human resources. According to its academic history, it is a city with a number of famous universities (Jagiellonian University, University of Mining and Metallurgy, Cracow Technical University, Academy of Economics, Agriculture University) and nearly 150,000 students in 2002 and about 5,000 professors and assistant-professors. As far as historical monuments are concerned, there are 192 churches, monasteries and other religious buildings, 87 palaces and manor houses, 112 parks and gardens. Moreover, there are over 9500 industrial enterprises registered in Cracow, of which the largest are: Huta Sendzimir, Tele-fonika Kable S.A., Delphi Automotive Systems Polska, Can-Pack S.A, Electroheating Cracow S.A., Linde Gaz Polska (UM 2003).

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ZARZĄDZANIE OBSZARAMI POPRZEMYSŁOWYMI NA TERENIE KRAKOWA

Słowa kluczowe

Surowce przemysłowe, obszary poprzemysłowe, zrównoważony rozwój

Streszczenie

Dynamiczny rozwój miasta Krakowa w XV—XVII wieku był związany m.in. z działalnością górniczą prowadzoną w okolicach miasta, tj. górnictwem soli oraz cynku i ołowiu. Na początku w XX wieku działalność przemysłowa i górnicza przeniosła się bliżej centrum miasta. 1 czerwca 1906 roku rozpoczęto bowiem produkcję sody w fabryce o nazwie B&W Liban — Fabryka Produktów Chemicznych w Podgórzu, a wydobycie potrzebnych surowców mineralnych prowadzono w kopalni odkrywkowej kamienia wapiennego „Zakrzówek”. Długoletnia działalność zakładów — oprócz korzyści ekonomicznych — wywarła znaczący negatywny wpływ na środowisko. Sposoby likwidacji, rekultywacji i rewitalizacji z uwzględnieniem aspektów społecznych, finansowych i środowiskowych tych terenów zostały przedstawione w niniejszym artykule.