

BULETINUL INSTITUTULUI POLITEHNIC DIN IAȘI  
Publicat de  
Universitatea Tehnică „Gheorghe Asachi” din Iași  
Tomul LIX (LXIII), Fasc. 3-4, 2013  
Secția  
HIDROTEHNICĂ

## A NEW CAPITALIZATION OF SLAG HEAPS, FROM A SUSTAINABLE DEVELOPMENT PERSPECTIVE

BY

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Received: September 09, 2013

Accepted for publication: November 26, 2013

**Abstract.** In the context of complex actions on environment protection and capitalization of natural resources, this paper highlights certain opportunities provided by the slag heaps for the prosperity and dynamics of certain localities or areas where these are located. It is mentioned that these opportunities can be considered as interactive and indispensable components for a sustainable growth. Special references area made to the slag heaps related to the mining coal field industry in Charleroi region, Belgium.

**Keywords:** slag deposits; protection; stability; environment.

### 1. Introduction

The mining activity has left behind traces which shapes the landscape: the slag heaps. These have been sometimes erased, and sometimes capitalized and remodeled and wooded, or abandoned, forgotten and recovered by nature, or even by the inhabitants. Nowadays, the old mining basin is scattered with mounds more or less wooded. The name “Black country” tends to change.

“Some things are going to fall over”. The slag heaps became important supports of the positive identity and development of districts, of highlighting

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the different opportunities provided by the slag heaps for the redevelopment and boost of a town or region.

It is particularly based on key examples of revitalization of symbolic sites in our country and in the neighboring territories.

Above all, this refers to the ambition of bringing the potential public and/or private partnerships to perform a cross program of large scale regarding a chain of slag heaps, in the context of sustainable development.

When various organizations activate in parallel for developing and conducting projects at European level or more local action plans, it seems, on the contrary, that joint efforts would ensure a more fruitful basis for mobilization at all levels. The development of such project and raising funding at communal, province, regional or even European level as of 2007.

## 2. Territorial Approach: Scene of the Mining Basin

*In Europe, the “industrial growing”, a specific landscape which extends from London to Prague*

The coal is the result of fossilization of huge quantities of living plants, for more than 300 million years in the lagoons of North-Western Europe (Fig. 1), subject to tropical climate.

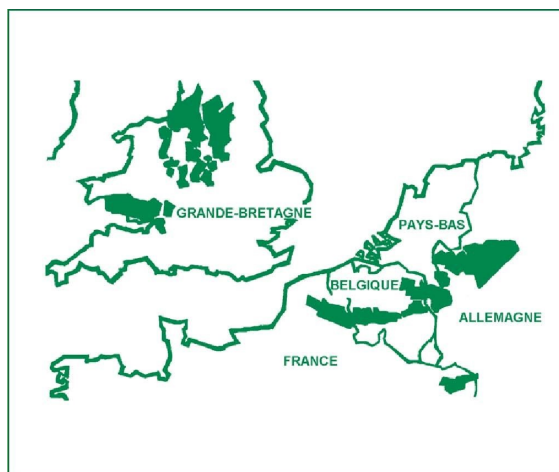


Fig. 1 Location of main oil deposits in North-Western Europe

Exploited since the Middle Age, the successive veins were the fortune of the Western countries at the beginning of the industrial revolution.

Two countries record this type of development: UK and Belgium.

The Walloon valley is covered with coal mines surrounded by mining estates and scattered with industrial castles. The region is prosperous and the overall economical benefits of the country are significant.

The exploitation techniques bring at surface the fuel, as well as the non-usable materials mixed with the coal. These residues are stored in the vicinity of the extraction areas and the materials deposit of deposit naturally set up a more or less high hill and more or less sharp, called slag heap or coal tip, depending on the region.

Upon discontinuation of the slag heaps loading, a new life begins for these abandoned debris, which are covered by vegetation, and sometimes turn into real forests in the middle of towns.

Nowadays, these represent the most visible relics of the mining exploitation and will remain there for long time. The slag heaps are considered as an essential connecting thread, appreciated within this mining region and for the entire history thereof.

### 2.1. Territory, Urbanization and Landscape of Charleroi (Belgium)

#### *The great landscape and geographical units*

A recent study of Conférence Permanente du Développement Territorial (CPDT) on the Walloon landscapes highlight the importance of slag heaps in the landscape of Charleroi agglomerations: “landscape of dense urbanization where the loud habitat and industry are intertwined with scattered slag heaps and green areas”.

It is true that, for few decades already, the slag heaps play an important role in this indispensable third dimension of the landscape composition. They point out the landscape, catching attention, closing the perspectives, enclosing the districts.

First of all they are reference points, which can be recognized by their size, shape and the characteristics of their vegetation.

Nowadays they are anchored in cross programs of Charleroi 2020 as *natural values o be preserved*. The slag heaps are transformed and improved, and become “eco-symbols”.



Fig. 1 – Images of tailings deposits.

Thanks to this rehabilitation, through the slag heaps the city of Charleroi recovers its past and even better, is anchored for the future.

The slag heaps become the expression of Charleroi and currently represent an ecological, landscape and environmental capital relevant as

freestanding in a range of approaches: sensitive, historical, sociological, nature-related, touristic, geographical.

The conjugation thereof can only be built across the concept of “*landscape ecology*”.

This concept should be implemented in the future analyses on the capitalization of slag heaps. The ecology of the landscape should apply with respect to each approach concerning a slag heap.

The ecology of landscape is an interdisciplinary orchestration, a “Russian dolls” analyzing method, enabling us to determine a diagnosis for various opinions.

## 2.2. The Landscape Charter

### *A tool specific for the sustainable development to be created*

In 1992, the Rio conference on environment and development attracted the attention of all countries on the decrease of biodiversity.

We consider that one quarter of the world biodiversity might be lost in the next 30 years, whereas 150 to 200 species disappear every year and 10 million of forest hectares also disappear every year. It was found concerning natural resources that the problem of biodiversity depletion was huge. If the biodiversity is endangered throughout the world, this could happen here as well.

Or, despite the obvious urban positioning, in Charleroi exist a large number of semi-natural environments which, currently, foster a botanical and faunal diversity. Among these areas listed by P.C.D.N., the slag heaps with significant areas have important functions in the ecological network and densely canvas the territory of Charleroi.

The slag heaps are perceived as “savage” and “natural” environments, fact that differentiates them from other green areas – parks and gardens – perceived as of an “organized” nature.

For about ten years, the concept of nature has widened and now also includes the slag heaps. The slag heaps, merely alone, have an important biodiversity capital. For instance: only at the slag heaps of Martinet à Roux, more than 200 plant species and 50 species of birds were listed, without counting the insects, amphibians and others. All 50 hectares are reclaimed by an original vegetation of various biotopes, wetlands, sources, pioneer and grassy areas, forest... so many different biotopes united as a whole.

The slag heaps, with the surface and volume, have a significant importance in the improvement of the biological and landscape diversity of Charleroi of Wallonia in general. The degradation of their landscape structure would automatically generate the loss of existing ecosystems.

Or, an ecosystem represents health and thus is sustainable. In a landscape marked by a hard industrial inheritance, the preservation of sustainable ecological health makes us think about the future preservation of slag heaps.

The Walloon region committed to implement the European convention on Open landscapes signed in Florence, on October 20, 2000, and ratified through a Decree on December 20, 2001.

The study of a landscape map of Charleroi will become a public action with various influences: the ecological knowledge, but also the history of the place, the singularities and diversity of the players; it is crucial to favor a shared and always renewed vision of the territory.

### 3. The Strengths of Slag Heaps

The slag heaps are everywhere, the clusters have a name: environmental strengths, living environment improvement, restoration of biodiversity, social cohesion and dynamics, touristic, patrimonial, cultural strengths. In this context, the roots of people and cultural landscapes remain deep and the family ties are obvious.

#### 3.1. Ecological Strengths

##### a) *Nature and city, a semi-natural environment*

With industry as root, Charleroi is currently covered by forests as a result of slag heaps. The slag heaps, symbol of the city, are servicing the general public. The slag heaps are taken over, inter alia, as usability places, participating in the animation of certain districts.

The Black Country is over, this is a world of forces and energies associated with reborn nature which states the living nature of the slag heaps.

##### b) *Richness and diversity of environments*

Wide and large spaces emerged from this artificial black slag dumps consisting of a mix of waste generated by the extraction of oil.

The slag heaps are expressive, they indicate the geography, the manifestation of life, flowers, insects, birds, rodents, plants, trees and reeds.



Fig. 2 – Images of deposits under rehabilitation.

Here take place many complex exchanges and influences. We are talking about the ecosystem of a slag heap.

The ecosystem of a slag heap depends on:

- the existing place and environment;
- the orientation and gradient of the slopes, the erosion or stability thereof, the humidity and texture of the soil;

The slag heaps, through their structure and morphology, represent a biotope with extremely special, sometimes rare microclimates.

c) *P.C.D.N. and the legitimacy of slag heaps protection*

Since 1998, four letters are recorded at the level of nature development in Charleroi : P.C.D.N., for the Communal Nature Development Plan.

This represents a response to a cry of alarm concerning the important losses of the biodiversity and the establishment of the 3 dimensions: economical, social and environmental of sustainable development.

In 1998, the city of Charleroi committed to take the way of P.C.D.N.

The city of Charleroi covers an area of 10,207 hectares for 15 old communes.

Despite the very urban nature thereof, this entity has an important and diversified natural patrimony.

One could say that Charleroi has the capacity of an ecological network and the natural patrimony is overall satisfactory and sometimes remarkable.

The old industrial sites and the old industrial lines, as well as the waterways hold a position of great biological potential.

It is important to identify long-term preservation solutions for these sites with such biodiversity.

### 3.2. Social Strengths

#### *The slag heaps and the catalyzing role thereof in the community social dynamics have shaped strong cultural identities*

The slag heaps represent indispensable borders between an industrial world and a residential district.

The fight for the preservation thereof as buffer area are pro rata with the height and the surface of these slag heaps.

The slag heaps, their slag heaps, become fundamental references in their “sanitary” balance, “ecological indicators”, in a district a bit “heckled” by the dust fallout, smells and vision of neighboring industries.

An original social action in response to the district needs was initiated by organizing horse riding courses, adjusted to an educational project on human respect for animals.

And the last, but not least aid was provided by the city of Charleroi by means of a gallop track on the slag heaps site of St Charles. This was possible following the permit to capitalize the slag heaps of St Charles and Bayemont issued to Société Exterbel, which was bound to implement compensatory measures such as the site sanitation, cleaning, supply of soil, leveling.

Mashed and locked up in the shade of slag heaps prior to the exploitation, the equestrian center and the road now benefit from an open space and a better accessibility.



Fig. 3 – The recreation area after rehabilitation.

The exploitation of slag heaps and the related consultative process were made public, generated a work of environmental comprehension and interpretation, source of collective mobilization for a better world and the improvement of their living environment.

The slag heaps are considered differently as landscape or gift of the nature. The wild life is considered as means of defense, is subject to elaborated inventories conducted by scientists. The slag heaps are green and should remain open to the district inhabitants.

In 1997, the city of Charleroi acquired the 52 h, preserved them as such prior to their classification as “nature reserve” and prior to classifying them in category A “unexploitable”. A new life begins, the one related to the promotion and arrangement thereof as an “eco-educational site”.

On the huge industrial part which still exists, Sambre, after few specific arrangements non restricting for the industry, but secure for the use of cyclo-pedestrians, might change the appearance and might reconnect with the trades and animations of the central city as well as with Maison du Hainaut (quay of Brabant) and Maison du Tourisme of Charleroi.

### 3.3. Touristic Strengths

Charleroi has a relatively recent touristic development compared to other Walloon cities.

Between the two great openings of the two delimitating streams, the industries in the center, the history of labor and the slag heaps thereof, the physiognomy of Charleroi has its contrasts. City of social nature, born during the industrial revolution, Charleroi intends to capitalize its present and laborious past by means of new touristic attractions.



Fig. 3 – The recreation and touristic area.

### 3.4. Patrimonial Strengths

a) *A landscape shaped by the industry, witness of the hard work and sweat, material component of the current society construction*

The density of slag heaps throughout the territory of Charleroi witnesses the intense mining activity with its peak in the 19<sup>th</sup> and 20<sup>th</sup> century. The deposit was distributed among various concessions, each with several pits. Most of the exploitation sites have been decommissioned in the '60s, the slag heaps remaining the sole current vestige.



Fig. 4 – Protection of vegetation on slopes.

Vegetation covered the shale, but the slag heaps are there as a witness of this glorious past and in the memory of people who made them. One should notice that the patrimonial interest of the slag heaps is recognized by the classification of some of them as sites in the context of monuments and sites protection policy: this is the case of St Charles (site of Bois du Cazier) and slag heaps of Martinet.



b) *Buildings of coal mining, infrastructures*

Classified as social patrimony (site and monument) and reinstated as museum of the industry (and also of glass), Bois of Cazier à Marcinelle should become an important touristic pole. This represents the most exhaustive local example of an ancient coal mining with the chassis with knobs, the establishments and pits heads thereof.

We should also mention the rehabilitation of old workshops and stores of coal mining of Monceau-Fontaine à Monceau-sur-Sambre through the actions of social economy.

c) *The habitat and places witness of the social movement*

The estates have traced the urban framework and in particular of the Charleroi city.

The mining companies undertake the edification of houses in order to accommodate the working population at the production locations.

Erected by the same promoter, these houses for workers have the same appearance, a sober architecture, few differences in terms of brick colors, for instance – and quality comes from the homogeneity of series instead of brutal transformations.

### 3.5. Cultural Strengths

The industrial landscape is quite present in the Museum collections.

Currently it is updated by artists sensitive to the identity of a region and to traces of industrial activity (slag heaps, former industrial sites and abandoned factories), left behind by one of the most extraordinary adventures of modern ages.

Following an exhibition organized in 2001, by the Museum of Fine Arts, on the topic “steel in sculpture”, a project of placing a monumental work of art on the slag heaps.



Fig. 5 – Cultural tourist area.

## 4. Conclusions

1. For certain countries, such as UK, Germany and the Netherlands, since the announced closure of coal mines, the authorities, without nostalgia, have programmed the scraping thereof and decided the reuse of the sites in a very diverse manner, for a new start.

2. Most slag heaps were capitalized or remodeled in order to merge and mingle with the environment landscapes.

The slag heaps became green areas and turned into parks sometimes on significant areas, with various purposes.

3. In other regions, as in France, the evolution of old “oil” companies generated the “regionalization” of many old mining sites and slag heap, fact that enabled the authorities to plan the future thereof with special attention.

4. For the chain of slag heaps of Nord-Pas-de-Calais region, the new stage of capitalization, social and environmental, consists of the importance granted to the candidature file of the mining basin for the international patrimony of UNESCO. The inclusion thereof in the big family of international patrimony would represent a label and an additional strength for the instauration of a collective preservation charter for the next years.

Many of the old coal mining companies turned into real estate agencies and other are undergoing liquidation or curatorship. The future thereof is uncertain and it is likely that these unprofitable formal industrial sites will be decommissioned and turned into green areas.

5. Knowing their due date would enable us to develop capitalization programs and would provide the time required for joining the competences of local associating dynamics.

6. The preservation of nature and landscape plays an important role because it guarantees biodiversity. This role should also be taken into consideration with respect to public actions.

7. The participation of citizens within the district committees and the affirmation thereof concerning the preservation and adoption of slag heaps. Anchored in the community, historical and cognitive life, this is defined as genuine social treasure which should be used as a criterion of democratic validity. These elements represent three interactive and indispensable components of sustainable development.

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## O NOUĂ FORMĂ DE VALORIFICARE A HALDELOR DE ZGURĂ, DINTR-O PERSPECTIVĂ DE DEZVOLTARE DURABILĂ

(Rezumat)

În contextul acțiunilor complexe de protecție a mediului și de valorificare a resurselor naturale, în prezenta lucrare se evidențiază unele oportunități pe care le oferă

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depozitele de steril pentru prosperitatea și dinamismul unor localități sau zone în care acestea se găsesc. Se arată că aceste oportunități pot fi considerate drept componente interactive și indispensabile pentru o dezvoltare durabilă. Se fac referiri în special la depozitele de steril aferente industriei miniere/carbonifere, din zona Charleroi, Belgia.

