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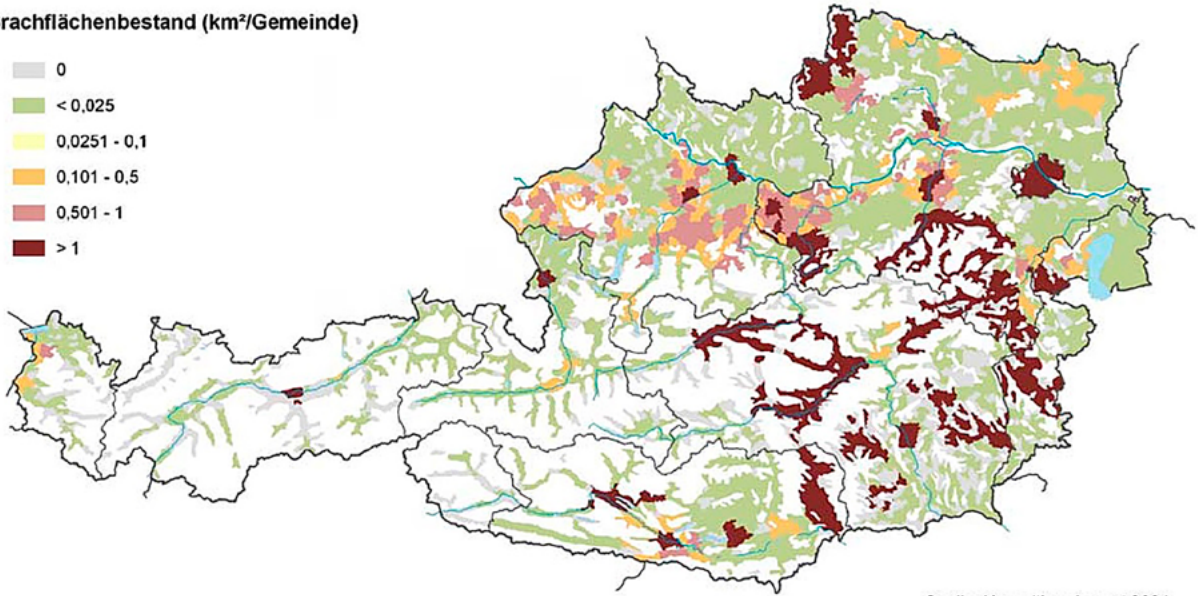
## Vienna–Budapest–Zagreb: Possibilities and Perspectives on the Residential Re-use of Central-European Industrial Heritage

**SUMMARY:** The development of industry in the Austro-Hungarian Monarchy has left a mark on the urban fabric due to the many factories and plants that were built at the time. These buildings were later abandoned during the process of de-industrialization, which left a number of spaces idle and empty (*brownfields*). This paper examines the attitude towards the industrial heritage of the Austro-Hungarian Monarchy in the cities of Vienna, Budapest and Zagreb, on the basis of six selected examples. The main focus of the research is residential re-use carried out on the industrial complexes in Vienna and Budapest, which could serve as a positive example and contribute to the future discussion on the revitalization of similar cases in Zagreb.

**KEY WORDS:** industrial architecture, revitalization, re-use, brownfield, residential re-use, Austro-Hungarian heritage, Vienna, Budapest, Zagreb

The starting point of the research<sup>1</sup> is the industrial heritage of the Austro-Hungarian Monarchy: specifically, selected buildings in Vienna, Budapest and Zagreb, which were the results of the process of industrialization at the end of the 19<sup>th</sup> century and the beginning of the 20<sup>th</sup>. The process began in Vienna around the 1830s, in Budapest around the 1840s, and, finally, in Zagreb in the 1860s. Another significant process is de-industrialization, which in Vienna started around the 1970s, and in Budapest and Zagreb about twenty years later. Hence, as a consequence of the processes of industrialization and de-industrialization, there are numerous abandoned industrial spaces that are often referred to as industrial heritage or brownfield sites.

As stated by ICOMOS, industrial heritage “consists of sites, structures, complexes, areas and landscapes as well as the related machinery, objects or documents that provide evidence of past or ongoing industrial processes of production, the extraction of raw materials, their transformation into goods, and the related energy and transport infrastructures”.<sup>2</sup> Similarly defined are brownfields, which belong to a notion of wider semantic scope, since they are not limited solely to former industrial areas. However, the term is still “not unequivocally defined by law at the level of the entire European Union”.<sup>3</sup> It is used to describe “previously urbanized and built, but neglected and degraded urban spaces that cover a wide range of locations of different sizes and positions in the city. Furthermore, it is

Brachflächenbestand (km<sup>2</sup>/Gemeinde)

Quelle: Umweltbundesamt 2004

1. Map of brownfields in Austria in km<sup>2</sup>/municipality, 2004 (THALER, THALHAMMER, 2008, 6)  
Karta *brownfield* površina u Austriji u km<sup>2</sup>/općina, 2004. (THALER, THALHAMMER, 2008., 6)



2. Gasometer complex in Vienna, aerial view, 2019 (© City of Vienna / Christian Fürthner, <https://www.wien.gv.at/english/viennafromabove/simmering/?i=14>, 25/04/2021)  
Kompleks plinomjera u Beču, zračna snimka, 2019. (© Grad Beč/Christian Fürthner, <https://www.wien.gv.at/english/viennafromabove/simmering/?i=14>, 25. 4. 2021.)

characterized as a space that is still determined by its former purpose, or the former purpose of the immediate environment, and as a place of actual or possible contamination, often by the manufacture processes that took place there”<sup>4</sup>

Abandoned areas that are referred to as brownfields are being re-used in the following ways: 1) by adapting the existing complexes to new functions, and 2) by means of complete destruction and replacement with new constructions. The problems associated with such projects

are similar throughout, with Vienna, Budapest and Zagreb sharing some of them. However, the question poses itself of how certain communities respond to these problems. The problems that directly affect the identification of an individual object as heritage and its preservation or, on the other hand, demolition include: a lack of reliable brownfield data, no clear administrative procedures and government programmes existing to handle brownfields (which issue, together with the lack of a master plan for cities, results in decisions usually being made on a case-by-case basis), ownership structure, funding, soil contamination, remediation costs, and opposing interests of different parties (political, economic stakeholders, experts and the local community).<sup>5</sup>

This paper analyses industrial-heritage revitalization, with emphasis on residential re-uses, which have been performed in Vienna and Budapest, and therefore could serve as positive examples, contributing to the further revitalization of industrial complexes in Zagreb. Six representative buildings in Vienna, Budapest and Zagreb have been selected as comparative examples and case studies, according to geographic, temporal and ‘building type’ criteria, which have a great impact on the results of residential revitalization.

### Industrialization and de-industrialization processes in Vienna

As the capital of the Austro-Hungarian Monarchy, Vienna experienced a phase of important growth in the second half of the 19<sup>th</sup> century. Numerous representative buildings that provide important landmarks of the unique character of the present-day city were constructed, and the economic changes brought by industrialization led to a rapid increase in the population. These processes followed a complete reshaping of the city’s urban fabric.<sup>6</sup> However, Vienna cannot be defined as a typical ‘industrial city’, since – throughout history, and especially during the Austro-Hungarian Monarchy – the primary goal of rulers and influential figures was to make the city known worldwide for its culture and charm.<sup>7</sup> Still, industrial complexes existed, but were, accordingly, built on the outskirts of the city, together with housing for industrial workers.

The processes of tertiarization and de-industrialization in urban areas throughout Europe intensified in the 1970s, when cities whose economic structure was strongly characterized by the leading sectors of the Industrial Revolution suffered major losses under new work organization. The shift from primary and secondary activities to the tertiary sector can also be traced during that time in Vienna. (Since 1971, employment in the tertiary sector has increased by 36%.<sup>8</sup>) As the new booming sector created new areas of growth within the city, de-industrialization left behind vast brownfield sites, and urban



3. Gasometer complex in Vienna, interior of Gasometer C (<https://www.wehdorn.at/projects/gasometer/>, 17/08/2021)  
Kompleks plinomjera u Beču, unutrašnjost plinomjera C (<https://www.wehdorn.at/projects/gasometer/>, 17. 8. 2021.)

regeneration has developed as a major issue of planning in recent decades.<sup>9</sup>

The German term *Brachfläche*<sup>10</sup> is used in Austria to address brownfield sites, even though it is not clearly defined, and it covers a broad field of meaning: derelict land/site, vacant land/site and/or brownfield site.<sup>11</sup> According to the research conducted in 2004 by the Federal Environment Agency, Austria had about 130 km<sup>2</sup> of brownfields, or approximately 3,000 to 6,000 abandoned sites (Fig. 1).<sup>12</sup> Due to the lack of large industries, the number of industrial brownfields and related problems in Vienna is relatively low in comparison to the rest of Austria. What is more, in contrast to Eastern European cities, in Vienna and some other Austrian cities a lot has already been invested at an early stage in the modernization of industry in order to avoid environmental problems.<sup>13</sup> There are a number of projects in Vienna that have achieved international recognition at the European level, thus contributing to a positive image of the city.

#### GASOMETER

Gasometer,<sup>14</sup> one of the most famous industrial complexes in Vienna, is located in Guglgasse, in the 11<sup>th</sup> District (*Simmering*), in the south-eastern part of the city. It is one of



4. Transformation of Anker Bread Factory in Vienna, 1891-2017 (<https://www.ankerbrot.at/ankerbrot/firmengeschichte>; © Klaus Pichler / Brotfabrik Wien, <http://www.brotfabrik.wien/en/area/press.html>, 27/04/2021)

Transformacija Tvornice kruha Anker u Beču, 1891.-2017. (<https://www.ankerbrot.at/ankerbrot/firmengeschichte>; © Klaus Pichler / Brotfabrik Wien, <http://www.brotfabrik.wien/en/area/press.html>, 27. 4. 2021.)

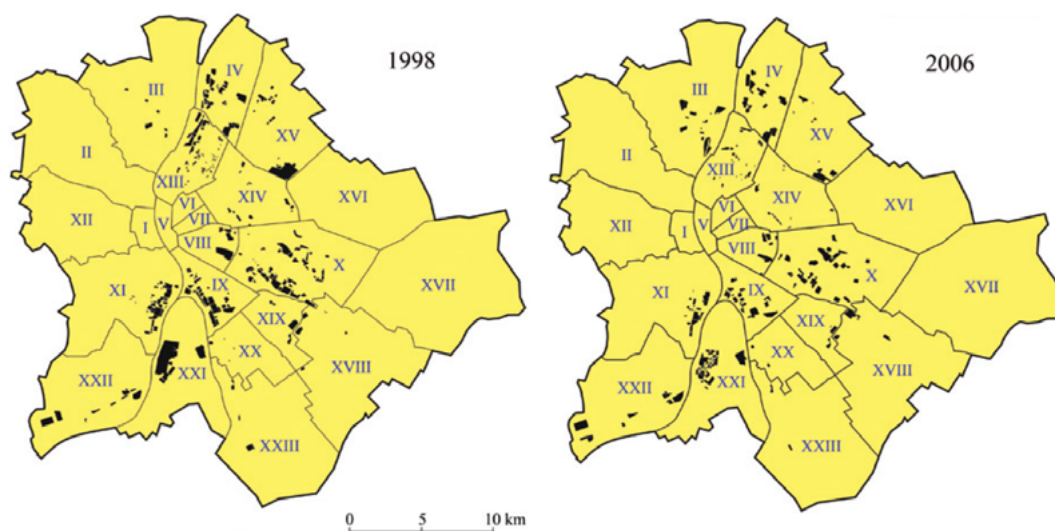


5. The Loft City redevelopment project / Anker Bread Factory in Vienna (© Loft City GmbH & Co KG, <http://www.loftcity.at/index.php/lofts-loftcity/projektbeschreibung-loftcity>, 27/04/2021)  
Projekt obnove Loft Cityja/Tvornice kruha Anker u Beču (© Loft City GmbH & Co KG, <http://www.loftcity.at/index.php/lofts-loftcity/projektbeschreibung-loftcity>, 27. 4. 2021.)

the city's older industrial areas, and was, at the turn of the century, outside the wealthy and luxurious city centre; and still, today, many industries call Simmering their home.<sup>15</sup>

The complex (Fig. 2) occupies an area of 22 ha and consists of four former gas tanks which originally belonged to the Simmering gasworks (*Gaswerk Simmering*). The construction began in 1896 and was completed by 1899, when, for the first time, hard-coal gas flowed from the Simmering gasworks into the 700 kilometres of pipelines that supplied gas to the inner districts of Vienna and the 20<sup>th</sup> District. During that time, it was Europe's largest gasworks. Because of the ever-growing population of Vienna, gas consumption increased soon after the completion of the tanks, so that the plant had to be constantly expanded. Around 1945, natural gas also began to be used in Vienna, and during the 1970s the city was completely converted to pure natural gas. The four gasometers, with their brick outer shells, were placed under monument protection in 1978,<sup>16</sup> and they are still protected.<sup>17</sup> After the gradual introduction of modern gas-storage technologies, the four gas tanks were taken out of service in 1985/1986.

In 1996, the City of Vienna initiated a revitalization of the abandoned industrial complex in order to create a new residential area. For this purpose, renowned architects were hired (Jean Nouvel for Gasometer A, Wolf D. Prix and Helmut Swiczinsky of the Coop Himmelb(l)au firm for Gasometer B, Manfred Wedhorn for Gasometer C, and Wilhelm Holzbauer for Gasometer D).<sup>18</sup> Restoration and redevelopment began in 1999 and was completed by 2001. Thereby, the distinctive brick facades and roof forms have been preserved, while the interior (Fig. 3) of every gas tank incorporates different facilities: flats on higher storeys, offices on intermediate storeys, and various amenities (large event hall, 12 cinema halls, shopping centre, municipal archives, student dormitory, day-care centre) on lower storeys. Thus, every gas tank was given its own unique identity, and the entire complex functions as a 'city within a city'. Numerous new amenities have also provided a significant number of new workplaces. The Gasometer complex today houses around 1600 tenants, and it functions as a workplace for about 600 employees.<sup>19</sup> This urban-renewal effort has greatly improved the living standard of the area in general. The adequately-solved ownership issue and the possibility of securing financing through a private-public partnership<sup>20</sup> significantly contributed to the success of this renewal project.<sup>21</sup> The innovative achievements of the architects have transformed the former gas tanks into a residential and commercial complex, but at the same time they have managed to preserve its identity. Thus Gasometer has also become a generator of urbanity on the south-eastern outskirts of Vienna, and one of its most famous landmarks, which should be used as a reference for the future management of industrial heritage.



6. A comparison between brownfield areas in Budapest between 1998 and 2006 (KISS, 2019, 167)  
 Usporedba *brownfield* područja u Budimpešti između 1998. i 2006. (KISS, 2019., 167)

### ANKER BREAD FACTORY (ANKERBROT FABRIK)

The Anker Bread Factory (Fig. 4) (*Ankerbrotfabrik*) was a bakery located in the southern part of Vienna: in Absberggasse, in the 10<sup>th</sup> District (*Favoriten*), which has the largest population, but remains one of the poorest districts in the city.<sup>22</sup> In 1891, brothers Heinrich and Fritz Mendl founded the bakery, and Friedrich Schön, a leading industrial architect at the time and a student of Theophil Hansen, was employed to build its industrial complex. He designed a complex that occupies an area of 6.8 ha in a U-shaped manner, including a *Schwarzbäckerei* (bakery dedicated to baking only brown bread), a storeroom, a garage, a stable, and residential and office buildings as well. The fundamental structure consisted of brick facades and central walls, which was typical of the buildings constructed in Favoriten around the turn of the century. The company grew and, in just 10 years, became the biggest bakery in Europe. Furthermore, during the First World War, it was one of the most important food suppliers. Even then it had 100 branches and 2000 employees.<sup>23</sup> After multiple ownership changes and economic struggles over the years, the Anker Bread Factory was bought by the Ostendorf family. With the new owners came an extensive restructuring programme, which led to the abandonment of the historical part of the bread factory. This abandoned building, despite being placed under monument protection,<sup>24</sup> faced demolition, but it was saved in 2009 when the *Loft City GmbH & Co KG* company acquired it.<sup>25</sup>

The 'Loft City'<sup>26</sup> redevelopment project (Fig. 5) has been implemented in an area of 1.6 ha, while, thanks to advancements in technology and logistics, the *Ankerbrot AG* production still continues in the rest of the complex. The built-up area is split into 12 buildings located around two large courtyards, which were restored as authentically as possible after the demolition of the subsequently

inserted structures. The new spaces are intended for representatives of creative industries and feature halls, galleries, studios, offices and restaurants, as well as lofts of different functions and sizes.<sup>27</sup> The project is characterized by great flexibility. The investors have only partially restored the buildings, and the lofts feature only minimal design, so users can develop their own personal style and adapt the space according to their means and needs.<sup>28</sup>

### Industrialization and de-industrialization processes in Budapest

Although the first industrial plants were established in Budapest in the 1830s,<sup>29</sup> significant industrial development took place between the Reform Era and the Compromise (1848–1867). At first, the River Danube played a major role in the development of industrial areas, before being replaced by the railway.<sup>30</sup> By the end of 1848, four industrial zones had been formed: North Pest Zone, North Buda (*Óbuda*) Zone, South Pest<sup>31</sup> Zone near the Danube, and *JózsefvárosKőbánya* Zone, the only one in whose creation the railway played a major role.<sup>32</sup>

By the end of the following stage of industrial development (1867–1896), two new industrial zones had emerged in the city of Budapest, both in suburban areas (*Csepel*, *Budafok*). In this period, huge industrial development took place, and the manufacturing industry was born.<sup>33</sup> Industrial expansion is related to the general industrial and technological progress of Europe, and with the terms of the Austro-Hungarian Compromise, which enabled Hungary to successfully export its agricultural products to the West.<sup>34</sup>

The greatest industrial development in Budapest happened in the period between the Millennium and the peace treaty of Trianon (1896–1920). Railway lines and railway stations were fully completed, Budapest was



7. Gizella Mill in Budapest, poster, 1925 (Archive of the Ferencváros Local History Museum, Budapest)  
Mlin Gizella u Budimpešti, poster, 1925. (Arhiva Zavičajnog muzeja Ferencváros, Budimpešta)

united, and the housing districts of the expanding city pushed the industrial areas on the outskirts. By the end of this period, the city of Budapest had five industrial zones in the city, and four in the suburban areas, which “drew visible and marked lines on the map of Budapest, shaping industrial districts and industrial suburbs, whose extension has changed only a little since then”.<sup>35</sup>

The fall of the Berlin Wall in 1989 marked the end of the socialist period in Hungary and the establishment of the Republic of Hungary, which made an impact on the de-industrialization process: Hungary opened up to foreign investments and a greater import of goods, which can be considered as the beginning of capitalism. Consequently, almost half of the factories in Budapest ceased to exist, which raises the question of utilization of abandoned industrial plants. Intense re-utilization of the former industrial areas in Budapest occurred at the end of the 20<sup>th</sup> century and the beginning of the 21<sup>st</sup> (Fig. 6). Therefore, the inherited ‘industrial areas of the greatest extension’ were considered to have great potential.<sup>36</sup>

These projects are financed mostly by private investors, combining domestic and foreign capital. Given that industry in Budapest was extremely well-developed, today we can recognize the former industrial belts (*rust belts*) – areas, wider than in Vienna and Zagreb, where, on the

other hand, industrial complexes were created individually. Re-use of former industrial plants is related to the area or expansion of the brownfield site; therefore, entire districts in Budapest became residential or business zones (e.g. the 3<sup>rd</sup>, 9<sup>th</sup> and 13<sup>th</sup> Districts), which is evident in the following examples.

#### GIZELLA MILL

At the time of the Austro-Hungarian Monarchy, the milling industry flourished in Budapest. Hungary “was the largest flour exporting country in Europe, and Budapest was the biggest milling town of the world”.<sup>37</sup> The Gizella steam mill (Fig. 7) was built in 1880, and it remains one of the 19 large mills in Budapest that once dominated the urban landscape.<sup>38</sup> It is located in the modern 9<sup>th</sup> District (*Ferencváros*), where, together with the 3<sup>rd</sup> and 13<sup>th</sup> Districts, significant investments in the development and construction of residential areas were planned in 2006. One of the largest of such investments was the conversion of the Gizella Mill, where about one hundred flats were built.<sup>39</sup>

During the period of greatest prosperity (the first half of the 20<sup>th</sup> century), the mill employed 400 people and produced 140 million kilos of flour.<sup>40</sup> After the First World War, Hungary lost many coal mines, which reflected



8. Gizella Mill in Budapest, 2017 (<http://www.theoldmillbudapest.hu/gal%C3%A9ria>, 09/08/2021)  
Mlin Gizella u Budimpešti, 2017. (<http://www.theoldmillbudapest.hu/gal%C3%A9ria>, 9. 8. 2021.)

negatively on those plants that were supplied with coal. The Gizella Mill therefore switched to electricity, thus successfully surviving the crisis. The Gizella Mill remained operational after the Second World War, since it was not damaged during the war.<sup>41</sup> The mill was closed in 1963, when it lost connection with the railway, due to new transport infrastructure. During the following decades, the main building was used as a warehouse, continuously degrading. To this day, only the main building has been preserved, having been converted into residential premises. Therefore, the former Gizella Mill is now a loft containing 104 luxury flats (Fig. 8).<sup>42</sup>

The mill was under protection until 2000, and remained vacant until 2009, when the re-use project, by the famous Hungarian architect József Finta, was completed. The underground floor contains 104 garage spaces and warehouses serving the catering facilities on the ground floor. The ground floor features residential and service spaces (catering facilities, a fitness studio, shops), while nine exclusively residential floors are located above. The building is organized around a central atrium with a glass roof to provide natural light for all flats. The flat types are loft and duplex (mostly one-bedroom or two-bedroom flats), and the spaces inside the south and west towers are also residential. The height of the ceilings in

some flats reaches up to five metres,<sup>43</sup> making the space extremely flexible and suitable for tenants who can organize it according to their own needs.

#### RIVERLOFT

Due to the investments in Budapest's former industrial districts, the former Gasworks warehouse Riverloft has been transformed into a residential and office building.



9. Riverloft complex in Budapest after reutilization project (© Tamás Bujnovszky, <http://www.kozti.hu/en/munkak/riverloft-apartment-and-office-building/>, 06/10/2021)  
Riverloft kompleks u Budimpešti nakon projekta ponovne uporabe (© Tamás Bujnovszky, <http://www.kozti.hu/index.php/2007/07/11/riverloft/?lang=en>, 6. 10. 2021.)







11. Paromlin complex in Zagreb, 1861 (Photo library of Zagreb City Museum, MGZ-fot-6371)  
Kompleks Paromlin u Zagrebu, 1861. (fototeka MGZ)

Regarding the ownership-structure problems mentioned above, it is interesting that eight of the re-used sites had private owners. The transformation models differ from business or mixed to social and public purposes. The sites owned by private investors belong mostly to the business or mixed-use categories, although there are some exceptions (Rudolf Barracks, owned by the State and City of Zagreb, or the Lauba Gallery, owned by a private company).<sup>53</sup>

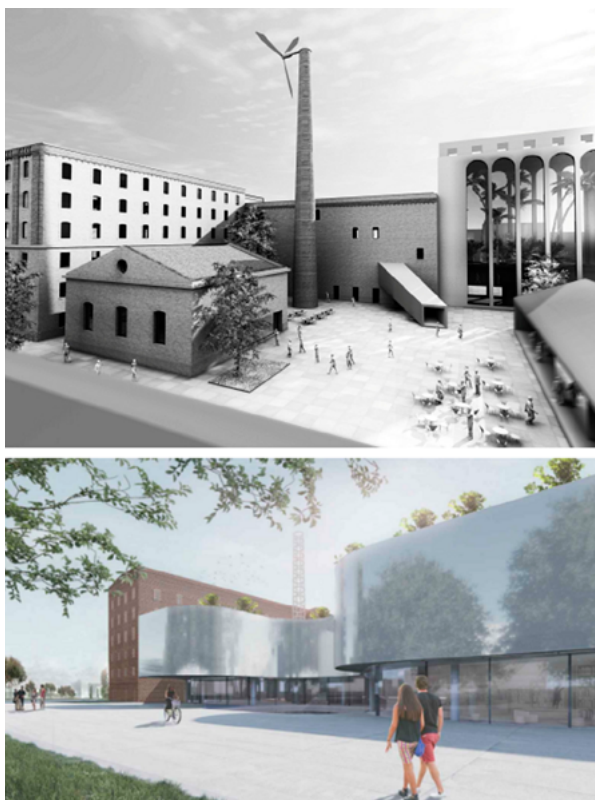
#### PAROMLIN

The Paromlin mill is considered to be the first Croatian large-scale industrial complex, and one of the most important monuments of Zagreb's industrial architecture (Fig. 11). It was built in several phases (1862–1906, 1907–1925, numerous additions being made during the 1960s)<sup>54</sup> and many prominent Croatian architects participated in its construction (Janko Jambrišak, Gjuro Carnelutti, Hönigsberg & Deutsch, Štefan & Kalda, Janko Holjac, Josip Dubsky).<sup>55</sup> The preserved architecture that was constructed by the mid-1920s represents an important site in the context of Croatian architectural heritage and in the field of industrial archaeology.<sup>56</sup>

At the time it was built, Paromlin was located on the city's outskirts. However, due to the urban expansion occurring over the years, Paromlin is now located in the city centre, bordering the Paromlinska and Trnjanska streets, the Koturaška street and the city's main railway station. It is located on "an extremely important junction line between the Zagreb Lower Town (*Donji grad*) and the neighbourhoods in Novi Zagreb".<sup>57</sup> Its position



12. Paromlin complex in Zagreb, 2021 (photographed by the authors)  
Kompleks Paromlin u Zagrebu, 2021. (fotografirali autori)



**13.** Projects for Paromlin Baths (NFO architects, K. Marunica and N. Ravnić, 2010, up) and City Library of Zagreb – Paromlin (UPI-2M architects, 2018, <https://upi-2m.hr/gradska-knjiznica-paromlin/>, 24/04/2021, down)

Projekti za Paromlin kupalište (NFO arhitekti, K. Marunica i N. Ravnić, 2010., gore) i Gradska knjižnica Zagreb-Paromlin (arhitekti UPI-2M, 2018., <https://upi-2m.hr/gradska-knjiznica-paromlin/>, 24. 4. 2021., dolje)

could be perceived as part of a new urban concept of city development. It could form a new green outline, extending from Lenucci's Horseshoe with public buildings,<sup>58</sup> among which the Vatroslav Lisinski Concert Hall and the City Hall stand out, together with the Gredelj complex on the east side.

Despite its position in the city centre, the once impressive industrial complex of Paromlin has now degraded (Fig. 12). Part of the complex is used as a car park, and valuable facilities (a transmission building, a flour warehouse, a silo, a single-storey office building and a main administrative building) still exist, though unused and in a dilapidated condition. Some degraded residential buildings in the Koturaška and Paromlinska streets and on the outskirts inside and outside the spatial scope of the complex are also in use. However, the collapse of the south wall of the mill building due to a large amount of snow in early 2013 was just one of the indicators of Paromlin's devastation.<sup>59</sup>

In 2004, the Ministry of Culture of the Republic of Croatia registered Paromlin as cultural heritage owned by the City of Zagreb. The Paromlin complex is one of

the first modern industrial plants that became a focal point of the general modernization and development of the City of Zagreb. Technologically advanced structural solutions, such as a load-bearing metal skeleton and a reinforced-concrete silo construction, demonstrate that industry in Zagreb has kept up with modern trends and innovative engineering solutions. Although the metal structure used in its construction at the beginning of the 20<sup>th</sup> century was in use throughout the 19<sup>th</sup> century, the reinforced concrete structure made by the famous builder Josip Dubsy is not only the first such known structure in Croatia, but also one of the first implementations of reinforced concrete in general.<sup>60</sup>

Although Paromlin was exposed to numerous historical, political and ownership changes, it was used as an industrial plant until 1988. Afterwards, a variety of new functions were proposed, namely as the Technical Museum, Gallery, and Museum of Contemporary Arts. The damage caused by fire in 1988 made the building dangerous to use, which attracted various potential investors who were interested in demolishing Paromlin to obtain vacant land in an attractive location.<sup>61</sup> Furthermore, there have been other revitalization ideas, such as using the building as a State Archive, business centre, hotel,<sup>62</sup> thematic park, facilities intended for entertainment, culture, service and shopping and a conference hall.<sup>63</sup> None of these proposals has been implemented, although we would like to point out two, due to their interesting features and importance (Fig. 13). Project 'PAROMLIN: change of face' of 2010 by NFO Architects (Kata Marunica and Nenad Ravnić) envisioned the complex as city baths. The latest project, 'Zagreb City Library – Paromlin', by UPI-2M architects, won the first prize at the last tender in 2018.<sup>64</sup> The latter project plans on maintaining Paromlin's architectural structure, thus also preserving its historical, symbolic and artistic values. Given that the new buildings would be lower than the older ones and would adapt to their position, the contemporary architecture would not overpower or disrupt the industrial architecture, and the ambiental value would remain preserved, as well. The use of glazed facades represents a significant and interesting visual contrast to the old buildings. On the other hand, using this solution for the facade brings a risk of perceiving the new space as cold and inaccessible. The construction of the new City Library has not yet begun, but, according to announcements from the City of Zagreb, the project is ongoing. Recently, a board containing project information was placed in front of the western façade of the silo building.

#### 'BUBARA' SILK FACTORY

The 'Bubara Royal Silk Factory' (Fig. 14) was one of the first complexes built in present-day Trešnjevka, a district that once formed the outskirts of the city. As is the case

with the other factory buildings from the time of early Zagreb industrialization, Bubara was built near the railway and the present-day Zagreb West Railway Station (*Zapadni kolodvor*), in the Adžijina street.<sup>65</sup>

Bubara was built in 1892 as the successor to the previously-built silk factory in the Preradovićevea street (formerly called *Svilarska*, or *Silkworker Street*).<sup>66</sup> The project and its construction were entrusted to the construction company Hönigsberg & Deutsch.<sup>67</sup> The Bubara complex consists of a building with an office and a superintendent's flat, a dryer, and, as the most prominent object, a two-storey storage unit for silkworm breeding.<sup>68</sup> All the buildings are still visible today, but, unfortunately, they are empty and abandoned ruins in extremely poor condition.

Unfavourable economic conditions and unprofitable production caused the cessation of Bubara's functioning, and in 1938 the complex was leased to the Zagreb Aero Club, which used it to hold piloting courses and build gliders. For these needs, the facilities were renovated with minor adjustments. After the Second World War, the former industrial complex became the property of the Taxi-remont company, which still exists today, but is not active, and its only possession is Bubara. Since then, the remains of the complex have been used as a set for filmmaking; in the mid-1990s it served as the first Zagreb squat, which, after shutting down, left the complex completely empty and abandoned. Today it is occasionally used only by the homeless.<sup>69</sup>

The Bubara industrial complex is currently not protected as cultural heritage in any way.<sup>70</sup> The reasons for this would probably lie in the long-term ruinous condition of the complex, the lack of original equipment and inventory, and, unfortunately, in the declining recognition of the original artistic characteristics. However, through observation of the former silk factory from several different aspects, the necessity of its preservation becomes clear. Dinko Duančić and Pia Sopta have highlighted this fact, correctly recognizing the values of the complex. Among them, the historical value stands out, since Bubara is one of the first factories created along the railway, and it was built to take over the position of the leading silk factory in Zagreb and Zagreb County. Its importance in the history of the development of the city and the area of Stara Trešnjevka is visible in the fact that, despite the devastation, it still remains in the minds of citizens as one of the most important factories from the first phase of industrialization in Zagreb. The social value of Bubara is reflected not only in the people who worked in it and lived from it, but also in their descendants, which can be very important for its reconstruction and re-use, on which various civil initiatives could have a great impact.<sup>71</sup>

In addition to this, in the context of present-day Zagreb, it is an extremely favourable location in the wider city centre, which fact has resulted in the public's interest



14. Bubara factory in Zagreb – a comparison between 1900 (Photo library of Zagreb City Museum, MGZ-fot-11849) and 2021 (photographed by the authors)  
Tvornica Bubara u Zagrebu - usporedba između 1900. (fototeka MGZ) i 2021. (fotografirali autori)

in the fate of the complex. Its economic value and ability to attract investors who could finance the possible renovation and redevelopment have also been recognized.<sup>72</sup> Therefore, it would be a shame not to mention an interesting student project designed by Hana Golubovac Ehrenfreund and Irma Šmuc of the Faculty of Architecture in Zagreb. During their course on architectural design, the students proposed a revitalization and re-use project for the Bubara complex that implements residential, office, commercial and recreational spaces (Fig. 15).<sup>73</sup> This scenario could be a successful solution to the devastation of the former royal silk factory.

## Discussion

For better understanding, requirements and results of residential conversion in selected cities will be presented in the form of a table (Table 1).

Interestingly enough, neither Vienna nor Budapest has a precise brownfield register (while Zagreb does). Urban planning is generally being taken into account only in Budapest, while Vienna and Zagreb tend to deal with problems of industrial brownfields on a case-by-case basis.

**Table 1.** Requirments and effects of residential re-use of industrial heritage (made by authors)

Uvjeti i učinci ponovne uporabe industrijskog naslijeđa u stanovima (autori)

RESIDENTIAL RE-USE	Brownfield register	Urban planning	Private investors	Needs of local community	Preserving identity	Coexistence between old and new	Sustainability	Affordability
Vienna	-	-	+/-	+	+	+	+	+
Budapest	-	+	+	+/-	+	+	+	-

Gizella Mill, Riverloft and the Anker Bread Factory have been financed by private investors, while income for the Gasometer project has been assured through public-private partnership. The last model seems possibly the best solution for Zagreb's cases, because the City still has its interests and plans for some of the industrial complexes, especially Paromlin, but insufficient funds and will to carry out the projects on its own. Redeveloping brownfields is extremely important and crucial to meeting the needs of the local community as well; of the examples selected, the best reference in this context is the Anker Bread Factory. Taking into account that the 10<sup>th</sup> District is one of the poorer districts in Vienna, the project has had a significant impact on local residents and young people who do not have many options for leisure and education, with its goal being the involvement of the local community to a greater extent, as well.

Every one of the examples from Vienna and Budapest has successfully preserved at least its former architectural



**15.** Reutilization project of former Bubar factory in Zagreb, H. Golubovac Ehrenfreund and I. Šmuc, Faculty of Architecture in Zagreb, academic year 2013-2014 (<https://vizkultura.hr/bubara/>, 26/04/2021)

Projekt ponovne upotrebe bivše Tvornice Bubar u Zagrebu, H. Golubovac Ehrenfreund i I. Šmuc, Arhitektonski fakultet u Zagrebu, akademska godina 2013.-2014. (<https://vizkultura.hr/bubara/>, (26. 4. 2021.)

forms and facades, which serve as a visual reminder of the former industrial use. Gizella Mill and Riverloft both were multistorey, monoaxial buildings, which made spatial transformation easier to achieve – with minimal interventions like balconies, vertical access and windows, it was possible to make the space functional. In cases where new architectural structures were added (Riverloft, Gasometer B) a balance has been achieved, yet the contrast between old and new is still emphasized. In the case of the Anker Bread Factory, parts of the complex were restored as authentically as possible. Preserving identity is extremely important for the preservation of historical, aesthetic and artistic values. Furthermore, a certain period of the city's past is documented and can be transferred to future generations, thus keeping the collective memory alive. Achieving coexistence between old and new was most successful in Riverloft, while the Anker Bread Factory and Gasometer B are quite satisfactory as well. Sustainability was met in all the examples from Vienna and Budapest. As far as affordability is concerned, in Gasometer there are not only high-quality flats, but also a student dormitory, and the Anker Bread Factory buildings were only partially restored, and the lofts have only minimal design. This has enabled cheaper adaptive re-use and lower selling prices. On the other hand, some flats in Riverloft are up to three times more expensive than the average flat in the 13<sup>th</sup> District, making them unavailable to people with lower income.

### Concluding remarks

Continuous and rapid growth and development of cities is increasingly suppressing the once important industrial complexes, and many of them are left to ruin. Although the topicality of this problem in Zagreb is shown in the examples of the industrial monuments of Paromlin and Bubar, there are many more real examples waiting for more concrete consideration of revitalization: the Gredelj industrial complex, the Badel block and the Nada Dimić factory are just some of them.

Brownfield analysis should involve a multidisciplinary approach enabled, for example, by methods based on the *Heritage Urbanism* (HERU) project.<sup>74</sup> Analysing Paromlin and Bubar in this way, one notices the great interest of citizens and society in general in their destiny, because

they are precisely the factors of the city's identity and have exceptional ambiental, aesthetic and spatial values. Paromlin and Bubara are also factors influencing the development of the city during the 20th century, because, from the very beginning, they have been the drivers and generators of urban fabric in certain parts of the city and have clearly influenced its image. In addition to spatial factors of identity, it is necessary to determine the criteria for new interventions and use, among which the solution of economic and legal issues is especially important, because their deregulation generally prevents the necessary action on buildings, which has been the case in both Zagreb examples. Methods and models of evaluation, planning and design should be based on maximum respect and efforts to maintain the original structures of the complex in which new functions would be introduced in a harmonious way and, if necessary, new facilities would be built. As scenarios, i.e. possible solutions to the problem of devastation of these, and also other, industrial monuments of uncertain fate, we propose a complete or partial conversion to a residential function. In order for this to be possible, it is necessary to carry out constructive repairs, given that the plants are currently in a dilapidated condition, which makes lengthy stays in them impossible, followed by re-use and renovation in accordance with the newly planned function.

The examples of the revitalized and re-used Gizella and Riverloft mills in Budapest, as well as the Anker Bread Factory in Vienna, can serve as good comparative examples and role models for rethinking the Paromlin complex. Although the milling industry was one of the most important industries at the time, it seems that complexes that prove this are still not recognized as identity factors in Croatia, unlike Austria and Hungary, which seek to preserve them and make them sustainable. On the other hand, considering the former function of Riverloft, which was a warehouse, there is a thought that this could be a reason and/or 'excuse' for the neglect and possible demolition of the building. On the contrary, the city of Budapest has recognized the potential for its preservation, which has enabled the achievement of historical stratification and ambience in the city and contributed to the perception of the city as a pleasant place.

However, we must mention potentially dangerous consequences of residential re-use. Despite the success of the projects, the question arises of their impact on the local community and the consequences they have brought. One of the negative aspects is the possibility of a gentrification process, because luxury flats and other amenities (like restaurants, cafes and shops) are pushing away the local population, who can no longer afford to live in such areas. The case of Bubara, i.e. the entire district of Trešnjevka, supports this claim. Trešnjevka was actually created as a workers' settlement south of the railway, but as early as

the 1990s and early 2000s it became the wider centre of Zagreb. Its once indigenous working-class population was forced to sell their family homes, which were then demolished so flat buildings could be constructed in their place. Since former industrial complexes can become a stimulus to such processes, it is necessary always to take their locations and immediate environments into account.

So why is residential re-use of industrial architecture lacking in Zagreb, and why has this possibility been marginalized so far within the framework of really numerous proposals and tenders? It is probably a combination of various factors that always linger with these topics, but are, for some reason, ignored and still remain unresolved. In addition to the systematic lack of adequate management and care for industrial heritage, there is a problem of the predominance of the private interest over the public, i.e. the relation between private and public ownership and financial interest, which ends up being much more important to certain parties than heritage preservation. Furthermore, there is the problem of an attractive location, which can be seen as a double-edged sword, because the great potential of exploitation attracts those investors who see ruinous remains of industrial monuments as an eyesore and who would rather have an empty plot ready for new construction. However, the greatest question is the current model of industrial-heritage management, or whether it exists at all, since access to industrial heritage in Croatia includes lack of supervision and slow law enforcement, which are two major culprits of the current situation. The planning that is mostly used is very outdated, superficial and on a case-by-case basis, and wider urban units and the spatial context of individual industrial monuments are not being taken into account, although they are inseparable from it. Another problem is the insufficient awareness of the importance and potential of industrial heritage in urban and economic development (within experts as much as within the general public). Innovative redevelopment ideas do occasionally exist, but end up being insufficiently influential for implementation.

It remains, therefore, to see what will happen in the future with Zagreb's valuable industrial monuments, such as Paromlin and Bubara. Although the results of the last tender for the Paromlin City Library promise significant changes in the future, let us remember that there have been many tenders throughout its history and that none of the proposals has been implemented so far. Bubara, however, is not so lucky, so the question of whether there will be an initiative for its preservation, restoration and revitalization still remains. Nevertheless, we hope that this paper will highlight the need to solve these issues and that Zagreb, and Croatia in general, will also develop a tendency for quality revitalization of industrial heritage. ■

## Endnotes

1. This paper was created as an elaboration of a seminar paper on the course “Architecture and Urban Planning in Nineteenth-Century Hungary” under the mentorship of Boris Dundović, and it was presented at the 8th International Congress of Art History Students in November 2019.
2. [https://www.icomos.org/Paris2011/GA2011\\_ICOMOS\\_TICCIH\\_joint\\_principles\\_EN\\_FR\\_final\\_20120110.pdf](https://www.icomos.org/Paris2011/GA2011_ICOMOS_TICCIH_joint_principles_EN_FR_final_20120110.pdf) (23/4/2021).
3. Therefore, the similar term *rust belt* is used in literature which concerns brownfields in Budapest: “This is a name used for formerly industrial but now abandoned areas or for those operating at reduced capacity and not yet refurbished” (KISS, 2009, 164–165).
4. <https://www.kulturpunkt.hr/content/potencijal-preskocenihi-prostora> (23/4/2021).
5. CIZLER, PIZZERA, FISHER, 2014, 54.
6. HATZ, 2008, 311.
7. BATTLE, 2000, 23–25.
8. MAYERHOFER, PALME, 1997, 485–486.
9. HATZ, 2008, 313–314.
10. In 2009, the term *Brachfläche* (meaning brownfield) was defined by the Austrian Standards Institute as “previously used site or part of a site, which is presently derelict or underused. Owing to the site characteristics (e.g. dedication, opening up for development, location), it offers a potential for re-use. The period, for which the site has been derelict, is not relevant” (SIEBIELEC, 2012, 4).
11. Its origins are in agriculture, where *Brache* means *fallow (land)*, i.e. land left uncultivated for a year to restore its fertility in the three-field crop-rotation system. In urban studies and urban-planning practice, *Brache* has been applied to abandoned or formerly developed land, particularly since the 1970s, when economic and technical structural change led to the widespread abandonment of sites. In contrast to fallow land in agriculture, the derelict or vacant sites in this context are not deliberately taken out of the use cycle, but usually find no subsequent use (SIEBIELEC, 2012, 4).
12. WEPNER et al., 2004, 82; THALER, THALHAMMER, 2008, 6.
13. CIZLER, PIZZERA, FISCHER, 2014, 54.
14. Although by definition a gasometer is the circular gauge outside the tank, the word was and still is commonly used when referring to the containers themselves.
15. <https://www.geschichtewiki.wien.gv.at/Simmering> (25/4/2021).
16. <https://www.gasometer.at/de/architektur> (25/4/2021).
17. <https://bda.gv.at/denkmalverzeichnis/#oesterreich-gesamt> (27/4/2021).
18. BATTLE, 2000, 35.
19. <https://www.gasometer.at/de/architektur> (25/4/2021).
20. The Vienna Business Agency (VBA) played an integral role in the redevelopment of the Gaswerks Simmering site, as well as the public-private partnership process. After it was taken out of service, they bought 20,000 m<sup>2</sup> of the site, drew up the project plans and also helped spur interest in the project among developers and city officials. The VBA is a non-profit agency established in 1982 by the city administration. It functions as a mediator between the public and private sectors, and it guarantees centralized and efficient business promotion in Vienna. The VBA functions as a ‘one-stop shop’ for investors interested in Austria as a business location (providing prospective buyers with all the necessary site information and obtaining the site at a reasonable cost, while offering funding provided by the City of Vienna) (BATTLE, 2000, 37–38).
21. ŠPIRIĆ, 2015, 872.
22. <https://www.geschichtewiki.wien.gv.at/Favoriten> (27/4/2021).
23. <http://www.brotfabrik.wien/en/area/history.html> (27/4/2021).
24. <https://bda.gv.at/denkmalverzeichnis/#oesterreich-gesamt> (27/4/2021).
25. <http://www.brotfabrik.wien/en/area/history.html> (27/4/2021).
26. The term ‘loft’ is used according to relevant literature and it is often related to specific residential re-use: “the original expression meant the upper floor or the attic of a factory or a storehouse”. That meaning has changed, and today ‘loft’ refers to a “whole building and not only the uppermost floor”, while at times it relates to flats or any “other functions (that) are created in a former factory or storage buildings” (CSAPÓ, LENNER, 2016, 161).
27. <http://www.loftcity.at/index.php/lofts-loftcity/projektbeschreibung-loftcity> (27/4/2021).
28. CIZLER, PIZZERA, FISCHER, 2014, 59.
29. BARTA et al., 2006, 7.
30. CSAPÓ, LENNER, 2016, 152.
31. Later referred to as *Ferencváros*.
32. CSAPÓ, LENNER, 2016, 152–153.
33. CSAPÓ, LENNER, 2016, 153.
34. BARTA et al., 2006, 12.
35. BARTA et al., 2006, 15.
36. KISS, 2009, 163–164.
37. BARTA et al., 2006, 14.
38. <https://www.industrialheritagehungary.com/02-Industrial-Heritages/01-Food/gizella-mill.html> (24/4/2021).
39. KISS, 2006, 176.
40. KRNJAIĆ, 2014, 9.
41. KRNJAIĆ, 2014, 11.
42. <https://www.industrialheritagehungary.com/02-Industrial-Heritages/01-Food/gizella-mill.html> (24/4/2021).
43. KRNJAIĆ, 2014, 9–11.
44. <http://www.kozti.hu/index.php/2007/07/11/riverloft/?lang=en> (24/4/2021).
45. KRNJAIĆ, 2014, 16.
46. KISS, 2006, 179.
47. KRNJAIĆ, 2014, 28.
48. DUANČIĆ, SOPTA, 2014, 6.
49. DUANČIĆ, SOPTA, 2014, 7–8.
50. DUANČIĆ, SOPTA, 2014, 8–9.
51. PERAČKOVIĆ, 2010, 89.
52. <https://geoportal.zagreb.hr/karta> (24/4/2021).

53. BUTINA WATSON, JUKIĆ, 2019, 5–6.
54. PALADINO, 2010, 149.
55. GALOVIĆ, 2000, <https://www.matica.hr/vijenac/174/od-zasticenog-spomenika-kulture-do-simbola-nekulture-17246/> (24/4/2021).
56. PALADINO, 2010, 149.
57. ARČABIĆ, 2007, 25.
58. PAROMLIN, 2013, 11.
59. PAROMLIN, 2013, 11.
60. GALOVIĆ, 2000, <https://www.matica.hr/vijenac/174/od-zasticenog-spomenika-kulture-do-simbola-nekulture-17246/> (24/4/2021).
61. PAROMLIN, 2013, 3.
62. ARČABIĆ, 2007, 24.
63. PAROMLIN, 2013, 55.
64. <http://www.d-a-z.hr/hr/vijesti/paromlin-changing-the-face-rezultati,202.html> (24/4/2021).
65. DUANČIĆ, SOPTA, 2014, 12.
66. KANTOCI, 2018, 14.
67. These architects of Historicism mostly designed representative civic residential buildings, and Bubara is their first project in the field of industrial architecture. Being rated as very successful, Höhnigsberg and Deutsch would later stand out by working on other important industrial complexes in Zagreb, such as the Penkala Factory, the paper factory and Paromlin (DUANČIĆ, SOPTA, 2014, 18).
68. DUANČIĆ, SOPTA, 2014, 19–22.
69. VANJA RADOVANOVIĆ, Neizvjesna budućnost trešnjevacke Bubare, portal *Pogledaj.to*, published on 10/12/2015., <http://pogledaj.to/arhitektura/neizvjesna-buducnost-tresnjevacke-bubare/> (26/4/2021).
70. KANTOCI, 2019, 191.
71. DUANČIĆ, SOPTA, 2014, 32–33.
72. DUANČIĆ, SOPTA, 2014, 33.
73. <https://vizkultura.hr/bubara/> (26/4/2021).
74. OBAD ŠĆITAROCI, 2015, 6.

## References

- GORAN ARČABIĆ, Zagrebačka industrijska baština u Registru kulturnih dobara Republike Hrvatske: pregled, stanje, potencijali, *Informatica museologica*, 38/1-2 (2007), 22–29
- GYÖRGYI BARTA, PÁL BELUSZKY, MÁRTON CZIRFUSZ, GYÖRGY KUKELY, Rehabilitating the Brownfield Zones of Budapest, in: *Discussion Papers no. 51*, (ed.) Zoltán Gál, Pécs, 2006, 5–69
- SOPHIA BATTLE, *Public-private partnerships in brownfields redevelopment: Chicago, Illinois and Vienna, Austria*, 2000, 1–43
- GEORGIA BUTINA WATSON, TIHOMIR JUKIĆ, Reuse and Revitalisation of Contemporary City Areas: Structural and Functional Transformation of Brownfield Sites, in: *Cultural Urban Heritage*, (eds) Mladen Obad Šćitaroci, Bojana Bojanić Obad Šćitaroci and Ana Mrđa, Cham, 2019, 1–16
- JASNA CIZLER, JUDITH PIZZERA, WOLFGANG FISHER, Industrial heritage as a potential for redevelopment of postindustrial areas in Austria, *ACEG+ Journal for Architecture, Civil Engineering, Geodesy and other related scientific fields*, 2 (2014), 52–62
- TAMÁS CSAPÓ, TIBOR LENNER, *Settlement Morphology of Budapest*, Cham, 2016.
- DINKO DUANČIĆ, PIA SOPTA, *Bubara. Prošlost, sadašnjost i budućnost zagrebačke tvornice svile*, Zagreb, 2014.
- KREŠIMIR GALOVIĆ, Od zaštićenog spomenika kulture do simbola nekulture, *Vijenac*, 174, published on 2/11/2000.
- GERHARD HATZ, Vienna, *Cities* 25, 5 (2008), 310–322
- TEA KANTOCI, *Zaštita i prezentacija tekstilne industrijske baštine u Zagrebu*, Zagreb, 2018 (master's thesis, Faculty of Humanities and Social Sciences, University of Zagreb)
- TEA KANTOCI, Zaštita i prezentacija tekstilne industrijske baštine u Zagrebu, *Informatica museologica*, 50 (2019), 186–200
- ÉVA KISS, Major trends in the development of industrial areas of Budapest in the early 21st century, *Hungarian Geographical Bulletin*, 58/3 (2009), 163–180
- IVONA KRNJAIĆ, *Converted industrial buildings in Budapest*, Budapest, 2014 (scientific paper, Ybl Miklós Faculty of Architecture and Civil Engineering)
- PETER MAYERHOFER, GERHARD PALME, De-Industrialisierung in Wien, *WIFO (Österreichisches Institut für Wirtschaftsforschung) – Monatsberichte*, 70/8 (1997), 485–499
- MLADEN OBAD ŠĆITAROCI, Introduction, in: *Prostorne i razvojne mogućnosti kulturnog naslijeđa: Zbornik radova (Cultural Heritage – Possibilities for Spatial and Economic Development: Proceedings)*, (eds) Mladen Obad Šćitaroci, Bojana Bojanić Obad Šćitaroci, Damir Krajnik, Irma Huić, Ana Mrđa, Marko Rukavina and Boris Dundović, Zagreb, 2015, 6–7
- ZRINKA PALADINO, Zaštita zagrebačke industrijske baštine izradbom konzervatorskih elaborata Gradskoga zavoda za zaštitu spomenika kulture i prirode u Zagrebu, *Godišnjak zaštite spomenika kulture Hrvatske*, 33/34 (2009), 147–172
- PAROMLIN 2013. survey, City of Zagreb, City Office for the Strategic Planning and Development of the City, working group: Iva Bedenko, Vladimir Beštak, Karolina Bui, Stjepan Kelčec-Suhovec, Romana Kunej, Aleksander Laslo, Mirna Meštrović, Sonja Sočivica, Nives Škreblin, Jadranka Veselić Bruvo and Robert Vojnić (online access: [https://www.zagreb.hr/userdocsimages/arhiva/PAROMLIN\\_elaborat\\_final.pdf](https://www.zagreb.hr/userdocsimages/arhiva/PAROMLIN_elaborat_final.pdf), 24/04/2021)
- KREŠIMIR PERAČKOVIĆ, Hrvatska u postindustrijsko doba – promjene u strukturi radno aktivnog stanovništva po sektorima djelatnosti i spolu, *Društvena istraživanja: časopis za opća društvena pitanja*, 20/1 (111) (2011), 89–110
- GRZEGORZ SIEBIELEC (ed.), *URBAN SMS Soil Management Strategy – Brownfield redevelopment as an alternative to greenfield consumption in urban development in Central Europe*, 2012, 1–24
- JÓZSEF SISA, *Motherland and progress – Hungarian Architecture and Design 1800 – 1900*, Basel, 2016.

ANA ŠPIRIĆ, Spatial criteria in urban renewal of industrial brown-field sites, *Gradevinar*, 9 (2015), 865–877  
 ROBERT THALES, WERNER THALLHAMMER, *(Bau)Land in Sicht Gute Gründe für die Verwertung industrieller und gewerblicher Brachflächen*, Vienna, 2008, 1–28

MARTHA WEPNER, KARIN EGGER, SYLVIA GANTHALER, STEFAN HAIDER, HANS KORDINA, FRANZ TRAGSEIL, MARTIN SCHMANN, *Wiedernutzungspotential industrieller Brachflächen in Österreich*, Vienna, 2004, 5–35

## Sažetak

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### BEČ – BUDIMPEŠTA – ZAGREB: MOGUĆNOSTI I PERSPEKTIVE STAMBENE PRENAMJENE SREDNJOEUROPSKE INDUSTRIJSKE BAŠTINE

Istraživanje propituje odnos prema industrijskom naslijeđu Austro-Ugarske Monarhije na području Zagreba, Budimpešte i Beča komparativnom analizom šest odabranih primjera. Brzi razvoj industrije na području cijele Monarhije ostavio je snažan otisak u urbogenezi metropola izgradnjom brojnih tvornica i postrojenja na tadašnjim rubovima gradova. U procesu deindustrijalizacije tijekom 20. stoljeća ti su prostorni sklopovi napušteni, što je za posljedicu imalo velik broj praznih prostora u izgrađenom gradskom tkivu. Literaturom su ta područja definirana kao *brownfield*, a rasprava o njihovoj revitalizaciji i uključivanju u suvremeni urbani život goruća je tema gradskih uprava. Načini prenamjene ili prepuštanje vremenu nameću pitanje radi li se uglavnom o neželjenoj baštini ili mogućem važnom čimbeniku urbanoga identiteta koji je ključno očuvati, revitalizirati i učiniti održivim. Kada je riječ o Zagrebu, austrougarsko je naslijeđe česta tema stručnih i teorijskih rasprava, ali praktična provedba izostaje. Budimpešta i Beč izdvojeni su kao primjeri metropola koje su jedan dio svojih napuštenih građevina i sklopova prenamijenili te ih aktivno integrirali u urbano tkivo. Takva vrste prenamjene u zagrebačkom kontekstu u praksi nema, no i dalje predstavlja velik društveno-kulturni i ekonomski potencijal. Primjeri industrijskih sklopova iz Beča, Budimpešte i Zagreba izdvojeni su prema arhitektonskim i urbanističkim značajkama koje su omogućile (ili bi, u slučaju Zagreba, mogle omogućiti) stambenu prenamjenu, te prema kronološkim i stilskim kriterijima. Odabrani su bečki bivši spremnici plina *Gasometar* i tvornica kruha *Anker*, budimpeštanski mlin *Gizella* i

bivše skladište plinare *Riverloft* te zagrebački *Paromlin* i bivša tvornica svile *Bubara*. Analitička metoda uključuje pristup koji se temelji na znanstvenom projektu *Heritage Urbanism* te na razmatranju kategorija čimbenika identiteta i utjecaja, kriterija, metoda, modela i scenarija. Istraživanje ukazuje na nužnost očuvanja industrijske i tehničke arhitekture kao urbanog povijesnog dokumenta te na različite modele pristupa očuvanju i oživljavanju tih lakuna u gradskom tkivu. Obraden je i širi utjecaj koji njihova revitalizacija ima na urbanu strukturu i doživljaj grada kao ugodnog mjesta, način na koji rješava probleme nesigurnosti i zagađenja te dodaje nove vrijednosti u vizuri grada, poput slojevitosti i prepoznatljivosti. Po uzoru na komparativne primjere u Beču i Budimpešti, kriteriji za revitalizaciju građevina u Zagrebu uključuju tipove građevina kao i rješavanje ekonomskih i pravnih pitanja koja su do sada priječila taj proces. Autorice se zalažu za revitalizacijski model koji bi u najvećoj mjeri očuvao ono što je preostalo od sklopova *Paromlina* i *Bubare* prilikom njihove prenamjene za stanovanje, a u slučaju nove izgradnje osiguralo harmoničan odnos novog i starog. S obzirom na nekada periferni, a danas centralni smještaj industrije u gradovima, radom su istaknuti i mogući negativni aspekti stambene prenamjene kao što su visoke cijene zemljišta i gentrifikacija, koji imaju znaatan utjecaj na lokalnu zajednicu.

KLJUČNE RIJEČI: industrijska arhitektura, revitalizacija i prenamjena, *brownfield*, stambena prenamjena, austrougarsko naslijeđe, Beč, Budimpešta, Zagreb