

# Historic Heavy Industrial Sites: Obstacles and Opportunities

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*The shutdown of heavy industrial complexes, a common occurrence in Western Europe and North America for the last half century or longer, often leaves manufacturing communities with little more than the hulking relics of a bygone age of prosperity. The conservation and adaptive reuse of steelworks and other heavy industrial complexes can benefit industrial communities socially and culturally. But there are often major obstacles to surmount. The least of which may be the complex's remote location or its fragile structural integrity. Obstacles of an economic and, moreover, of a social nature may make reuse infeasible. Furthermore, the economics of conservation are complex – possible financial returns may not be sufficient to justify conservation because these returns may never materialize. Therefore, what should communities take into account before choosing to move forward with conservation and reuse? Furthermore, when should communities choose conservation and reuse instead of demolition? This paper suggests that communities should pursue conservation and reuse when they are seeking a civic benefit, and when that end is sufficiently important to justify a substantial long-term investment in a project that may never be commercially viable. To explore this, the paper uses cases from the United States, Mexico, Germany, Luxembourg, and Italy where conservation and reuse yielded obvious social or cultural benefits. Chosen for their reputation as well as for their diversity, these projects differ by type of industrial use and represent practices spanning more than 40 years of development in the field. The trend in projects that conserve heavy industrial infrastructure suggests that the benefits of conservation and reuse have become more diverse and more substantial over time.*

Over the last quarter century, heavy industrial complexes – mines, steelworks, shipyards, and refineries, to name a few – have frequently been rapidly dismantled and scrapped following their closure. Their vast, barren, and often polluted, sites imprint the landscape. Heavy industry cannot be reduced to its physical detritus, however; the social context of mines, steelworks, and other complexes is central to understanding their sites and the problems that result from their closure. As labour-intensive enterprises, heavy industrial complexes tend to loom large in the lives of workers and their families,

as well as in local and regional histories. With their shutdown, communities that timed daily life to their shift changes are often left with little more than the hulking relics of a bygone age of prosperity.

The conservation and reuse of heavy industrial complexes may offer a way forward. This approach is not straightforward, however. Conservation and reuse requires the careful consideration of both challenges and benefits. A starting point for communities evaluating the merits of conservation and adaptive reuse might be the criteria set by international institutions – UNESCO, the

International Council for Monuments and Sites (ICOMOS), the International Committee for the Conservation of Industrial Heritage (TICCIH) – and by various national institutions. If a complex meets the criteria set by UNESCO, then UNESCO might recognize the complex as a World Heritage Site, for example. Once conservation has been decided upon, implementation, particularly raising the short- and long-term capital conservation requires, can be extraordinarily difficult. What should communities take into account before choosing to move forward with conservation and reuse? When should communities choose conservation and reuse instead of demolition? The literature on these questions discusses the characteristics that endow industrial complexes with value, the obstacles communities and conservationists must overcome to rescue these complexes, the economics of reuse, and the social and cultural benefits of conservation. This paper complements this literature by using cases from the United States, Mexico, Germany, Luxembourg, and Italy where conservation and reuse yielded an obvious social or cultural benefit. Chosen for their reputation as well as for their diversity, these projects differ by type of industrial use and represent practices spanning more than 40 years. This paper suggests that communities should pursue conservation and reuse when they are seeking a civic benefit, and when that end is sufficiently important to justify a substantial long-term investment in a project that may never be commercially viable. The civic benefits of conservation may include environmental remediation, opportunities for community introspection and the cultivation of public memory, and the building of new cultural amenities. In addition, communities should understand that the transformation of obstacles (e.g. environmental contamination, geographical isolation) into assets is a major professional challenge inherent in this type of project.

In elaborating these ideas, this paper proceeds as follows. The next section dis-

cusses heavy industrial complexes as conservation projects, addressing their value and the obstacles that often impede or stop conservation. Further detailing the challenges to and the potential of this genre of project, the two subsequent sections discuss the economics of conservation and the civic dimension of conservation using varied examples. The paper ends with a discussion of the civic opportunities that reuse offers and the set of factors on which successful conservation depends.

### **Heavy Industrial Complexes as Conservation Projects**

The International Committee for the Conservation of Industrial Heritage (TICCIH) and the International Council for Monuments and Sites (ICOMOS) are influential transnational organizations that recognize industrial heritage and work to protect it. In 2011, TICCIH and ICOMOS signed the ‘Joint ICOMOS–TICCIH Principles for the Conservation of Industrial Heritage Sites, Structures, Areas and Landscapes’, a foundational document in the field (Douet, 2012, p. 2). The Joint Principles define industrial heritage as ‘sites, structures, complexes, cities and settlements, areas, landscapes and routes [that] bear witness to human activities of industrial extraction and production’ (Joint ICOMOS–TICCIH Principles, 2011). Furthermore, the Joint Principles assert, ‘Industrial heritage reflects the profound connection between the cultural and natural environment, as industrial processes ... depend on natural sources of raw materials, energy and transportation networks to produce and distribute products to broader markets’, and includes ‘intangible dimensions such as ... the complex social and cultural legacy that shaped the life of communities...’ (*Ibid.*).

The Joint Principles emphasize the importance of industrial heritage as a record of the Industrial Revolution, a period that profoundly altered the world and the course of human history. Other literature discusses at greater length the value of industrial heritage

as a record of the intangible history of industrial communities. Writing on heritage more generally, scholars Dolores Hayden (1997), Randall Mason (2003), and Howard Green (1998) argue for a definition of significance that is rooted in public memory, or a community's collective memory of place, and in the diverse narratives associated with place (e.g. the histories of women and children, of racial, ethnic, and religious minorities, and of the landscape and environment). The scholars emphasize the importance of heritage as a tool to *cultivate community identity* and to *narrate local history* in addition to national and global history.

Arguing for industrial heritage sites to be integrated into communities' daily lives and for local involvement in industrial heritage conservation projects, scholars Louis Bergeron (2012) and Paz Benito Del Pozo and Pablo Alonso González (2012) extend the ideas of Hayden, Mason, and Green to industrial heritage. In addition, there may be value in the *experience* that adapted industrial heritage sites could offer visitors (Oevermann and Meig, 2015; Lane *et al.*, 2013; Swensen and Stenbro, 2013). In a 3-year study of industrial heritage sites in Europe, Heike Oevermann and Harald Meig (2015) suggest that industrial heritage sites might be appreciated for their value as historical records or for their value as potential attractions or icons (or some combination thereof). Zip World Velocity at the Penrhyn Quarry in Bethesda, Wales, is an example of a site valued for its historic importance on the one hand (it was once the largest slate mine in the world), and the unique experience that it offers visitors on the other (it combines a tour of the quarry with two zip line rides, both of which offer aerial views of the quarry and one of which is a mile long). Indeed, industrial heritage may be a record of technological evolution and of the intangible history of industrial communities and also a tool to cultivate community identity and to narrate local history, while offering visitors a rare experience. But first,

industrial complexes must be saved. Thus the question is, what are the obstacles that impede conservation and reuse?

In a study of mines adapted for tourism, researchers Ballesteros and Ramírez point to 'the geographical, social and economic isolation and remoteness of mining areas', 'the presence of large facilities and infrastructure that have a great impact on the landscape', and 'the processes of deactivation, crisis and abandonment that are recurrent in the mining industry' as major obstacles to the conservation and reuse of mines (Ballesteros and Ramírez, 2007, p. 679). Impediments to industrial heritage conservation projects include the physical constraints of the site (Joint ICOMOC-TICCIH Principles, 2011; Jones and Munday, 2011; Chmielewska and Marzena, 2011; Ballesteros and Ramírez, 2007), the fragile structural integrity of the infrastructure (Sashoua and Matthiesen, 2012), the initial and recurring cost of conservation (Lane *et al.*, 2013; Jones and Munday, 2011; Chmielewska and Marzena, 2011), an absence of public appreciation of the complex's importance (Nevell, 2011; Joint ICOMOS-TICCIH Principles, 2011; Bergeron, 2012; Cossons, 2012), feeble or no protection through formal recognition (Joint ICOMOS-TICCIH Principles, 2011), and political discord within the community (Rautenberg, 2012; Swanton, 2012; Castillo 2011). In other words, physical, economic, and social obstacles impede attempts to rescue heavy industrial complexes from demolition, and obstacles of one type reinforce obstacles of the other types (see figure 1).

With regard to physical constraints, several scholars identify heavy industrial complexes' remoteness, vast size, and compromised environmental quality as obstacles to conservation (Joint ICOMOC-TICCIH Principles, 2011; Jones and Munday, 2011; Chmielewska and Lamparska, 2011; Ballesteros and Ramírez, 2007). Light industrial sites, including ports, textile mills, power generation plants, paper mills, and similar facilities are often closer to city centres than heavy industrial sites,

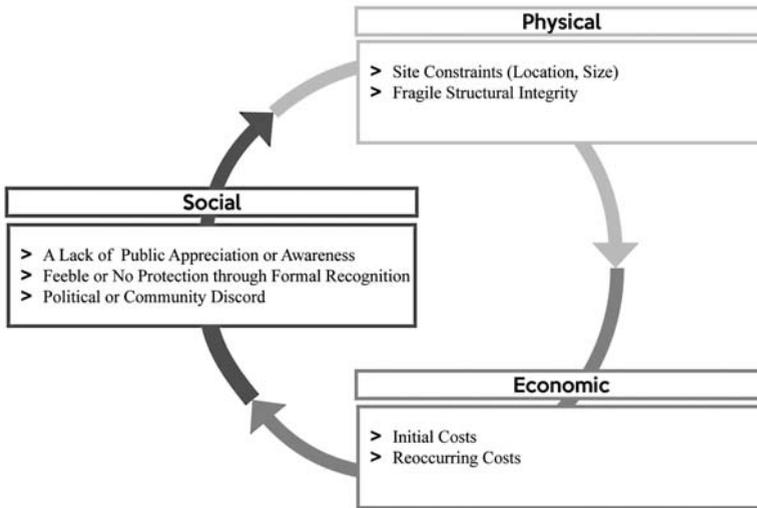


Figure 1. Obstacles that often impede the conservation of heavy industrial complexes.

making them more attractive to private developers. For example, the oil-fired Bankside Power Plant in London was converted into Tate Modern, one of the most renowned contemporary art museums in the world. The coal-fired Battersea Power Station, also in London, is the anchor for a massive live-work-play development that includes 3,700 residences, offices, shops and restaurants. Furthermore, some light industrial sites, especially ports, offer marketable views of the cityscape or natural landscape. Albert Dock, the historic port of Liverpool, England, which was restored and repurposed between 1983 and 2003, exemplifies this trend (Oevermann and Mieg, 2015, p. 33).

In addition, corrosion and physical degradation from exposure to the elements are especially problematic. Whereas groups of buildings largely make up light industrial complexes, industrial machinery and equipment, generally composed of iron or steel, make up heavy industrial complexes. Studies demonstrate that the climate controls preservationists typically use to protect artefacts from degradation cannot be used to protect industrial machinery and equipment because of '[its] size and immobility' (Sashoua and Matthiesen, 2012, p. 357). Thus, preserva-

tionists need routinely to apply protective coatings to machinery and equipment (*Ibid.*). Furthermore, in addition to their comparative material durability, the buildings that compose light industrial complexes make them well suited to adaptive reuse as loft-style residences, restaurants, and shops. Moreover, these buildings' materials (brick, wood, etc.) are attractive to developers, as well as renters, restaurant-goers, and shoppers, who appreciate their 'industrial-chic' aesthetic. Heavy industrial sites do not generally share these aesthetic advantages.

The initial and recurring costs of conservation or adaptive reuse are also major obstacles to surmount. Significant capital is necessary to conserve heavy industrial complexes and to transform these complexes into historical and cultural attractions (Jones and Munday, 2011; Chmielewska and Lamparska, 2011). In addition to the initial investment, the recurring cost of maintaining mines, ironworks, steelworks, shipyards, and other disused heavy industrial sites is high. The EU study, 'Industrial Heritage and Agri/Rural Tourism in Europe', argues, 'many attractions face growing maintenance costs as their heritage ages beyond its life expectancy: the most successful part of industrial heritage,

railway tourism, is especially at risk, because of its reliance on bridges, tunnels, earthworks and complex machinery' (Lane *et al.*, 2013, p. 96). Because these types of heritage sites are capital intensive, they 'have been shown to be highly reliant on public sector support' (*Ibid.*).

In terms of social challenges, ironworks, steelworks, and other complexes made up of metal infrastructure are quite vulnerable; owners who are unaware or sceptical about the historical significance of these complexes and have no mandate to protect them are likely to sell them to metal-scraping enterprises. Community opposition to demolition and scrapping may not coalesce because the public fails to appreciate their historical or social importance. In an editorial for *Industrial Archeology Review*, Michael Nevell cites a study commissioned by English Heritage (*Industrial Heritage at Risk Project 2011*) which found that '[in the UK] listed industrial buildings are more at risk than almost any other kind of heritage' (cited in Nevell, 2011, p. 79). The Joint ICOMOS–TICCIH Principles also observe that industrial heritage 'is highly vulnerable and often at risk, often lost for lack of awareness, documentation, recognition or protection' (Joint ICOMOS–TICCIH Principles, 2011). As the Joint Principles further observe and as scholar Louis Bergeron notes, in the long term, public knowledge of industrial processes (e.g. smelting, steel fabrication) wanes, and thus public recognition of industrial systems (e.g. blast furnaces, rolling mills) disappears. It therefore becomes easier to justify demolition with the passage of time (Joint ICOMOS–TICCIH Principles, 2011; Bergeron 2012, p. 37). Moreover, scholar Neil Cossons observes, 'To advocate preservation of a redundant industrial site ... does not always look attractive to a community afflicted by economic collapse or high unemployment' (Cossons, 2012, p. 8). Industrial communities may believe that razed heavy industrial sites will be more attractive to developers seeking empty land. Finally, to raise public awareness of industrial artefacts necessitates better interpretation

either through guides or through the use of technology to establish a high-quality attraction. Industrial heritage sites can be more labour intensive than other heritage sites for this reason (Jones and Munday, 2011).

Finally, political discord may play a significant role in paralyzing conservationists' and developers' efforts. Projects that conserve and repurpose heavy industrial complexes must balance the desires and vision for the site of local people with the aims and vision of those who intend to conserve and repurpose the site, whether the latter are ordinary citizens, not-for-profit organizations who care deeply for the historic importance of the site, local governments, or private developers. Examining heritage policies and practices in Great Britain and France, Michel Rautenberg argues that the transformation of industrial heritage into a source of revenue and revitalization may be a source of conflict because locals may see these projects as editing and revising workers' stories to tell a myth and, also, they may see these projects as something 'imposed [by outsiders]' (Rautenberg, 2012, p. 513). Curatorial methods also sow discord. In 'The Memory of Work and the Future of Industrial Heritage: New Issues Five Years Later', Juan José Castillo argues that the physical traces of industrial sites tend to be divorced from a *memory of work*; visitors come to experience the ambience of the site, but leave without an understanding of the industrial processes that once occurred there or the intangible history of the industrial community, including the workers, their families, and their culture (Castillo, 2011).

These varied obstacles – of a physical, economic, and social nature – impede conservation. This means that not-for-profit organizations, public agencies, and private developers might consider conservation only when they possess the political will and the resources to do so. The next section examines further the economics of conservation, and a survey of the social and cultural dimensions of conservation follows.

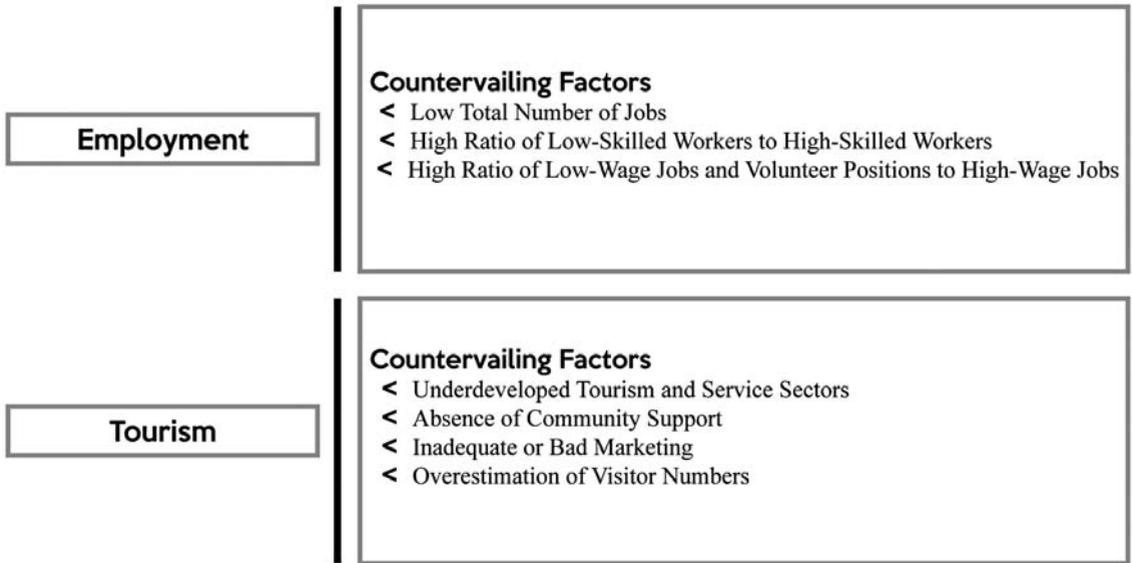


Figure 2. Potential economic stimuli from conservation and counteracting factors.

### The Economics in Conserving Heavy Industrial Complexes

Local and regional governments throughout Europe, in the United States, and in other countries, including Mexico, have undertaken initiatives to conserve and adapt heavy industrial complexes in the belief that their efforts will generate economic benefits for distressed industrial regions and offer these regions a role in increasingly service-oriented national economies. Yet the qualitative study, 'Industrial Heritage and Agri/Rural Tourism in Europe', observes that there are reasons to believe that these projects benefit local economies, and there are also countervailing reasons to believe that these projects are neutral in their economic impact, but it is inconclusive as to which outcome is more common (Lane *et al.*, 2013, p. 33). Other studies indicate that anticipated economic benefits often prove to be elusive: first, because industrial heritage sites employ very few workers; second, due to underdeveloped or nonexistent service and tourism sectors; and finally, because projects that conserve and adapt heavy industrial sites

are insufficiently integrated into broader governmental redevelopment programmes (Kerstetter *et al.*, 1998; Hospers, 2002; Ballesteros and Ramírez, 2007; Jones and Munday, 2011; Chmielewska and Lamparska, 2011) (see figure 2).

With regard to employment, cases demonstrate that projects that conserve heavy industrial complexes and adapt these complexes as historical and cultural tourist attractions generate only a small number of jobs (Hospers, 2002; Lane *et al.*, 2013). Gert-Jan Hospers contends that the establishment of tourist attractions 'never fully compensate[s] for the loss of jobs resulting from the closure of the former work places' (Hospers, 2002, p. 401). He further argues, 'Although tourists may spend some money in local services (e.g. restaurants and pubs), they normally will not stay overnight in hotels because industrial attractions are usually visited by day trippers...' (*Ibid.*). Current research indicates that visitors choose not to stay overnight because distressed industrial regions lack the amenities they need and want (Ballesteros and Ramírez, 2007; Jones and Munday, 2011; Lane *et al.*, 2013). The aforementioned 2013 EU

study contradicts this, asserting that industrial heritage tourism 'does bring notable direct and indirect income wherever it is successful (emphasis added), and can improve the image and reputation of former industrial areas' (Lane *et al.*, 2013, p. 9).

These studies point to two major problems in the development of service and tourism sectors in distressed industrial regions. First, these regions' service and tourism sectors are woefully underdeveloped, and second, efforts to develop a cultural attraction fall flat when these regions' communities do not appreciate or identify with their industrial heritage. Other problems include the need to invest in infrastructure to guarantee visitors' safety, the need for astute marketing campaigns, and the challenge of predicting visitor numbers. Researchers Calvin Jones and Max Munday, studying the Blaenavon World Heritage Site in Wales, a former colliery and its surrounding landscape, note that the site is in 'one of the most economically and socially disadvantaged areas of [Wales]' and that the growth of a tourism sector 'has been highlighted as a realistic development option in many economically marginal areas of Wales' (Jones and Munday, 2011, p. 585). The researchers conclude: first, that in order to succeed development initiatives based on industrial heritage conservation need to cultivate the supply side of the tourism sector in depressed industrial regions; second, that the convocation of World Heritage status 'was an important component in local plans to conserve and develop the Blaenavon Industrial Landscape'; and third, they caution that preservation aims and local interests, on the one hand, and development aims and visitors' interests, on the other, may conflict (*Ibid.*, p. 585). On Blaenavon's 'under-developed supply-side' Jones and Munday note, 'many in the local community do not currently possess the skills or financial resources to fully contribute to a regeneration process based upon tourism' (e.g. by opening small businesses, including hotels, shops, and restaurants) (*Ibid.*, p. 589).

Other studies report similar findings observing, 'Tourism skills are often weak' (Lane *et al.*, 2013, p. 9), and noting first, that sites often receive their funding and are managed and staffed by not-for-profit organizations or the public sector, and second, that volunteers make up a significant proportion of their staffs (*Ibid.*). Furthermore, Jones and Munday find that the sites that best engage visitors employ former workers as guides (Jones and Munday, 2011, p. 586). The researchers observe that this can be difficult in economically depressed regions suffering from substantial emigration (*Ibid.*).

Historical grievances and the aesthetics of former heavy industrial complexes can also make it difficult to engage former workers and the local community (Lane *et al.*, 2013). Former workers may hold contempt for the site because they suffered hazardous working conditions or remember bitter labour disputes. Yet, the local community and its appreciation of its industrial past are of the utmost importance to the promotion of industrial heritage sites because the community is part of the attraction. Pritchard and Morgan in their study of tourism promotion campaigns in Wales confirmed that these campaigns are 'constructed expressions of destinations' cultural and political identities' (Pritchard and Morgan, 2001, p. 177). Finally, conflicts between the local community and those seeking to attract visitors may arise if the former and the latter possess divergent visions for the site (Jones and Munday, 2011, p. 586). This is problematic because 'in heritage tourism, the convergence of the host community, tourist activity and visitors is chiefly mediated by local heritage, which has a dual role to play: it is the central focus of the tourist activity whilst at the same time being a fundamental element in the construction of community identity' (Ballesteros and Ramírez, 2007, p. 677).

Other challenges with regard to the development of a tourism sector include the need to invest in infrastructure to guarantee public safety, the need for convincing marketing

campaigns, and the over-estimation of visitor numbers (Lane et. al, 2013; Kerstetter *et al.*, 1998). In particular, an important study demonstrates that marketing matters, asserting that thematically ‘packaging’ sites ‘can help tourists to recognize the benefits of experiencing heritage’ and ‘the contribution the region made to the industrial revolution and as such raise the tourism profile of the area’ (Kerstetter *et al.*, 1998, p. 102). In sum, the factors that detract from job creation and revenues from tourism include the low total number of jobs; the high ratio of low-skilled workers to high-skilled workers; the high ratio of low-wage jobs and unpaid volunteer positions to high-wage jobs; underdeveloped tourism and service sectors; absence of community support; inadequate or poor marketing; and an overestimation of visitor numbers. Clearly these factors should also be seen in the regional context of the site and its connections to the broader tourism industry and to other tourist destinations (Lane *et al.*, 2013; Ballesteros and Ramírez, 2007). It seems that it is difficult to translate industrial heritage projects into broader, community-wide revitalization successes. Therefore, as elaborated in the next section, a better rationale for conservation might be its potential civic benefit.<sup>1</sup>

### The Social and Cultural Benefits of Conserving and Reusing Heavy Industrial Complexes

To understand why it might make sense to save and repurpose a heavy industrial complex despite the difficulty and expense of doing so and a possible lack of commercial returns, the following section considers first, the range of civic benefits of conservation, and second, how this type of project has become more ambitious over time, broadening its purpose and adding to the ways in which it benefits communities socially and culturally. One clear benefit is the protection of a site of historical importance. Other important civic benefits may include (but are not limited to): environmental remediation; the development of a new recreational area; an opportunity for community introspection and the cultivation of public memory; the building of new cultural amenities and the establishment of a regional locus for cultural production; and the building of a new development on a historic and iconic site. The earliest projects conserved the industrial complex, remediated its site, and gave the public a new recreational area. More recent projects have done this and much, much more. To better understand the civic benefits of conservation and their

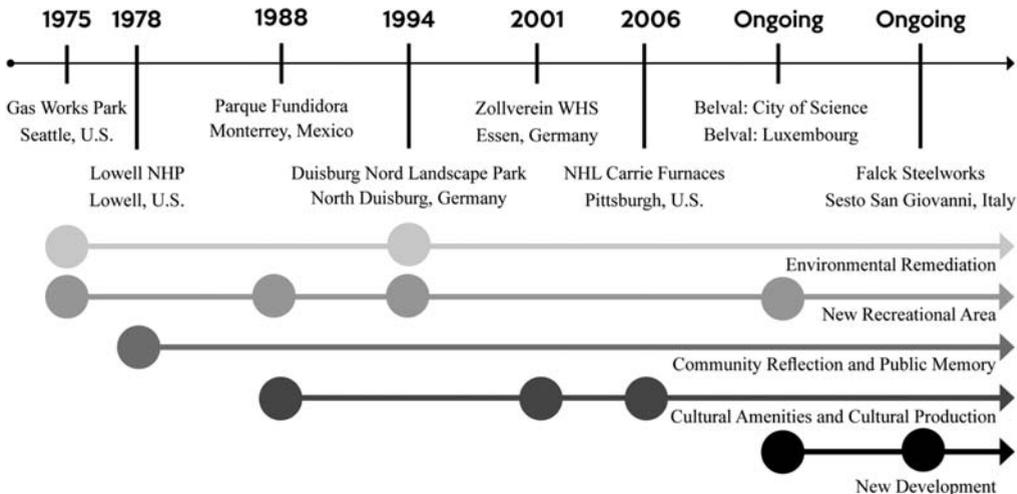


Figure 3. Projects by year completed and the most notable civic benefits.

expansion and diversification over time, it is useful to look at and discuss some exemplary projects (see figure 3).

Projects that repurpose historic heavy industrial complexes can become a powerful impetus for environmental remediation and the cultivation of the natural landscape. Opened in 1975, Gas Works Park in Seattle, Washington, preserves a former coal gasification works on Lake Union (figure 4). The project included the environmental remediation of the site and its conversion into a public park. A later and far more ambitious project, the North Duisburg Landscape Park in North Duisburg, Germany, conserves the historic Thyssen Ironworks, which operated

from 1903 until 1985 (Uttke, 2008, p. 32). The North Duisburg Landscape Park was an International Building Exhibition (German abbreviation IBA) project and lies within the Emscher Landscape Park system. The park opened in 1994, 4 years after a competition to design the site. The remediation of the ironworks' polluted landscape and the restoration of a waterway-turned-sewage-drain were imperative (Uttke, 2008, p. 32). Thus, a need for environmental remediation inspired an unconventional design. The park's design allows nature to reclaim parts of the site spontaneously, including sections of the ironworks (figure 5). Other sections of the ironworks are reserved for gardens and

Figure 4. Sunbathers at Gas Works Park, Seattle. (Photo: CC Wildcat Dunny)



Figure 5. Nature reclaims the ironworks in the North Duisburg Landscape Park. (Photo: CC Zoetnet)



recreational use. Within the former bunkers of the sinter plant, there are gardens patterned in classical design, for example, and within the cells of the ironworks' former ore bunker, now a labyrinth, there are gardens that vary by microclimate (see Landscape Park Duisburg-Nord and Gas Works Park official websites, for further information).

Conservation projects may also offer distressed industrial communities new high-quality recreational spaces. In addition to repairing the environmental damage wrought by intensive industrial use, the North Duisburg Landscape Park is such a project. The park offers a well-developed recreational programme that reuses elements of the ironworks. The walls of the former ore bunker now serve as a climbing wall; a gasometer, now filled with water, has been repurposed into a diving centre; and a former casting house contains a high ropes course (Uttke, 2008,

p. 33) (figure 6). There is also a tube slide through two of the former ore bunkers and a 70 metre viewing platform on one of the conserved blast furnaces. The difference between the earlier, more modest Gas Works Park project and the later, bolder North Duisburg Landscape Park project is striking. The latter benefits a wider range of people and in more ways.

Another example is Parque Fundidora a 350-acre (142 ha) public park and cultural and entertainment centre in Monterrey, Mexico, roughly 500 miles (800 km) north of Mexico City. The Mexican government and the State of Nuevo Leon led the initiative to conserve and repurpose the iron and steel works on the site, which had been built at the beginning of the twentieth century and operated by the Fundidora Iron and Steel Company until 1986 (Cantú Delgado, 2008, pp. 3, 5). The Fundidora Trust adapted the #3 blast



Figure 6. Ore bunker repurposed as a climbing wall in the North Duisburg Landscape Park. (Photo: CC Zoetnet)

furnace into the Horno 3 Museum, a museum and science centre focused on the Mexican steel industry and science and technology (see figure 7). In addition to establishing the museum and a large public park, the Fundidora Trust developed extensive entertainment and cultural programmes at Parque Fundidora. Parque Fundidora's conserved industrial buildings serve as an art museum that includes exhibition spaces, a theatre, and a cinema. The mission of the cinema includes the preservation of the culture of the state of Nuevo Leon through film and photography. The cinema is an entertainment venue and a medium that curates and interprets local and regional history. Parque Fundidora's arts programme also includes a plastic experimentation workshop (see Parque Fundidora's official website, for further information).

Planning for the reuse of industrial complexes – heavy or light – catalyzes a process of community introspection when project

directors and planners engage the public. These projects' planning phase is an opportunity, first, for the public to rethink their local identity and, second, for the public to participate in the framing or reframing of their locality's public image, which is inextricably linked to public memory. The process that led to the establishment of a national historical park in Lowell, Massachusetts, exemplifies this. Lowell was once the United States' foremost production centre for textiles. Its textile mills have been conserved and repurposed through the creation of the Lowell Historic Park and Lowell Historical Preservation District. Of the four case studies examined by the Community Revitalization Project under the direction of Ross Gittell, Lowell 'experienced the most dramatic turnaround during the period of observation [1985–1989]' (Gittell, 1992, p. 67). Remarketing on the locality's identity, Gittell observes, 'The continual feeling of defeat



Figure 7. The Horno 3 Museum at Parque Fundidora. (Photo: CC ivangm)

brought on by half a century of economic decline created a mindset that had become self-perpetuating' (*Ibid.*, p. 71). To become a national park, the city had to make an application to the United States Congress. The application process acted as a catalyst for a process of public dialogue and reflection (*Ibid.*). The period of introspection reminded the public of Lowell's historic geographical, economic, and social assets and inspired its contemporary economic development plan (*Ibid.*). Gittell views the planning phase of the Lowell Historic Park and Lowell Historical Preservation District as a watershed moment for the city. Other scholars remark on the *mindset of defeat* common in former industrial regions and the importance of changing this mindset and, with it, these communities' perception of themselves and regional and national perceptions of these communities. Researchers Ballesteros and Ramírez remark, 'Strong collective identities linked to life

spaces ... or imagined spaces ... give rise to a solid sense of community. This is how the link between identity, place and community is shaped, a link which is as ambiguous as it is *crucial* [emphasis added] to social and political functioning' (Ballesteros and Ramírez, 2007, p. 677).

Adapted complexes can become regional foci for cultural production. The building of new cultural amenities on-site may propel this transformation. The Zollverein World Heritage Site in Essen, Germany, exemplifies this (figure 8). The site comprises the former Zollverein colliery and coke works. The coalmine closed in 1986 and the coke works' shutdown followed in 1993. The coalmine includes shaft XII and shaft 1/2/8, designed by German industrial architects Fritz Schupp and Martin Kremmer in the Bauhaus style between 1928 and 1932 (Uttke, 2008, p. 276). Fritz Schupp later designed the coke works in the Modernist style between 1957 and



Figure 8. Shaft XVII, Zollverein UNESCO World Heritage Site. (Photo: CC Daniel Mennerich)

1961 (*Ibid.*, p. 280). The IBA Emscher Park held a competition for the park's design in 2004. Design and the arts were selected as the focus of Zollverein's programme in reference to the site's industrial architecture as well as the shafts' and coke works' industrial design (*Ibid.*, p. 277).

In addition to the historic colliery and coke works, Zollverein's cultural amenities include the Red Dot Design Museum, the Zollverein School of Management and Design, a performing arts venue, art exhibitions, including temporary installations, and arts' and artisans' workshops, as well as the Ruhr Museum, which exhibits the region's natural and cultural histories. Other attractions synthesize recreation with design and the arts: 'The Sun Wheel', a solar-powered Ferris wheel, offers visitors aerial and underground views of the coke works; a swimming pool, opened for the Contemporary Art and Criticism

exhibition in 2001, is strikingly set within the coke works (see figures 9, 10, and 11). An outdoor concert venue uses the colliery and coke works as a stage. The World Heritage Site is a wildly popular and successful cultural attraction. As of January 2016, about 1.5 million visitors tour Zollverein annually, generating €68.4 million in net sales (official press release, 2016). The project's cost, €325.4 million invested from 1990 to 2015, however, will still take many years to recuperate (official press release, 2016). Replicating the site's financial success might require a similar level of investment. The site's future economic revenues or potential economic spillovers might not be the best grounds on which to justify such an investment. Instead, a more persuasive argument might rest on the site's potential to provide a much needed public good (see the Zollverein – UNESCO World Heritage Site website, for further information).



Figure 9. Zollverein Park's Sun Wheel at night. (Photo: CC Willi Heidelbach)



Figure 10. The Swimming Pool, Zollverein UNESCO World Heritage Site. (Photo: CC Leo Laempel)

On a very much smaller scale, the National Historic Landmark Carrie Furnaces also exemplify how historic heavy industrial complexes can be regional foci for cultural production. Shut down in 1984, the former blast furnace plant in Pittsburgh, Pennsylvania, underwent a partial demolition. In 1997, a group of local artists surreptitiously entered the site to construct the Carrie Deer, a 40-foot (12 m) sculpture of a deer, from materials salvaged at the site (figure 12). The Carrie Deer emerged as the heritage site's icon. Some of the artists went on to form the Industrial Arts Cooperative. The Cooperative's programmes include the Mobile Sculpture Workshop, a summer workshop that educates local youth in metalworking while producing a large-scale sculpture for public display. Rivers of Steel, the non-profit heritage corporation

charged with administering the Carrie Furnaces, periodically exhibits metal arts at the heritage site through large, outdoor events. These events include demonstrations by metal sculptors and the Industrial Arts Cooperative. In addition, the Carrie Furnaces have been a set for film, television, and music productions (see the websites of Rivers of Steel and the Industrial Arts Cooperative for further information).

Two projects presently underway are building new urban districts around conserved heavy industrial complexes. These projects are on the new frontier of efforts to save and repurpose heavy industrial complexes. In Belval, a new urban district of Luxembourg City, parts of the blast furnace plant of the ARBED steelworks is being preserved while the remainder of the site is being entirely



Figure 11. The Amphitheatre, Zollverein UNESCO World Heritage Site. (Photo: CC Michael)

redeveloped and built up. In Sesto San Giovanni, Italy, parts of the Falck steelworks are being preserved while the remainder of the site undergoes large-scale redevelopment. ARBED's former steelworks in Belval, Luxembourg, stand about 12 miles (20 km) from Luxembourg City, and provide an example of twentieth-century Luxembourgish steel manufacturing technology. ArcelorMittal (formerly ARBED) and the Luxembourgish government formed the Agora Development Company following the steelworks' shut-down. The master plan that emerged from a 2001 design competition held by Agora proposes the construction of a 'City of Science for Research and Innovation', anchored by the University of Luxembourg. In addition to relocating the University of Luxembourg to the site, the plan divides the site into four

sections, distinct in concept, density, and programme. The A and B furnaces of the site's former blast furnace plant are the new urban district's landmarks, and the district's civic square, the Blast Furnace Terrace, centres on these monuments of iron production (see figures 13 and 14). The Blast Furnace Terrace will include the university's campus, cultural and entertainment spaces, and residences at an urban density. The remaining sections are a mixed commercial and residential area, a large central park, and two residential neighbourhoods. This plan is radically different from the traditional approach to *heavy* industrial heritage conservation because it incorporates elements of the historic blast furnace plant into an entirely new urban fabric and because it includes residential development. Furnace B will remain as it is, while

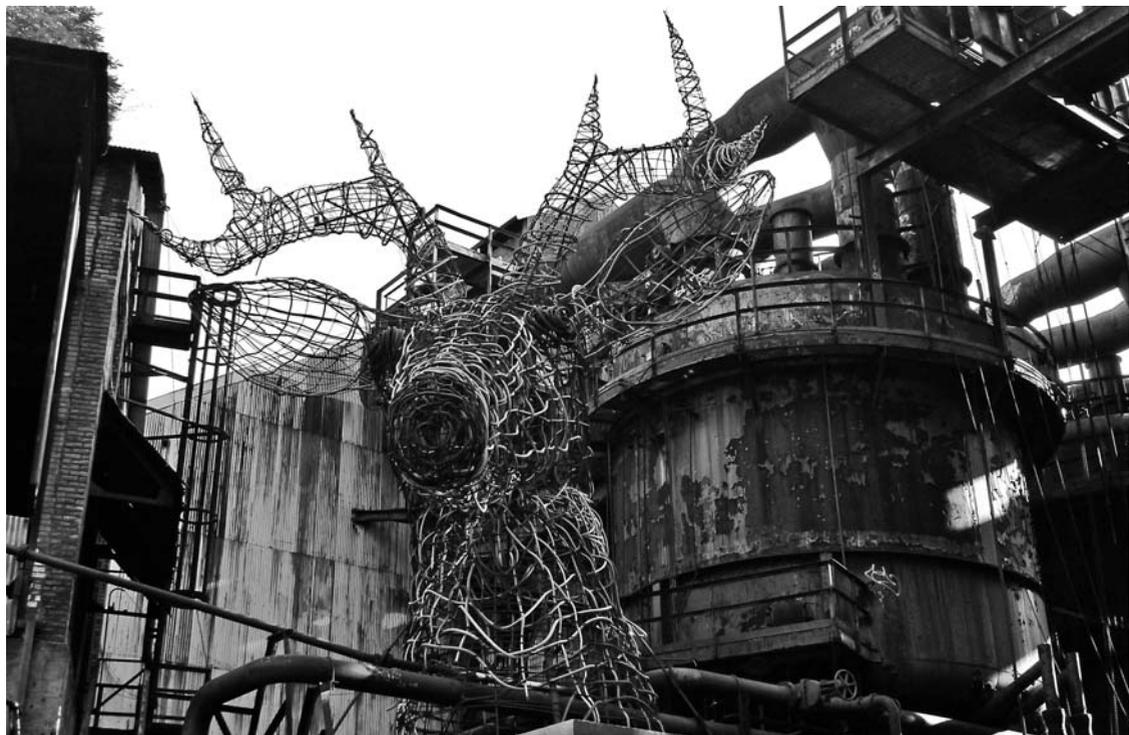


Figure 12. The Carrie Deer at the Carrie Furnaces, Pittsburgh, Pennsylvania. (Photo: © Sunny Menozzi)



Figure 13. Beval, Luxembourg. (Photo: CC Daniel Bracchetti)

the interior of Furnace A will be converted into the National Centre for Industrial Culture. The stock house, a 170-metre long shed where the blast furnace charges were prepared, will be conserved and repurposed as an exhibition space for the National Centre for Industrial Culture and a library for the University of Luxembourg (see Le Fonds Belval, the development's website, for more information). Belval: City of Science will theoretically be linked to the site's historical use as a steelworks in two ways. First, through the conservation and adaptive reuse of the steelworks' blast furnace plant, and second, through the site's programmatic focus on science, which recalls the technological process of steelmaking.

The plan for the former Falck steelworks, by architect Renzo Piano, also proposes the development of a new urban area. The Falck steelworks operated in Sesto San Giovanni, Italy from 1906 until 1995. The plan proposes the construction of a health care institution

as well as educational amenities, residences, and a large park, quite like the plan for Belval. Notably, it also reserves some space for manufacturing. These elements set this approach apart from traditional conservation plans for heavy industrial complexes. Like Belval, the plan proposes the conservation and reuse of some of the steelworks' machinery and buildings, including its T3 and T5 blast furnaces and fabrication mills, to be adapted for uses as diverse as a university library, a sports centre, a retirement home, and a cultural events space. As in the plan for Belval, the blast furnaces and the mills will be the new area's landmarks. Piano's plan aims to recall the site's historic ethos of work by establishing a programme that will 'produce' ideas (Oevermann and Mieg, 2015, pp. 65–68; Preite, 2012, pp. 189–199).

In sum, these projects exemplify, first, a range of benefits decision-makers seek from efforts to save and reuse heavy industrial complexes, and second, the widening of this



Figure 14. The Blast Furnace Terrace at Belval. (Photo: CC Robert Glod)

range over time. These projects can benefit communities socially in five ways. First, they may be strong impetuses for environmental remediation and the cultivation of the natural landscape. Second, heavy industrial sites may be transformed into new, high-quality outdoor recreational areas. Third, these projects' planning phases can catalyze a process of community introspection, which can help a locality rethink its identity and reframe its public image. Fourth, repurposed complexes can become regional foci for cultural production through adaptive reuse and the construction of new cultural amenities on-site. Fifth, these projects might respond to a public need (e.g. for a new educational institution, hospital, stores, or even manufacturing space) through the heritage-sensitive construction of a new development. Recent projects have been more ambitious, expanding their scope and adding to the ways in which this type of project has historically benefited communities. The most recent projects surely offer the broadest and greatest social and cultural benefits. Given the value of historic heavy industrial complexes, the obstacles conservationists and communities must surmount to save and repurpose them, the complex economics of conservation, and the valuable civic benefits that conservation can offer, the conservation of heavy industrial infrastructure is both worthwhile and challenging. As such, conservation should only be undertaken when there is a strong public commitment to investing in heritage preservation and adaptive reuse. In addition, decision-makers and communities need to acknowledge that the new amenities they build will not necessarily be commercially viable by themselves, although they may contribute to redevelopment.

### **Debating the Rationale for Conserving (or Demolishing) a Heavy Industrial Complex**

The criteria for the conservation of industrial heritage published by various cultural heri-

tage institutions are only a starting point for evaluating the merits of conservation. The conservation and redevelopment process is extraordinarily difficult. Regardless of the benefits that any particular conservation project promises, major obstacles may prevent the project from moving forward. The most difficult obstacles to surmount may be social and economic: with community support, some legal challenges may be overcome, and through creativity and with sufficient funding, most physical challenges may be surmounted. Given the complex economics of conservation, especially the factors that detract from the potential for job creation and revenues from tourism (e.g. the ratio of low-skilled workers to high-skilled workers, the ratio of low-wage jobs and volunteer positions to high-wage jobs, underdeveloped tourism and service sectors, and an absence of community support, to name but a few), a site's future economic revenues or potential economic spillovers might not be the best grounds on which to persuade a community of the merits of conservation. Instead, a more persuasive argument might rest on a site's potential to provide a range of civic benefits.

The projects presented in this paper differ by type of industrial use and represent practices spanning more than 40 years. They suggest the potential range of social and cultural benefits generated by projects of this type. Thus, in responding to the question, 'when should communities conserve heavy industrial complexes?', one must refer back to the community. The community needs to assess if what it is seeking constitutes a social or cultural benefit, and whether its need for such benefits justifies a substantial long-term investment in a project that may never be commercially viable. After all, in exhibiting former workplaces, expansive in land area and in the number of workers they once employed, these projects exhibit not merely machines and production processes, but the human histories of entire communities. To measure the importance of a potential civic benefit to a community, decision-makers should

consider the community's needs, expectations, and their willingness to contribute resources (from donations to tax revenues to time) to the project. If either political will or investment is insufficient, decision-makers may not want to proceed. In sum, community support and the benefit to local residents are the most important factors when evaluating the rationale for conservation and adaptive reuse. Finally, the trend in projects that conserve heavy industrial complexes suggests that the benefits of conservation and reuse have become more diverse and more substantial over time. Ongoing projects that are building new urban developments around preserved heavy industrial complexes appear to represent a new and promising iteration of the industrial heritage endeavour.

#### NOTE

1. It should be noted that the economic returns on projects that conserve and repurpose heavy industrial complexes in the context of new urban developments will surely differ from the returns on traditional, tourism-centric approaches, and could be subjected to further study. In addition, a study that systematically quantifies the external benefits of industrial heritage projects would be insightful.

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