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Dunkirk and the Search for Balance**

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## ABSTRACT

Port authorities who once considered the inclusion of local actors in the decision-making process a threat to efficiency have begun to see their inclusion as an opportunity. The notion of inclusion can bring together the sometimes diverging objectives of port and city actors. In the Northern Range – the most important European ports between Le Havre and Hamburg – the competition of port authorities to attract people and industries is particularly tough. This area includes numerous ports with their own governance. The drive for both economic benefits and environmental preservation pushes public authorities towards compromises in the implementation of their policies. The competitiveness of ports can be impeded by the need to protect natural environments and by demands for inclusion. The paper analyses how the French government has tried to reform relationships between ports and cities and to give more power to local actors in hopes of reaching a balance between economic interests and environmental protection. The paper focuses on the French port city of Dunkirk to illustrate the impact of legal frames on the competitiveness of port cities. It emphasizes the importance of the different legal scales available to public authorities facing the challenges of governance that result from globalization.

## KEYWORDS

Environment; Governance; Port City; Regulation; Dunkirk



## The Interplay of Economic Development and Environmental Protection: Dunkirk and the Search for Balance

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# The Interplay of Economic Development and Environmental Protection: Dunkirk and the Search for Balance

*“Every problem interacts with other problems, and is therefore part of a set of interrelated problems, a system of problems. I choose to call such a system a mess. Furthermore, solutions to most problems produce other problems.” (Ackoff, 1974)*

Conflicting but interrelated interests between authorities of ports and cities have created great challenges, as in C. W. Churchman’s description of *Wicked Problems* (Churchman, 1967). Trying to solve one problem will produce another, creating a “mess”. Growing concerns over the environmental impact of industries and the effects of climate change have produced problems for the authorities of port cities and all the stakeholders involved in them. The combination of different concerns, such as the protection of the environment, the economy, the attractiveness of both the port and the city and the transport of all goods has heightened the challenge, especially when it is clear that all these domains are linked. In the hope that this “mess” in port cities can be tackled in a unified way, the French government has prioritized the development of integrated policies and systems of governance.

In urban planning and the governance of ports, when tackling global warming and climate change we should not “*be distracted by the myth that ‘every little helps’. If everyone does a little, we’ll achieve only a little. We must do a lot*” (MacKay, 2008). Port authorities and a diversity of actors in France must find a compromise between environment and economy. Through the lens of legal frames, this paper analyzes how the French government has tried to update the governance of port areas, while increasing the inclusion of local actors. The port city of Dunkirk, located on the north coast of France near the Belgian border, provides a relevant case because of its industrial past and strategic location on one of the busiest maritime roads.

The French government has long considered Dunkirk a strategically important place, first for military purposes, then for infrastructure and trade. In the eighteenth century, Dunkirk was fortified by the military engineer Vauban. In 1861, with the establishment of the city’s first oil refinery, the western part of the city became an industrial port<sup>1</sup>. After the Second World War, the city became one of the most important steel industry sites in France and Western Europe<sup>2</sup>. The French state was the leading actor in modifying the port area and determining its purposes, the primary objective being to connect the ports, such as that of Dunkirk, to the national network. However, the emergence of multiple actors —the European Union, local authorities, citizens, local association— along with increasing globalization revealed the lack of flexibility inherent in such a restrained governance. The diversity of interested parties contributed to the apparent “mess” in the governance of port cities and their regions.

The port city of Dunkirk illustrates this struggle to deal with diverging yet related concerns of port and city authorities. Analyzing legal texts, aerial pictures of the area and relevant published

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<sup>1</sup> In 1861 the refinery of Trystram became the first refinery in the city of Dunkirk.

<sup>2</sup> The steel factory of Usinor, later ArcelorMittal, also led to the transformation of the port in 1956, creating a need for a new basin and infrastructure. This national project was supported by local politicians who hoped it would enhance the activity of the port and renew its infrastructure.

literature, the paper exposes the power the state wielded over port area strategies before the emergence of the European Union and the environmental protection movement. The study of these evolving and sometimes opposing fields – economy and environment – highlights the importance of laws, their effects on the governance of ports in France and the need for a legal transition to reach a sustainable balance between economic interests and environmental protection.

## Centralized Governance: From Post-War to the 1970s

In the early post-war period, the government was the key actor in the governance of French ports. The centralization of decision-making resulted in autonomous ports that were detached from any local influence. The state planned its port strategies in collaboration with large French companies of the time – Usinor and Elf for instance – which were interested in developing their business with the support of the government (Tourret 2012). Local authorities adopted a benevolent attitude towards the establishment of such industries because they hoped they would provide economic benefits on the local scale.

A law passed in 1947 gave power to the French state in the management of ports, including giving it the right to name port directors and to appoint representatives to management committees<sup>3</sup>. Then, in 1965, the modern era of port governance began with the introduction of ‘Autonomous Ports’<sup>4</sup>. If designated as such, ports became public institutions of the state with a civil personality and financial autonomy. However, autonomy was mainly in name as the government appointed half of the 26 members of the governing body and named the director. The latter had to follow the decisions of the board of directors, while also taking on other missions assigned by the state – like safety and security. A president of the port was appointed by the board of directors, in addition to the director, and put in charge of the overall management of the institution and the execution of decisions made by the board. In case of a conflict between the president and the director, the government was able to remove the director, but could not change the president until the end of the period of tenure (Direction de l’information légale et administrative, 2008). This apparent balance of power could not hide the state’s stranglehold on the administration of the port.

In the 1970s, petroleum became a key player in shaping Dunkirk’s port city region and its landscape. This resource and its associated industry, along with the establishment of other heavy industries, increased port activity and changed its shape, scale and entire environment (Deboudt 2004; Hein et al. 2019, 2020). These developments had detrimental effects on the rest of the city and on the ecology of the coastline<sup>5</sup>. While the eastern part of the city was preserved for tourism and leisure, in the western part, port authorities and industries pushed industrial development (Dewailly and Barbaza, 1974). The need for bigger facilities to allow ever-larger ships to access the port transformed the landscape and brought about a change in sea currents. Formerly, the flow of water had been parallel to the beach; the engineering interventions led to a new flow that curved to hit the coast, accelerating erosion (Figure 1 and 2). The local authorities and engineers reacted by creating rock dykes, a response that illustrates the lack of inclusive thinking and consideration for the environment. The state prioritized economic development over any environmental impact to the extent that environmental impact was not even assessed.

The relocation of port activities has long been a way either to enhance their efficiency or to improve the management of risks within the area. For example, in Dunkirk the dock that received

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<sup>3</sup> Law n° 47-1746 of the 6 July 1947 on the organization for handling work in the ports, or ‘sur l’organisation du travail de manutention dans les ports’.

<sup>4</sup> Law n° 65-491 of the 29 June 1965 on autonomous ports, or ‘sur les ports maritimes autonomes’.

<sup>5</sup> The modification of the coast on the west side of the city for the new infrastructure of the port transformed now-protected natural areas and modified the flow of the sea, which led to a loss of sand on the beaches of the east side, Dunkirk’s primary tourist destination.

oil ships was moved from the center to the north of the port for security reasons<sup>6</sup> before being moving again to improve efficiency of the infrastructure and air quality for the city. In spite of such relocations, the port and the city remained close. But actors concerned about economic pressures pushed for new and greater facilities which were incompatible with contemporary health and environmental concerns around cities. The central and unilateral decision-making process of the state facilitated the establishment of such industries. With this centralized form of governance, ports were considered on a regional and national scale without input from regional and local actors. The government was interested in promoting the growth of the port area but not in the development of the city around the port. The governance of the port city region was only seen through the port itself.

The focus on economic development and the demographic explosion of the post-war era<sup>7</sup> combined with a general lack of awareness of the environmental and health impact of industrial, petroleum-based development, led politicians and citizens to support the industrial and port activities. Industrial companies settled, at the end of the second World War until 1970s, their sites near the city, thus near housing zones. Companies even built homes right next to their sites to ensure the constant availability of their engineers<sup>8</sup>. The workforce's proximity to port activities was convenient for both workers and management. Nonetheless, as environmental and health risks started to manifest, the French government and the European authorities began making regulations—including distance requirements—to protect citizens from industrial hazards.

## Environmental and European Influences on Legal Systems

New attention to environmental matters appeared around 1972 with the Club of Rome's publication of *The Limits to Growth* (Meadows et al., 1972) and with the first of a series of international summits on this subject<sup>9</sup>. The report of the Club of Rome concluded that trends in the consumption of natural resources and economic growth were unsustainable, but at the time many private and public actors considered the report a doomsday fantasy<sup>10</sup>. The lack of interest regarding the protection of environment and health resulted in a compromise between the growing concerns of citizens and the need for states to protect and ensure economic growth. This situation led to the emergence of a "reactive process" in the creation of new regulations in environment, health and economy: there was a need for incidents, failures and outrages to prove the existing framework to be insufficient. As hubs for the national and global economy, ports were places where the detrimental effects of these events were particularly visible<sup>11</sup>.

Legal tools for urban planning had emerged in parallel with the early stage of industrial growth and they continued to promote economic growth. The creation of regulations to prevent environmental catastrophes needed a trigger such as the chemical disaster of Seveso, Italy, in 1976 to challenge existing patterns and stakeholder constellations. The disaster of Seveso was

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<sup>6</sup> The fires of Dunkirk in 1868 and Bordeaux in 1869 were both related to oil activities and transshipment.

<sup>7</sup> Also known as "The Glorious Thirty", it refers to the period from 1945 to 1973 marked by full employment, economic growth and increasing industrial production and population size.

<sup>8</sup> The "Cité des Ingénieurs", located next to the BP refinery, was built to house the engineers of the refinery and their families.

<sup>9</sup> The United Nations Conference on the Human Environment, in Stockholm, in 1972, was the first Earth Summit. They are held every ten years, the most famous and consequential being the Rio Summit of 1992.

<sup>10</sup> Soon after, in the 1980s, big oil companies – the most powerful oil companies – knew about the effect of their activities and products before the public and public institutions. See the article in *The Guardian* in March 2018: "Shell and Exxon's secret 1980s climate change warning".

<sup>11</sup> Examples include the fires occurring due to oil transshipment in Bordeaux and Dunkirk, air pollution of industries, modifications of the landscape and the soil pollution from past oil industries in the port city of Dunkirk.

followed by a series of European regulations named after it that addressed industrial risks<sup>12</sup>. Throughout Europe, sites that posed severe industrial risks became known as ‘Seveso sites’. The Seveso regulations implemented new rules in spatial planning practices around dangerous industrial sites, requiring for instance that any housing be located at a certain distance in order to protect inhabitants in case of emergency<sup>13</sup>. The Seveso incident and subsequent regulations are an example of the tendency of national and European lawmakers to wait for events to reveal the weakness of existing laws<sup>14</sup>. National legal systems in general, and the French ones in particular, were no different.

The Shoreline Act of 1986 introduced a shift in the politics of urban planning in French coastal cities<sup>15</sup>. It forced local authorities to change their approach to land development, moving from a strategy of sprawl to one emphasizing density and quality of life. This legislation was also an answer to the chaotic urban development brought about by the lack of a legal frame. The prohibition of any construction on a hundred-meter-long stretch of the shore<sup>16</sup> and the protection of local natural environments, formerly seen as potential new urban areas, led to a deep change in urban and regional strategies. However, these legal dispositions often came with exemptions and unclear definitions, allowing interpretations to avoid some of the requirements. While this law could have been a strong demonstration of political will to protect the coastal environment, the precise terminology, as well as the numerous exemptions, highlighted the reluctance of politicians to involve themselves in regulation that could impact the economic growth of ports and cities.

The Shoreline Act was one example of the compromise that authorities tried to reach, one which involved a subtle balance between economic, health and environmental concerns. It aimed at creating a harmonized management of coastal planning on a regional and national scale. The shore was no longer an opportunity for the development of a city but a common landscape for regional and local authorities to protect. However, due to the lack of political investment, this innovative law suffered from unclear definitions in its more relevant points. The prohibition of construction within a one-hundred-meter-long stretch of the shore for example, was limited to spaces not yet urbanized. Yet there was no explanation of what was considered to be an urbanized area or how temporary installations, wind turbines or oil storage facilities were to be classified in this context. This legal uncertainty impeded the development of regional strategies on the coast, such as the creation of wind farms. In the case of Dunkirk, the landscape had already been transformed by the time the Shoreline Act emerged.

The growing sense of urgency surrounding sustainability, global warming, pollution and environmental protection led environmental activists and citizen groups to put pressure on decision-makers. Economic development remained a priority of populations and public authorities but was, since the 1990s, expected to go hand in hand with an improvement of living conditions in the city. This movement led to better environmental protection, as well as better air, water and soil quality for inhabitants. Nevertheless, the two conflicting interests led to a paradox in the

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<sup>12</sup> The chemical disaster of Seveso in Italy in 1976 contaminated the environment and exposed the population to high concentrations of dioxin. The release of dioxin by a factory led to the death of many animals and the hospitalization of some inhabitants, with long-term adverse effects, including the contamination of the soil. It led to a European regulation in 1982, named after Seveso, which applied to dangerous industrial sites, with a classification based on their potential hazard.

<sup>13</sup> The distance depends on the intensity of the technological hazards of each site, article L515-37 of the environmental code. It implemented zones around the site where housings are forbidden or allowed under specific conditions and adaptations.

<sup>14</sup> Many other examples later demonstrated this need, with for instance the sinking of the tanker Erika in 1999, or the Prestige in 2002 triggering new regulations on tankers through multiple “Erika Packages”.

<sup>15</sup> Law n° 86-2 of January 3, 1986 on the planning, the protection and the development of the coast, or “loi relative à l’aménagement, la protection et la mise en valeur du littoral”.

<sup>16</sup> The law prohibits any new construction within 100 meters of the shore outside of urbanized areas.



management of the port and its relation to the city and the region of Dunkirk. The port started to grow on the west side, away from the urban area and its citizens, to create bigger infrastructure, and keep pollution and other port-related problems away from residents (Figure 1). Although at the same time, the port and the city were growing in separate zones, with diverging and also overlapping interests.



*Figure 1. Aerial picture of the port region of Dunkirk in 2015, still with the city of Gravelines on the eastern border, and its nuclear power plant right next to the new LNG terminal area of Dunkirk<sup>17</sup>. The development of the port completely transformed the coastal landscape.*

The enactment of the Shoreline Act in the French system was an early attempt to protect the coastal environment. Many other regulations, on the national and international level, have appeared since the rise of environmentalism (Maljean-Dubois and Rajamani, 2001)<sup>18</sup>, but the political will behind these laws or treaties has always kept the economic domain as a priority; the European Union is no different, although it has proved to be the most efficient institution with the scope to deal with the protection of the environment through its numerous directives. In the end, however, the most relevant scale for public authorities to deal with both environment and economy and forge a compromise was the local one. It was up to administrative courts and local authorities to be innovative in the interpretation of unclear rules – national and European – to solve legal uncertainties according to local needs and specificities.

## French Ports: From Closed to Collaborative Institutions

To improve the competitiveness of the port region, the French government tried, through multiple reforms, to modify the governance of ports and the relation between ports and cities. To coordinate economic and environmental strategies, authorities of ports and cities must rely on the various legal tools that national or European bodies have created. However, European ports compete with one another to attract trading flows and management is a crucial element in their ability to handle a constant increase in the number and size of ships. In the case of Dunkirk, that competition led to more specialization of the port and more separation of port and city.

The division of powers between the public authorities of metropolitan Dunkirk and the port authority led to conflicts – regarding security and pollution – in spatial planning on both sides, to the detriment of citizens and efficiency. Historically port and city both depended on each other

<sup>17</sup> Ibid.

<sup>18</sup> Like the European Directive 92/43/EEC of May 21<sup>st</sup>, 1992 on the conservation of natural habitats and of wild fauna and flora, the Convention for the protection of the marine environment of the North-East Atlantic (OSPARCON) of September 22<sup>nd</sup>, 1992, or the French law n.95-101 of February 2<sup>nd</sup>, 1995, strengthening the protection of the environment (“loi relative au renforcement de la protection de l’environnement”).

and on their proximity, but the growth of port activities and the size of ships were incompatible with acceptable modern living conditions and economic efficiency. Such divergent perspectives produced uncertainty in the definition of the port's strategy. The uncertainty put investors off, and diminished the competitiveness of both port and metropolitan area; regular delays and conflicts in the design of projects impeded the economic development of the area. Economic developments gave more power to authorities of port cities to voice their needs and claim for inclusion in the management of their ports. The diversity of actors with interests in the development of the port — private companies, local authorities, citizens, and the government— in addition to the emergence of environmentalism created an apparent "mess" in the governance of the area. Dunkirk's situation was similar to that of other French port cities (Tourret, 2012). The absence of a common strategy among port and city authorities made French ports less competitive internationally, highlighting the weak flexibility of a central and closed governance.

The decentralization law of 1983 represented a first attempt at national reform<sup>19</sup>, but the main commercial ports and all the autonomous ports remained under the exclusive control of the state. This state tutelage led the Court of Audits (Cour des Comptes) to continually report a lack of investment in ports, highlighting the responsibility of the state and its replacement by local authorities, private companies and the European Union. The integration and involvement of local actors grew with the state's decreasing interest in the development of these autonomous ports.

The concurrent processes of globalization and containerization in the 1980s and 1990s required continual adaptation, including deeper and wider structures for ports. The emergence and rapid development of ports around the world and the pressure exerted by Chinese ports pushed European ports to adopt management techniques that would attract private companies. The changes brought an increase in ship traffic, which led to more pollution, more transformation of natural lands in spite of ecological compensation requirements, and, in Dunkirk, more distance between the port infrastructure and the city<sup>20</sup>. This physical division —filled with greenways and railways— diminished city residents' sense of connection with the port.

At the beginning of 2000, a new trend in the management of ports emerged in Europe. The main activity of port authorities became the administration of the port area and the development of new areas to facilitate private companies' access to the port and to improve competitiveness (Lévêque, 2012). The French reform to implement this new kind of administration in ports appeared in 2008<sup>21</sup>, following some of the advice given in reports provided by the Court of Audits. Besides the change in the name of the ports —from Autonomous Port to Large Seaport<sup>22</sup>— the reform implemented a new form of organization and rules for the port authorities in France. The large seaports were put in charge of the management of the public domain and of natural spaces in their territory. Although strict rules applied to the public domain, port authorities became owners of the domain of the port and were allowed to privatize the port's handling equipment and to change the status of the land. If the natural land within port's territory is modified to address the need for new infrastructure for instance, then the status of the land also changes. This artificialization of natural spaces —the transformation of preserved natural lands— transforms the

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<sup>19</sup> Law n° 83-8 of the 7 January 1983 and law n° 83-663 of the 22 July 1983 on the division of powers between municipalities, departments, regions and the state or "relative à la répartition des compétences entre les communes, les départements, les régions et l'État".

<sup>20</sup> The container infrastructure of the port of Dunkirk is 12km away from the city centre. This distance separates citizens from the pollution of the ships, but at the same time, it intensifies the feeling of remoteness.

<sup>21</sup> Law n° 2008-660 of the 4 July 2008 on the reform of port or "portant réforme portuaire".

<sup>22</sup> "Grand Port Maritime".



right of port's authority over the land, from a simple enjoyment of natural lands to full ownership of this now artificial public domain<sup>23</sup>.

The organization of port authorities also changed, giving more space to local actors in the strategy of the port. The board of directors was transformed into a supervisory board, composed of eighteen members, with a mix of representatives from the state, local authorities, local and qualified persons chosen according to their skills —named by the competent authority of the state— and employees of the port, with a president elected by this board<sup>24</sup>. The former director position became a directorship with two to four members, the government appointing a president with the assent of the supervisory board. A new body emerged in this organization, a development board, to be consulted regarding the most important decisions affecting the port, and including local actors engaged in the functioning of the port. The inclusion of local actors in the organization allowed more convergence between the strategies of the port and the city. Eventually, when multiple ports were located in the same geographic area, an Interport Coordination Council was created to harmonize and coordinate the actions and policies of these ports.

Machines of French ports were sold to private companies, with a transfer of crane operators, to enhance the competitiveness of the handling and of the port as a whole. Through the inclusion of public stakeholders and better communication with the public<sup>25</sup>, the port authority improved its visibility and its link to the city, while facilitating the acceptance of new projects. This mechanism allowed French ports to reduce complications, protests and uncertainties around its extensions, and reduced the amount of time the infrastructure would be unavailable to private companies. The sharing of information between public and private actors and citizens proved to be an effective way to manage and complete economic and urban projects (Pundt and Heilmann, 2020).

Through unified decisions and inclusive councils and committees, the 2008 law introduced a separation between activities related to controls and operations. The division between investment and development boards allowed the first to control the strategy and the activity of the latter. The management of the infrastructure was also modified to respond to the external pressures of the market and the internal needs of cities and regions. The aim of the French government was to improve the competitiveness of its ports and update their management to conform to the new requirements of globalization. Some port authorities also improved their communication with cities through the establishment of Port Centers to inform residents about objectives and activities<sup>26</sup>.

Private companies and external observers could consider the new form of organization as adding layers to the decision-making of port authorities, thus reducing efficiency. The “mess” coming out of the complexity of port cities and their diverging interests would be enhanced through multiplication of stakeholders and opinions on the strategy of ports. However, since the 2008 reform, the competitiveness of French ports has improved. In their report on the transformation of ports' economic model in France, Colrat et al. mentioned: “The evolution of container traffic represents a relevant indicator of the competitiveness of a port”. The report demonstrates later on that the share of containers meant to be used for the French market and received in French ports has increased – from 47% in 2008 to 58% in 2017 (Colrat et al. 2018). Thus the reform proved to

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<sup>23</sup> This way of playing with words and status did not appear with this reform and was common to avoid stricter regulations in many other fields. The rights attached to this new status were, in this case, not the same, passing from simple enjoyment to real rights on the land.

<sup>24</sup> Website of the Ministry of Ecological and Solidarity Transition, <https://www.ecologique-solidaire.gouv.fr/ports-maritimes-france#e0>

<sup>25</sup> In September 2018, the port authority of Dunkirk created a Port Center in the middle of the city, within the existing Port Museum.

<sup>26</sup> Dunkirk and Le Havre are two French examples. The Port Center initiative was supported by the network AIVP, an international organisation with private and public stakeholders.

be efficient, with more traffic and better infrastructure connecting port and hinterland, in spite of a complex and apparent “mess” of actors and interests taking part in decisions. However, these positive statistics cannot occult the fact that French ports lag behind their European counterparts (Tourret, 2012) nor all the improvements that are still possible in their governance and infrastructure. The reform, however, represents a step towards the renewal of French ports’ competitiveness.

Dunkirk, with its industrial port and its oil-related past, illustrates the necessity for port areas to innovate. In Dunkirk, transformation has been underway since the two oil refineries of the port city ceased their activity, even though their ongoing conversion involves some uncertainties<sup>27</sup>. The Total refinery is now an education center for newly hired employees, and a part of it is now dedicated to research on bio-fuel. In the meantime, the “Dunkirk refinery”, or “SRD”<sup>28</sup>, is being dismantled and cleaned to welcome another activity. The port also bets on LNG, which is supposed to be a less polluting energy, with its new terminal and its repairing docks. Many shipowners are trying to adapt their fleets to this new energy, and the position and infrastructure of Dunkirk offers a great advantage in this transition. The container port is now equipped with electrical plugs to ensure that these huge ships are not using fossil-fuels when they are moored, thus reducing air pollution in the area. Finally, many industrial sites of the port are now linked, providing resources to one another through the reuse of waste and generated heat<sup>29</sup>.

The construction in 2011 of the LNG Terminal in Dunkirk offers, however, an illustration of the priority of economic interests over protection of the natural environment<sup>30</sup>. It transformed 56 hectares of natural land in spite of the fact that this area was a migration site for many bird species<sup>31</sup>. The ecological compensation involved relocating these natural habitats and reduced the impact of the project on the environment. Nevertheless, it damaged wildlife populations and the ecological balance could never be fully relocated from the original place. It shows that even though economic and environmental questions are addressed together, the first takes precedence over the latter.

The strategy of protecting citizens by making the port, along with industrial and economic opportunities, more remote led to the alteration of a large amount of previously untouched natural environment on the outskirts of Dunkirk (Figure 2). The LNG terminal on the west side of the port also transformed the shape of the coast. Although compensation was made for the destruction of natural habitat, it was impossible to restore the shoreline. To address their different concerns, the port and the city agreed to the compromise that deepened the geographical division between them.

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<sup>27</sup> Remaining uncertainties involve the cleaning process, the reuse of the land and the creation of employment in the area.

<sup>28</sup> SRD stand for “Société de la Raffinerie de Dunkerque” or Dunkirk Refinery Company.

<sup>29</sup> This mechanism is also known as the industrial web, or “Toile Industrielle”, and improves circularity while reducing wastes and carbon emissions.

<sup>30</sup> The site was built on the Dune of Clipon, on the west part of the port, next to the nuclear power plant of Gravelines.

<sup>31</sup> Its classification as a Seveso site prevented this proximity to the city.

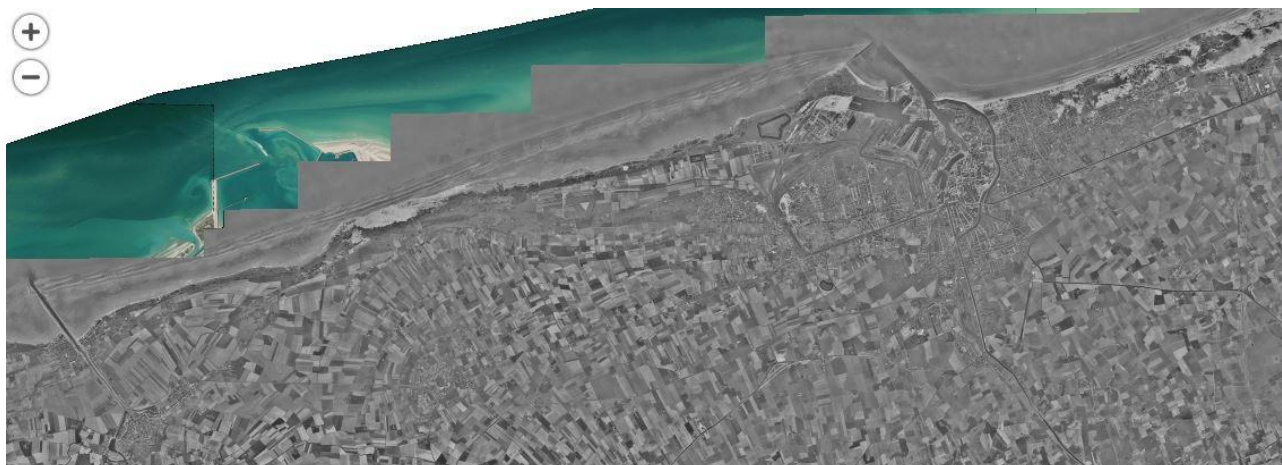


Figure 2. Aerial picture of the port region of Dunkirk in 1957, with the city of Gravelines on the eastern border<sup>32</sup>.

The need for the port authority of Dunkirk – now including local stakeholders – to protect living conditions within the city led the port to expand its activities to the west, away from the urban fabric but within a preserved natural area. Because the port has needed to welcome continually bigger ships, its development is usually incompatible with environmental protection. The expansion of the port highlights the priority given to economic benefits over environmental protection and, because of the mechanism of environmental compensation, the inability to hold companies responsible for environmental damage.

## Conclusion

Port cities are areas of profound importance for the global economy as they are privileged places for international trade and among the most populated areas of the world. That importance provides a certain degree of power for leaders of ports and cities in Europe to push economic actors forward in the race towards sustainability and against global warming. Ports and cities have to aim for greener, cleaner and more resilient ways of doing things, rather than just trying to get bigger and more efficient. The challenge is great, but against threats like pollution and climate change, citizens and important local actors, more than ever, call for this evolution.

In the port city of Dunkirk the local actors the search for a balance between economy, environment, health and competitiveness created separations within the same area: A geographic division of the port region with the remoteness of the port from the city, and a management division between the authorities of metropolitan Dunkirk and the port authority. Problems arising in each zone had to be addressed separately. Policies of port and city authorities were formulated without the input of both parties. New organizations for the port and new powers for the city demonstrated that the government had an interest in the local management of the economy and the development of the metropolitan area. Through the 2008 reform, national authorities acknowledged the efficiency and the role of local administrators.

The port of Dunkirk's innovations in technology, planning and governance represent experiments with which to face the challenge of global warming and to meet the ambitious objectives of the European Union concerning CO<sub>2</sub> emissions. The port city of Dunkirk has tried, especially since 2016, to distinguish itself and became an energetic and innovative area<sup>33</sup>. This multi-disciplinary transformation highlights the importance of an inclusive answer and points out the significance of

<sup>32</sup> Pictures obtained from <https://remonterletemps.ign.fr>

<sup>33</sup> High-profile innovations include a recent LNG Terminal, the reuse of a former refinery for biofuel, a link between many of the industries of the port for energy and wastes, and one of the biggest nuclear power plants in Europe nearby. In 2016 the "Euraénergies" initiative of Dunkirk also promoted innovation in the energy sector.

both the local and the European scale in meeting the challenge. To achieve the energy transition while improving competitiveness, port cities must consider innovative strategies. But these tactics have to go hand in hand with a legal transition to unlock new opportunities and solutions to attract investment and enhance the quality of life in port cities. There is no single way to solve the “mess” of problems related to the development of these areas, but the inclusion of multiple disciplines and actors has proved to be effective in tackling obstacles.

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