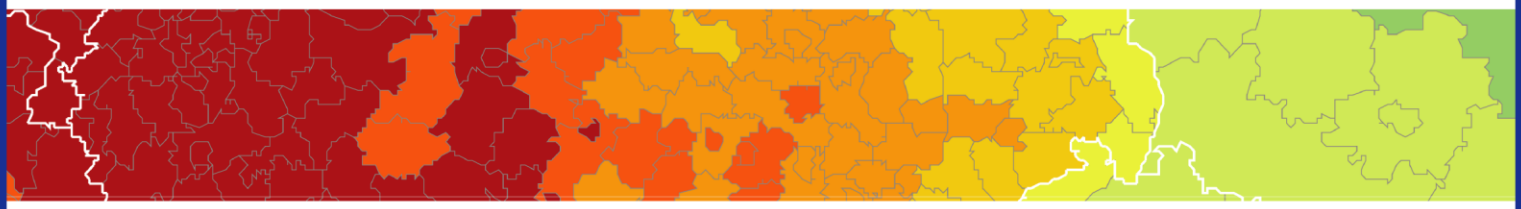

ENSURE – European Sustainable Urbanisation through port city Regeneration

Targeted Analysis

Annex 2: Port city regeneration in Europe: An overview

Annex

This targeted analysis is conducted within the framework of the ESPON 2020 Cooperation Programme.

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Annex 2 Port city regeneration in Europe: An overview

ENSURE – European Sustainable Urbanisation through port city Regeneration

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Table of contents

List of Maps

List of Figures

List of Tables

Abbreviations

EC	European Commission
ESOF	European Science Open Forum
ESPO	European Sea Ports Organisation
ESPON	European Territorial Observatory Network
EU	European Union
GRETA	Green infrastructure Enhancing biodiversity and ecosystem services for territorial development
INTERCO	The 'Indicators of Territorial Cohesion'
LEED	Leadership in Energy and Environmental Design
LSEZ	Latvian Strategic Economic Zone
NUTS	Nomenclature of Territorial Units for Statistics
SDG	Sustainable Development Goals
SGPTD	Secondary Growth Poles and Territorial Development in Europe - Performance, Policy and Prospect
SIESTA	Spatial indicators for a Europe 2020 Strategy Territorial Analysis
SEMs	Société d'Économie Mixte (Mixed Ownership Enterprise)
SUD	Sustainable Urban Development
SUPER	Sustainable Urbanization and land-use Practices in European Regions
USEACT	Urban Sustainable Environmental Actions
ZAC	Zone d'Aménagement Concerté (Concerted Planning Zone)

1 Introduction

This Annex to the ENSURE (EuropeaN Sustainable Urbanisation through port city Regeneration) project reviews the key challenges and risks faced by European cities with respect to completed, ongoing or planned port city regeneration. This review provides a broader context for the four in-depth case study reports that are key outputs of the project and was produced through a literature review of the scientific literature and an analysis of the regeneration experience of more than 40 small and medium-sized cities across Europe. The analysis is based on desk research to identify appropriate cities and key trends.

The document is structured as follows. Section 2 provides an overview of the key literature on this topic, while Section 3 introduces the methodology for selecting cities to inform the analysis. Section 4 focuses on key patterns and trends of regeneration across European small and medium-sized cities, highlighting the spatial distribution of port city regeneration and the variable character of these regeneration projects. Section 5 focuses on the key challenges faced by European cities engaged in port city regeneration activities and highlights some of the innovations or solutions that have been attempted by cities aiming to promote sustainable port city regeneration.

A synthesis of this report is provided in sections 3, 4 and 5 of the main report of the ENSURE project.

2 Waterfront regeneration: A review of the relevant literature

From the outset, it should be noted that the relationship between port city regeneration and sustainability is not without its problems. Although the regeneration of brownfield land can be economically and environmentally beneficial, the dominant model of port city regeneration has been couched within entrepreneurial or neoliberal approaches to urban development. These approaches have been criticised as leading, in different contexts, to gentrification, social segregation, and the privatisation of urban land at the expense of more public uses (Boland et al., 2017; Degen and García, 2012; Harvey, 1989). However, the scale of redevelopment required by many regeneration projects, coupled with underfunded municipal government structures, means that the delivery of port city regeneration is often not possible without significant private sector investment. Moreover, although normative narratives have cast port city regeneration as the wholesale replacing of the industrial port with a post-industrial waterfront combining office, consumption, and residential functions, the reality is more complex. Indeed, in many cases, port city regeneration occurs within the context of expanding port activity (though declining employment) or through the relocation of the port. Balancing these competing economic functions, as well as managing the environmental transitions involved, makes port city regeneration a fraught process involving multiple agendas and stakeholders. This literature review maps out the main elements of port city regeneration, identifying models, stakeholders, and where barriers occur. Drawing on the wider academic literature as well as the ESPON evidence base, we show how port city regeneration can be a tool, but also a challenge, for sustainable urban development.

2.1 Sustainable urban development

Sustainable urban development (SUD) is defined as the redevelopment of cities, in line with, the long-term protection of human habitation and ecological systems. This includes the protection of urban ecosystems, the development of sustainable communities, the promotion of green infrastructure among other objectives (Wheeler, 1996). The importance of SUD is recognised within the United Nations 17 Sustainable Development Goals (SDGs) for the year 2030 and within Europe 2020 strategy targets (Eurostat, 2019). Goal 11 of the SDGs places a particular emphasis on ‘Sustainable Cities and Communities’ and is contextualised by the projection that by "2050, 66% of the global population will be urban residents” (Lloyds, 2018:2). Measures include "creating career and business opportunities, safe and affordable housing, and building resilient societies and economies" (United Nations Development Program, 2019: np). These also align with the Europe 2020 strategy which aims for enhanced, employment, research and development, focus on climate change mitigation, energy transitions, educational enhancement, and addressing poverty and social exclusion (Eurostat, 2019).

In order to meet the aims of SDG 11, the other SDGs and the Europe 2020 targets need to be considered (see Rynikiewicz, 2011; Smith & Soledad Garcia Ferrari, 2012a/b/d; Soledad Garcia Ferrari & Smith, 2012; Bunce, 2009; Moore & Bunce, 2009; Borriello, 2013; Green,

2018; Bardos et al., 2016; Essex & Ford, 2015; Darchen & Ladouceur, 2013; Timur, 2013; Wessell, 2014; Shah & Roy, 2017; Longo & Campbell, 2017 and Attia & Ibrahim, 2018). For example, the sustainable urban development of cities in relation to good health and well-being (Goal 3) drives the re-greening of brownfield sites which may have been contaminated and present significant environmental health hazards (Green, 2018). Meanwhile, energy (Goal 7) has always been a critical element of port city development from the changes in transport which encouraged port, city and industrial growth in the 19th and 20th century to the discovery of oil creating new industrial clusters of oil terminals and refineries. Nowadays, energy is still a key economic driver of ports but in the form of renewable energy (Smith & Soledad Garcia Ferrari, 2012a/b/d) with Siemens estimating that over the next few decades ports and cities will invest billions in renewable infrastructure to capitalise on this new economic and environmental agenda (Rynikiewicz, 2011). This is already evident in some of the port-cities studied for this research.

European cohesion policies are critical in supporting the vision of sustainable growth, especially "the Community Strategic Guidelines on Cohesion 2007-2013, the Fourth and Fifth Reports on Cohesion, as well as (the debate on the) Green Paper on Territorial Cohesion" (ESPON, 2013a), the European Regional Development Fund and Cohesion Fund 2021- 2027 (European Parliament 2019 and the EU Sustainable Development Strategy (European Commission 2019A) and the 2030 Agenda for Sustainable Development (European Commission 2019B). A key feature of sustainable urban development is the remediation and regeneration of brownfield land in de-industrialising cities. A brownfield site is an abandoned or disused building or piece of land that was often, historically, a site of industrial activity (Castree et al., 2013). The redevelopment of brownfield sites has also been tied in with the provision of green infrastructure (Bardos et al., 2016; Burinskiene et al., 2017; Kotval, 2016; Li et al., 2016; Loures, 2015; Attia & Ibrahim 2018; Bunce, 2009; Cook & Ward, 2012; Daamen & Vries, 2013; Da Cunha & Selada, 2009; Darchen & Ladouceur, 2013; Eidelman, 2018; Frantzeskaki et al., 2014; Giovinazzi & Moretti, 2010; Gunay & Dokmeci, 2012; Hein, 2014; Hesse, 2018; Jelovac, 2013; Jones, 2017; Lalovic et al., 2015; Lloyd-Jones, 2010; Martí et al., 2018; Rynikiewicz, 2011; Sairinen & Kumpulainen, 2006; Salet, 2008; Schubert, 2015; Swaszek, 2014; Timur, 2013 and Van Den Berghe, 2018) which is a core goal of many city governments because of its environmental and broader health benefits. Across Europe, many projects and policies focus on sustainable urban development, but a key issue is the lack of indicators, benchmarks and data for measuring progress towards more sustainable urban futures. ESPON research provides a good evidence-base for considering these challenges.

The 'Indicators of Territorial Cohesion' (INTERCO) (ESPON, 2013b) project aimed to define, contextualise and develop indicators for measuring progress towards cohesion within Europe. It illustrated that the greatest levels of cohesion have been in terms of developing strong local economies to ensure competitiveness but that the picture is more mixed across other indicators including social and environmental sustainability. Similarly, the findings of the 'Spatial Indicators for a Europe 2020 Strategy Territorial Analysis' (SIESTA) project illustrates a significant

variation across Europe in making progress towards more sustainable, smart and inclusive growth (ESPON, 2013a). Of interest to the four case study cities that are the focus of this ESPON ENSURE project, the 'Secondary Growth Poles and Territorial Development in Europe; Performance, Policy and Prospect' (SGPTD) project focused on the opportunities and risks of secondary cities. The project concluded that city-regions which strategically mobilised and exploited their assets were more resilient through the economic crisis, but also argued that national governments must strategically invest in second-tier cities in order to support the national economy more effectively (ESPON, 2012). Port city regeneration and infrastructure projects are one key avenue through which this could be achieved.

This focus on supporting infrastructure expands beyond just hard engineering projects and is encompassing green infrastructure, the focus of the ESPON 'Green Infrastructure Enhancing biodiversity and ecosystem services for Territorial Development' (GRETA) project. This project focuses on the concept that land (even brownfield land) can offer "many environmental, social, cultural and economic benefits at the same time" (ESPON, 2019a) as long as the space is not being "degraded by land fragmentation, urban expansion and the building of transport and energy infrastructures" (ESPON, 2019a). This project highlights the potential of green infrastructure for port city development, but cautions that some of the key infrastructural projects we associate with port cities (e.g. energy and transport) actually cause environmental damage and reduce mixed-use and green spaces (Rynikiewicz, 2011; Witte et al., 2014; Wessells, 2014; Smith & Soledad Garcia Ferrari, 2012a/b/d; Soledad Garcia Ferrari & Smith, 2012; Bunce, 2009; Moore & Bunce, 2009; Borriello, 2013; Green, 2018; Bardos et al., 2016). USEACT (Urban Sustainable Environmental Actions), which is part of Urbact II, fosters sustainable urban development through the use of brownfield sites. The aim of USEACT is to explore different sustainable methods for cities to re-use space as an alternative to consuming new land and in doing this, aim to integrate policies around energy consumption, heritage and the re-integration of brownfield sites into urban spaces.

"How sustainable land use can be promoted and how land-take, soil sealing and urban sprawl can be avoided, reduced and compensated in Europe, its cities and regions" (ESPON, 2019b), is a key challenge, particularly in port-cities. The ESPON 'Sustainable Urbanization and land-use Practices in European Regions' (SUPER) is currently investigating the dynamics of land-use change across European cities and how they are influenced by spatial planning and territorial governance implication. The outcomes of the ENSURE project may provide a useful input into this project as we uncover the tactics, governance and methods of regenerating brownfield sites in our selection of port-cities.

2.2 Port city regeneration as a driver of sustainable urban development

Port city regeneration can take several forms and the OECD (2014) identify four main policy options available to stakeholders:

- Growth of maritime clusters (logistics, maritime services, shipbuilding and repair)
- Development of new industries (industrial ecology, renewable energy)
- Waterfront regeneration (tourism, recreation, food, events industry)
- Diversification (non-port sectors)

While the first two options have tended to be constrained within the boundary of the port itself, the most dominant policy option adopted along the port city interface has been waterfront regeneration in order to transition towards new economic sectors. In different scenarios, this has been coupled with both port expansion and decline.

Waterfront regeneration is a driver of sustainable urban development as it aims to repurpose formal industrial lands for new urban uses (Castree et al., 2013). Waterfront spaces were highly industrialised up until the 1970s, after which they began to experience deindustrialisation due to globalisation, a shift from Fordism to post Fordist modes of production, and the development of new technologies and larger vessels which required the port to relocate to facilities generally outside of the urban core. Thus, former port zones became derelict and were abandoned, with the legacy brownfield sites having significant urban implications including contamination and health risks, increased levels of unemployment, poverty, and social problems. Brownfield land presents a set of development challenges relating to environmental risks (due to contamination) and financial risks, both in terms of the substantial up-front costs of environmental remediation and in relation to the perceived risks of investing in areas in socio-economic decline (Green, 2018). However, waterfront regeneration also presents substantial opportunities for property investment and speculation. Urban entrepreneurial approaches focused on replacing declining industrial functions with post-industrial waterfronts based on consumption, residential and the knowledge economy, and underpinned by urban branding and boosterist strategies, became a mainstay of urban development policy. Thus, waterfront redevelopment can be seen a driver of sustainable urban development, in that once dilapidated and abandoned sites are redeveloped to provide housing, commercial buildings, and open spaces, while reducing contamination and other associated risks. Further, these sites often engage in new technologies and green infrastructure, creating more environmentally friendly spaces, which can contribute to the growth of the new economic sector and provide new residential areas.

2.3 History of the port city relationship and interface

A large number of Europe's principal towns owe their origins to port trade and the operation of the seaport as a gateway or import node. Historically, the fate of the city and the port have been closely connected socially, economically and physically. As cities developed and port-trade increased there was a gradual physical separation of the two entities, with economic interests diverging and physical separation becoming the norm (Table 1). The most widely cited model of the port city interface has been developed by Hoyle (1988;2000) in which six distinct phases of waterfront development were identified:

Table 2.1: Hoyle's typology of waterfront development

Stage	Period	Characteristics
1.Primitive port and city	Ancient and medieval-19th century	Port near to city and trade link important for city prosperity
2.Expanding port and city	19th-early 20th century	The rapid growth of port function; ports develop beyond the city
3.The modern industrial port	Mid-20th century	Separation of port and city; containerisation, industrialisation, ro-ro ships
4.Retreat from the waterfront	1960s-1980s	Further separation – the growth of the port and industrial areas away from the city; deep water berths
5. Redevelopment of the waterfront	1970s-1990s	Older waterfront areas become derelict due to the departure of port functions: renewal of these sites begins including attempts to integrate with the city
6. Renewal of port and city links	1980s-2000+	Promotion of 'liveability' and multiple functions for older waterfront areas in globalised age – further integration with rest of city

Source: Hoyle (1988;2000)

The model developed by Hoyle (1988;2000) is descriptive and demonstrates in a relatively linear way the effect of global economic restructuring on inner-city areas – and more specifically waterfront districts – and illustrates the acute nature of this change. Malone (1996) argues that the factors causing decline and facilitating redevelopment of the waterfront or port city interface are the same processes that have affected other areas within the city. Samperi (1986) identified three key considerations that drove an explosion in waterfront regeneration programmes in the 1980s - large areas of under-utilised industrial land lay derelict close to the city centre, urban economies were transitioning from manufacturing / heavy industry to service dominance, and the aesthetic nature of the waterfront became a magnetic attraction for people. Some authors also argue that because of the political significance given to certain early regeneration programmes (for example, London Docklands as the crowning achievement of Tory urban policy), the waterfront was assigned new functions – 'to accommodate personal political ambitions … to house new nodes in the global economy' and in particular to act as 'a place where the forces of capitalism are currently exercised under a new guise' (Malone, 1996: 2 – 3). In some cases, newly redeveloped areas competed directly with the traditional urban core. Rather than becoming integrated with the existing economic and physical fabric, waterfront redevelopment focused on the creation of 'flagship' initiatives and development setting the waterfront quarter even further apart from the city. Later projects in the 1990s addressed some of these early failings, particularly in relation to the relationship between the city, the port and the interstitial zone, but also in terms of achieving a better balance between physical, economic and social regeneration.

Since Hoyle (2000), other authors have developed alternative conceptualisations of the port city interface. For example, Shaw (2001) identified four phases of development within the period from the 1960s to the 1990s, including the more recent expansion of waterfront regeneration programmes to smaller cities and towns outside of the major metropolitan regions. In the last decade, Gallard and Hansen (2012) have developed a model, which traces different planning approaches to manage the port city interface. The fourth phase of their model focuses on what they term 'leverage planning' – the private sector drives change but is facilitated by the state, in particular through infrastructural investment and provision.

The renewed focus of attention on waterfront redevelopment in small and medium-sized cities in recent years is a function of new drivers of urban development, a wider context of crisis and austerity, and a realisation of the need to plan and develop more sustainably. Brownfield sites – such as former port lands - have been re-conceptualised as places of opportunity, with the potential to satisfy the demand for space close to the urban core. In the 1990s, Breen and Rigby (1994) described waterfront areas as new urban frontiers. In the last decade, this has taken on renewed importance as cities plan their emergence from a period of austerity and recession. In an age when the service economy dominates – and particularly financial and knowledge services – the redevelopment of land close to the heart of the city ensures easy accessibility and facilitates institutional agglomeration. The European Commission (2017) has recently argued that port cities have an opportunity to use old industrial waterfront locations to revive their economy, to strengthen their attractiveness and competitiveness and to demonstrate the potential of more sustainable urban planning. They also provide opportunities to address some of the Sustainable Development Goals and ensure the optimisation of land resources within existing urban footprints. This growing emphasis on the role of the waterfront in promoting the wider interests of the city-region has spurred thinking about a potential new phase in the relationship between the port and city. Muir et al. (2015) have described this as the emergence of the "competitive waterfront" and suggest it as an additional stage in the typology of waterfront development proposed by Hoyle (1998; 2000). Characteristics of this latest phase of the port city relationship include: the intertwining of competitiveness and branding; complex governance arrangements, usually facilitated by the state through flexible planning (similar to Gallard and Hansen's (2012) leverage capitalism); high value housing and iconic architecture alongside the growing control and privatization of space; and former port areas becoming more functionally similar to the rest of city but still significantly disconnected physically and mentally from the rest of the city (Muir et al., 2015). This phase is indicative of the growing importance of neoliberal urban governance in shaping the port city interface.

2.4 Waterfront regeneration and the changing political economy of cities

Much of the academic literature argues that waterfront regeneration is associated with urban entrepreneurialism and underpinned by neoliberal approaches to urban economic development (Harvey, 1989; Lovering, 2007). Neoliberal urbanism is an umbrella term that refers to a new

emphasis on economic competitiveness, marketisation and economic growth in cities (Larner and McClean, forthcoming). Associated with this is the rise of urban entrepreneurialism, which the Oxford Dictionary of Human Geography defines as a “form of urban governance focused on promoting economic growth through enabling the private sector to flourish, in contrast with urban managerialism, which concentrates on the provision of public services”. Waterfront regeneration became one of the key exemplars of urban entrepreneurialism in that deindustrialising docklands offered large landbanks for property development, while the associated rebranding of these areas as sites of consumption and the knowledge economy offered a means for cities to escape the image of their industrial past. However, drivers of urban regeneration are multifaceted and can involve the coordination and conflict between a range of different stakeholders. As such, these projects have also been used as sample cities to understand the emergence of new neoliberal modes of urban governance involving the cooperation between local, regional and national scales, property developers, citizens and landowners (Harvey, 1989). Further, neoliberal urbanism supports the regeneration of brownfield sites in a way that maximises its commercial potential. Waterfront regeneration can result in the pushing out of traditional communities, the gentrification of the space and an increased commercial focus. Thus, neoliberal urbanism alongside waterfront regeneration results in new axes of polarisation and exclusion (Boland et al., 2019).

2.4.1 Reasons for regenerating port-cities

Regeneration is just the latest stage in the evolution of the port city interface. Port-cities shifted from mercantilism in the eighteenth century, to become the focus of industrial development in the nineteenth century, and the identity of the city and port was closely connected. For example, European cities like Bilbao (ES), Glasgow and Belfast (GB) became closely associated with shipbuilding and industrial port activity and thus de-industrialisation was a major blow for both the ports and the identities of the cities. Cities that had been the drivers of economic activity now became markers of a decaying economy and perceived as obsolete for 20th century economic purposes. The retreat of the port was very much a product of the new political-economic order, with intensified international competition having been facilitated by the emergence of new technologies facilitating a new international division of labour. In port zones, containerisation and the forced relocation of port activity seaward were of critical importance from the 1960s. This trend continues today in cities such as Cork (IE), for example, where the port is relocating more activity seaward towards Ringaskiddy.

Landscapes of decay and obsolescence in older port areas have become familiar the world over, and for decades these brownfield sites were considered too high a development risk. This led to a perception that cities had turned their backs on ports. In some cities, clear tensions began to emerge between port planners and city planners with little cognisance of the need or desire to develop a coherent vision. The maritime past in many places was erased from the landscape through regeneration schemes, and indeed is one of the major critiques of some projects such as the Dublin Docklands regeneration (Moore, 2008). In others, the waterfront

has become touristified – while the maritime history is retained through the conservation of heritage buildings. Thus, the real port history has become sanitised and the past commodified to support the development of the 'experience economy'. The challenge and opportunity for seaport cities now are how to harness the potential of former port areas to support a modern identity, enable competitiveness but also to retain a sense of the past.

Recent work by the OECD (2014) suggests that a key approach is not to use regeneration projects to force the increased separation of the port from new urban functions, but to mix port activity with new residential and other functions. The re-integration of the port and city is resulting in various impacts on the city, hinterland and ports. This reclaiming of the port city identity is removing natural and physical barriers and fostering the full economic, environmental, social, cultural and amenity potential of these renewed partnerships (Chang and Huang 2010). Waterfront regeneration is primarily the re-using of former port spaces and is an act of harnessing abandoned land and to open up the water for different economic sectors, wider society, cultural developments and to create sustainable and environmentally friendly initiatives (Chang and Huang, 2010). Thus, the desire to enhance economic, environmental and social sustainability are drivers of port city regeneration.

Economic: Waterfront regeneration and the re-integration of port cities are critical to inter-urban competition for investment. Cities such as Dublin (IE), Liverpool (GB) and Istanbul (TR) have redeveloped brownfield spaces to attract and create economic agglomerations in order to re-brand and market the city for foreign direct investment (Gunay, & Dokmeci, 2012; Moore, 2008; Parkinson, 1988). More recently, post-crisis economic growth has influenced the development of new urban regeneration plans and reignited implementation for the first time since 2008 in cities such as Waterford (IE), Reykjavik (IS) and Bilbao (ES). Regeneration has also occurred as the port city relationship has been re-evaluated by policymakers who recognise co-operation and integration is key to sustainable economic development and that societal integration of the city and port activities is critical (ESPO, 2010). These spaces are often identified as sites of strategic or national economic importance. The OECD (2014:151) argue that while economic value-added created within the port is associated with port city economic performance, "the interaction between ports and their cities is underpinned by a set of policy dilemmas, because port authorities and city governments do not necessarily have the same interests, goals and perception of challenges and policies that are needed".

Social and cultural reasons: While planning strategies emphasise the positive features of port city regeneration, for pre-existing communities' negative impacts have been gentrification, loss of local culture and sense of place as the regeneration of brownfield sites abandoned during deindustrialisation are often promoted as 'new city quarters' (Neill, 1993) and deliberately re-branded in an attempt to transform identity. These positive re-imaginations of brownfield sites aim to remove the stigmatization of crime and poverty which may have been associated with these areas (Loures & Vaz, 2018; Loures, 2011). Such negative conceptions result in regeneration being proposed to provide new resources and amenities, the

development of a new spatial identity and changing social dynamics (Sairinen & Kumpulainen, 2006). However, the result is often that areas are regenerated for a different community and class squeezing the traditional community in direct and indirect ways (Boland et al., 2017). The polarisation of wealth and poverty (Wessells, 2014: 771) is often an impact, as evident in South Lake Union in Seattle. This was a deindustrialised brownfield that was redeveloped into a premium space welcoming Amazon, high-end apartments, trendy restaurants and other spaces that became perceived as highly exclusionary (Wessells, 2014).

Other drivers for redevelopment include a desire to preserve historical sites and monuments. However, Airas et al. (2015) argue that this is a misconception, as often a bid to retain "historical distinctiveness" morphs into a form of gentrification with the demolition of industrial buildings and warehouses, and their redevelopment in ways that are not reflective of the history of the space.

More recently, social impact assessments, which indicate the potential outcomes both “positive and negative” of a regeneration project (Sairinen & Kumpulainen, 2006:123), have begun to be undertaken alongside environmental assessments. While social transformation can underpin a developer’s case for regeneration, it can also generate more engagement and participation by social actors. Issues such as a lack of recreational and open spaces, affordable housing, health and education facilities and transport infrastructure can often become drivers of redevelopment plans, potentially resulting in healthier outcomes for citizens. The redevelopment of Davenport in Plymouth (GB) is an example of health-focused regeneration as part of their vision included the building of sports centres, health care facilities and breakfast clubs.

Environmental: Energy has always been a key economic sector in port-cities. However, as oil and gas reserves diminish, energy-making port-cities are re-thinking their position in the global economy. The transition towards more renewable energy activities is now a key economic driver of ports and regeneration in many places (Smith & Soledad Garcia Ferrari, 2012a/b/d). Siemens estimates that over the next few decades, ports and cities will invest billions in renewable infrastructure to capitalise on this new economic and environmental agenda (Rynikiewicz, 2011). Bardos et al. (2016) have identified a significant number of European cities that are using clean energy to remain competitive in the global market. These include a number of cities in our sample including Bremerhaven (DE), Dunkerque (FR) and Aberdeen (GB).

Soledad Garcia Ferrari et al. (2012) highlight the potential of clean energy or the transition towards it, in achieving more sustainable urban development. They argue that an environmental framing of the political agenda can result in positive benefits of regeneration. For example, in Malmö (SE) in the early 2000s, nature-based solutions and renewable energy were a key focus of the new mixed-use waterfront regeneration. €1.5 million was provided by the European Union to support the renewable energy aspects of the project (Borriello, 2013).

A number of cities, including Toronto, are adopting the ‘Leadership in Energy and Environmental Design” (LEED) to ensure sustainable designs through the promotion of green buildings and plans on brownfield land (Moore & Bunce, 2009). The public sale of waterfront

land to private developers in Toronto includes a clause stipulating adherence to LEED and enforced through the public education of developers in energy-efficient development (Bunce, 2009). Another key argument for regeneration is to increase density and promote more compact urban growth to “minimize investments in infrastructure, energy consumption and emissions from private car traffic (Sairinen & Kumpulainen, 2006: 122). Some cities co-located with their port already suffer from environmental pollutants, but sustainable urban design can mitigate these factors and thus, the re-integration of port-cities is essential for using available space wisely but also integrating environmentally safety measures for both citizens and the surrounding ecosystem (Borriello, 2013).

2.4.2 Public policy towards and governance of waterfront regeneration

Due to the size, cost and complexity of projects, public-private partnerships tend to be the dominant governance arrangement with waterfront and port city regeneration projects (Sanchez, 2016). They involve a multitude of stakeholders, multiple interests and often exist within multi-level governance frameworks. Ownership structures in terms of land and port functions, and the role of private sector actors differ from country to country and occur within different governance systems, centralised and decentralised (Sanchez, 2016). Centralised governance involves the national government having a key role in the redevelopment process and can result in contestation between different actors creating difficulty in maintaining coherent and collaborative projects (Sanchez, 2016; Daamen & Vries, 2013; Witte et al., 2014). A decentralised system does not remove the state from the process but reduces their power and input to a shared scheme of knowledge between the port and actors at more local scales (Sanchez, 2016).

Sanchez (2016) examines the variety of governance systems at work during port city re-integration and waterfront development, ranging from a public-private partnership approach in Helsinki with a focus on housing to a more state-led approach in Genoa (IT) focused on the updating of port infrastructure. Most ports in Europe operate under the landlord model, which ensures that basic infrastructure is provided by the authority, but other spaces and functions are leased out (Sanchez, 2016). Although a similar management technique, the regulations and governance processes of each state affect the port and city interface (Sanchez, 2006), demonstrating the importance of a contextual approach to waterfront regeneration.

While there is variation across contexts, there are also common challenges faced at the port city interface related to the need to co-negotiate that space (Witte et al., 2014). Often processes of regulation favour one spatial outcome over another, further entrenching the separation of port and city (Daamen & Vries, 2013). While collaboration and cooperation principles underpin sustainable development, governance structures often fail to mediate between the different interests of the city and port (Witte et al., 2014). Often this is related to the complexity of the situation, and the need for mediation within informal regulatory processes but also "informal institutional structures" (Witte et al., 2013: 44).

More formalised and targeted governance arrangements have been put in place in some cities to manage large-scale regeneration programmes, through the creation of specific development agencies or designation of strategic development zones (Moore, 2008; Cardullo & Kitchin, 2018 and Giovinazzi & Moretti, 2010). These zones and agencies offer flexibility outside of the normal planning system and have been associated with the provision of specific tax incentives and deregulated planning processes, thus they can be attractive for a range of sectors. These approaches have played a large role in promoting cultural shifts in the identity of areas in need of regeneration to stimulate different kinds of uses and attract new users to what were often normatively categorised as 'no-go areas' (Loures & Vaz, 2018; Loures, 2015). Such cultural transitions have been facilitated by rebranding initiatives and the development of flagship or landmark facilities. However, without appropriate regulation and participatory structures embedded in governance models, Boland et al., (2017) have argued that regeneration does not result in benefits for the general public.

2.5 Implementation of waterfront regeneration

The implementation of waterfront regeneration differs from city to city based on institutional culture, societal values, the strength of the economy, and relevant city and/or port priorities. This section reviews three challenges and opportunities highlighted in the literature that impact the implementation phase; funding, land ownership and public participation.

2.5.1 Funding

Across the literature, four types of funding streams for port city regeneration are evident. In common with other forms of regeneration, these are:

- Public funding (also funding emanating from creative and cultural projects) (Sepe, 2013,2014 and Boland et al., 2017)
- Private investment (O'Callaghan & Linehan, 2007; Moore, 2008)
- Public-private funding (Papatheochari, 2011; Bardos et al., 2016; Moore Cherry & Vinci, 2012 and Hein et al., 2013)
- EU funding (Shaw et al., 2008).

In many cases, the wider political-economic and financial context means that access to public funding can be limited, and thus there is increased reliance on the private sector. In some cases, public money is invested at the outset to 'pump-prime' development and act as a catalyst for regeneration to lever in private sector funding (Moore Cherry & Vinci, 2012). However, Lee et al. (2013) caution that while there are many examples of this strategy working, the absence of public investment in key enabling infrastructure can cause the bankruptcy of private developers, evident in London (GB) during the initial phase of regeneration at Canary Wharf. For re-integration or regeneration to be successful, funding is required from both the private and public sectors (Hoyle, 2001; Moretti, 2008; and Papatheochari, 2011). The success of private-public funding schemes is evident in Rotterdam and Amsterdam (NL) where public

funding supported the transport infrastructure connecting the ports to the cities (McCarthy & Romenin, 2012).

Publicly funded creative regeneration and flagship developments are important in terms of generating profit for re-investment but also boosting investor confidence (Sepe, 2013,2014; Schubert, 2015). In Malmö (SE) public sector funding supported the development of a successful housing expo, which then was used to lever private funding for the second phase of the regeneration project (Baltic Urban Lab, 2019). Investment in cultural projects and events can also be used to justify public spending during a regeneration project as evident in Bjørvika (NO) where the city developed a new Opera House (Smith & Van Krough Strand, 2011).

EU funding, particularly from the 1990s, has encouraged urban regeneration across Europe (Shaw et al., 2008) and continues to be a significant funding stream for some countries and regions. However very often this comes with strict eligibility criteria and obtaining it can often be a fraught process (De Rossa & Di Palmo, 2013 and Swaszek, 2014). For example, when Belfast (GB) applied for EU funding, their application was investigated due to a perceived lack of competition between construction companies for the Titanic Quarter project (Ramsey, 2013). Belfast (GB) offers a salutary lesson than on the importance of timing related to funding, and how funding can be temporally contingent and thus also dependent on economic cycles and the health of the public purse.

2.5.2 Land ownership

Land ownership is a critical aspect of regeneration projects and can be a critical barrier as well as an enabler to effective and successful waterfront regeneration. Land ownership can act as a barrier for re-integration and regeneration when the realisation of the value of the land may cause contestation between public and private sectors (Leger et al., 2016). Particularly, where land is to be transferred between one agency and another, or public agencies wish to compulsorily acquire land, fragmented ownership patterns can act as a significant challenge in unlocking regeneration. Sanchez (2016) suggests that when the port area is owned by the city, it can choose not to renew leases for certain port functions, which potentially would open up the land for re-development. When land is primarily owned by the private sector (Leger et al., 2016), waterfront regeneration can become more speculative in the sense that they are facilitated by financial and property development actors. In this situation, the timing of development is extremely significant in mitigating the risk factors associated with boom-bust cycles (MacLaren & Kelly, 2014).

2.5.3 Public participation

Rizzo et al. (2015:437) argue that there is a lack of “comprehensive studies providing an overview of stakeholders’ perceptions, concerns, attitudes and information needs when dealing with brownfield regeneration”. Even so, public participation is an increasingly important aspect of sustainable waterfront regeneration, particularly during the implementation phase (Timur, 2013; Scholl & Kemp, 2016). Transparent democratic decision making is required for truly sustainable regeneration (Wang, 2014) and can open up a range of new sustainable urban

development avenues including housing type, open spaces, ecological, environmental and urban footprints, energy sources, and transport infrastructure (Green, 2018). For example, in Aalborg (DK), the public was engaged with redevelopment at all stages (Yildiz et al., 2015) while in, Valencia (ES), the project was based on public consensus (Giovinazzi & Morretti, 2010).

Nonetheless, there have been many critiques of poor public participation practices in waterfront regeneration projects (Brudell and Attuyer, 2014) where a top-down approach resulted in no more than passive or tick the box exercises (Xi & Gu, 2015). This approach evolves out of the ideology that some form of public participation is required for regeneration to be legitimated but it does not contribute to higher-level decision-making (Wang, 2014). Although public participation was promoted as a key element of Seattle's waterfront regeneration, such that public participation in regeneration projects is often nicknamed the 'Seattle Way' (Wessells, 2014), the commercial imperative of the regeneration produced increased inequality and social polarisation. In many cases, only certain 'publics' participate, and thus social exclusion and polarization can be common outcomes of waterfront regeneration (Xi & Gu, 2015).

2.6 Outcomes and impacts of waterfront regeneration

The impact of economic development projects is traditionally classified into four distinct types (Ferrari et al., 2010): direct, indirect, induced and catalytic. Although these are a useful frame for examining the impact of regional economic initiatives, they are much more difficult to apply to waterfront regeneration because of the lack of data at an appropriate scale. Hall & Jacobs (2012) adopt a more qualitative approach by examining the different interactions created by changing relationships between the port and the city and the types of impacts they may possibly produce.

Positive impacts include urban and regional economic growth, new commercial and residential clusters, environmental upgrades and the attraction of new international shipping functions such as containerisation, cruises and other activities to ports and cities (Urbanyi-Popiołek & Klopott, 2016). When a port is successful, economic change can also benefit the city more broadly as it intensifies economic clustering and labour growth. Increasingly there is a realisation of the social responsibility that port areas have as 'neighbours', which has fed into changing priorities for and approaches to, planning sustainably for regeneration. For example, in 2004 Ecoport identified port waste, dredging (navigability maintenance) and the resulting disposal of sand as the most pressing environmental issues facing ports, whereas by 2016, air quality, energy consumption and noise pollution had become the top priorities (European Commission, 2016). Smith and Soledad Garcia Ferrari (2012c) and Kreutz (2008) discuss the mixed impacts of port city regeneration in Hamburg (DE). On the one hand, innovative strategies have been successful in generating local improvements and supporting the economy. On the other hand, there are concerns that the approach has supported an agenda of privatization, particularly of public spaces.

Early waterfront regeneration schemes have been critiqued as appropriating and gentrifying run-down traditionally working-class areas for international capital and investors. Former residents in rejuvenated areas have generally failed to benefit from renewal activity. Even where social renewal has been the most important priority, as in Rotterdam (NL), social polarization has occurred. The widely held conception that the interests of capital and local residents are non-compatible has resulted in inadequate attempts to make each responsible to the other. Community and social cohesion are; thus, a major challenge of any sustainable regeneration model have the potential to contribute to significant policy goals around inclusive growth and increasing access to affordable and adequate housing. Taşan-Kok (2010) posits that analysis such as the social impact assessment and the environmental impact assessment should be applied at the neighbourhood, functional urban, metropolitan and regional scales in order to ensure that polarisation of services, society and culture are minimised. Sairinen & Kumpulainen (2006:120) argue that social impacts of waterfront regeneration can be classed in four ways; "resources and identity, social status, access and activities and waterfront experience". They advocate for a social impact assessment - a process of accounting for all social outcomes of regeneration both "positive and negative" - to be conducted on all waterfront developments.

Negative impacts of port city regeneration include environmental issues. Ports are high pollutant creators and affect "air emissions, water quality, soil, waste, biodiversity and noise". For example, in Koper (SI), this can cause conflict between the port and the city and have a major impact on the success of re-integration and/or regeneration. Environmental impacts can also generate public resistance especially with regard to port expansion, although port relocation is often supported due to this argument. Further, without the suitable infrastructure to support port and city re-integration, urban congestion can become an issue and can create conflict with the public, business associations and other organisations (Yildiz et al., 2015). This is usually symptomatic of central planning schemes with little public participation (Muir et al., 2015).

Waterfront regeneration has the potential to have long term impacts on urban space, this is particularly the case for cities that have hosted mega-events such as the Olympic Games (Xi and Gu, 2015). The regeneration of brownfield waterfront sites for the hosting of events has long been identified as having catalytic effects. But these event-oriented regeneration programmes can result in long term impacts such as the gentrification of the wider urban area and increased tourism. Smith & Von Krogh Strand (2011) discuss the impact of major flagship developments using the example of Bilbao's (ES) Guggenheim museum. Across the literature, the 'Guggenheim effect' is a key trend that recognises the impact that flagship developments can have on tourism, employment and the wider economy. However, Smith & Von Krogh Strand (2011) suggest that the positive impact on tourism experienced by Bilbao was an accidental consequence and that there has been relatively little monitoring or evaluation of the true impacts of this and other similar projects.

2.7 Opportunities and challenges of waterfront regeneration as a driver for sustainable urban development

While it is relatively difficult to disaggregate the long-term impact of port city regeneration on the wider city-region, the European Sea Ports Organisation (ESPO) (2014) argues that for port-cities to be competitive, waterfront regeneration projects should combine residential urban actions with port activities as has been undertaken in Marseille (FR). The wider regional significance of the port city interface is also recognised by ESPO, who have identified different ways to connect with their stakeholders in the wider city-region (European Parliament Briefing, 2016). They suggest the need to make neighbours your ambassador; limit negative externalities and develop a functional and spatial mix of ports and cities (ESPO, 2016). However this is a significant challenge and the OECD (2014:151) acknowledge that "the policy challenge for port-cities will be to find synergies between the two perspectives, e.g. by introducing smart and selective port growth perspectives, attracting high value-added port employment, use the port as a site for green businesses and develop mixed urban waterfronts with room for port functions."

Port city, and particularly waterfront regeneration, presents an opportunity for land recycling in that brownfield spaces can be re-used to facilitate the growing urban population, new forms of economic clusters and as spaces of city branding, boosting and placemaking. Further, as brownfield spaces often present environmental and health hazards for the city, their regeneration allows cities to rethink their urban footprint, a process that can be defined and established as part of the early plans and/or as a significant contractual agreement between all stakeholders. However, these types of decisions, particularly around sustainable urban development, can be affected by the different governance mechanisms in place. Criteria around understanding how regeneration and re-integration will change the environment, biodiversity, use of resources and demolishing or destroying of natural resources (urban footprint) and an analysis of social and environmental impact are more evident within public-private partnerships (Sairinen & Kumpulainen, 2006). This is particularly true when the public/city owns the land and can issue guidelines and contractual obligations. Similarly, when space is governed solely by the public and they own the land, these opportunities are often evident. However, challenges arise when these projects are governed solely by the private sector and the land is not owned or sold by the public. While cities benefit from the redevelopment of these areas in terms of urban branding, economic growth and new industrial clusters, regeneration can also present challenges in social polarisation, gentrification and changing city identities (Lovering, 2007; Loures & Vaz, 2018; Loures, 2015).

The implementation of waterfront regeneration differs vastly between cities based on funding models, governance structures, power dynamics, institutional collaboration, priorities and goals. However, four key funding streams are evident, with different cities adopting different mixes with implications for implementation practices and processes (Sepe, 2013,2014; Boland

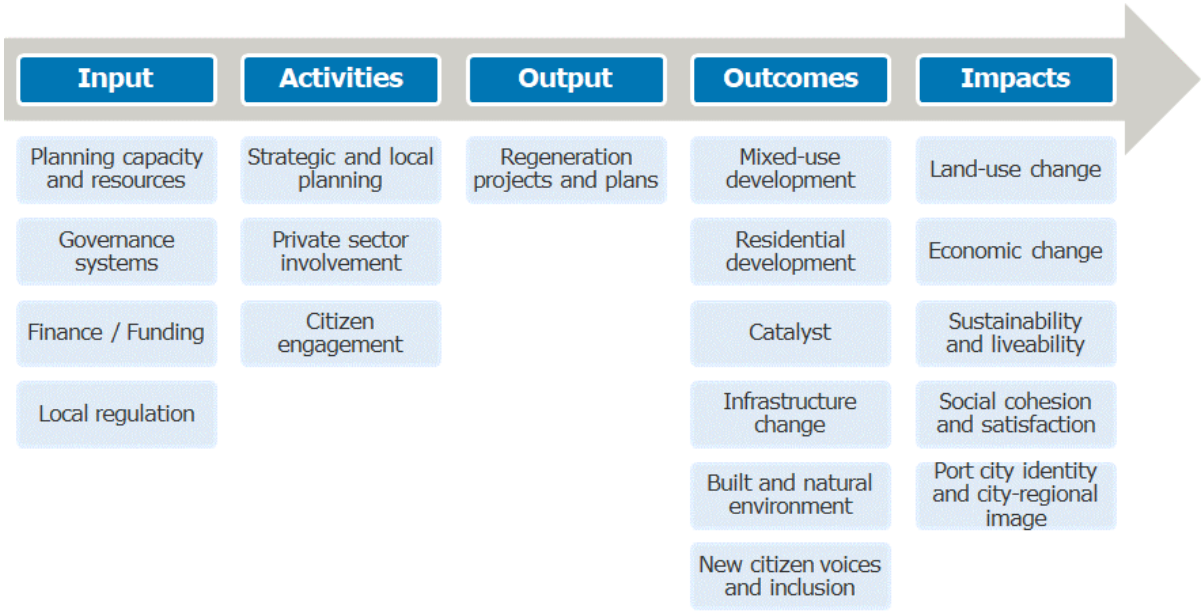
et al., 2017; O'Callaghan & Linehan, 2007; Moore, 2008; Papatheochari, 2011; Bardos et al., 2016; Moore Cherry & Vinci, 2012; Hein et al., 2013; and Shaw et al., 2008). Although a number of impacts or implementation challenges are discussed in the literature, there is very little synthetical research on the actual processes of port city re-integration and thus, the literature is dominated by empirical discussions. The key outcomes of regeneration tend to be new urban uses, flagship developments, new infrastructure provision and new economic activities. The impacts (positive and negative) evident from these city-by-city studies are increased economic growth, competitiveness, issues related to environmental, social and cultural sustainability, and social polarisation.

In conclusion, port city regeneration projects have the potential to enhance the city-regional economy through the attraction of new activities to generate direct and indirect employment, tax revenue and support the development of important infrastructure. Critically, while bringing under-utilised brownfield land back into re-use for urban development, compact city objectives can be supported by building within the existing urban footprint and protecting greenfield and amenity sites in the wider metropolitan region. The amenity and environmental value of the former port lands also provide an opportunity to develop facilities and green-blue infrastructure of wider social, environmental and economic importance to the city-region. Sanchez (2016) argues that it is impossible to fully re-integrate a city and port, but that a more sustainable relationship than heretofore observed can be achieved.

2.8 Conclusion: A theory of port city change

Drawing on the international academic and policy literature as well as our pan-European data gathering and analysis, it is clear that port city regeneration is a key issue in terms of promoting the more sustainable and inclusive urban development of the European territory. What is also evident however is that there are significant gaps in knowledge regarding small and medium-sized cities in. particular and limited *ex facto* evaluation and monitoring of regeneration schemes. To address these limitations, we propose adopting a theory of change approach to understanding port city regeneration in our four case study cities. This is summarised in Figure 2.1 below, which is an attempt to integrate outcomes and impacts into a wider **theory of change of port city regeneration**. The pathway between input and impact is a succession of causality links, which can materialise in various combinations depending on the local regeneration objectives and context. It begins with the necessary pre-conditions for regeneration being in place (inputs) and is followed by actions (activities) necessary to create a specific regeneration plan (output). Once the plan is in place and being implemented, it usually produces direct, immediate consequences (outcomes) which then lead to, sometimes indirect, longer term consequences or impacts. The general patterns evident across our sample and case-study cities are detailed in later chapters.

Figure 2.1: A generic theory of change for port city regeneration

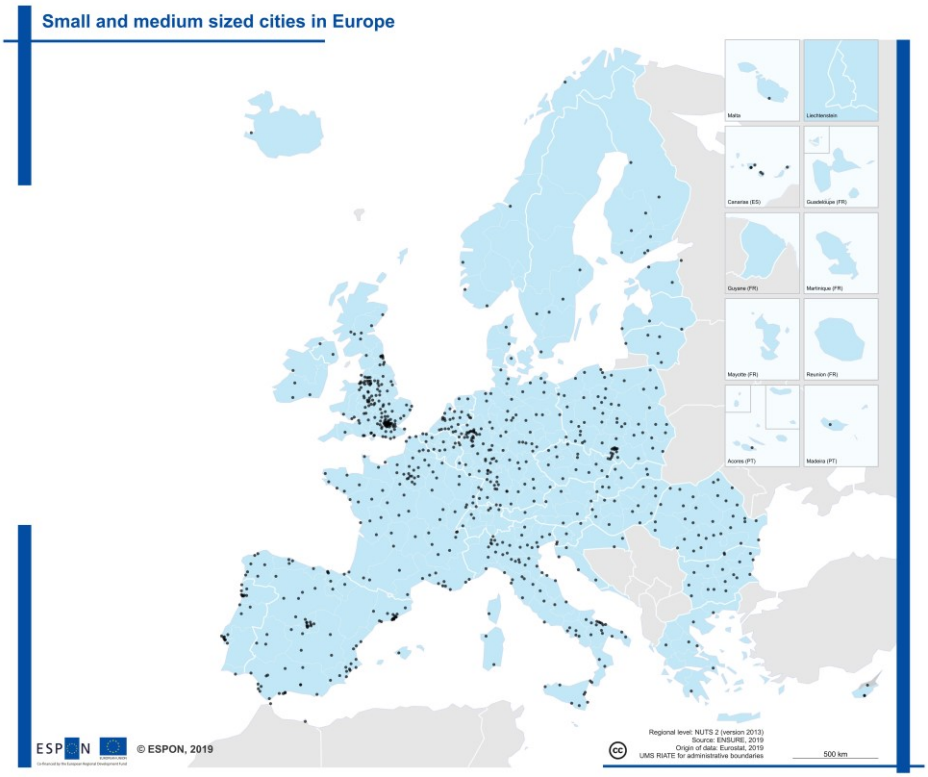


Source: Author's own elaboration

3 Methodological approach

This research focuses on the challenges of port city regeneration, as outlined in the previous section, and aims to build the evidence base for policymaking to support the redevelopment of port city areas across Europe. The particular focus is on small and medium-sized port cities. The EU-OECD harmonised definitions of small cities (population of 50,000-200,000) and medium-sized cities (population of 200,000-500,000) has been used. Population data on Cities and Greater cities - defined as the administrative city and where appropriate, a wider area where the urban centre extends beyond the administrative boundaries (EUROSTAT[1]) - has been used. Selecting cities at this spatial scale, rather than a functional urban area, created a tighter boundary around the urban areas, and captured cities of comparable size to our four main case study cities – Aalborg (DK), Brest (FR), Catania (IT) and Cork (IE). This produced a mapping of 791 small and medium-sized cities across Europe (Map 3.1). While cities of this scale are evident across the continent, there is a coastal concentration evident in Scandinavia, Ireland, Iberia, Italy and Greece and a second concentration evident in the old industrial belt of north-west Europe from the British Midlands, through Belgium and into Germany.

Map 3.1: Small and medium-sized European cities

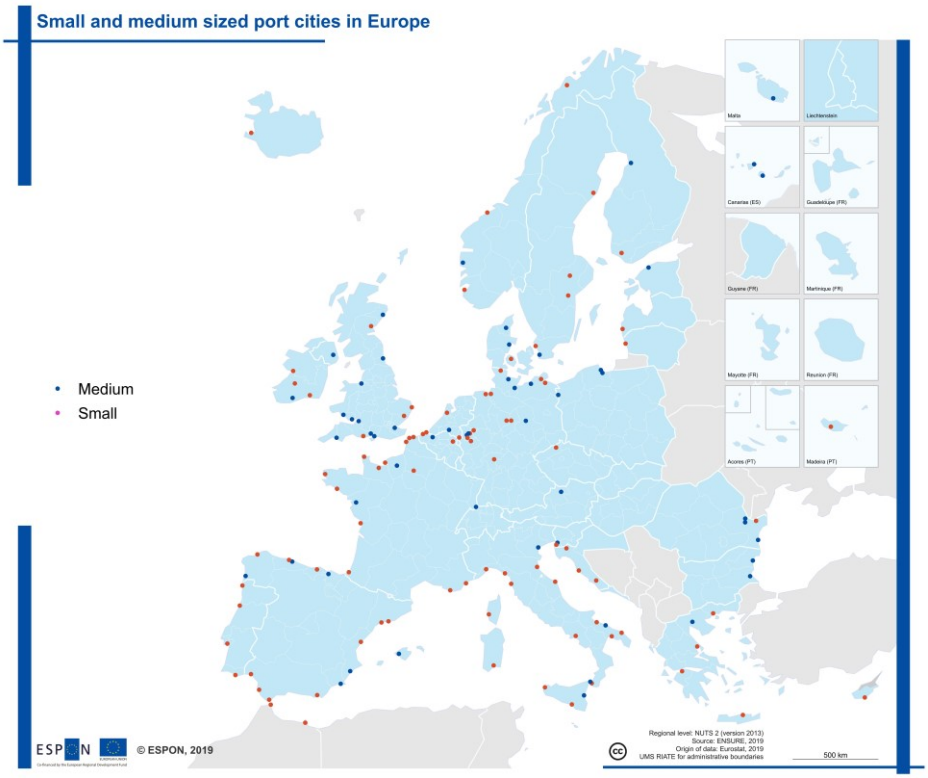


A list of European ports was identified using EUROSTAT maritime transport data. When cross-referenced with the small and medium-sized cities dataset, a definitive list of 144 small and medium-sized European port cities was produced (Map 3.2). A desktop analysis, based on

[1] https://ec.europa.eu/eurostat/cache/metadata/en/urb_esms.htm

available online documentation in English, French or Italian, was undertaken to identify whether there was evidence of port city regeneration in these cities.

Map 3.2: Small and medium-sized European port cities



96 cities have undergone or are undergoing some form of port city regeneration and short, summary reports on regeneration history, governance, implementation and challenges were produced for forty-four cities. This was a convenience sample based on the cities for which most data were publicly accessible online. The list of cities is provided in Table 2.1.

Table 3.1: European port-cities informing analysis

City	Country
Aalborg	Denmark
Aarhus	Denmark
Aberdeen	United Kingdom
Ancona	Italy
Aviles	Spain
Bari Vecchia	Italy
Barletta	Italy
Basel	Switzerland
Belfast	United Kingdom
Bilbao	Spain
Burgas	Bulgaria
Bremerhaven	Germany
Brest	France

City	Country
Brindisi	Italy
Bristol	United Kingdom
Caen, France	France
Calais, France	France
Castellon	Spain
Catania	Italy
Cherbourg	France
Cork	Ireland
Creil	France
Dundee	United Kingdom
Dunkerque	France
Gdansk	Poland
Gdynia	Poland
Klaipeda	Lithuania
Koper	Slovenia
Le Havre	France
Liepaja	Latvia
Limerick	Ireland
Linz	Austria
Malmö	Sweden
Norrköping	Sweden
Reykjavik	Iceland
Rijeka	Croatia
Santander	Spain
Split	Croatia
Swansea	United Kingdom
Tallinn	Estonia
Thessaloniki	Greece
Trieste	Italy
Turku	Finland
Valetta	Malta

4 Trends in European waterfront regeneration

Since the 1970s, academic and policy discourses have suggested a fundamental shift in the global north context towards the post-industrial city model. Port, docklands, and waterfront regeneration has been seen as a core component of these shifts (ESPO, 2016). However, as indicated earlier, it is not the case that port activity has ceased to be important. Although the nature and footprint of port activity have changed in qualitative terms, port activities remain of fundamental economic importance to a range of European cities. A key challenge for cities is harnessing more local value from port activity and minimising negative externalities (OECD, 2014). As urban economies based on knowledge, work, consumption and leisure have become increasingly significant, one mechanism of harnessing value, has been through port-related waterfront redevelopment. However, this has occurred in tandem with the growth of port zones in some cases and expansion rather than the retreat of the port. The challenges and risks associated with regeneration are related to managing these dual transitioning functions as the relationship between them is much more complex than traditional port city models (for example Hoyle, 1989; 2000) might suggest.

4.1 Extent of waterfront regeneration in small and medium-sized cities

While 70 small and medium-sized European sample cities have already experimented with implementing some form of port city regeneration, it is clear from our analysis of the 44 cities in Table 3.1, that regeneration is at very different stages and can refer to different sets of processes. For the purposes of this research, we have identified three **implementation typologies** of port city or waterfront regeneration projects (including 96 of our 144 cities), namely those that have demonstrated a:

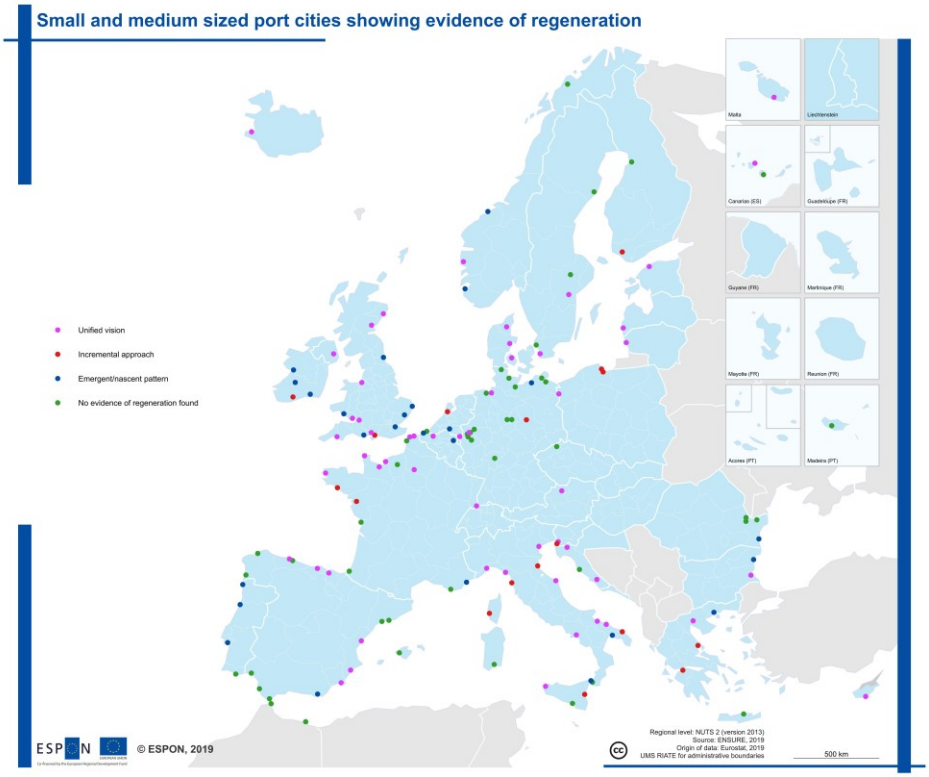
- ***Unified vision (54 cities):*** an overarching strategic line of development based on a coherent vision, masterplan or other strategic document is evident
- ***Incremental approach (16 cities)***: evolved either on a project-by-project basis or in separate phases over significant periods of time
- ***Emergent / nascent pattern (26 cities)***: plans or policies are in place, but concerted implementation has not yet got underway

Each of the three typologies has its own challenges, including managing the tensions between master planning versus more flexible planning; the benefits of a ‘big-bang’ regeneration impact versus a more organic evolution; and how to progress from effective planning to efficient implementation. The spatial distribution of this typology is illustrated in Map 4.1.

The analysis also indicates that there is significant potential for European small and medium-sized port-cities to further harness the opportunities of waterfront regeneration and port city reintegration. More than 50% of the cities that meet the definition of small and medium-sized European port city, do not demonstrate as yet any evidence of regeneration based on our desk-

top analysis. While some cities may be thriving and have no need for regeneration, there is likely to be significant latent potential across the European territory.

Map 4.1: Types of port city regeneration



4.2 Characteristics of port city regeneration in Europe

Seaports are the dominant type of port which have or are undergoing port regeneration, relocation and/or expansion across Europe. A *seaport* is a harbour or port which can facilitate seagoing vessels and they are usually co-located with a major city. Riverports are also important port types in Central and Western Europe, given the scale and significance of the Rhine, Danube and other similar rivers within the landscape. A *riverport* is defined as a port co-located along a river or lake and it is normally a central element within a city or town.

In Northern, Western and parts of Southern Europe, most ports developed during the industrial revolution. Shipbuilding was critical to the port economy in cities such as Bremerhaven (DE), Aberdeen (GB), Reykjavik (IS) and Klaipeda (LT) while industries such as textiles, wool, cotton and sugar dominated Norrköping (SE), Calais (FR), Liepaja (LV), Reykjavik (IS), Valletta (MT) and Le Havre (FR). Hoyle (1988) defines this period as the expanding port city where the growing economy and industrialisation often forced the port beyond the urban core and encouraged the outward growth of the city. However, during the mid-20th century, a retreat from the waterfront became evident as deindustrialisation gathered pace driven by increased global competition, the spatial relocation of industry, and growth in technology. Since the 1970s, cities have been confronting the need to redevelop and reposition themselves within the global

market as locations for the service and cultural economy such as in Liverpool (GB) and Bilbao (ES).

Although, industrialisation and deindustrialisation were phenomena that affected many of Europe's ports, another key aspect was the collapse of socialism in former Eastern Europe. Many cities in this part of Europe had active ports that became militarized during the Soviet era and later de-militarised as these states transitioned to a new political-economic structure. Cities, where this had a particularly strong influence, were Tallinn (EE) and Liepaja (LV). During and after the transition, these ports had to expand, develop and in many cases were privatised to integrate more fully into the global market economy. In some cases, port spaces played an active role in the collapse of communism, one example being the Gdansk shipyards (PL). This has given these particular port-cities an added layer of identity that is being harnessed through regeneration programmes. Port-cities in Western Europe with a military port were also affected by the end of the Cold War, including Brest (FR).

For the most part, regeneration projects aim to redevelop brownfield sites through land recycling, deliver mixed-use spaces, and encourage modal shifts in urban transport to more sustainable approaches. These are represented in the plans of many cities including Bremerhaven (DE), Norrkoping (SE), and Basel (CH) amongst others. A variety of catalysts therefore are driving waterfront or port city regeneration across Europe, as outlined below.

4.2.1 Global competition and the need to innovate:

Each port city faces economic challenges and thus must continually evolve and innovate to ensure their economic success. For example, Dunkerque (FR) has become home to Europe's largest energy platforms, housing nine different forms of energy generating companies including wind farms, a nuclear power plant, subsea gas lines and coal. The city has used the energy platform to re-brand and market the city for foreign direct investment. To attract workers and companies, regeneration of deindustrialised sites into mixed use housing, amenity and open spaces is required. This trend to re-brand and market the city internationally is also evident in Liepaja (LV), which markets itself as one of the only ice-free ports in the region and a Trans-European Network Transport hub in the East-West Corridor thus, giving it unique accessibility to European and Asian ports. As port-cities regenerate and innovate, it is also clear that they begin to compete directly with each other. For example, Aberdeen (GB) is competing with Dunkerque (FR) to attract energy industries. Aberdeen (GB) recognises that its industrial base of the oil and gas industry may cease or relocate and thus is regenerating the port area to accommodate offshore renewable energy activities.

4.2.2 Sites of national or strategic importance:

Across Europe, port-cities are recognised as sites of strategic or national economic importance and therefore have significant development potential. Port city regeneration is often part of a boosterist agenda to retain and enhance global competitiveness and attract foreign direct investment, workers and tourists to the city, city-region and sometimes the country. This

strategic positioning is clearly evident in Limerick and Waterford (IE), Aberdeen and Dundee (GB), Liepaja (LV), Split (HR), Bilbao (ES) and Klaipeda (LT) among others.

4.2.3 Population and economic growth

Planning for future population growth and supporting a compact growth agenda has driven the regeneration of brownfield sites across Europe, many of which are waterfront sites. For instance, by 2030, 39% of the entire population of Iceland will be in Reykjavik (IS). The city is regenerating numerous sites including three in the old harbour space to ensure adequate housing supply that is sustainable and will enhance urban liveability. Other examples where changing demographics have acted as a driver include Le Havre (FR), Basel (CH) and Limerick (IE).

Post-economic crisis growth has also influenced port city regeneration plans and reignited implementation for the first time since 2008 in cities such as Waterford (IE), Reykjavik (IS) and Bilbao (ES), countries all devastated by the global financial crisis. Regeneration has also occurred as the port city relationship has been re-evaluated by policymakers who recognise the need for co-operation and integration in order to deliver more sustainable economic and urban developments. For example, Dunkerque (FR) is a key economic asset for France in terms of renewable energies. Liepaja (LV) has used a Strategic Economic Zone (LSEZ) designation to drive regional growth while Aberdeen (GB) is focusing in integrated growth within the “energy industry, tourism and lifeline ferry services”.

4.2.4 Re-integration of the city and the port

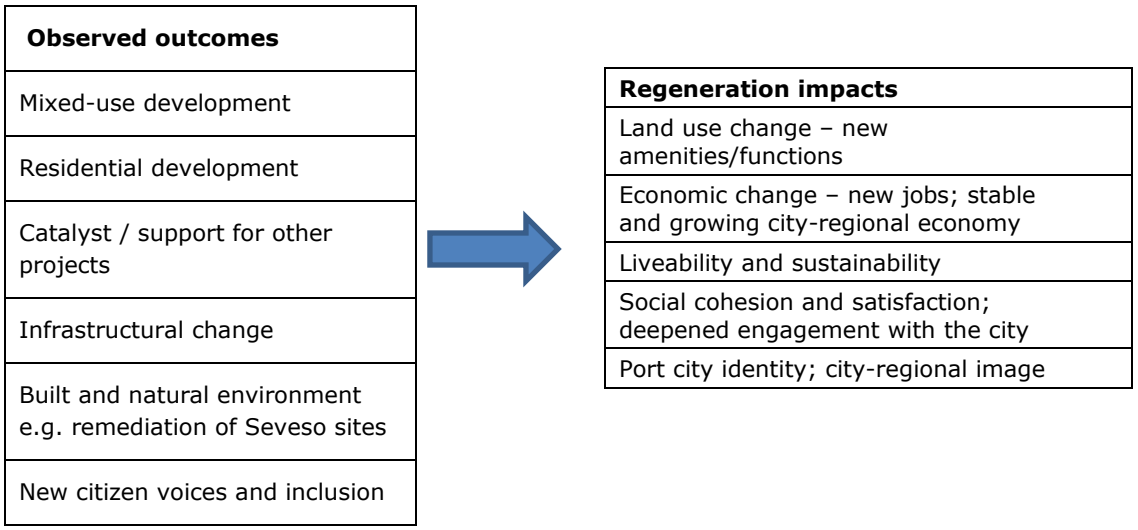
From the mid-20th century until relatively recently, the port city relationship has been weakening, producing a fragmented functional urban area. For environmental and other reasons, there is renewed interest in removing or working around natural and physical barriers to re-integrate ports and cities and harness their full economic, environmental and amenity potential. This has been central to regeneration in Koper (SI), Le Havre and Creil (FR), Rijeka (HR), Santander (ES), Swansea (GB) and Aarhus (DK), among others. Contrary to the linear and singular relationship between the port and city portrayed in some of the existing literature, we highlight a more complex set of port city relationships that exist where regeneration is taking place.

5 Outcomes and impacts of port city regeneration in Europe

Hoyle's (1988; 2000) model of the port city interface suggests the evolution of the port city relationship over centuries in a linear way towards increasing separation. Although the later stages and recent experiences suggest that there has been a 'return' to the waterfront, re-integration of the port and city has not been a key feature of planning or orientation of policy. In fact, in many cases, it could be argued that policy has reinforced the separation by replacing port function with new urban uses. The OECD (2014) suggest that the outcomes and impacts of public policy at the port city interface can be classified according to their economic or development orientation, with many market-oriented outcomes and impacts evident in the form of new commercial enterprises and high-end housing developments. Other forms of orientation include those that are more publicly-focused such as the recapturing of the waterfront for public use and recreation, a trend evident in some of our Mediterranean sample cities (see Annex 1) such as Barletta (IT) where a new public park has been created from Margherita di Savoia to Bisceglie or in Split (HR) where the Riva promenade has been developed into a new public square. A third orientation can be financial, in terms of intensifying land use to create value. Because of these differing and sometimes conflicting orientations, obtaining an optimum functional mix, desired outcomes and long-term positive impacts can be a significant challenge.

Our sample city analysis generated an overview of the outcomes and impacts of port city regeneration, a theme that is under-studied in the academic but also in the policy literature where there appears to be less emphasis on monitoring and evaluation of plan implementation, than on plan development. We define ***outcomes as the direct, immediate consequences*** of the regeneration process, mostly functional and physical changes within the regenerated areas. ***Impacts are the indirect, longer-term consequences*** of the regeneration process, mostly economic, social, environmental and identity changes within the broader city-region or metropolitan area summarised in Figure 5.1. While there is a causal relationship between outcomes and impacts, any particular outcome can have multiple impacts.

Figure 5.1: Outcomes and impacts of port city regeneration



5.1 Outcomes

While much of the literature on port city regeneration has focused on the transformation of the built environment through the development of mixed-use facilities and housing, this analysis highlights that while this outcome is important, the picture is more diverse.

5.1.1 Mixed-use development

Mixed-use development is a key outcome of port regeneration across a range of different contexts and represents the shift from single use traditional port activities to multiple urban functions. Thus, mixed-use refers to the development of spaces for combinations of uses including residential, commercial and leisure e.g. Belfast (GB) where the Titanic Quarter has been developed alongside residential and new office functions. In Bremerhaven (DE), Gdansk (PL), Cork (IE) and Aarhus (DK), regeneration comprises a mix of hotels, residential and recreational (leisure) uses. Bremerhaven (DE) is also developing a technological park to complement other activities, while Aarhus (DK) recognises that mixed-use spaces lead to a more diverse residential profile which can act as a catalyst for further innovative development.

In Gdansk (PL), Gdynia (PL) and Thessaloniki (GR) mixed-use and leisure spaces have been developed to incorporate and embed green infrastructure, such as trees, shrubbery and green spaces, and in Gdansk (PL) there is a significant emphasis on regenerating in line with wider sustainability principles. Further, Thessaloniki (GR) is considering the development of cultural amenities along with recreational, leisure, sports and other mixed-use spaces, similar to Dundee (GB) which has enhanced its cultural infrastructure through the construction of the V&A (Victoria and Albert) Dundee Museum that is designed to link the city with its historic riverside.

5.1.2 Residential development

A key outcome of most port city regeneration projects is the construction of new residential complexes and neighbourhoods. Malmö (SE) provides a unique example of using an international housing exhibition in 2001 to catalyse new thinking. Initially resisted by some within the city who viewed it as a promotional tactic, the new residential area morphed into a permanent quarter with new waterfront access and recreational spaces that has proved highly attractive. The initial phase delivered only private housing but, in phase 2, 70% was developed as affordable housing. A key challenge facing cities who engage in waterfront regeneration is that while new residential spaces are opened closer to the city centre such as in Tallinn (EE), affordability issues can create tensions between those who can afford to live there and those who can only afford to live at greater distances. A third outcome of regeneration, linked to housing issues, are tensions that arise when an active port remains close to the residential property resulting in heavy traffic and air and noise quality issues such as in Bari (IT) or Reykjavik (IS). A test-bed for how this might be better managed is the Linnakaupunki district (270ha) in Turku (FI). This is planned as a residential area for up to 10,000 residents, while also being a major cluster for jobs and services, but it is co-located with an active port and thus

innovative solutions have had to be found. Although residential units are usually a key goal and outcome of waterfront regeneration, sometimes they are not the core priority, as in Belfast (GB).

5.1.3 Catalyst/building support for further projects

Port city regeneration projects take a variety of forms and often these are driven by the specific catalysts underpinning the project. The designation of these projects, cities and/or ports as sites of national or strategic importance can support both initial regeneration and subsequent development. This strategic positioning which is evident in Limerick (IE), Aberdeen and Dundee (GB), Liepaja (LV), Split (HR), Bilbao (ES) and Klaipeda (LT), Aarhus (DK) enhances the visibility of the city and port, and is often supported by accompanying investment in residential and recreational infrastructure. Regeneration in Malmö (SE) and Trieste (IT), Bristol (GB) occurred in concert with broader urban projects supported at various levels. As noted above, Malmö's (SE) new waterfront residential quarter became permanent after a very successful housing expo and the second stage of development reflected learning from the first. In Trieste (IT), the redevelopment of the Porto Vecchio area is part of the larger European Science Open Forum (ESOF) 2020 event, when Trieste will be European Capital of Science.

5.1.4 Infrastructural change

Some of the most visible outcomes of regeneration projects, and often a key enabler of wider development, are the upgrading of road networks, railways, public transport, cycleways and walkways. These upgrades result in generally positive outcomes for residents. In Basel (CH), Aberdeen (GB), Creil (FR), Gdansk (PL), Norrköping (SE), Catania (IT) and Koper (SI), the delivery of key infrastructures – such as roads and railways - was a critical part of their redevelopment planning and implementation. In Burgas (BG), the outcome was an integrated transport scheme with intermodal connections between rail, water and bus transport. In Caen (FR), the designated ZAC (Concerted Planning Zone) areas were designed to be connected via new bridges and river crossings, also facilitating a kayaking base and pedestrianised spaces. Similarly, the strategic development zone in Liepaja (LV) supported by the INTERREG Project 'Development of Advanced Marina Infrastructure' encouraged investment in road and port facilities which have delivered increases in both cargo and passenger numbers. In Rijeka (HR), the development of a new deep-sea terminal and the potential of a new cruise terminal combined with the redevelopment of the Vienna Port and new roads and bridges have enhanced the competitiveness of the city. Tallinn (EE) and Brest (FR) has developed cable cars to meet the transport needs of both new and pre-existing development. Although, for the most part, these are positive outcomes. Belfast (GB) is an example of a port city regeneration project where development did not sufficiently address key infrastructure requirements alongside other elements. Although it developed commercially and has become an attractive tourist destination, the road network leading from the city centre to the regenerated Titanic Quarter is difficult to navigate and there is limited public transport access. Combined with residential and mixed-use development, a direct outcome of infrastructural development is the

creation of direct employment in construction. This is generally temporary short-term employment that has a short-term impact on the local economy.

5.1.5 Built and natural environment

Across Europe, a changed built and natural environment is a significant outcome of regeneration. In Aberdeen and Bristol (GB), special attention has been placed on the ecology, habitat, heritage and geological features and potential of cities and ports. A well-documented outcome has been the recycling of brownfield and SEVESO sites, as decontamination enables repurposing as new urban spaces. Often, they facilitate new cultural infrastructure such as the Centro Cultural Internacional Oscar Niemeyer in Aviles (ES), the Titanic Museum in Belfast (GB), the Guggenheim Museum in Bilbao (ES) and the Museum of Bristol (GB), The House of Music, Aalborg (DK), “Le Ciminiere” Expo centre in Catania (IT) and SS Britain in Bristol (GB). In Thessaloniki (GR) old warehouses have been restored and now accommodate the Museum of Photography and the Centre of Contemporary Art. Adapting the built environment and enhancing the natural amenity to improve quality of life has a transformative effect. The building of the courthouse, library, as well as the landscaping of public space and development of canoeing and kayaking bases in Caen (FR), ensures an urban environment that is more attractive for residents and visitors. Similarly, in Cherbourg (FR), new public spaces include a shopping mall and a promenade which runs along the canal towards Cité de la Mer.

Open and green spaces are also a key outcome of waterfront regeneration especially in cities adopting sustainability principles such as Gdansk (PL), which is transforming its factories and warehouses into mixed-use developments but has a particular focus on enhancing open and green spaces. Split (HR) has developed a new public square to host a range of public events from sporting to religious events. Re-opening access to the waterfront in this way is a key trend in Adriatic port-cities. Thessaloniki (GR) has also created new public spaces such as large multipurpose rooms, restaurants, green spaces and outdoor amenities such as sports courts, amphitheatres and playgrounds. Sculptures, water features, 2353 new trees, 118,432 new plants and 58.75 acres of green space have been added to the urban environment to support the development of a greener and more sustainable city profile.

Unfortunately, transformations in the built environment can be targeted at a specific ‘public’ or sometimes have unintended outcomes by creating spaces of exclusion. For instance, in Gdynia (PL), 10,000 square meters of A-class office space has been built for financial institutions, and the hotel Courtyard by Marriott and the ground floor walkway is occupied by cafes and restaurants. The public space and urban interiors are designed to create a good atmosphere and sense of living between buildings, but this is a part of the city that is interpreted as being for highly skilled and high-income workers, and not particularly welcoming to the broader urban population.

5.1.6 New citizen voices and inclusion

The scale of transformation occurring in neighbourhoods undergoing regeneration often draws the attention of local residents and the urban citizenry more broadly and depending on how

public engagement is managed, regeneration can act as a conduit for hearing new voices and perspectives. In Norrköping (SE) the Baltic Urban Lab worked closely with numerous groups from developers to citizens during the planning process to ensure sustainable, equitable development. Social media was used to facilitate knowledge sharing and coordination between stakeholders. In other cases, a key outcome of regeneration can be enhanced usability the creation of more inclusive urban spaces. The creation of the Titanic Quarter marked the first post-conflict space created in Belfast where all residents, irrespective of tradition or background, were welcomed and could feel a sense of belonging. Meanwhile, in cities where an enhanced public realm has been a key aim such as in Bari (IT), increased feelings of belonging and social inclusion also emerge. Nonetheless, outcomes are not always positive, and some projects have exacerbated social exclusion and because of their governance, can exclude particular voices. Social stratification is still an issue in Gdynia (PL), Belfast (GB) and Bilbao (ES) amongst others where regenerated spaces often outprice native and/or lower working classes formerly associated with port activity.

5.1.7 Summary outcomes

In general, some of the most positive outcomes of port city regeneration are a radically transformed and enhanced built environment that creates longer term impacts such as new employment and economic activity. While much of the literature on port city regeneration has focused on the economic outcomes and development of mixed-use facilities and housing, this analysis highlights that the picture is more diverse. However, the limited volume of data available on the outcomes of regeneration also speaks to a need to enhance the monitoring of regeneration projects to document their trajectory and associated changes.

5.2 Impacts of port city regeneration in Europe

While there is some discussion in the academic literature on the outcomes of waterfront or port city regeneration, less emphasis has been placed on monitoring or evaluating the longer-term impacts. In their review of the global competitiveness of port-cities, the OECD (2014, p. 29-30) recognised that while port-cities benefit from some impacts such as the clustering of industries, “most of the indirect and catalytic effects of ports take place outside port-regions. Backward and forward linkages of port clusters stretch out over the whole country; these impacts are usually fairly small in the port city itself”. This suggests that while the costs and negative effects may be localised, the benefits of ports accrue at wider geographical scales, often at the national level.

Across our sample cities, data to assess the impacts of regeneration is relatively limited. However, the following general impacts of port city regeneration can be identified.

5.2.1 Land use change

How land is used and transformed has significant impacts on the city and port relationship as well as the success of waterfront regeneration. In cities such as Swansea (GB), Limerick (IE), Aalborg (DK), Aviles (ES) and Bristol (GB), the regeneration involved the transformation of industrial, disused or abandoned brownfield sites into post-industrial mixed-use spaces such as residential, commercial, tourist or recreational. A particular influence on how these changes impact on a city are land ownership patterns, as well as different investment and development priorities. Where land ownership is disputed or there is a need to transfer land as part of the longer-term plans, this can create development delay between stakeholders such as in Koper (SI) or Cork (IE). In Koper (SI), this has resulted in increased tensions between the local government and the Port Authority and National Government while, in Cork (IE), the Port Authority have conducted their own land value assessments to demand a higher transfer price for the land, creating some uncertainty and tension. There is some evidence that where regenerated land remains in public ownership, the impact is the retention of at least some port-related or maritime activities alongside new urban functions. This has been the case in Aviles (ES) where the quality of commercial and fishing services has been enhanced, and also in Koper, (SI), Split (HR) and Valetta, (MT) where the port and its services have been expanded including the development of new berths, container capacity and terminals. Where land is in diversified or private ownership, the land use changes tend to be more dramatic and favour urban high-value land uses, such as commercial development. The longer-term impact of this is an intensified severing of the port city relationship.

5.2.2 Economic development and employment

The ultimate impact of port city regeneration is economic development and new employment opportunities, heavily discussed across literature. Measuring the direct impact comparably is difficult due to the different methods of categorizing and analysing data. Economic impacts can be measured through the value of the area, its buildings and new tourist attractions, which are expected to impact on the GDP and create long-term employment. As a result of its regeneration project, Ancona (IT) expects the creation of over 1,000 new jobs, while Basel (CH) expects port city redevelopment to benefit the entire city-region. Jobs and activities related to new economic sectors are evident, for example, in Bilbao (ES) in the cultural industries. In this city, unemployment has fallen from 25% to 10.4% between the 1980s and 2000 aligning with the period of regeneration. Tourism is also another growth industry following port city regeneration. The impact on Bilbao's tourism and commercial sector was an increase in air passengers from 1.4 million in 1994 to 3.8 million in 2005, many visiting the Guggenheim museum which attracts over 1,000,000 tourists annually and is a major employer. In Belfast (GB), the redevelopment of the Titanic Quarter has attracted 800,000 visitors and created 25,000 new jobs.

Further, port city regeneration is often an element of a broader economic growth strategy involving the modernisation of the port, enhancing international competitiveness and sustaining

growth. For instance, in cities such as Bourgas (BG), Brindisi (IT), Dundee (GB) and Klaipeda (LT), the impact of economic development is evident from structural changes in the maritime economy. In Bremerhaven (DE), port traffic has considerably increased during the life of the project with bulk increasing 7% and container turnover increasing by 10% between 2003 and 2004. In Koper (SI), the viability of the port has been enhanced as it now handles 33% of North Adriatic container traffic compared with 25% in 2010.

Other forms of economic restructuring include the development of new industrial clusters such as in Dunkerque (FR) and Aberdeen (GB), which have become Europe's leading port-cities for energy platforms. Aberdeen (GB) recognises that its industrial base of the oil and gas industry may cease or relocate and thus is regenerating the port area to accommodate offshore renewable energy activities and re-establish its place in the energy market. However, as port-cities regenerate and innovate, it is also clear that they begin to compete directly with each other as Aberdeen (GB) and Dunkerque (FR) appear to be doing.

Enhanced competitiveness is a desired impact of regeneration for many cities including Aviles (ES), which envisions becoming more marketable through the redevelopment of its brownfield sites and Liepaja (LV) which created a strategic development zone (LSEZ) to attract more international shipping companies and indirect commercial activities. The LSEZ builds upon Latvia's old manufacturing industries and has helped to support industry, a high-quality infrastructural network and skilled workers. The strategic location facilitates trading both within Europe, Asia and elsewhere while traditional manufacturing industries and new foreign manufacturers benefit from tax incentives. These include a 0% rate of VAT for all supplies and services and exemptions on tax and customs duties and has resulted in the creation of jobs, more investment and growing cargo and passenger numbers between 2009 and 2018.

5.2.3 Liveability and sustainability

In line with principles of sustainable urban development, enhanced liveability and sustainability is a desired impact of regeneration. This is significant for many cities that attempt to re-integrate ports and cities and harness the full economic, environmental and social impacts of regenerating within sustainable principles. This has been central to regeneration in Koper (SI), Le Havre and Creil (FR), Rijeka (HR), Santander (ES), Swansea (GB), Barletta (IT) and Aarhus (DK).

For example, port city regeneration can provide the necessary funding and governance framework to remediate SEVESO and other challenging, potentially contaminated sites, and thus bring them back into productive re-use as spaces for living, working and socialising. Regeneration projects have also provided a platform, for example in Creil (FR), to address, mitigate or adapt to hazards associated with climate change such as flooding. In Cork (IE), a new Levels Strategy for the south docks addressing the multi-faceted nature of flooding (tidal, fluvial and pluvial) is a key foundation for a redevelopment strategy and a critical element for the future liveability and sustainability of the city.

Further, in cities where the commercial port is still active, liveability must be considered with regard to the impact of an active port on human health and wellbeing. In Limerick (IE), the Docklands Framework aims to deal with problems of air quality and implement noise strategies that seek to move nosiest operations furthest from new residential areas. The reduction of noise pollution, enhanced air and water quality, as well as enhanced wellbeing through the creation of new green and blue infrastructure for example are all potential impacts of port city regeneration.

5.2.4 Social cohesion and satisfaction

The impact of regeneration on social cohesion and satisfaction are challenging to identify, as often times they are relatively intangible, but in Ancona (IT), residents have indicated general satisfaction with the improved public amenities delivered through the regeneration project. The project envisaged intangible impacts connected to aesthetic aspects and the improvement of the usability and liveability of the regenerated areas for the local citizens. This occurred due to three reasons:

- The redevelopment of large areas of the historic city;
- An improvement in citizens quality of life due to an increase in the value of the areas and buildings after the redevelopment and;
- A new scale of tourism contributing to economic and employment growth.

In Brest (FR), previously deindustrialised areas of the commercial port have now become attractive spaces with new cultural and leisure amenities available. Further, the opening of waterfront areas formerly owned by the navy offers citizens and tourists new views of the city and access to the water. New areas such as the Capucins also offer mixed housing for the elderly, students and families, smart energy grids and low carbon transport options such as the cable car, while also offering spaces to host and promote a range of citizen activities. As a result, Brest has received positive feedback from citizens with regard to the social cohesion and satisfaction of the regenerated spaces.

However, there are also examples where regeneration projects have generated some dissatisfaction as they have been considered exclusionary. For example, in Malmö (SE), regeneration was driven by an international housing expo which created tensions as it was perceived to have ignored housing affordability and contributed to gentrification. No social housing or public amenities were included in phase 1 but as a result of disquiet, these issues were addressed directly in phase 2 of the project.

5.2.5 Port- city identity and city-regional image

Port city regeneration is often part of a broader boosterist agenda linked to the attraction of foreign capital, workers and tourists to both the immediate city and wider region. It is often part of a broader economic plan to become more internationally competitive and to grow employment and the regional or national economy. This is clear in the regeneration plans for Ancona (IT) branded as ‘waterfront Ancona 3.0’. The ICT solutions activated by this project are

centred on the idea of transition from "Information and Tourist Reception" to "Immersive experiences and Augmented reality" focused on the archaeological heritage of Ancona.

Other cities which are using port city regeneration to rebrand and transform their identity are Limerick (IE), Aberdeen and Dundee (GB), Liepaja (LV), Split (HR), Klaipeda (LT) and Belfast (GB). Bilbao (ES) is an extreme case of how regeneration can create an entirely new urban identity, and the city is now known for the cultural 'Guggenheim effect' rather than for any former ship-building activity. It has also acted as a model for other cities in terms of post-industrial regeneration. The development of a university and knowledge based industrial cluster has created a new identity in Aalborg (DK), one which differs from its previous maritime identity.

Identity change in European port-cities can also be linked to broader attempts to address past political as well as economic legacies. Belfast (GB) is an example of how waterfront regeneration has been used to alter the identity of the city and produce a post-conflict urban landscape. The Titanic quarter is designed to be a politically 'neutral' space, where urban dwellers irrespective of their identity or political perspective are equally welcomed. The project uses Belfast's history as the home of the Titanic to re-brand the city away from its conflict or Troubles-related history. Similarly, in post-Socialist cities such as Tallinn (EE), Liepaja (LT), Gdansk and Gdynia (PL), port city regeneration projects are being used to rebrand and undo some of the legacy of Soviet-style planning and urban development over the longer term.

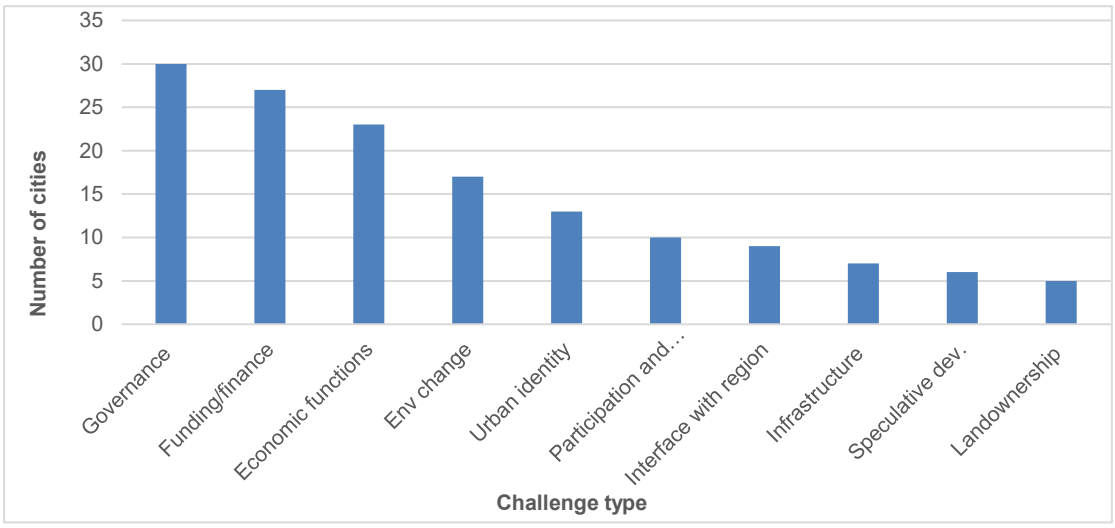
6 Challenges and opportunities of port city regeneration in Europe

6.1 Introduction

Waterfront or port city regeneration has become relatively ubiquitous across Europe, North America, Australia and increasingly parts of Asia, but this has created challenges as well as opportunities for policymakers and other stakeholders (Breen and Rigby, 1996; Brownill and O'Hara, 2015). One-third of the port-cities we identified as small and medium-sized in Europe show no evidence of waterfront or port city regeneration. In some cases, this may be because the urban and port areas are functioning optimally, but it is also likely to be related to the scale of challenges that cities face when they consider regeneration programmes. Based on our analysis, key challenges and opportunities emerged in the planning and implementation of port city regeneration programmes. We have categorised them within ten headings which are discussed in more detail in the sections that follow:

- Changing economic functions
- Governance arrangements
- Funding and finance
- Managing environmental change
- Landownership
- Infrastructure provision
- Changing urban identity and functional use
- Speculative urban development
- Port city interface within the wider metropolitan and regional context
- Public participation, engagement and cohesion

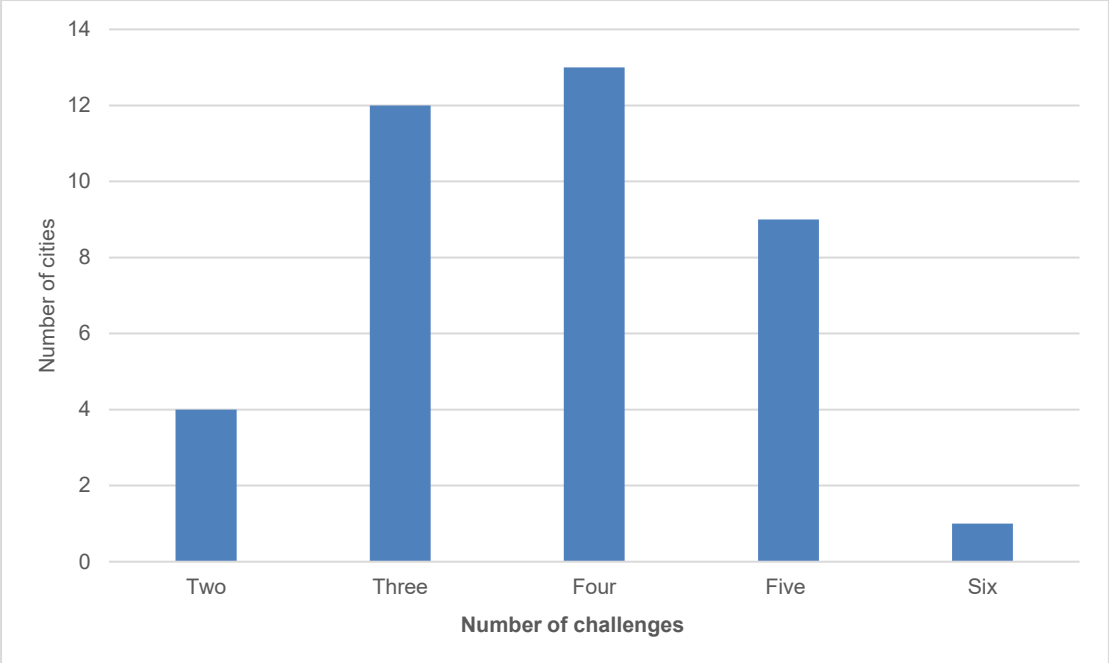
Figure 6.1: Extent of the challenges involved in port city regeneration projects



The most frequent challenge identified relates to the governance of port city regeneration, both in terms of how public-private relationships are structured, but also how public agencies engage with each other and organise their interactions. In many cases, this is closely related to available finance and the funding models in place to deliver on particular projects. Prioritisation and the changing relationship between the port and city (both physically and from a governance perspective) can result in competition for economic supremacy as the needs and aspirations of the port and city can diverge significantly.

Cutting across all of the challenges is the issue of time – both the timing of regeneration in economic cycles but also in terms of delays, length of the project, timelines to deliver infrastructure and so on. Addressing these challenges to enable effective regeneration in a timely manner is particularly complex as our analysis demonstrates that in all cases, cities face particular combinations of challenges rather than one specific barrier to change or development. Figure 6.2 illustrates that the majority of cities we analysed are facing a combination of between three and five of the challenges that we discuss below.

Figure 6.2: The combination of challenges facing cities undergoing port city regeneration



However, where there is challenge, there is also often opportunity. Innovative methods to address a challenge can produce significant and sometimes unexpected opportunities. While it has been relatively easy to identify challenges facing stakeholders involved with port city regeneration as they are common and often well documented, it has been more difficult to identify opportunities in our descriptive analysis. We offer some insights into potential opportunities that may be available to cities based on our four-case studies of Cork (IE), Aalborg (DK), Catania (IT) and Brest (FR), and our sample cities although we are mindful that these will always be context-specific. Often-times the challenge and opportunity are inter-twined, enhancing the complexity of the project, as discussed below.

6.2 Changing economic functions

Regeneration can occur both within the functional port and on former port or dockland land. In both scenarios the relationship between the port and the city is undergoing transformation, and different ports have retained greater or lesser degrees of economic importance in broader regional development. Regeneration plans therefore play a role in rebalancing the port city relationship in a variety of ways, as follows:

- Regeneration of city waterfront areas facilitated by the ***relocation of the functional port***, usually involving infrastructural upgrades to keep pace with changing international shipping trends. Examples include Cork (IE), Aalborg (DK), Catania (IT) and Aberdeen (GB).
- Regeneration of city ***waterfront areas to be infilled around existing port functions***, sometimes along with the expansion of the port. Examples include Gdansk (PL) and Aarhus (DK).
- Regeneration of deindustrialised waterfront areas ***to replace port functions,*** for example, Bilbao (ES).
- Relocation or proposed ***relocation of port areas triggered by the development of a regeneration plan***, the change of functional purpose and the latent asset value of port lands. Examples include Brest (FR) and the Tivoli Docks area of Cork (IE).

This can have significant implications in terms of the prioritisation of one set of economic functions, land use and infrastructure (either port or urban) over the other. The lack of integrated spatial planning between the city and port can often exacerbate this challenge and make the process of prioritisation opaque.

Where port relocation is proposed, this must be carefully managed to ensure that it does not detrimentally impact. For example, in Aberdeen (GB), the economic performance of the port related to energy is critical. As noted earlier, in the case of Koper (SI), plans to significantly expand the port have resulted in conflicts between economic interests (importance of port) and those concerned with culture, ecology and infrastructure in the city. Where new urban functions are infolded around existing port functions, key challenges include how to co-locate residential and leisure functions in proximity to noisy, and sometimes polluting, industrial functions. One potential measure to overcome these challenges is evident in ESPO's (2010) work on societal integration of ports, which suggests that this re-integration of the port city may be the model of the future, something the port city of Calais (FR) addressed during the early phases of regeneration.

Although port relocation is a challenge regarding the different competing functions during the transition phase, it is also an opportunity. Where full or partial port relocation is a driver or part of the regeneration plan, brownfield land and SEVESO sites can be opened up and harnessed for new economic functions either primarily 'urban' in nature or complementary, for example

maritime leasing activities. In Cork (IE), the proposed relocation of the active port from Tivoli Docks over the next decade has generated much interest from the port authority and city council in terms of future potential uses and economic strategy. The opportunities that changing economic roles and functions bring to cities are evident in cities like Catania (IT) and Aalborg (DK) where there is a new emphasis on the development mixed use, open, connective and liveable spaces.

6.3 Governance

While the general observed trend in the governance of waterfront regeneration is towards public-private partnerships or other form of joint arrangement, selecting the appropriate governance framework can be a major challenge. Port city regeneration requires the interaction of an array of stakeholders and managing these multiple interests can be challenging. The diversity of experiences in relation to multi-level governance frameworks, land and port ownership structures, and the relative power of private sector actors, make direct comparison between cities difficult. Determining best practice is not always possible given the contingent nature of stakeholder arrangements. However, the preliminary analysis suggests some significant factors.

The significance of the regeneration project at regional and national level – particularly when clearly articulated through formal plans or frameworks - can be significant in stimulating a wider set of stakeholders, as it provides a regulatory framing and certainty that builds confidence. While recognition in high-level plans is important, the crucial determinant of behaviour relates to the source of funding which can impact governance arrangements. For instance, in Bremerhaven (DE), port regeneration was funded by the state of Bremen, a court battle ruling that the Federal Government had given insufficient resources to the port during the 1990s. More common was the approach taken by Bilbao (ES) to create a development agency Bilbao Ría 2000 to oversee project delivery. Through the establishment of these arms-length development agencies operating in a market-driven manner, the state became an enabler or change agent (Harvey, 1989). However, this does not imply that top-down governance models are inherently positive. In the case of Valletta (MT), for example, high-level support for development of a new cruise terminal was economically a success but led to the erosion of local resources.

In the absence of robust governance models, development can be more incremental. and unfold over much longer time periods (Boelens & De Roo, 2016; Attia & Ibrahim, 2018; Airas et al., 2015; Green, 2018; Russo & Formato, 2014), which may partly explain some of the variation in implementation typologies identified in the sample cities. It can also present challenges in managing the overall coherence and design of the project particularly where projects are exposed to the cyclical nature of property markets as in Swansea (GB).

In other cities, such as Aarhus (DK), the city has taken a strong lead in experimenting with new forms of cooperation between public and private actors to ensure a mix of functions and types of residents. In others such as Barletta (IT), the port authorities have been completely

dissociated from regeneration, illustrative of the 'context-specific ways in which urban politics are reshaped' (McGuirk, 2012: 259). There are challenges associated with any model where multiple stakeholders are engaged, and this can result in the risk of delay from lack of consensus such as in Koper (SI). It is very difficult to offer a measure to overcome governance challenges due to their embeddedness within the city and wider metropolitan, regional and national scales combined with the uniqueness of each city.

However, governance models which offer flexibility have proven to be a major opportunity and catalyst for waterfront regeneration in Brest (FR) and Aalborg (DK). For instance, Brest's 1994 Reference Plan outlines agreed goals for regeneration, but these were not overly defined, ensuring that the city and different stakeholders could respond to urban, economic and social changes or opportunities swiftly and without burdening layers of bureaucracy. The different formations of public and private cooperation proved beneficial and resulted in a smoother than normal regeneration process for Brest (FR). Meanwhile, in Aalborg (DK), a strong public-private cooperation was a catalyst for development allowing the city to focus on its role as a planning authority but leaving investments to the private sector. In Cork (IE), regeneration has been driven by the private sector in a post-crash boom to develop hotels and office blocks in the south and north docks, supported by the city authority and their vision.

Evidence suggests that in cities where multi-agency governance was effectively structured and steered, good relationships between the port and city authorities acted as a catalyst for wider urban redevelopment and regeneration, as it produced a development momentum and revisioning of the city's identity. An example is in Brest (FR), where the city and Navy built new working relationships to ensure the appropriate regeneration of former naval lands.

6.4 Funding and finance

Port city regeneration can involve significant costs and how it is funded is often closely linked to the types of governance arrangements in place, a major risk particularly where projects are exposed to the cyclical nature of property markets (Green, 2018 and Russo & Formato, 2018). The absence of public funding sources can be a challenge for some cities that become reliant on the private sector and result in what Gallard and Hansen (2012) term a form of 'leverage capitalism'. On the one hand, this risk relying on speculative forms of development that may or may not be successful and can be exclusionary in terms of their outcomes. It can also leave cities particularly exposed and vulnerable to changes in economic cycles as was the experience in Barletta (IT), or in Aviles (ES) where one project was funded but a longer-term funding commitment was not made. Another critical issue is that unless a particular type of development is deemed commercially viable, it may not be funded. Up until recently, this was the case in Cork (IE) where new housing developments were needed but were deemed unviable for taxation and phasing reasons despite consumer demand. Contrary to some arguments that public sector funding lends itself to more inclusive development, public funding of the flagship Guggenheim museum in Bilbao (ES) has been viewed by some as an elitist approach to

regeneration. Culture-based regeneration was also a model adopted in Bristol (GB), but this has proved risky as cultural funding was significantly cut during the austerity period, leaving the sustainability of the regeneration project at risk.

Clear from our analysis is the diversity of funding frameworks and financial models that have been used to catalyse and support regeneration across Europe's port-cities. These ranging from complex combinations of public funds (e.g. Brest, FR) to almost primarily private sector driven development (e.g. Gdynia, PL and Cork, IE). In Brest (FR), the development of semi-public/private vehicles known as SEMs "Société d'Économie Mixte" or mixed economies were created to support public action and coordination with the private sector and carry the financial risk, alleviating the risk on the city and private sector. In Aalborg (DK), funding for housing was left to the private sector with the exception of public funding of social housing. Both Brest (FR) and Catania (IT) have benefitted from public funding from European, national and regional funding streams particularly with regards to infrastructure. Cork (IE) is expected to benefit from funding via the Irish Strategic Infrastructure Fund, which is a financial arrangement drawing on loan funding from the European Investment Bank. In Ireland, central government funds such as the Urban Regeneration and Development Fund or the Disruptive Technologies may be drawn on depending on the project proposed. Despite the available of these public funding streams, regeneration in Cork (IE) is dominated by private equity-based finance models. A funding arrangement that we have not seen deployed to any great extent in our sample cities and the 4 case studies is land value capture or tax increment financing. These models essentially provide ways to finance future development based on the anticipated land value uplift from infrastructure provision and development and are increasingly being used in the US and UK contexts.

6.5 Managing environmental change

A further set of risks and challenges exist around managing environmental change in regeneration areas. As the analysis in section 4 illustrates, environmental change is one of the most significant outcomes of waterfront regeneration, but it is also one of the key challenges.

Regeneration usually involves the transformation of industrial, often polluted or contaminated, land to post-industrial land uses such as residential, tourism, or leisure. The risks associated with this transition include how to decontaminate sites from former industrial uses. Le Havre (FR) provides an example of successful remediation. Remediating these sites presents legal risks in terms of future liability (Moore, 2004), financial risks and challenges in terms of funding. In Cork (IE), it is expected that the private sector would fund remediation, and some argue that this can generate significant development delays. However, there are examples where the public sector has undertaken all of the remediation work such as in Brest (FR), where the industrial and military ports were remediated by public agencies or the military itself. The regeneration of former port areas also presents other environmental challenges, such as those related to climate change issues and the need to mitigate flooding risk, as the city of Creil (FR)

has been doing. Environmental sustainability is an increasingly important element of planning strategies and development plans, driven in large part by European directives and guidance. In some cases, such as Aberdeen (GB) and Limerick (IE), specific measures to protect areas of biodiversity from the impacts of redevelopment have had to be introduced. Managing and adapting to environmental conditions as they relate to land-use patterns, economic priorities, and societal norms (Borriello, 2013) is a key challenge for port city regeneration.

As demonstrated in Catania (IT), port city regeneration provides an opportunity to protect natural structures such as cliffs and beaches as well as better manage and remediate SEVESO sites. In Cork (IE), discussion on regeneration of the south docks has been the impetus for significant work on how to address complex flooding in the area. A new Levels Strategy has been developed that outlines a number of innovative strategies for dealing with pluvial, fluvial and tidal flooding. Regeneration has also provided an opportunity to enhance the volume and role of green infrastructure in the urban environment, including additional tree planting. In Thessaloniki (GR), this has been an important element of the regeneration plan and has benefits in terms of health and wellbeing. Most cities are also regenerating with sustainability principles front and centre; thus, Cork (IE), and Brest (FR) are promoting sustainable and active transport modes to minimise car usage, something that Aalborg (DK) has implemented already. This will contribute to the reduction of greenhouse gas emissions and promote shared public transport and healthier more active lifestyles.

6.6 Landownership

Landownership can be a major barrier for cities undergoing port city regeneration especially where it is fragmented and in private ownership. Coordinating and implementing a coherent regeneration plan is easiest for those cities where the port and waterfront lands are already in public ownership, for example in Bremerhaven (DE) and Aalborg (DK). Similarly, Norrköping (SE) port is owned by the city, therefore allowing – at least in the planning stage – the development of an integrated planning framework for extending the port and transforming brownfield land into districts for cultural and other similar uses. In Bilbao (ES), a paradigmatic example of entrepreneurial urban regeneration, the state intervened through a development agency to take control of vacant land and then used public and speculative private investments to transform the use, function and economy of the city. A more extreme case is that of Thessaloniki (GR) where the state transferred its ownership to a private entity in order to enable the necessary port upgrades to happen, in the context of economic crisis and austerity.

In other places, landownership is more fragmented and the south docks of Cork (IE) provide an excellent exemplar. Here the city has limited capacity to steer development other than through site-by-site planning permissions, because private sector landowners can determine the scale and pace at which they wish to engage in regeneration, if at all. Similarly, regeneration in Split (HR) has been slowed down because of the fragmented nature of land ownership in the Kopilica district.

The ability to control access to and the value of land was a key opportunity in Brest (FR) and Aalborg (DK). As the cities owned the land, they were able to develop infrastructure (cable car and smart energy grids in Brest), create an overall development plan with an opportunity to then sell it to the developer (House of Music (Aalborg, DK); La Carène (Brest, FR) and "Le Ciminiere" Expo centre (Catania, IT)) or invite private investors to share the ownership of a building and its future revenue from selling it on (Stisborg Harbourfront in Aalborg (DK)).

6.7 Infrastructure provision

In all of its guises, connectivity is perhaps the most significant barrier facing port city regeneration. Based on decades of dis-integration, physical connectivity between the port area and the city is generally poor and requires significant infrastructure investment. While the construction of new infrastructure is often viewed as a way to reconnect the port and city, the experience of Dundee (GB) is a cautionary tale. A new bridge constructed in the city in the 1990s resulted in a further severing of the port city relationship rather than assisting with re-integration. Once planned appropriately as part of wider plans for the port city interface, publicly supported infrastructure can be crucial in enhancing the competitiveness of the wider metropolitan region (Van Hamme and Strale, 2012). Belfast (GB) provides an important lesson in terms of the challenge of moving people into and out of regeneration areas when appropriate and upgraded transport infrastructure has not been provided alongside other forms of development.

The delivery of strategic infrastructure thus presents a key risk and challenge in a number of respects. Port city regeneration can entail both the relocation/upgrading of the functional port and the redevelopment of brownfield land. Both of these require significant infrastructural provision. For the former, this can include the deepening of existing harbours to accommodate larger vessels as in Klaipeda (LT) or alternatively, where relocation is involved, the provision of new transport infrastructure like road and rail links to facilitate the continuation of port activities. This can require the remediation of SEVESO sites as in Le Havre (FR) and the construction of infrastructure to protect against flooding, or to enable new forms of public transport. While some cities were already better provisioned with regard to transport infrastructures prior to regeneration (depending on the historical relationship between the port and the city), investment in public transport has been a key challenge for almost all cities undergoing regeneration, as exemplified in Swansea (GB) where the delivery of infrastructure is deemed crucial but has not been enabled. A potential measure for overcoming infrastructural challenges is through more strategic regional and national funding, possibly drawing upon the diversity of EU funds.

In Aalborg (DK) and Catania (IT) the development of infrastructure such as road, parks, underground lines and amenities has been critical as a catalyst for new regeneration projects but also for attracting people to live, work and play in the area. In light of concerns around sustainability, creating new public transport infrastructure can contribute to both regeneration

but also to wider climate adaptation strategies. A possible model for cities to consider is the deployment of land value capture mechanisms. How this has been operationalised in our sample and stakeholder cities is not particularly evident. However, the Lincoln Institute of Land Use Policy (https://www.lincolninst.edu/key-issues) offers many resources on how land value capture can be deployed to finance infrastructure and enhance future urban development.

6.8 Changing urban identity and functional use

Ashworth and Tunbridge (2017) and others (Balderstone et al., 2014; Darchen & Tremblay, 2013 and Middleton & Freestone, 2008) argue that changing cultural perceptions of place can only happen as a bottom-up organic process, although strong planning visions can help to mediate this. In many cities, the development of flagship or landmark facilities such as the Bilbao Guggenheim Museum (ES), the V&A Museum Of Design in Dundee (GB) or the proposed cable car and aquarium in Tallinn (EE) plays a key role in facilitating urban transitions and rebranding. While many port city regeneration projects focus on shifting the former port or industrial identity to a new mixed-use 'urban' identity, our sample cities demonstrate a diversity of approaches or strategies to delivering this. For example, Aarhus (DK) has sought to create a leisure identity by developing recreational activities in the redeveloped waterfront; Reykjavik (IS) has attempted to use the regeneration project as a means to promote a more compact city form; while. Santander (ES) has aimed to position itself as a benchmark city for waterfront regeneration in relation to sustainability, sports, culture, innovation and as a "smart port". Translating these rebranding initiatives into new uses is complicated by the dual challenge of making these new areas inclusive – through, for example, including affordable housing – and financing the necessary physical upgrading of the built environment. Flagship or landmark developments illustrate this tension well. In order to anchor and give a sense of identity to regenerated areas, significant public money can be put into flagship initiatives that may not pay off in terms of boosting visibility and tourist numbers. Finding ways to strategically decide on where to make public investments can be a challenge in terms of balancing the need for inclusivity with visibility.

In some Eastern European examples, there is the extra challenge of how to deal with the legacies of the Soviet era. In Liepaja (LV) for example, a major focus of the Special Economic Zone has been to promote the city as an economic engine and focus for job creation, however transforming the identity of the former port areas has been much more difficult. Moving away from a challenging past has also been an issue of significance for Belfast (GB). The redevelopment of the Laganside waterfront was deliberately conceived as a post-conflict 'neutral' space within the city, but that has resulted in a relatively generic template-based approach to waterfront redevelopment that deliberately distances itself from the urban past. This is evident also in places like Bari (IT), where a standardised, generic approach to regeneration has meant the emergence of a rather ubiquitous form of urbanism and the loss of maritime identity.

This may be where the idea of co-existence could be better harnessed. Rather than seeing urban functions as replacing port or maritime functions, more attention could be placed on how they might co-exist or complement each other giving the regenerated district a distinct personality within the wider city. For example, a key aim of the regeneration in Brest (FR) has been to retain the maritime cultural identity of the area and its citizens as a result, port service activities and the Naval base remain in place and are used to promote and protect the unique culture of the area. Meanwhile, in Aalborg (DK), the vision for a new urban identity created the opportunity to create new types of industrial activities, attractive waterfront areas, new cultural projects and attractive housing. Two of the biggest cultural and identity changes that Aalborg underwent was the introduction of the University in 1974 and the development of the harbour front into a new knowledge based industrial zone. The knowledge based industrial zone in combination with the University have globalised the city and created a new profile of citizens, acting as a catalyst for new amenities and services. As a result, Aalborg has a new identity and a higher ranking amongst Danish cities.

6.9 Speculative urban development

Since the move from a more managerial to entrepreneurial approach to urban governance in the late 1980s (Harvey,1989), speculative urban development has been a key feature of waterfront or port city regeneration projects where the state does not fully control the land (Leger et al, 2016). Regeneration projects are speculative in that they involve strategic bets from a range of stakeholders that transitioning from one set of urban and economic functions to another will have net benefits for the city as a whole. In some cases, the public risk can be particularly high as public investments in infrastructure and flagship developments are frontloaded (Smith & Van Krough Strand, 2011). This was the case for example in Bilbao (ES), Gdansk (PL), and Reykjavik (IS) where the state played the driving role in funding large-scale catalytic projects. The risks and challenges associated with this approach include the possibility that the regeneration will not have the envisioned payoffs and the difficulty in accessing impact data suggests that this is often not well monitored.

Further, regeneration projects are speculative in the sense that they are facilitated by the speculative activities of financial and property development actors, as their financial orientation means that land use is intensified as a way of capturing value (OECD, 2014). The risks and challenges associated with this type of approach more specifically relate to the cyclical nature of property markets. In cities such as Cork (IE) and Norrköping (SE), the implementation of port city regeneration was negatively affected by the 2008 global financial crisis. However, in the case of Reykjavik (IS) the new regeneration plan, which aims to rebrand the city as ‘City By The Sea’, is seen as an opportunity and one of the first signals of economic recovery after that country’s crisis. In more general terms, the timing of development is extremely significant in mitigating the risk factors and recognising opportunities associated with property development cycles.

6.10 Port city interface within the metropolitan, regional and transnational context

While regeneration projects tend to focus on the relationships and impacts at the port city interface, the place of the waterfront within the wider metropolitan and regional context is critically important. As the OECD (2014) have noted, the benefits of port-related activity and the port city tend to accrue disproportionately to the wider region and national scale and thus the nature of port city regeneration projects can be driven by national or regional determinants, rather than the needs of the immediate local area. For example, while the regeneration of the Belfast (GB) waterfront was an important element in the development of a post-conflict discourse about the city, the top-down approach taken had significant exclusionary effects on the surrounding neighbourhoods and districts. The regeneration project in Valletta (MT) has been designated as a national priority with the promotion of cruise tourism at its core, leading to the erosion of significant local resources within the area but contributing more widely to the national economy.

In Cork (IE), however, there is evidence that the alignment of the project with metropolitan and regional plans could provide an opportunity which could be leveraged into the regeneration to ensure the development of key infrastructure and housing. Other port city projects are exposed to potential vulnerabilities because of the manner in which they have been positioned externally. Regeneration in Bourgas (BG) is closely aligned to its role as a strategic node on the Black Sea linking Europe and Asia. This wider strategic positioning can act as both challenge and opportunity. Similarly, the port city of Calais (FR) is under severe pressure as it copes with the European migrant crisis. As every city is organised and influenced differently within the metropolitan, regional, national and transnational scale it is difficult to offer an effective measure to overcome these challenges.

6.11 Public participation, engagement and cohesion

Timur (2013:192) argues that any urban development that is branding itself as sustainable needs to be “transparent and they must provide meaningful opportunities for the involvement of people”. The experience of waterfront regeneration in many port-cities across Europe, North America and Australia highlights the limited role of the public and citizen engagement in both the development of regeneration plans but also in their implementation (Brudell and Attuyer, 2014). Public participation within property-led regeneration even if the “official discourse” is one of a “bottom-up approach”, still tends to be limited or tightly controlled (Taşan-Kok, 2010:133; Frantzeskaki et al 2014). Across our sample cities, the extent of public engagement is diverse For example, in Gdynia (PL) a private entity developed the area without much input from any other stakeholders, including local communities,

While critiques of public participation in port city regeneration projects are plentiful in the academic literature, there are examples where it has been harnessed well. In Aarhus and

Aalborg (DK) for example, consultation processes were integrated into the project planning from the outset. However, even where the public is involved and supports an idea, success is not guaranteed. This was the case in Turku (FI) where a test project to co-locate urban and port activities, although broadly supported in principle, proved challenging to implement as citizens were not convinced about living in an area of shared port/urban space.

One measure to overcome this challenge is through co-design and co-creation activities which can play an important role in promoting social cohesion within regeneration schemes. While there are a range of examples where communities have been involved and actively participated in regeneration processes, Wang (2014) argues that the role of the community is limited, with little evidence being able to substantially impact change when the redevelopment has broader scale significance. However, the case of Brest (FR) illustrates that when development is governed via a strong and cohesive group of public actors, it can be easier to steer development towards the needs of citizens. The Capucins redevelopment has received widespread support from urban residents because it addressed the needs of the community in terms of providing amenity space, library facilities etc. Citizen engagement from the outset created the conditions to ensure the completed regeneration scheme was accepted and has quickly become embedded in the urban fabric and local mindsets.

7 Key messages

To close this chapter, we wish to offer a small number of reflections which point towards the need for greater support of port city regeneration in small and medium-sized cities:

- The data required to engage deeply with the outcomes and the impact of port city regeneration within the broader urban and regional context is not available. It would be helpful to disaggregate some existing data at smaller spatial scales in order to define an appropriate methodology for assessing the long-term consequences of these substantial investments. Ongoing evaluation and monitoring of projects is lacking.
- This research identifies a significant range of challenges facing port-cities and attempts to provide some sense, from the limited data available, of the opportunities that might be available to cities considering a port city regeneration project. The manner in which a sub-set of cities deal with these challenges in practice could be the subject of a more substantial research programme.
- This report offers a synthesis of the general experiences of small and medium-sized port-cities across the European territory. By its nature it is a relatively simplistic snapshot in time and does not suggest that trends, outcomes, impacts, challenges and opportunities identified are the only ones facing cities. The contingent nature of these experiences also needs to be stressed.
- During the course of this research, there was much debate about defining outcomes and impacts of regeneration. It would be helpful if the development of a standardised approach to assessing and understanding such variables were considered by ESPON or another relevant agency.
- The typology of strategic, incremental and nascent regeneration is developed from the limited available data on each city we examined. These categorisations are not intended to be hierarchical in any way and simply reflect different pathways and temporalities of regeneration. They are useful in demonstrating the diversity of experiences across Europe.

Finally, it is clear that understanding the port city relationship and regeneration in Europe generally, but particularly in urban centres beyond the major metropolises, is a major challenge and there remains many unanswered or partially answered questions. We would urge ESPON and its policy partners to consider a specific call for a large scale Applied Research project on this topic.

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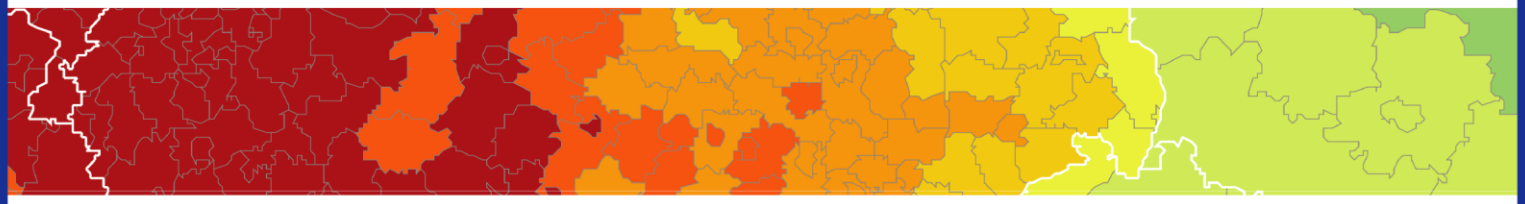

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