“POST-MINING REALITY” in Western Europe: Selected Collieries in Belgium and France Following Discontinuation of Coal Mining

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Abstract. There are numerous areas in Europe that were developing and functioning based on traditional industries, such as coal mining. These include among others: The Ruhr and Saar Coal Basins in Germany, Upper Silesia in Poland, Limburg in Holland or Nord-Pas-de-Calais in France. The spaces of industrial regions and cities, including those related to coal mining, have undergone a fundamental metamorphosis following the economic transformation which – in western Europe – started in the second half of the last century. A vast majority of collieries have been shut down and joined the group of former industrial facilities of great adaptation potential, commonly referred to as brownfields. The article contains a concise analysis of the condition of former mining facilities in two countries in Western Europe – Belgium and France, as well as a synthetic evaluation of the significance of these facilities for contemporary urban spaces. The discussion has been based on the Author’s field research carried out in August 2017, focused on now defunct collieries that have been adapted to serve new public utility functions. The primary objective of the research was to diagnose the following problems related to the development of former mining facilities and grounds, with special focus on the complexes of shaft headframes and their accompanying dumps: a. the contemporary practical significance of adapted collieries; b. spatial and compositional role of former mining facilities; c. how the surviving collieries affect preservation of the identity of cities and regions historically related to coal mining. The above problems have been discussed on the basis of and illustrated with the examples of former Belgian collieries: “C-Mine” in Genk and “Bois du Cazier” in Marcinelle, as well as two collieries in France, in the Nord-Pas-de-Calais region: “Delloye” in Lewarde and “Dourges” in Oignies. The conclusions stemming from the conducted research and the article itself may prove useful in evaluation of the results of actions undertaken in relation to the shut-down collieries. They may also provide a good starting point for similar research in other mining regions in Europe, particularly in the areas where the process of the mining industry transformation is still in progress or has only just begun.

1. Introduction
In April 1951, representatives of France, Belgium, Holland, Luxemburg and Italy, as well as the then existing West Germany, established the European Coal and Steel Community (ECSC), thus initiating the process of integration of the western European countries that has been continuing until today. The community was, in principle, to achieve important political goals, and the tool for achieving the said goals was cooperation in the area of economy that would engage Germany – ruined in the war. As the name of the organization and the content of its founding treaty [1] suggest, the emphasis in integration of Western Europe was placed on heavy industry – steel metallurgy and other related sectors. The impulse for development of metallurgy triggered the increased demand for coal and iron – raw materials indispensable for steel manufacture. In the period when coal mining industry was most active, there were numerous underground
collieries operating at full steam in the member countries of the European Coal and Steel Community\textsuperscript{1}, most of them situated in the area stretching from the western Lands of West Germany, through some parts of Luxembourg, Belgian as well as Dutch Limburg, all the way to Lorraine and Nord-Pas-de-Calais in the north-eastern France.

The prosperity of the West European coal mining industry lasted only until the late 60s of the previous century, when the trend to reorient the economies of the countries of Western Europe first began to take shape, and – gradually – they departed from the traditional sectors of industry and shifted the focus towards an economy based on innovation, knowledge and environmentally friendly technologies. The above developments, accompanied by rising operational costs, competition from fossil fuels imported from abroad and the growing pressure from environmental movements led to stagnation of the West European coal mining industry in the late 20\textsuperscript{th} century and – later on – to its complete regression.\textsuperscript{2} The decline of the mining industry entailed closing of the collieries hitherto remaining in operation. The liquidation process affected virtually all coal mining industry in France and the Benelux countries, as well as in Germany, where only two underground collieries have survived until today – one in Bottrop (the Ruhr Basin) and one in Ibbenbueren (North Rhine-Westphalia), both planned to be closed down in 2018.

Despite permanent cessation of any industrial operation, some collieries have physically remained at their sites and thus joined the stock of degraded areas requiring intervention, often referred to as “brownfields.”

The degree of preservation and actual use of these collieries, as well as the role they play in creating the space and maintaining the cultural identity of the cities and regions traditionally associated with coal mining, is called “POST-MINING STATUS” by the author.

2. The scope and method of research

The author’s field research conducted in recent years in the Western European countries have unambiguously demonstrated that the most frequently adopted approach towards defunct collieries is their complete liquidation, i.e. filling up the underground working areas, complete demolition of the facilities above ground and re-cultivation of dumping grounds. In the majority of cases, former mining facilities, mostly large-scale buildings within the former headframe complexes, have been left without any new function, or they have been adapted for activities without any connection to mining. Only in a few cases could we observe certain attempts to re-use defunct collieries by their revitalization, which is understood by the author as adaptation to various public utility functions based on making use of and displaying the preserved cultural values originating from their former industrial operations. The article discusses this method of contemporary reconstruction of liquidated collieries as representatives of a numerous and internally diverse group of elements of the “brownfield” type.

In his research into the above problem, the author has focused on selected areas which could be summarized in the form of the following basic questions:

- What is the present practical significance of former collieries, in particular – what is the scope and manner of their adaptation for public utility functions?
- What spatial and compositional role do the preserved former mining facilities play?
- What is the significance of the preserved collieries in the social sphere and how do they affect maintaining the cultural identity of the cities and regions historically connected to coal mining?

Looking for answers to thus formulated questions was the essence of the field research work carried out by the author in July and August 2017 in the area of the West European underground coal mining. Four defunct collieries, at present adapted to new functions, had been selected for a more detailed study (cases I – IV), i.e. two Belgian collieries: “C-Mine” in Genk and “Bois du Cazier” in Marcinelle near Charleroi, and two facility complexes in the French region of Nord-Pas-de-Calais: “Delloye” in Lewarde and “Dourges-Fosse 9-9bis” in Oignies. The field research included: direct exploration of the facilities in the aspect of their present function, form, condition and scope of transformation as well as its scenic and compositional significance, detailed photographic documentation, study of the historic background of founding and transformation of the collieries, as well as analysis of the available source materials, maps and planning documents. The selected collieries could be treated as representatives of a larger group of revitalized former

\textsuperscript{1} From 1958 onwards, the European Coal and Steel Community acted under the name of the European Economic Community (EEC).

\textsuperscript{2} French coal mining industry was at the peak of its productive powers in the late 50s of the 20th century, extracting 29 million tonnes annually. Only a third of this amount was being extracted in the 70s. The mining sector regression was related to the implementation of economic plans (Jeanneney Plan of 1960 and Bettencourt Plan of 1968) aiming to limit the increasingly less profitable exploitation of the coal deposits in the country, mostly in the regions of Nord and Pas-de-Calais [2, p. 10, 13].
mining facilities, of which there are more in Western Europe – apart from the aforementioned ones, there are also e.g. “Careau Wendel” in Petite-Roselle (France), “Zollverein” in Essen (Germany), or “Bois-du-Luc” and “Blegny” in Belgium. Therefore, a synthesis of the research results offers a number of universal conclusions referring to the method of transforming the liquidated underground collieries aiming at post-industrial adaptation to public utility functions.

3. Case I – “C-Mine” colliery in Genk, Belgium
The city of Genk, situated in the Belgian province of Limburg (Flanders), entered the phase of dynamic growth in the early 20th century following the discovery and subsequent extraction of rich deposits of coal. The underground extraction of the source material was carried out from 1917 by the colliery called “Winterslag,” which reached its peak productivity levels in the 60s [3]. Mining operations were definitively terminated in 1988, and at the beginning of the present century, following filling-in of the underground working areas and partial demolition of the above-ground infrastructure, the site was transferred to the municipality of Genk as degraded former industrial area.

The historic rank of now defunct “Winterslag” and its good accessibility resulting from its location close to the centre of Genk induced the city officials to undertake action aimed at revitalisation of the preserved headframe of the colliery and to regenerate and develop its accompanying dumping grounds. The oldest parts of the colliery, now renamed “C-Mine,” were covered by legal protection as national heritage and systematically adapted for public functions related to the mining origin of the place (Figure 1).

![Figure 1](image1.jpg)

**Figure 1.** The preserved shaft frames of the former “Winterslag” colliery in Genk, seen against the background of the historic mining facilities, at present adapted to public functions in the cultural and educational centre “C-Mine”

![Figure 2](image2.jpg)

**Figure 2.** Interior of one of the original buildings of the now defunct colliery – a multifunctional post-industrial space used for exhibitions, conferences, as a restaurant and for recreation

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3 Two extraction shafts situated at the site of Winterslag were the oldest and the newest in Belgian Limburg, built in 1916 and 1963, respectively. For this reason, the colliery could be considered to be a facility offering a generous insight into the coal mining history in Belgium (based on [4]).

4 The site of the colliery is located at a motorway junction and the national road N76, the strict city centre is merely 3 km away, to the north-west.

5 The contemporary name of the colliery – “C-Mine” was selected in a competition. Letter C comes from the English word creativity, and it refers to the creative and innovative manner of reconstruction and redevelopment of the former mining facilities.
The former power plant and one of the hoistroom buildings have been arranged as exhibition spaces, where exhibits and modern art pieces (paintings, drawings, photographs and sculptures) are presented among original appliances and technological installations. The unique industrial interiors also house an educational trail, conference rooms, cafés and restaurants, as well as cozy and intimate areas for relaxation, games and play (Figure 2). The redevelopment plan of the headframe area featured introduction of contemporary architecture into the historic scheme of industrial facilities, including among others a building for an art school (LUCA School of Arts) offering higher education courses of animation, industrial design, photography or multimedia, as well as a steel labyrinth built at the foot of one of the shaft frames to celebrate the tenth anniversary of creation of the “C-Mine” centre.

4. Case II – colliery “Bois du Cazier” in Marcinelle, Belgium

The colliery in Marcinelle near Charleroi is a unique facility in the sense of its history and contemporary significance. “Bois du Cazier” was established in 1822, i.e. long before founding the European Coal and Steel Community, yet the colliery achieved its peak extraction levels in the 50s of the previous century. A particularly memorable moment in the history of “Bois du Cazier” was the 8th August 1956, on which day 262 miners died underground in consequence of a fire [5, p. 2]. The liquidation process was commenced in 1961, and the colliery was finally closed nearly seven years later. The preserved headframe of the mine was entered onto the list of national heritage in the 90s, and soon after actions were undertaken to revitalise the defunct mining facility. In March 2002, owing to the efforts of the specially established special purpose foundation and financial support from the European Union, “Bois du Cazier” was opened as a public utility facility. The main profile of the contemporary operations of the colliery is the museum housing exhibitions related to the regional industry, i.e. coal mining, steel metallurgy and glass manufacture. The headframe area also features a specially arranged site for cultural events and a number of elements commemorating the tragic incidents of 1956. An important component of the colliery redevelopment plan are clusters of arranged greenery and the dumps, neighbouring on the historic facilities, now turned into a strolling area and a scenic viewpoint.

Figure 3. The site of the revitalised colliery “Bois du Cazier” in Marcinelle. The dominant feature still remains the historic headframe with two hoist towers facing each other.

In 2012, the revitalised colliery “Bois du Cazier” was entered onto the UNESCO List, it was also included in the European Route of Industrial Heritage (ERIH) – alongside the most valuable and best known European former industrial facilities [6].
5. Case III – colliery in Lewarde, France

Colliery “Delloye” (the region of Nord) is representative of a numerous group of facilities working on coal deposits in the French regions of Nord and Pas-de-Calais, which stretch in a 120 km long band the width of which reaches a dozen or so kilometres at certain places. Similarly, to “Bois du Cazier,” the greatest productivity of “Delloye” was observed in the mid-20th century, although the facility started its industrial operations before the 2nd World War. Due to the low profitability of mining, resulting – among others – from the geological make-up of the local deposits, the colliery in Lewarde was closed in 1971 and soon after it was selected to become the site of a mining history centre of regional rank [7]. The facility was put into public use already in 1984 as Centre Historique Minier Lewarde (the Mining History Centre in Lewarde).

The adaptation of the former mining facilities preserved their original spatial layout, architectural form and building materials. At the same time, it added some contemporary elements: a glass and steel structure housing an exhibition space in the central part of the shaft building as well as a new reception pavilion (Figure 4).

Figure 4. Inner courtyard surrounded by historic mining facilities adapted for the needs of the regional museum – view from a walking bridge on the visiting trail around the above-ground part of colliery “Delloye” in Lewarde.

The revitalised colliery in Lewarde is now performing the function of a museum and an additional tourist and educational function, co-realised by three institutions: the mining museum (Le Musée), the archive centre for documents related to the mining operations in the area of Nord-Pas-de-Calais (Le centre d'archives et de ressources documentaires) and the centre of research on energy (Le Centre de Culture Scientifique de l’Énergie) [8]. The facilities open for visitors include rooms with exhibitions presenting the 300-years-old tradition of coal mining, technological appliances and the buildings of the former colliery – the pulley cloakroom, lamp room, the hoist engine hall, stables and the coal sorting hall. A unique element of the services offered by the colliery is the underground tourist trail taking visitors around parts of the preserved working pits, the only attraction of this type in the whole region.

6. Case IV – colliery in Oignies, France

The last of the presented examples is the French colliery “Dourges” in Oignies (region of Pas-de-Calais), or – more precisely – a part of it: a development scheme at two defunct mining shafts labelled with numbers 9 and 9bis (“Fosse no. 9-9bis). The colliery, which reached its maximum productivity in the 50s of the previous century, terminated its industrial operations in December 1990 – as the last mine in the northeastern France [9]. The preserved facilities in headframe 9-9bis, recognized as part of the national historic heritage owing to, inter alia, the efforts of former miners, were covered, in 2003, by a comprehensive reconstruction plan featuring transformation of the former industrial facilities into a modern cultural centre offering various forms of activities related to music, education and promotion of the region’s cultural heritage (Figure 5).
Figure 5. A complex of headframe facilities of the former colliery “Dourges” in the French town of Oignies. On the right – shaft buildings 9 and 9bis, built in the 30s of the 20th century, on the left, further in the background – a contemporary facility called Métaphore, put to use in 2013.

The heart of the revitalised colliery is the building called Métaphore – a contemporary facility erected in the vicinity of the historic headframe buildings, housing a concert hall for a thousand listeners and rooms for music workshops. Architectural solutions applied in Métaphore may be considered innovative. The façades of the building, adequately shaped and made of multi-coloured materials (glass, wood and corten steel), play the function of musical instruments emitting sounds characteristic of the organ, drums, xylophone and cymbals (Figure 6).

Figure 6. The multi-coloured facade of Métaphore, closing off the view from one of the park alleys in the area of the revitalised headframe site of the “Dourges” colliery.

Figure 7. The historic building in the area of headframe complex “9-9bis,” adapted to the contemporary needs – an example of combining historic industrial facilities with contemporary architecture, characteristic of the French model of former mining facilities revitalisation.
The program of rebuilding the "Dourges" colliery provided for a new use of the preserved headframe facilities “9-9bis” and their accompanying auxiliary buildings. The pulley cloakroom and the shower room now house a small auditorium and professional recording studios (l’Auditorium), halls for music rehearsals (Les Studios), places for realising projects combining music and dance (Le Balatum), and conference facilities in the former boiler room (Les Chaufferies). The space between buildings has been turned into a park, blending with the greenery of the neighbouring miners’ housing estate (built in line with the garden city concept) and the forested area of the former dump (Terril no. 110). In 2012, the revitalised area of “Dourges”, together with its accompanying dumps and historic miners’ housing estate, was entered onto the UNESCO list in the category of evolving cultural landscape.

7. Results and discussions
The author’s field research at the sites of former collieries in the area of Western Europe – two in Belgium (“C-Mine” in Genk, “Bois du Cazier” in Marcinelle) and two in France (“Delloye” in Lewarde and “Dourges” in Oignies) enabled exploration and evaluation of some problems characterising the condition referred to by the author as “POST-MINING STATUS.” All the analysed examples were related to redevelopment of liquidated underground mines by adapting them to various public functions – in each case placing the emphasis on and making full use of the preserved cultural values resulting from the mining past. The collieries presented in the article are thus representatives of a numerous and internally diversified group of regenerated former industrial facilities, previously considered to be "brownfield.” It should be stressed at this point that adaptation of the liquidated underground collieries to public utility functions is not a standard or universal approach. Usually, facilities of this type are completely liquidated and their above-ground buildings remain unused or transformed in a way degrading the existing values. The basic data characterising the four studied facilities have been presented synthetically in the table (Table 1).

Table 1. Basic data characterizing the defunct collieries covered by the author’s field research in Belgium and France in 2017

| No. | Name of the colliery | Country, city, (region) | Location in relation to the neighbouring city or town | Year | Dominant function after the facilities had been adapted | Development | Approx. annual number of visitors |
|-----|----------------------|-------------------------|-----------------------------------------------------|------|------------------------------------------------------|------------|---------------------------------|
| 1.  | „C-Mine” (Winterslag) | Belgium, Genk (Limburg) | within a big city, near the centre                     | 1917 | culture, art, education, museum function, entertainment | yes no      | 800 thousand                     |
| 2.  | „Bois du Cazier”      | Belgium, Marcinelle near Charleroi (Hainaut) | in the outskirts of a big city | 1822 | museum function, art, culture                        | yes no      | 50 thousand                      |
| 3.  | „Delloye”             | France, Lewarde (Nord)  | in a distant vicinity of a small town                 | 1931 | museum function, art, tourism, science               | no yes      | 150 thousand                     |
| 4.  | „Dourges” (Fosse no 9–9bis”) | France, Oignies (Pas-de-Calais) | in the outskirts of a small town | 1930 | art, culture, education                              | yes no      | no data                         |

A number of observations and conclusions may be drawn from the research results synthesis, referring both to the method and to the consequences of the actions undertaken with the aim to revitalise defunct collieries in Western Europe. The author has classified the results of his research into three basic groups referring to: the function (usefulness, accessibility), the space (structure, form and composition) and vitality and identity (social and cultural significance, continuation of tradition).

7.1. Conclusions and observations related to the functional aspects
The analyzed collieries differ as to the time when they started their industrial operations ("Bois du Cazier" was the oldest – established in 1822, and “Delloye” – the newest, from 1931), but the important thing is that the peak levels of coal extraction in all these collieries were observed in the 50s and 60s of the 20th century
and they were related to coal mining intensification in the countries associated within the European Coal and Steel Community. The processes of economic restructuring going on in these countries forced them to terminate coal mining operations and the collieries were liquidated as industrial plants (“Bois du Cazier” was first again – 1967, and “Dourges,” closed in 1990, was the last functioning colliery in the region of Nord-Pas-de-Calais). The fates of these collieries show that coal mining cessation was a turning point in their history, initiating the process of redevelopment aimed at adaptation of the facilities to public utility functions, which is one of many ways of dealing with the problem of liquidated collieries considered degraded post-industrial sites. It must be stressed that the time lapse between the industrial function termination and complete restructuring of the colliery in the post-industrial phase, encompassing actions in the aspect of space, technology, economy and legal standing, may vary considerably. In the case of the Belgian “Bois du Cazier,” it took 35 years, whereas in the remaining facilities – only 13 years.

In all the discussed cases, the revitalized collieries were turned into multi-functional facilities, whose contemporary operations are visibly connected with mining tradition and which, in principle, offer free access to the redeveloped buildings and areas. The primary directions of the functional adaptation include: culture, art and museum functions, complemented with other services: education, science, recreation, entertainment, gastronomy and small-scale retail. A special role is played in this respect by exhibitions encompassing both presentation of original objects coming from the period of active mining operations (machines and appliances, archival documents, photographs, maps etc.) and of modern art pieces displayed in industrial interiors: paintings, drawings, sculpture, photography, audio-visual art and industrial design.

The scope of adaptation in the case of all the discussed collieries was not limited to buildings but also encompassed the accompanying open areas, most frequently arranged as parks, sites for organizing events and open-air exhibitions, playgrounds and educational trails. In most cases (“C-Mine,” “Bois du Cazier” and “Dourges”) the system of open grounds also incorporated the former mining dumps, which – following re-cultivation and partial development – offer places for recreation and scenic viewpoints. At the same time, only one of the four analyzed collieries (“Delloye” in Lewarde) offers parts of its preserved underground corridors for visitors as a tourist attraction. In the remaining collieries, the former working pits have been completely filled in and permanently eliminated as spaces of potential utility.

7.2. Conclusions and observations related to the aspects of space
As refers the spatial aspect, the discussed collieries may be viewed in two perspectives: local – analyzing the layout, form and scenic as well as compositional significance of components within the revitalized headframe schemes, or broader – taking into account the relations of the former mining areas and facilities with its surrounding environment, primarily their neighbouring cities or towns. Considering the urban context, it must be noticed that the four analyzed cases differ fundamentally as to their links with urban space. Whereas “Bois du Cazier” and “Dourges” are situated in the outskirts of urban schemes – a big city (Charleroi) and a small town (Oignies), respectively, “C-Mine” is a part of a big city structure (Genk), and “Delloye” lies at a small distance from a town (Lewarde). Relations of the collieries with urban development and proximity of urban schemes seem important from the point of view of how attractive these facilities appear to the city or town inhabitants. They are also significant for scenic relations and urban space composition, since former mining facilities, in particular large-scale buildings and hoist towers – characteristic of underground collieries, may play the role of local dominant features, accents, perspective closures and landmarks.

In the local perspective, the areas of revitalized headframe schemes are, in the author’s opinion, a specific space of confrontation in the field of urban design and architecture, where original mining facilities enter into complex relations with newly added contemporary elements. As regards the studied collieries, it could be said that the structure and spatial organization of the facilities making up the headframe schemes have not been drastically transformed in the process of their revitalization. In all four cases, the reconstruction plan featured introduction of completely new components as free-standing structures or as parts of the original buildings constituting their horizontal or upward extensions. In the architectural creation, the contrast between the old structures and the new contemporary additions is clearly visible – both in the aspect of form and the used building materials. It is particularly striking in the facilities in France, particularly in “Dourges” adapted for a music center. The newly built facilities are characterized by high quality in the aspect of aesthetics, structure and building materials; they also feature solutions that may be considered innovative, e.g. the sound-emitting façade of the Métaphone building in Oignies. Attention to adequate standards is also discernible in development of the open areas accompanying the headframe facilities, which are saturated
with modern urban detail in the form of carefully designed and executed paving, greenery, water and light features and public space furnishings. At the same time, the revitalization plans make use of the original facilities, the great number of which have been covered by legal protection as heritage components. The buildings of great historic value, primarily headframe buildings, have been preserved, restored and revitalized in their original architectural form, materials, colors and detail. Functional adaptation of former industrial interiors has preserved most of the original furnishings, including appliances and technological installations, related to the former mining function. Thus, the new functions, e.g. displaying modern art, have acquired unique scenery, such as the former power plant or hoistroom in the Belgian colliery “C-Mine”.

7.3. Conclusions and observation related to vitality and identity
Apart from functional and spatial aspects – undoubtedly most important from the viewpoint of an architect and urban planner – there is also the cultural and social role of the revitalized collieries, which must not be overlooked. The considerable numbers of tourists visiting the adapted facilities every year prove that these sites are still alive and engaged in many types of public activities. Each of the four collieries plays the role of an important center of services in the regional scale and a place integrating their local community, the arena for city life – mostly owing to the cultural events, workshops and educational as well as entertainment-related activities that take place there. For this reason, the revitalization of the discussed collieries may truly be seen as bringing these facilities back to life (revitalization = regaining vitality). Redevelopment of a defunct colliery, which – in some cases – has ceased its industrial operations after several hundreds of years of continuous mining, also has a symbolic dimension since it helps to maintain a deeply rooted tradition and enables preservation of the cultural identity based on mining history.

Considering the contemporary utility appeal and spatial assets of the four collieries presented in this article, it could be said that they may undoubtedly be viewed as added value. They are also of key importance for maintaining the mining tradition and identity of the cities and regions which used to be related to industrial coal mining in the past, even though now they base their growth on other foundations. From this point of view, redevelopment of defunct collieries – aimed to adapt them for public functions and, at the same time, to put the preserved cultural values to use, may be considered the optimal approach towards facilities of this type, in spite of all the obvious problems (technical, economic, legal and others) that may accompany the process of reconstruction and redevelopment of liquidated collieries. This conclusion seems important for the areas where the process of the mining industry restructuring is in progress or will soon begin, and the collieries ceasing active mining operations will become elements of the “POST-MINING” reality.

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