

Circular (City) Ports Workbook 1 Circular initiatives in the Delta

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This explorative trajectory 'Circular City Ports', initiated by OVAM (Public Waste Agency of Flanders) and Vlaanderen Circulair (Circular Flanders), deals with the future transformation of ports, where circularity will play an important role. Both in the publication of 'Lage Landen 2020-2100' 'Low Lands 2020-2100' as well in context of the IABR-2018+2020-THE MISSING LINK and its Brussels' component 'You Are Here', circular ports are a reoccurring subject. 'The Circular Ports of the Delta' was a theme on the Delta Working Conference of 4 to 7 July 2018 and

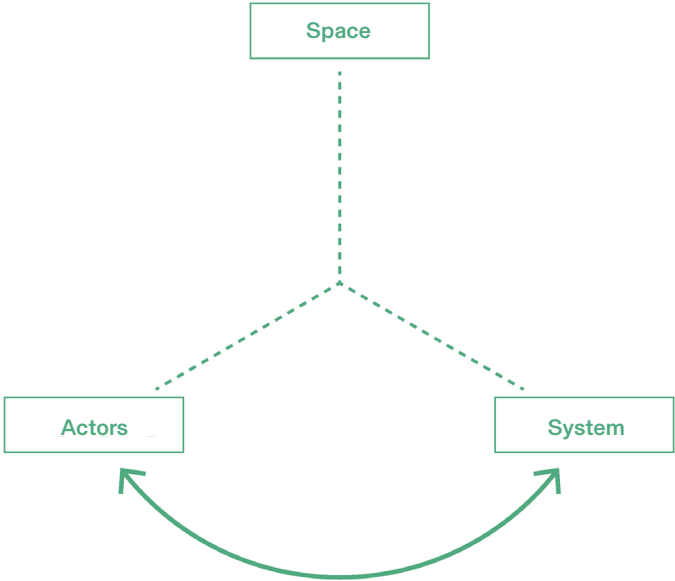
where four trajectories were set out, focused on the four scales on which circular ports work: the circular company, the city port (city-port interface), the port region (the regional range of the port) and the delta region (circular mainframe). Architecture Workroom Brussels and 1010au took up the assignment on the 'circular city ports' and investigate the shared chances and challenges, connections and opportunities by looking at different city ports and their current circular initiatives.



The trajectory was based around a benchmarking of 11 city ports in the Delta. Herein, we focused on the actors and the system as entry point. In this way we could keep a broad perspective in the reading of 'city ports', which are not easily depicted one-sidedly. The idea was, by first looking at the actors and their systemic functioning, to translate this knowledge towards relevant spatial ideas afterwards.

The trajectory started with a desktop research, enriched with a series of interviews to encompass the young initiatives not visible via the web and to have a better insight in the working of some initiatives. This research formed the input for three working sessions and resulted in different materials:

- A series of fiches of circular initiatives: each fiche is a descriptive compilation of: what happens here, what are the ambitions, who is behind it, what is the relation to the city and port?
- A comparative analysis, both descriptive and by mapping the city ports: are they a sea or inland city port, to which extent can recent history of the city port explain the current strategies they deploy, what are the economic dynamics and geographical context they operate within?
- Bottlenecks and leverages city ports encounter in the furthering of circularity: both at the level of planning economic activities and at the level of organizing the governance necessary to support this change
- Some possible recommendations to further circularity in city ports, by focusing on the framework and on the programming.



The initial hypothesis is that city ports are of strategic importance in the transition to circularity. City ports have the combined fact that they have easy access to all kinds of flows: the port as a gateway and match-maker between producers and traders and the proximity to the city as market and pool of skills and services, as well as the city as a mine of residual flows. The actors who operate in city ports have been historically and geographically positioned 'in-between', thus more open for new ways of operating and a priori more willing to embrace transition.

Today, we witness a renewed attention toward the city port as a place of production and intramodality, due to the financial crisis and climate change trends. Many stakeholders and experts envision city ports as a space where cities and ports can meet and interact again, reintroducing and reinforcing their commercial and productive relationships which were present in the past.

Next to the desktop research, public debates, interviews and working sessions were a way to interact with these stakeholders and experts on the subject.



Urban Debate
'City Ports in the Delta: Ports in transition'Haka, July 4th, 2018
 (IABR-2018+2020-THE MISSING LINK)
 ↓



Working session 2
'Benchmarking: learning from each other', March 13th, 2019
 (Exploration OVAM/Vlaanderen Circulair)
 ↓



Work Programme
'Circular Harbours of the Delta', June 1st - November 11th, 2018
 (You Are Here 2018)
 ↓



Working session 3
'Benchmarking: wrap-up and next steps', April 2nd, 2019
 (Exploration OVAM/Vlaanderen Circulair)
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Urban debate - Working session 1
'Circular City Harbours', October 23th, 2018
 (You Are Here 2018)
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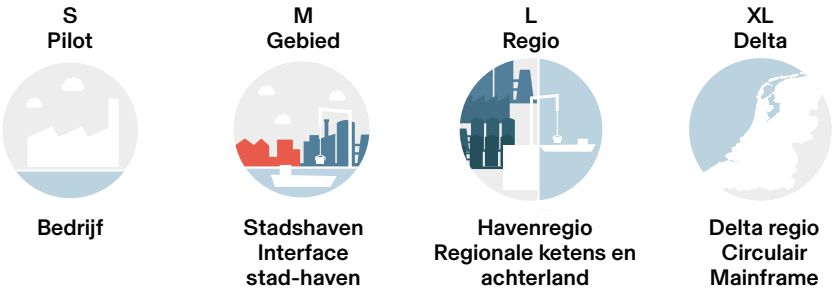


Delta Atelier Conference
'Circular Harbours in the Delta', May 15th, 2019
 (You Are Here 2020)

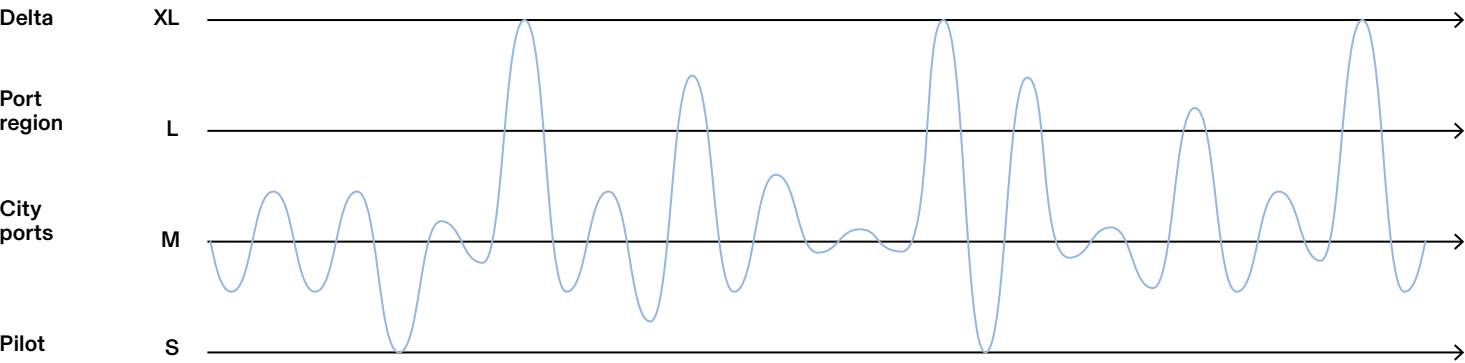
Delta Working Conference, 4-7 July 2018
'Circular Ports in the Delta'

The hypothesis that ports will play a crucial role in the transition towards more circularity, positions itself in a longer discourse on ports. Both in the publication of 'Lage Landen 2020-2100' (Low Lands 2020-2100) as well in the context of the IABR-2018+2020-THE MISSING LINK and its Brussels' counterpart 'You Are Here 2018', the topic of ports in transition was picked up. At the Delta Working Conference of 4 to 7 July 2018, a session was dedicated to this topic. During this conference, four trajectories for further research were set out according to four scales:

- A the company: the smallest link in making global chains circular. Many circular initiatives are initiated on this micro-level. They could act alone inside the industrial port, city port, city or hinterland, or they could interact inside an existing network. Sometimes they position themselves to fill the missing link inside a chain of flows.
- B the city port: the interface of city-port as a new area development model. This port-city interface is of great importance for both urban and maritime economy and their circular transition. Nowadays, it is a place under pressure of waterfront housing development, taking over old economical sites and/or pushing out productive activities outside the city. However, this trend should reverse, since the city port location is of strategic importance.
- C the port region: the industrial port and its connection to the inland waterways. The use of the inland waterways and their connection to the industrial port is an asset that has not yet been fully exploited. Focusing on the regional distribution chains
- D the delta: the whole region of the delta of the North Sea and the Low Lands of the Netherlands and Flanders. The interaction and interchange between the different ports and the economic production sites in the hinterland could be investigated on a larger scale. A Circular Mainframe could be set up, where different flows could be exchanged at a larger scale and to a wider network.

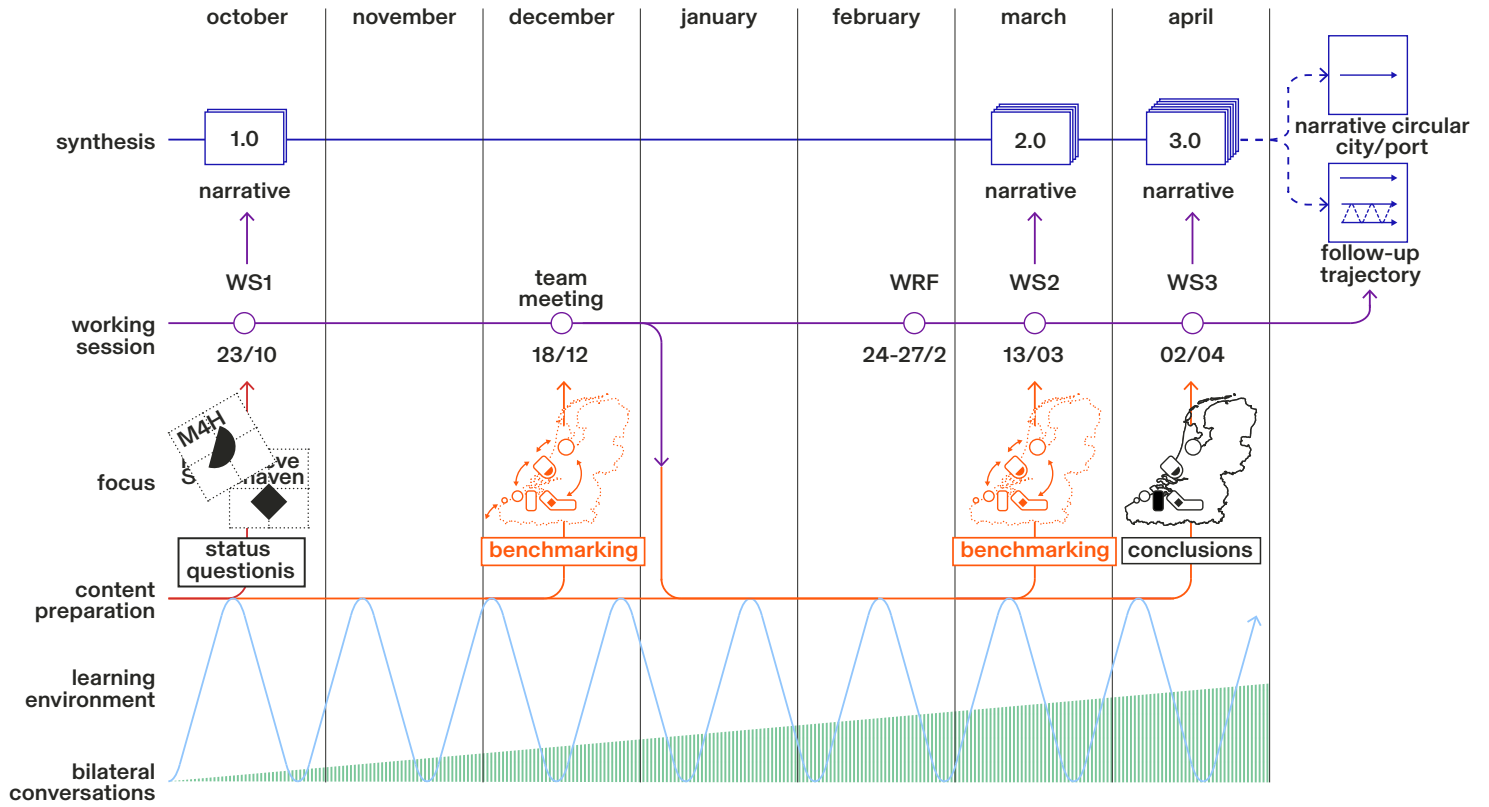


Circular Ports in the Delta



Public debate/working session 1, 23th October 2018
'Circular City Ports'

This first working session was in the form of a public debate inside the World Transformation Sessions of the lectures and debate program of 'You Are Here 2018'. It set out the tentative content for the explorative trajectory. Nadia Casabella (1010 architecture urbanism), Marco Vermeulen (StudioMarcoVermeulen) and Karel Van den Berghe (TUDelft) were the three speakers who gave their knowledge and expertise about circularity and city ports, touching upon the different scales of and approaches to circularity. After the presentations, a public debate was held with panel members Isabelle Vries (Port of Rotterdam, Rotterdam Makers District) and Hans Ten Hoeve (Dutch Ministry of the Interior and Kingdom Relations) and moderated by Joachim Declerck (Architecture Workroom Brussels).



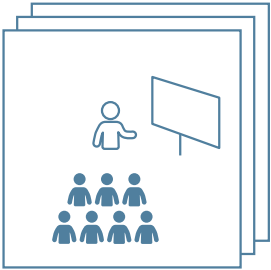
The interviews were used as an enriching tool in order to gather deeper information and knowledge regarding the practices analyzed and the dynamics taking place inside the Ports. The aim was to develop a series of talks with different figures taking actions already toward more circular dynamics, covering different roles in this transition. Therefore, the interviews have been done starting with the local economical actors already strategizing toward circularity, understanding the port authority point of view regarding the future steps to be undertaken, enriching the content exchanging with figures working in the innovation and research field. In this sense, it was possible to have a more comprehensive view from political and decision-making realm in relation with a more technical and specialized on site knowledge, interrelated with the innovation and research in development processes.

List of interviewed people:

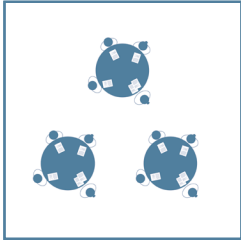
- Vera Dua (Bond Beter Leefmilieu, toezicht-sorgaan North Sea Port, UGent Duurzame Ontwikkeling)
- Arie de Bode (Heros Sluiskil, voorzitter Portiz)
- Veerle de Bock & Carl Dejonghe (Project Gentse Kanaalzone)
- Jörg Knieling (HafenCity University, professor urban planning and regional development)
- Jose Sanchez (Port of Hamburg, AIVP)
- Ulrich Malchow (Port Feeder Barge)
- Adinda Baro, Barbara Govaert (Stad Gent – Cleantech Cluster Ghent)
- Daan Schalk and Karen Polfliet (North Sea Port)
- Hans Maes (Gebiedsmanager Kanaalkant, Antwerpen)
- Michael Doods (Associate Professor Management and Strategy VUB)
- Marielle Chartier, Janneke Pors (Business manager ‘Circulair’ Havenbedrijf Rotterdam)
- Marie Van Breusegem (Stevens Recycling) + Philippe Van den Brande (Suez) + Michel Debievre (Havengemeenschap Brussel)
- Jan-Willem Kanters (Cirkellab)
- Pieter van Exter (Metabolic, Amsterdam)
- Anthony Callens + Valerie Tanghe (Havenbedrijf Brussel)
- Suren Erkman (Sofiesgroup, expert industrial ecology)
- Peggy Ricart (Director of Ecopal association)
- Marc Dumoulin, Vincent Leignel (Urban Community of Dunkerque)
- Jean Gravellier (Director of Pôlénergie)
- Sandrine Capo (Conseiller Environnement - Sécurité - Développement Durable, CCI)
- Lucille Audièvre (Regional Urbanism Agency of le Havre (AURH))
- Olivier Forget (Service stratégie dominiale, port du havre)
- James Hallworth (Manager Circular & Renewable Industry, Port of Amsterdam)
- Gilles Vandenborre (Vlaamse Waterweg)
- Benoît Charrière (Sofies Développement régional)

In parallel with and based on the desktop research and the interviews of practices, three working sessions were organized between October 2018 and April 2019. At these moments, the insights were presented, and specific challenges, possible leverages and shared ambitions were discussed with the actors involved. With the research and working sessions, the aim is to figure out two main questions. First, why do we look at city ports for future circular economy and what is their strategic role for it? Can we prove the initial hypothesis that city ports play a crucial role in the transition towards circular economy? Second, which role does the city port play in relation to the Delta port system and its geographical network?

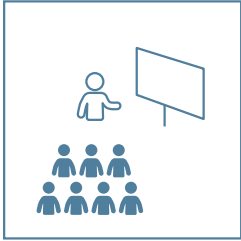
In what follows, we show the outline, content and working materials of each working session.



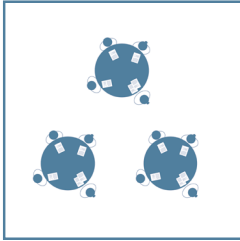
WS1 PRES
circularity beyond
recycling



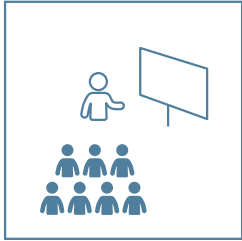
WS2 TABLES
3 levers for further-
ing circularity



WS2 PRES
multiplexity of
city ports



WS3 TABLES
7 key issues



WS3 PRES
circularity pathways

Working session 2 -

Benchmarking: learning from each other'

The second working session 'Benchmarking: learning from each other' on March 13th 2019 gave insights on the current circular initiatives of city ports. What is happening? How take it place? Who is behind it? Which spatial infrastructure is needed?

Eleven city ports, in the Delta and close by, have been investigated and brought together: Le Havre, Dunkerque, Ostend, North Sea Port, Brussels, Antwerp, Rotterdam, Amsterdam, Dordrecht, Hamburg and Duisburg.

The working session was divided in two main part: the first half of the session was based on a plenary discussion firstly explaining the methodology of the benchmarking held until that moment, and secondly regarding the multiplexity of city ports and of their differentiated circular economy strategies.

We explored the concept of city port, not with the aim to identify a panoply of models that could be copied elsewhere, but to explore their peculiarities and the diverse pathways they follow in their development. What makes them so interesting, so specific? Five parameters were used to describe and compare the eleven city ports. The traits they share as well as the trajectories that pull them apart are dealt with in detail. The topics help to sketch the diversity and contingency of city-ports strategies.

Relationship port and city

The sometimes-divergent interests of port and city are a steering force for city ports. These interests are driven by changing growth dynamics (socio-economic, demographic, etc.) and reach beyond the merely spatial aspects. Therefore, we tried to know better what this relationship between port and city is, and what dynamics impinge upon it. After much time growing apart (port moving further away towards the sea and away from the city), new trends of collaborations between port and cities are emerging.

Transition to new economies

External dynamics (climate change, scarcity of materials, social inequality) have a major impact on how our ports function. New promising economies seem arising, as diverse in character as bio-based economy, blue economy, smart logistics, makers economy, waste as resource ... This change will not come as a disruption, but will manifest itself as a transition, with existing and new actors engaged. Although dependent on the context of the 'old industry', and trapped inside cumulative causation processes hard to sub-

vert, these transitions can also be influenced by detecting and attracting the right actors and activities.

Networks and governance

The network of the city port is active on multiple scales. It further enjoys a strategic position as it has access to: materials, the flows crossing the area (both incoming and outgoing); human capital (knowledge, skills). The fact that these flows intersect physically with initiatives that try to exploit them locally opens up new opportunities for the future operation of city ports, provided awareness would be raised and the broad spectrum of actors would be steered toward a collective venture and new forms of governance: companies, public actors, knowledge institutes, sector-federations, social actors, all have a say and a role in this development.

Pin in the system

City ports are embedded in a bigger system, within which city ports have traditionally functioned as gateways for incoming and outgoing flows. Oil, containers and food enter the city through the port, while valuable waste leaves it through the same place. Closer integration between these flows and with the available know-how seems promising. Restricting integration to the city port seems unwise: the city port is part of a bigger system that includes inland waterways (the corridor) and an interwoven network of different kinds of places that work complementarily along them. On the other hand, the scale of city ports seems right, as actors operating in them are positioned in-between, acquainted with the global challenges and involved in projects attempting coordination of actors at the local level.

Circularity Roadmap

There is a need to put words into deeds. City ports can become specific areas, subject to different legislation and activity that the ones reigning either on ports or on cities. City ports can become a place for experiment ... a place where the advantages of the proximity between city and port, in terms of a close by market, other companies, secondary resources, knowledge... could be exploited. This seems to require specific networks of collaboration between different kind of actors.

During the second part of the working session, the aim was to dive into concrete circular economy initiatives of the eleven city ports, using as main topic of conversation, as we defined, three leverage to further circularity:

Collaboration platforms as triggers for action

The accessibility to know-how, both scientific and hands-on based, boosts existing and new circular initiatives. Platforms where this knowledge is shared and where it therefore extends beyond the borders of the participating actors, are a key element for circular economy. You can't be circular on your own. This collaboration needs to be initiated and managed by certain actors of all fields. How does these collaborations precisely happen? Who, what, how, where, when?

New infrastructure to further circular economy

What kind of infrastructure and typologies are needed to facilitate this material and knowledge-intensive circular economy?

In order to further circularity, city ports need new kinds of infrastructure and facilities: e.g. new transshipment docks, consolidation warehouses, structures to sort out the different kinds of waste, disassembly facilities. The success of these investments

will partly depend on how well integrated they are within a wider (economical) context, and partly on good timing and fortunate coincidence. The investments themselves will derive from public-private partnerships and innovative governance agreements, key to steer, facilitate or initiate change.

Port-related productive ecosystems

Which interdependencies play a role between city, port and hinterland and how can the city port make the bridge to systemic change? Can the belonging to such a physical network or corridor increase the chances for establishing circular economy?

City ports are too small to work on their own, they are a pin in the network and depend on a vast network of providers, transporters and recyclers. The network of inland waterways and most specifically the corridor that links directly the city port to the sea or to other ports are an important economic structure. Thanks to them, the city port positions itself strategically on the cross-point of access to flows and knowledge in an urban environment. The mapping and consideration of these locations and interdependencies along the corridor are of decisive importance for any circular economy strategy undertaken by the city port itself.

WORKING TABLE 3 PORT-RELATED PRODUCTIVE ECOSYSTEMS

OUTLINE

City ports are too small to work on their own

- city port as pin in the vast network of providers, transporters and recyclers
- network of inland waterways as important economical structure
- mapping and consideration of locations and interdependencies in the system
- relation between city, port and hinterland can be important for systemic change

How can the city port make the bridge to systemic change and can its belonging to a establishing circular economy?

WORKING TABLE 2 NEW INFRASTRUCTURE TO FURTHER CIRCULAR ECONOMY

OUTLINE

new kinds of infrastructure and facilities for circular economy

- transshipment docks, consolidation warehouses, sorting of waste, disassembly facilities...
- investment goes beyond interest of companies and sectors
- too big investments for single actor could be shared investment of city port

WORKING TABLE 1 COLLABORATION PLATFORMS AS TRIGGERS FOR ACTION

OUTLINE

sharing information & tools to make circularity workable

- both for policy makers as companies
- platforms of know-how (scientific and hands-on) to boost new circular initiatives
- platforms of accessible information: where does actor have to position itself in eg. the different flows (frequency, volumes, quality...) to take action
- going beyond borders of actors as key element for circular economy
- initiated and managed by certain actors of all fields

You can't be circular on your own, but who, what, how, where, when?

BEST PRACTICES

- Toile industrielle, Dunkerque
- Flanders Biobased Valley, North Sea Port - Ghent
- Clean Capital, Amsterdam
- Kanaalkant Area Manager, Antwerp
- Cleantech Cluster Region Ghent, North Sea Port - Ghent

STARTING QUESTIONS

- > How does these collaboration precisely happen?
- > What collaborations are missing where?
- > How are the public actors (city/port) working together?
- > What type of companies are or should be involved?
- > How can the information be shared?
- > Is there a need for more knowledge about promising flows? Or is it more about taking action with a selection of actors?
- > Is the expertise and knowledge of economical actors or groups smartly used?
- > What can be the role of OVAM and others regarding this issue?

These three topics were discussed within three separated working tables, in which a small selection of the initiatives considered the 'best of', analyzed during the first phase of benchmarking, were used to deepen the understanding of the topics together with the aim of use them as an exemplar cases of activation on field. Quickly, the discussion shifted towards more general and interdependent challenges and bottlenecks that different parties at the city port level have to face. These comments and insights were the starting point for the revealing of the 7 'key issues' discussed during the following Working session.





1

TODAY THERE IS A LACK IN KNOWING AND NEW AND EXISTING ACTORS IN ORDER TO GO TOWARD FURTHER CIRCULARITY

Furthering circularity is finding new actors, but at the same time is also developing new relations, collaborations with existing actors. It can be considered an iterative system to understand the relations to look at the actors level. In this sense it is important to look at the actors level, there are different needs and ambitions, and furthermore to understand the facilities needed for a possible transition.

1

HOW DO WE DETECT, ATTRACT AND KEEP THE RIGHT ACTORS IN ORDER TO ACTIVATE CIRCULAR DEVELOPMENT MANAGING AND CURATING THE SYNERGIES?

Working session 3 – ‘Wrap-up of the benchmarking & next steps’

The third working session was focused on the analysis of the seven key issue or challenges, that has been detected throughout the desktop research, interviews, and previous working sessions and further described. These are bottlenecks that involved actors - companies, policy makers, experts, etc. - are confronted with when moving towards more circularity in city ports.

During the third working session, the aim was to dive into these 7 issues, via working tables: to verify their relevance and urgency, on the one hand, discuss possible direction that can be taken, on the other hand.

The aim is to start up the discussion and to make it possible to learn from each other, since these are often shared issues and challenges that can open up the discussion and try to break free from the beaten paths towards circularity.

The seven key issue are:

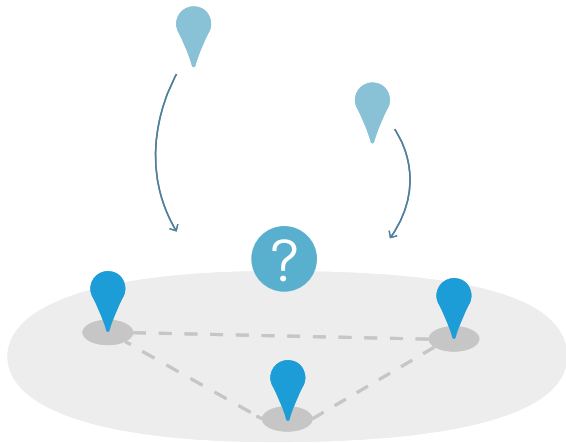
- 1 Today there is a lack in knowing and balancing new and existing actors in order to strategize toward further circularity

Furthering circularity is finding new actors, but at the same time is also developing new relations, collaborations and synergies with existing actors. It can be considered an essential factor to understand these relations to curate the right synergies.

From this perspective, it is important to look at the

actor level, which are the different needs and ambitions, and furthermore to understand the facilities needed for building up possible coalition of actors enhancing collaboration and exchange. It is important to build up strategies around the process of attraction of actors, and, moreover, there is the need to plan and design the management process for the selection and location of the new companies. Such a transition process, towards more circularity, could revolve around working together with key companies, that could be the one starting up the process.

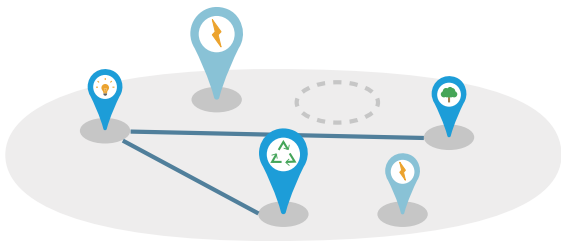
How do we detect, attract and keep the right actors in order to activate circular development managing and curating the right synergies?



Directions:



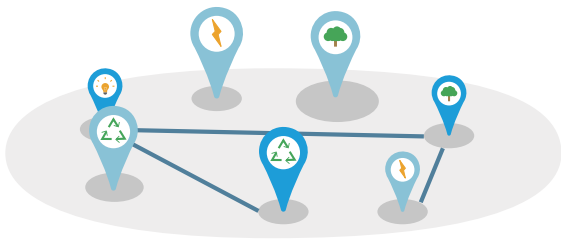
A Gathering knowledge on what is there; ambitions, types of companies, stages of transformation (company, area)



B Investigate new kind of facilities, either adapted to nourish and attract certain types of companies, either open proeftuin model.



Combined service



C Experiment combined pallet of services in order to provide specific facilities for specific needs; infrastructure + permit + network + growth opportunity (via concession-management, zoning)

D Provide continuity for companies, in order to invest, and growing through time

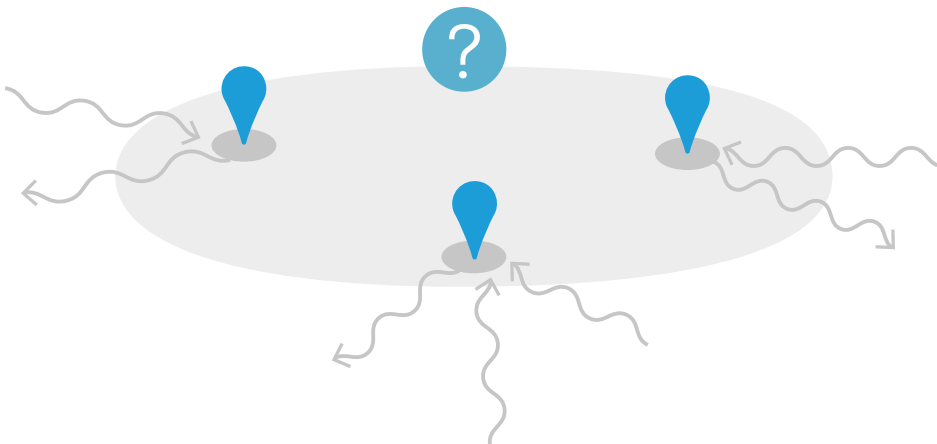
E Envision a comprehensive strategy balancing new and existing realities (concession strategy at different level)

- 2 Today data and knowledge are collected but not collective, lacking a shared platform to become operational.

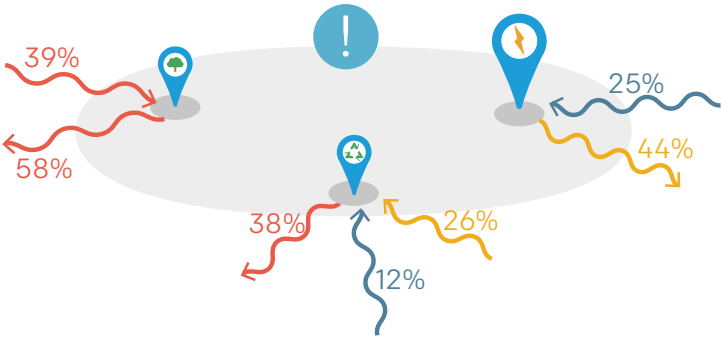
In order to have good data to act upon, trust is needed as those kind of information is sensitive and collaboration among different actors are taking place only if there is a trustful environment. Companies competition is not helping the collaboration between them, slowing down the possible connections and new links that could be built. There is a need for a certain management and curating of

information. This could overlap with the provision of infrastructure able to facilitate the exchange in knowledge and speed up the learning process, supplying companies with a body of knowledge (data, tools, know-how) that should be common and available in a neutral ground setting.

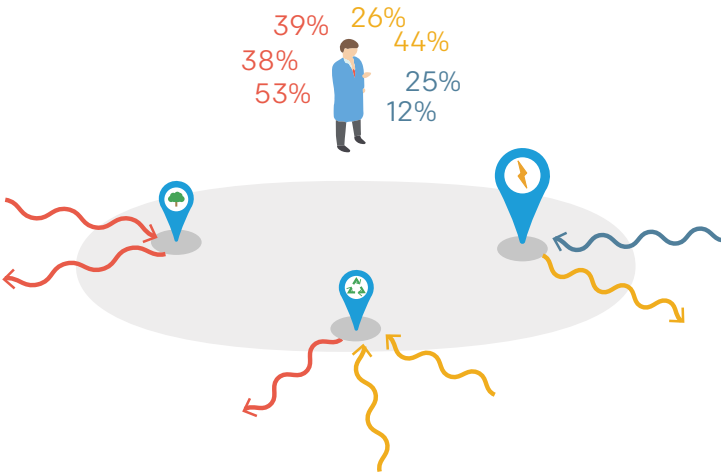
How do you collect and manage data on flows, for (other) companies to act upon?



Directions:



A Collection of knowledge on flows and operational functioning of companies



B Constitution of neutral ground or intermediate body (trust, tackling competition)



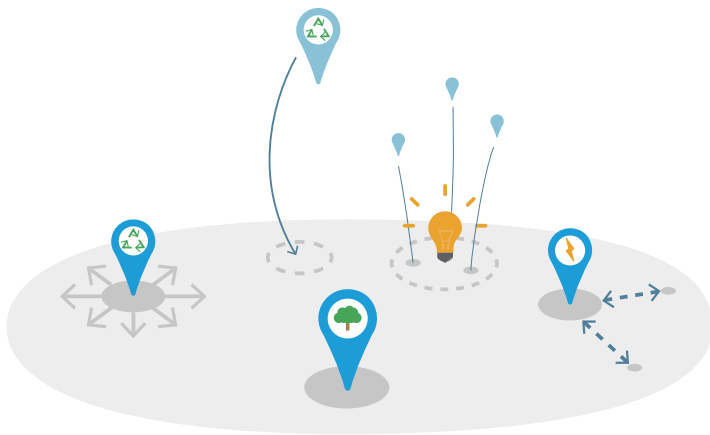
C Intermediate figure that could play the role of "matchmaker", enhancing new collaborations of the different actors using the knowledge and data

3 Today land management is not flexible enough in order to respond, in a proactive way, to the differentiated needs of circular initiatives

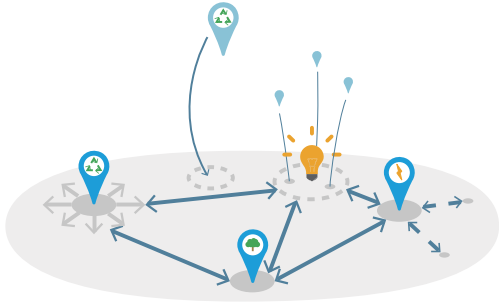
A recurrent issue is to provide the (right kind of) space for new circular initiatives. In order to act upon new circular trends, and nourish synergies and symbiosis in a proactive way, ports need to have a flexible enough system to allocate space. It should be possible for existing and new actors in the port, to have

available space for starting and developing the transition process. It is crucial for new initiatives to settle down in a suited and (activities) related environment, in this sense, there is the need of building up other tools and/or concession-systems and space flexibility to answer to the circular economic development dynamics.

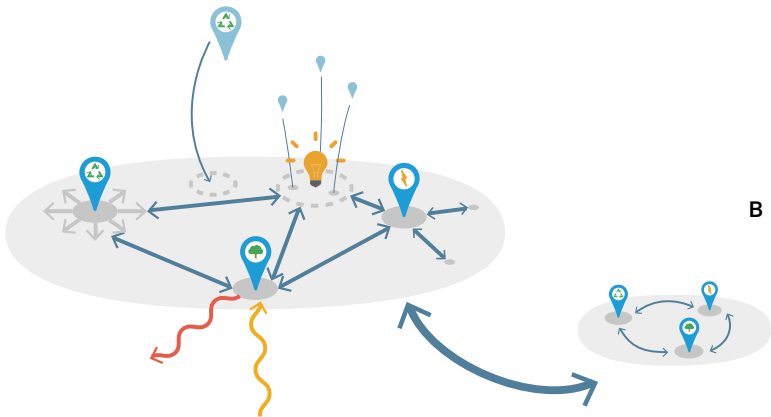
How can you incorporate and preserve enough space for new economies in a proactive manner?



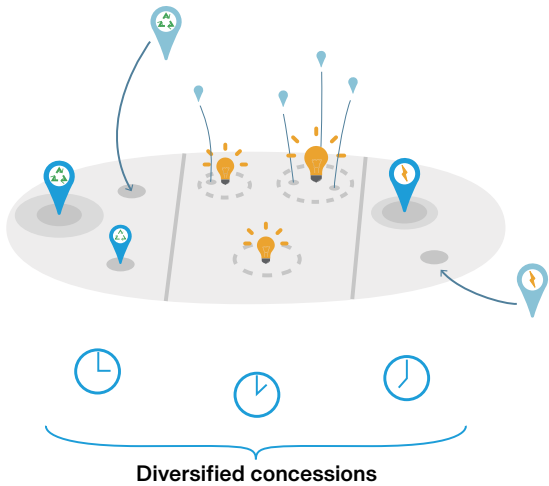
Directions:



A Connecting different kind of milieus, characterised by different environmental spaces, urbanity and accordingly, land-prices.



B Looking inside and outside the port area, as these milieus extend along corridors/inland waterways and across political borders



C Provision of spatial flexibility managing the spatial development of the different milieu, based on the functioning and the role that can play, throughout regulations and planning strategies (diversifying concessions based on company's role, permits flexibility)

4 Today city-ports are conceived mostly as a possible mix zone of housing and port activities

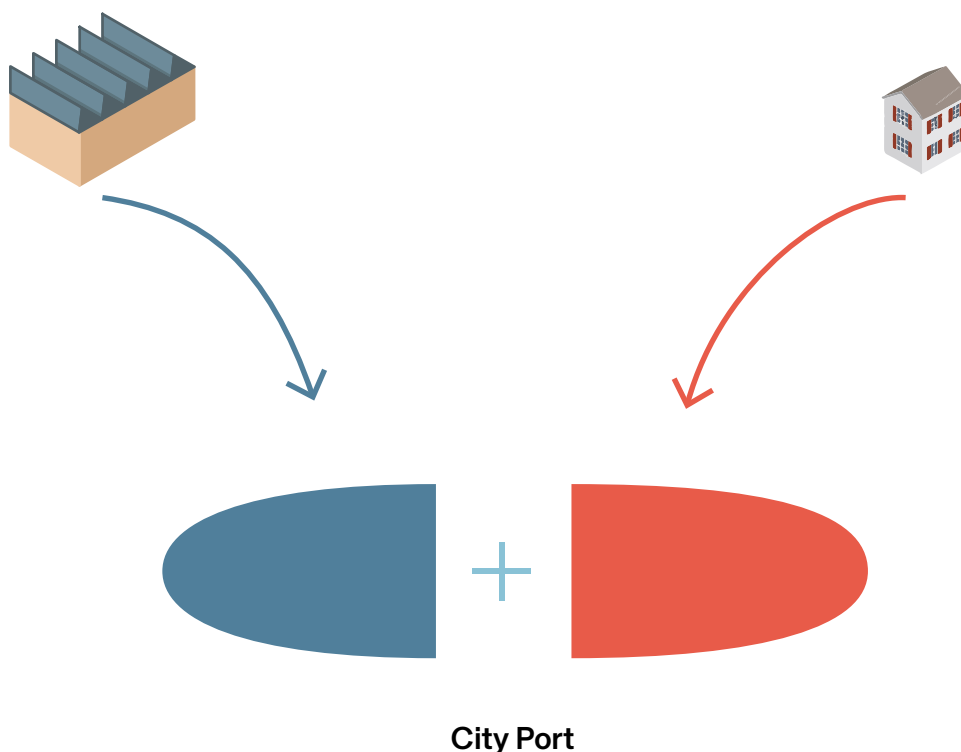
Certain circular activities confine different kinds of (mixed-)uses, as they relate to specific environmental conditions or required legislations. This tagging of a wide spectrum of different “milieus” requires a shared vision between port and city (planning) authorities.

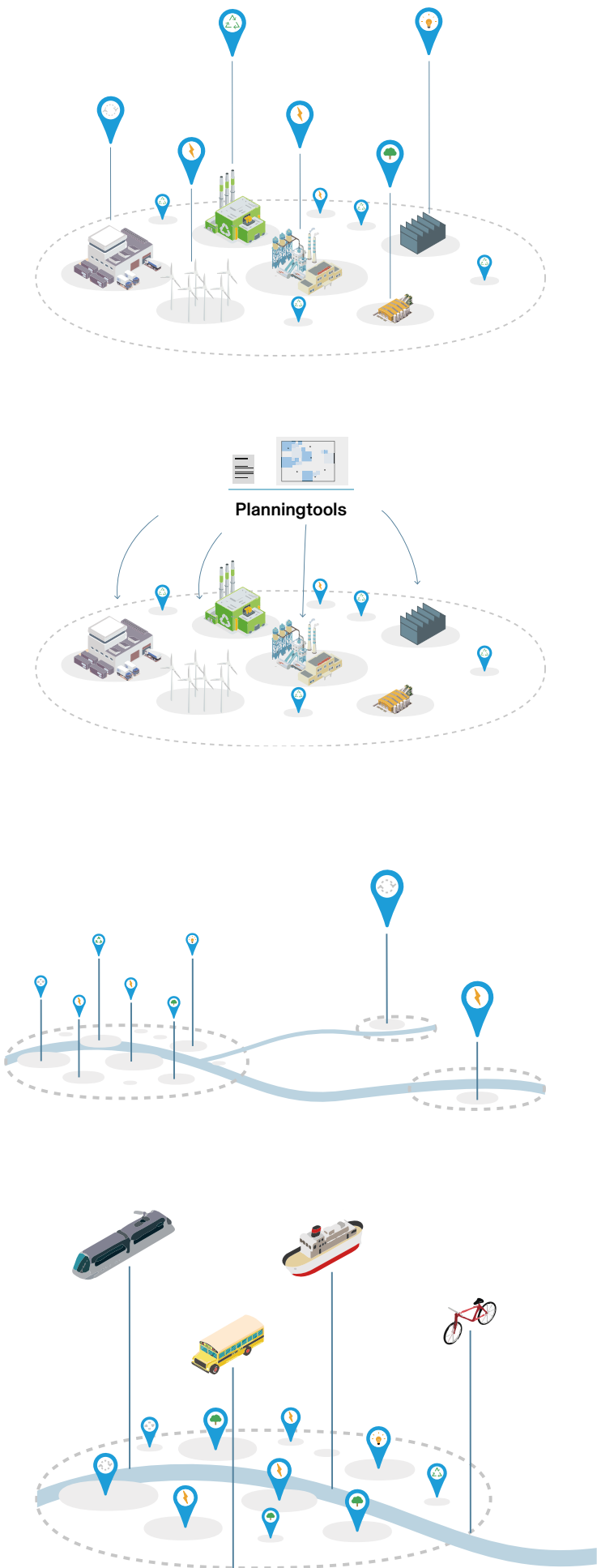
A spectrum of different “milieus” can be described, characterized by different gradations of environmental impact (and required legislation), investments done in public space/infrastructure, desired degree of urbanity, etc. There is need for a comprehensive understanding and development of these different milieus of the city-port. Herein, it is important to recognize

and tag different kind of “milieus” in which functions can be located strategically. We can imagine certain circular activities that require an industrial context as there is a large degree of nuisance (smell, noise,...); while other circular activities require access by public transport but also a medium-high environmental space/permit; while other circular activities (like makerspaces,...) could be mixed with other functions like offices, housing...

How can we spatially organize the common agenda?

How can we develop different milieus for a diverse range of circular initiatives to flourish in?





Directions:

- A 'tagging' different kind of milieus, characterised by different environmental spaces, urbanity and according land-prices.
- B Providing specific planning tools in order to respond to specificity of certain milieu (micro-zoning)
- C Looking inside and outside the port area, as these milieus extend along corridors/inland waterways and across political borders
- D Providing public transportation, or implementing existing ones, in order to enhance accessibility to certain specific area, providing new proximityExperimentation of new typology exploring different directions for the development of mixed use areas (housing, offices, atelier, etc.)

5 Today transition toward sustainable logistics is conceived as the constitution of new infrastructure

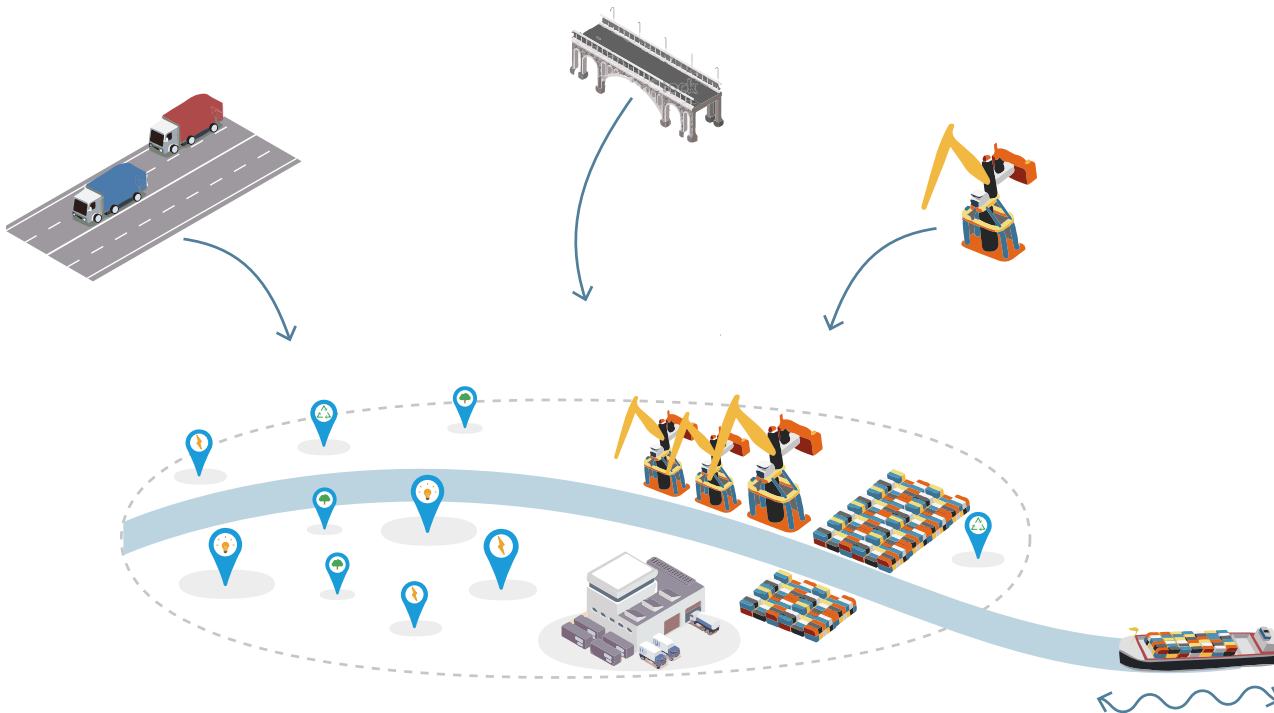
New, smart logistics services and connections are required in order to collect, distribute and process incoming and outgoing flows to and from the city. How we organise our logistics (related to flows) can be defined by chain optimization and the type of flow that is handled - which can be either collected in large quantities and low qualities (volume optimization), or rather in small quantities and high quality (mono-stream). On the one hand there is an efficient collecting system required, in order to separate, collect and distribute flows coming from the city. On the other hand, there is the system of the port that can fulfil either a function of transhipment

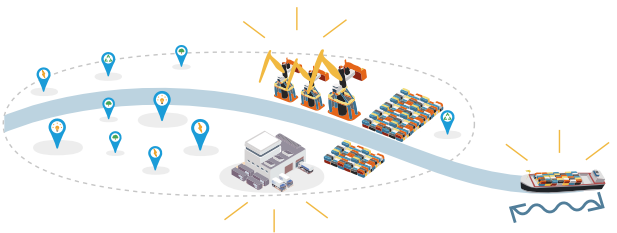
or processing, depending on the flow.

The city ports are of strategic importance here, as it is located on the cross-point between the collecting and distribution system of the city, and the transshipment and/or processing function of the port.

Chain optimization tries to avoid rising costs, related to working hours, (fuel costs), the amount of transshipment, need for large infrastructures and the speed and frequency of this transshipment. Herein, smart logistics relates to the new technologies and smart organisation of logistics that formulate an answer to these challenges.

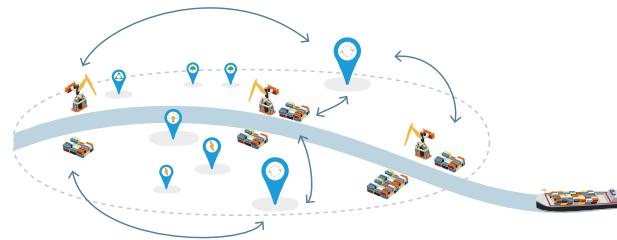
How will we organize and facilitate within the port in and out flows in a sustainable manner?



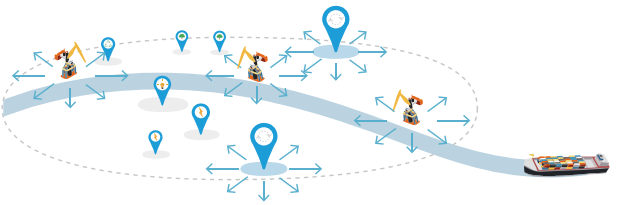


Directions:

A Improving the use of already existing infrastructure, trying to shift the use of them on a more sustainable and multimodal way (understanding the tipping point in which the reuse is not sustainable anymore)



B Decentralizing the logistic point creating a series of strategic location in which the in and out flows can be managed, avoiding central congestion



C Creating a series of shared infrastructure for the management of the flows that could be used in a smart way in order to serve different areas and purpose



D Constitution of different typologie and categories of agreements between the two parts, based on specific project, in order to build up ad hoc contracts enhancing flexibility



E Defining a specific type of area manager playing a key role of “in-between” party that steer and facilitate the construction of common agenda

6 Today, the opportunities of the city-port, for both city and port are not yet fully discovered and/or developed

Crucial is to redefining the task and operational logic of our (city-)ports.

The instruments that port authorities can develop or deploy are limited by their current contract with the city (or state, in the case of France). The respective role and business-models of these ports are in that way restricted, and new ways of taking the lead for furthering circularity requires new collaboration and agreements between port and city and other authorities.

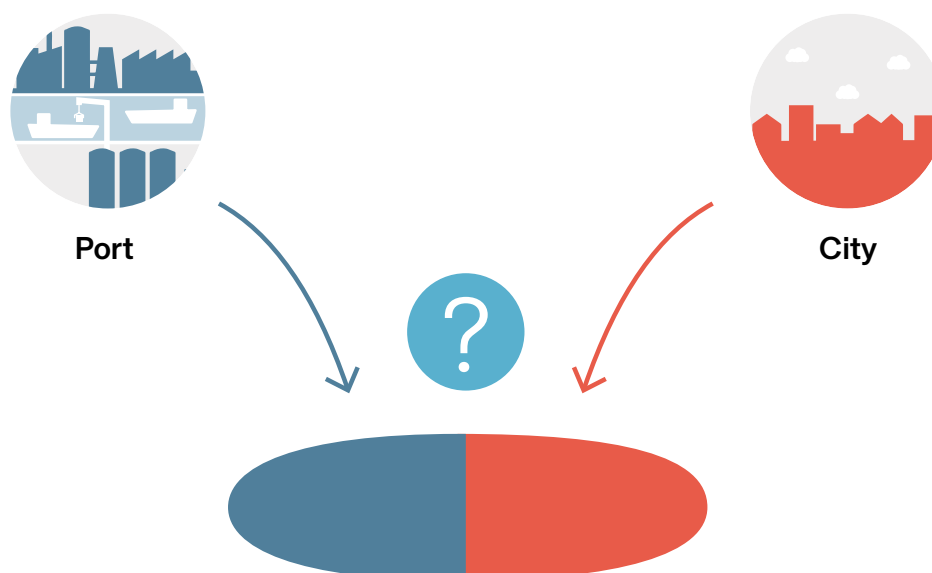
For example, land-management is steered by a business-model that tends to opt for maximization of land-use and profit deriving from it. This is in conflict with a required flexibility in order to react and

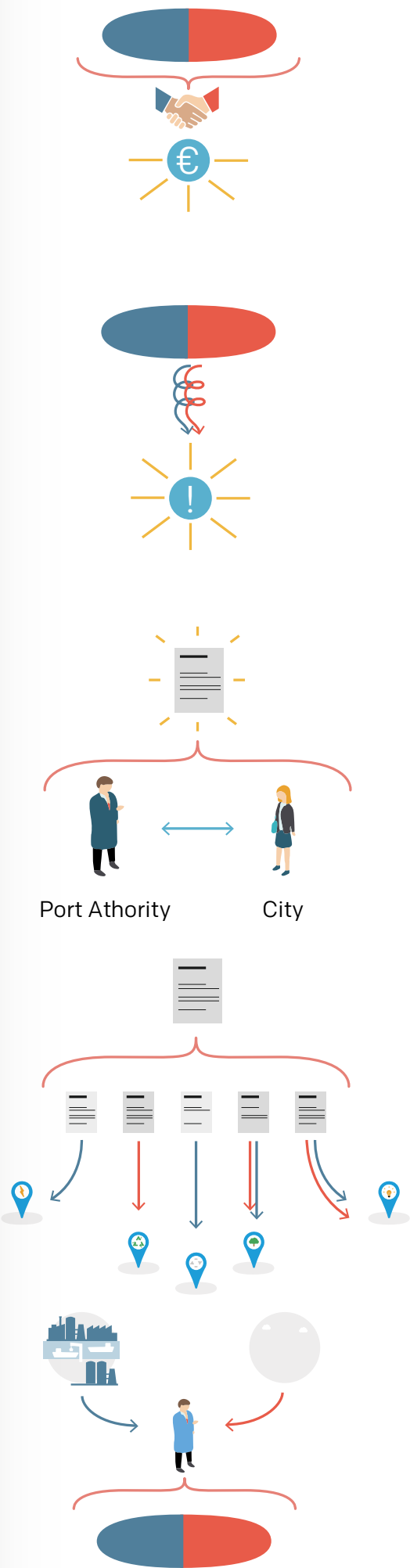
provide space for circular initiatives. The added value of (allocating) new economies should also be a factor in making the choice

What should be the tasks of our ports? How is this reflected in their contract with the city? The city should think in the same way the port is, and vice versa: how do we make the city better making the port better and vice versa? How do circular principles form the basis of rewriting such a covenant?

How can we form a common agenda between city and port and make their exchange and interrelation ongoing?

How can we form a common agenda between city and port, and what is the role of circularity herein?





Directions:

- A Definition of new business models for port authorities
- B Constituting common values and objective for the city and port as a whole mobilizing the forces of both in the same direction
- C Re-defining the contracts that port authorities have with the city or state for achieving a vider flexibility
- D Constitution of different typologie and categories of agree-ments between the two parts, based on specific project, in order to build up ad hoc contracts enhancing flexibility
- E Defining a specific type of area manager playing a key role of “in-between” party that steer and facilitate the construction of common agenda

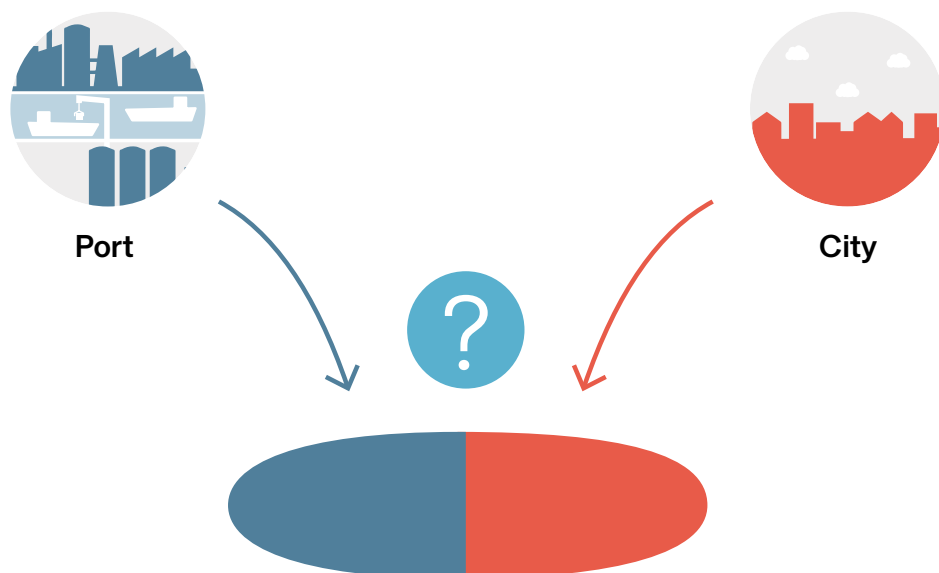
- 7 Today our economy does not yet acknowledge the right costs and values in its daily operations and use of resources

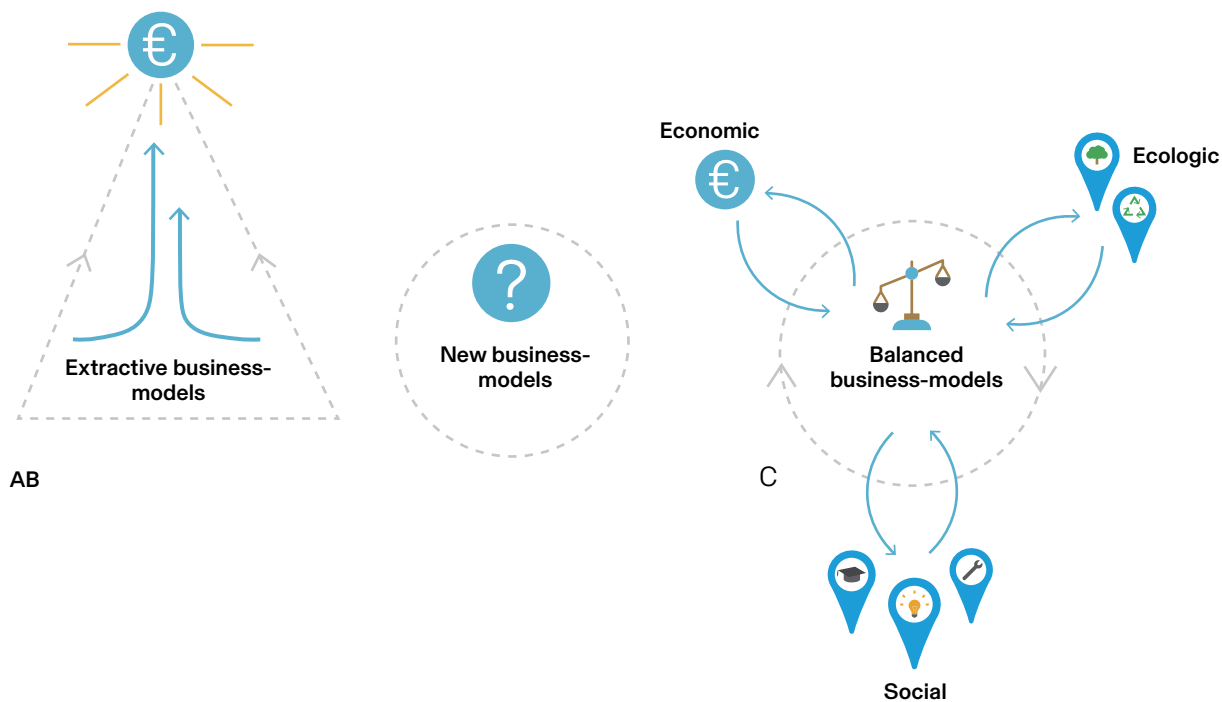
We can be confined by our known or existing way of doing business, not aware of other possible value frameworks. Circularity is not only about processing waste. It is also about organising a new industrial system and its inherent division of labour. Through circularity, we have the opportunity to; recognise and valorise new and diverging value systems (social, ecological and economical). The city port is of strategic importance due to its close proximity to either the flows (mining the city) and knowledge networks (companies, educational institutes...). This

new economy requires new kinds of roles and tasks. These new jobs can be both a driver, as a necessity towards more circularity. Business-models seek to recognise these other values and organise new ways of operating - wherein educational programs, new jobs and valorising flows are intertwined.

How can we, through new business-models, explore and establish other value frameworks, wherein there's a more balanced division of costs and benefits?

How can we explore and establish other value frameworks, and what is the role of new jobs herein?





Directions:

A collaborations across the chain, different parts of the chain to work together (imagined role; gatekeeper/clairvoyant/..)

B Constitution of socio-economic programmes that seek to combine job creation with circular ambitions (long-term unemployment)

C Connecting small initiatives to programs or (inter)national investment funds. Collaboration between knowledge institutes, companies and socio-economic programs. Re-educational programs (for existing companies)

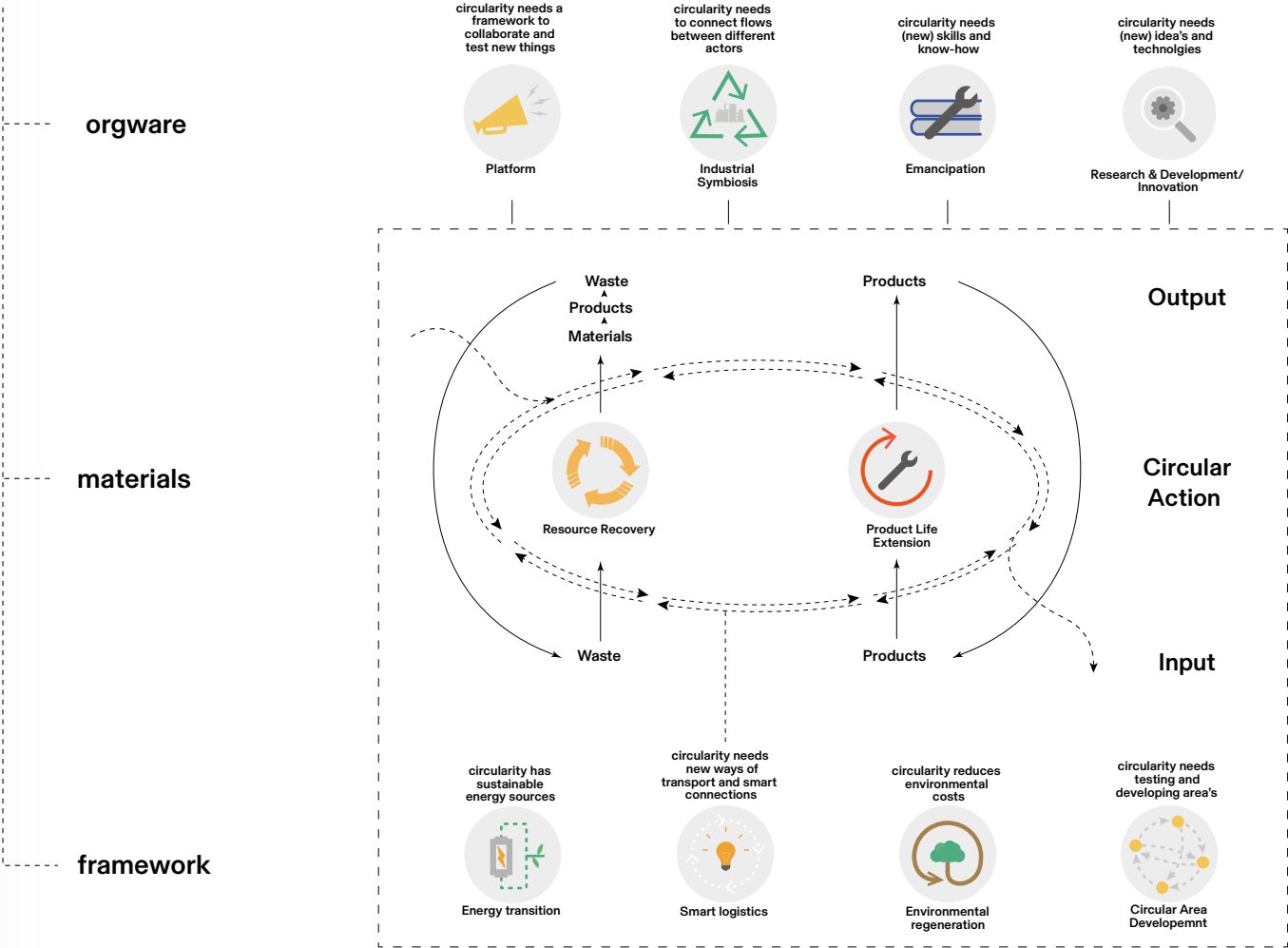
The exploratory trajectory started with a desktop research on eleven ports in different parts of Europe. The benchmarking of these different ports had the aim of learning and understanding different ways in which ports start to strategize upon circularity at different scale, level and with different methodologies, motives that each port have and the leverage that they use. Herein, we started from the actors and system as entry point. In this way we could keep a broad perspective in the reading of 'city ports' (which is not easily depicted one-sidedly in spatial terms or can be very limiting). The idea was, by first looking at the actors and its systemic functioning, we could say something more relevant about space afterwards.

The benchmarking started posing to main questions related to the ports: What type of circular Economy is present in each port? To which other activities do they relate?

In order to understand the different ambitions of the ports, we zoomed in the analysis of practices in each city port, documenting different circular initiatives, translating all the information gathered in a descriptive "fiche". Each "fiche" was then categorized according to their functions, their role, in the narrative of the circular economy as a whole system. In this sense, the work brought to the creation of a body of knowledge of interesting practices, together with a general overview on port ambitions and strategies, which can be shared and extended with new practices and ports, in order to envision together strategies for the transition toward circular economy.

The practices analysed for each port were categorized following the distinction of: orgware, materials and framework:

Circular Economy



Location



City



City harbour



Industrial
harbour



Hinterland

Scale



Company



City harbour



Port region



Delta region



Possible tags:
juridical framework
policy framework
research studies
spatial development framework
strengthening of sectors
digitalisation



Possible tags:
network-sharing platforms



Possible tags:
research & development



Possible tags:
training
job creation

Platform

The transition towards a more circular economy demands collaboration between city, port, companies, civilians, knowledge institutes, federations, development companies. This happens on all scales: locally, areal, regional or European. This development towards a more circular economy depends on the quality of coalitions, where the proximity plays an important role. These collaborations and platforms are called the orgware. Which initiatives, policy decisions, collaborations or platforms can steer towards a more circular economy? To what extent do cities and ports cooperate and form a policy on this? To what extent do citizens and companies use this policy?

Industrial symbiosis

In circular economy, the term of industrial ecology

Onder circulaire economie wordt vaak de beperkte term van industriële ecologie verstaan, als het efficiënte (lees, optimale) gebruik van bestaande hulpbronnen. Industriële symbiose gaat hier op verder en kijkt naar de industriële processen om te zien waar een afvalstroom van de ene producent, een grondstof kan zijn voor de andere producent. Het afstemmen van deze stromen of elkaar gebeurt tussen specifieke spelers.

Research & development/innovation

Technology plays an important role in this transition towards more circular economy. New processes, modifications or production are based on old, renewed or new highend technologies. Where is this innovation initiated and who is behind it? In which field are these new idea's implemented? Which (new) places or infrastructure does it need? How are these new innovations shared and put into practice?

Emancipation

New idea's on circular economy and the innovation in companies and with public actors demand skilled people in the working field. Training in these new-found technologies, as well as updating the knowledge of the working sector, asks for places where knowledge is shared. On the other hand, new technologies asks for new functions in the working field: job creation is necessary.



Possible tags:
sorting & collecting
recycling
mixed wasteflows
monostreams
waste to energy
circular infrastructure



Possible tags:
remanufacturing
repair
recuperating patrimonium

Resource recovery

Waste is a resource. With resource recovery, disposed products or by-products are used to make new valuable products. This makes that there will be less waste, more recycled raw materials and reduced landfill space. To extract the maximum value from waste is the aim. This touches upon the collecting, sorting, waste to energy... In the port area's, resource recovery focuses mostly on the industrial scale of global material chains (textile, agri-food...) Since the ports make the transition from transit port, focused on import and export of semi-finished products and products, to a port in the service of more local production chains, the resource recovery activities changes with it.

Product life extension

A product or component is reused by reparation, upgrading or remanufacturing to become again a functional product or component.



Possible tags:
energy transition
circular mainframe



Possible tags:
transshipment (water or rail)
return logistics



Possible tags:
water quality - biodiversity
CO2 neutral



Energy transition

The energy transition is a question of new technologies and economies, but is also a spatial assignment. Fossil fuels are obtained far away or in remote places. Renewable energy has a direct impact on our space. Windparks on the North Sea, biomass, urban waste streams... The current infrastructure will have to be rethought, since new resources (hydrogen, CO₂, sludge...) will be used, which demand different modes of transport or space. The port is a place where this transition plays an important role: sustainable growth is a task of many big companies.

Smart logistics

Logistics becomes smart. This doesn't only mean to implementation of new technologies and infrastructures to aid logistics. The inland shipping and the minimization of the amount of shipped goods changes the way logistics are organized. Smart logistics also asks for a dynamic traffic management: connection between different modes, where are there places for transshipment, on which scale does these serve the city, port or hinterland? The connection with the changing attitude of the port from typical landlord to an active facilitator is important for these kinds of logistics and infrastructure.

Environmental regeneration

Circularity affects also the environment in a good way. The connection between the circularity and the climate change is evident. Different circular activities have the specific aim to reduce their external negativities as CO₂, waste water... Some circular activities use these negativities as a resource. Specificities for ports, such as dredging, can also happen in an alternative, more natural way.

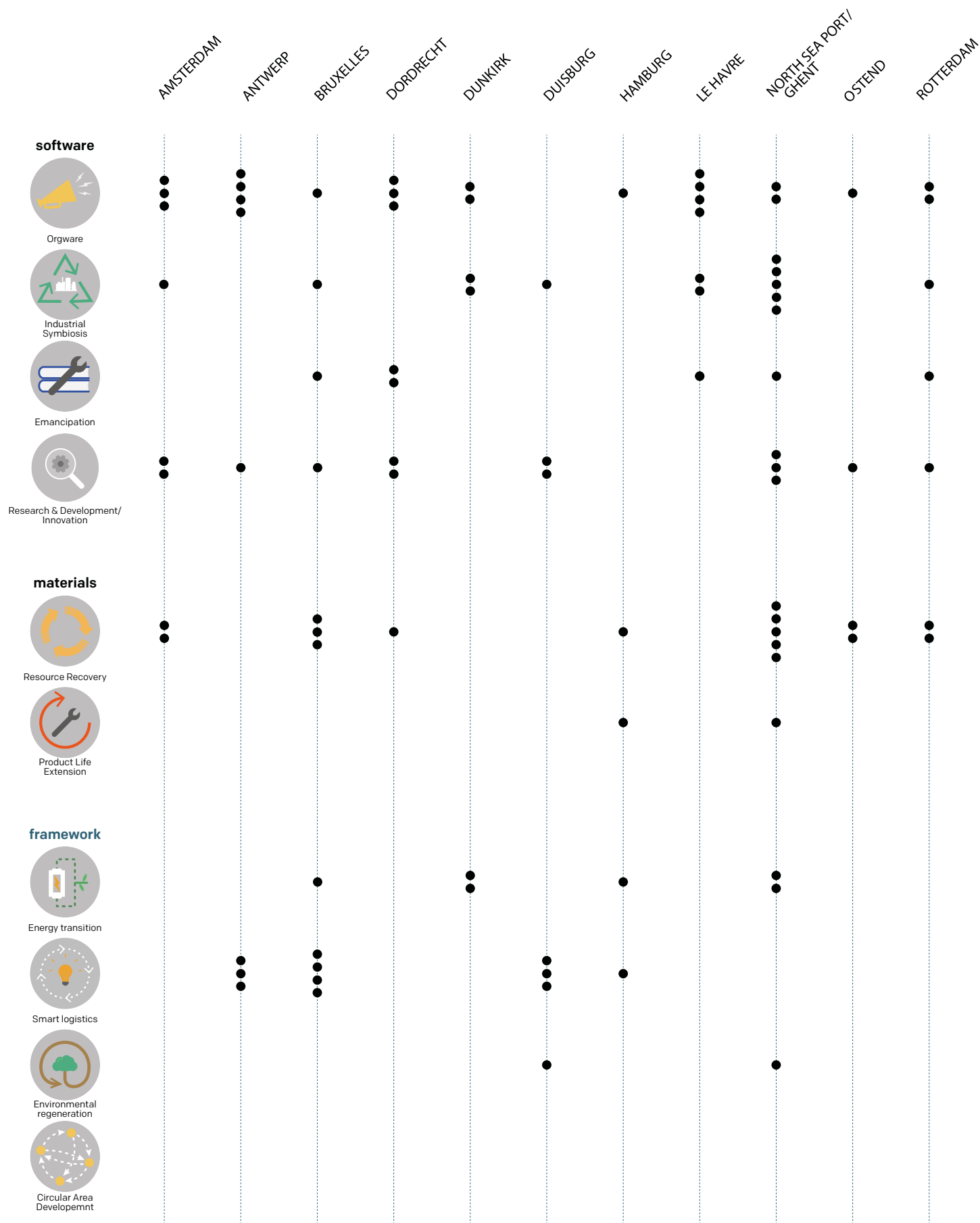
Circular area development

Circularity is here connected to the development of a specific area. Different circular activities are present or will be implemented here, to close chains, to facilitate smart logistics...

The circular practices analyzed in each port were synthesized in a “fiche” format that was structured in order to clarify which are the activities carried out by the actor analyzed; what has been the development of such activities through time; what are the ambitions toward a more circular economy; furthermore, it is very important to highlight the exchange and relation with the city, and moreover, the relation with the port and the inland water ways.

Understanding the ambitions and the strategy to each practice in relation with the transition of each port toward a more circular functioning, have been crucial in order to building a body of knowledge to start sharing, and, at the same time, to find a methodology to compare each port and each strategy.

The synthesis of this work has been translated in a matrix scheme, that starts to give a first insight of the different constellation of strategies that each port is developing, giving an overview of the different circular economy leverages present in each port.



In the next pages the body of knowledge gathered during the benchmarking phase for eleven ports located in different part of Europe, is represented:

For each port, the analysis has been developed by understanding the different dynamics taking place; furthermore, we tried to have a spatial understanding of the ports by having a mapping exercise for each of them; moreover, we selected the “best” practices located in each port, zooming in in them, building up fiches

Materials

Orgware

Framework

Hamburg

2

1

2

Amsterdam

2

6

Antwerp

5

3

Brussels

3

4

5

Dordrecht

1

7

Dunkirk

4

2

Le Havre

3

6

2

North Sea
Port/Ghent

6

10

3

Ostend

2

2

2

Rotterdam

2

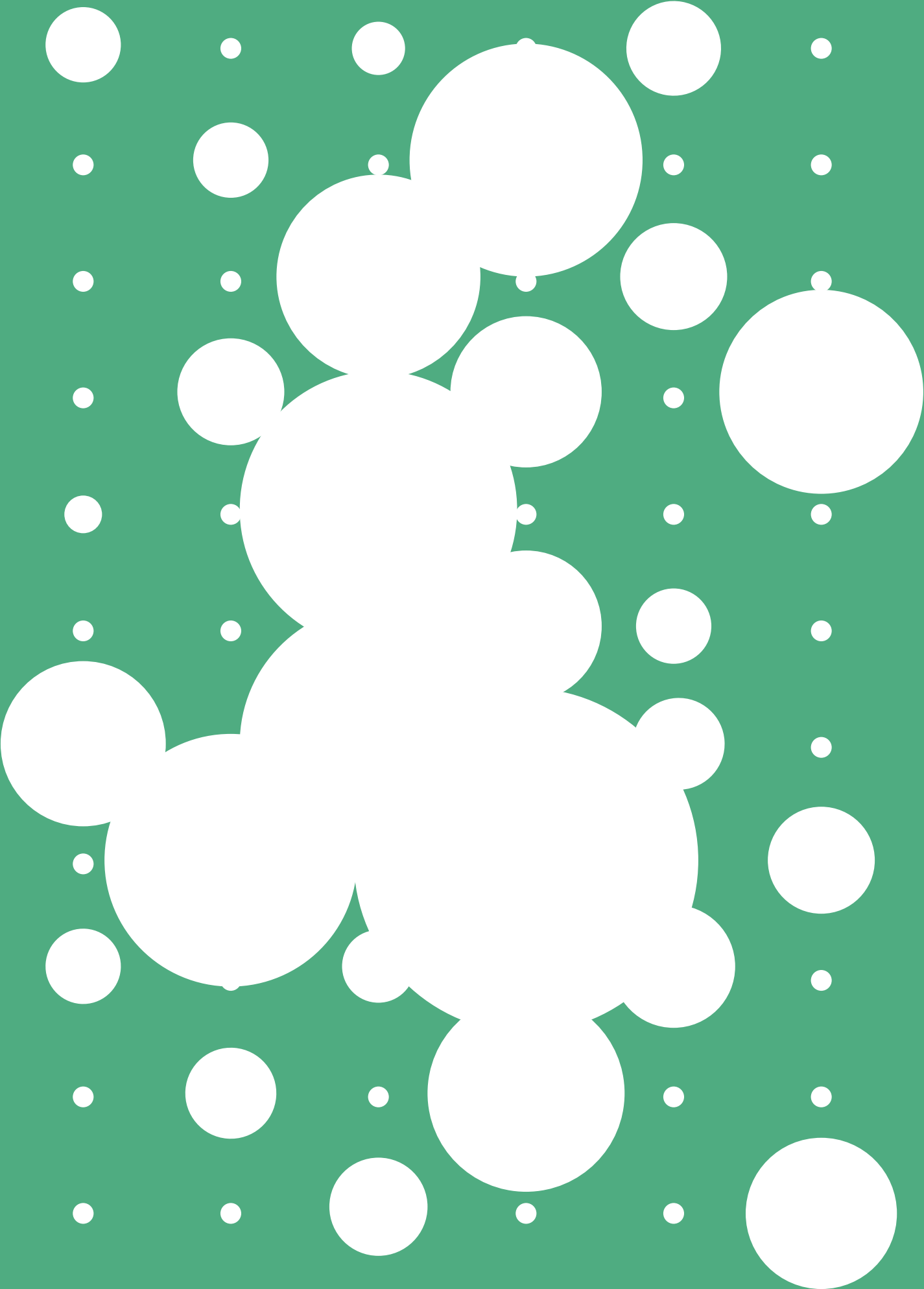
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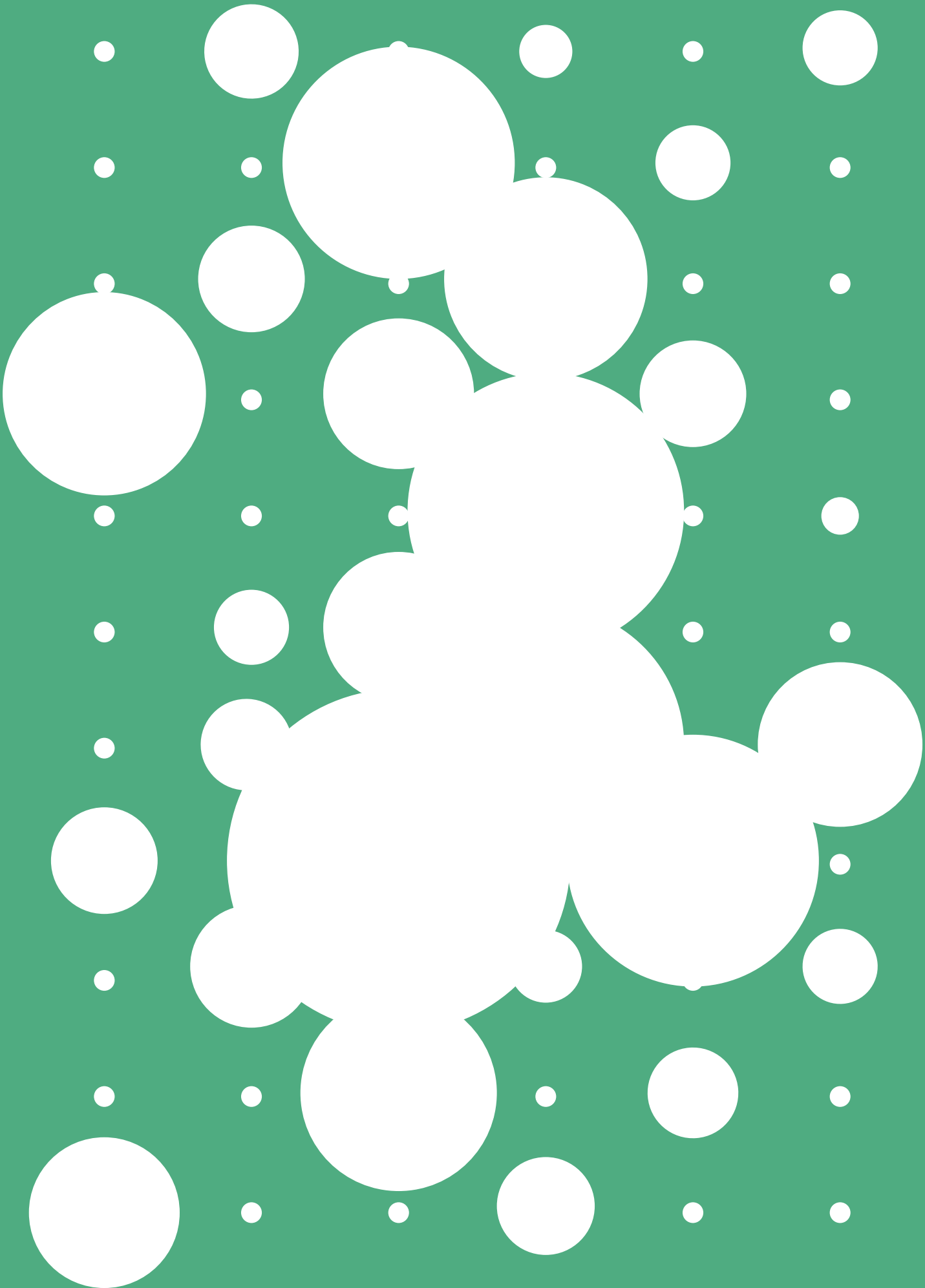
Duisburg

2

4

Amsterdam	1	Ecopal	76
City-port context of Amsterdam	2	Hamburg	79
Map	5	City-port context of Hamburg	80
Prodock	6	Map	83
Clean Capital	8	Port Feeder Barge	84
Green Mills	10	TSR The Metal Company	86
		Smart Port Initiatives	88
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City-port context of Antwerp	14	Le Havre	91
Map	17	City-port context of Le Havre	92
Area Manager Kanaalkant	18	Map	95
Blue Gate	20	Haropa	96
BlueChem	22	Estener	98
Blue Line Logistics	24	Toile Industrielle	100
		Synerzip	102
Brussels	27		
City-port context of Brussels	28	North Sea Port	105
Map	31	City-port context of North Sea Port	106
City Depot	32	Map	109
Material Village	34	Bio Base Europe Pilot Plant	110
Logistics Platforms	36	Bio Base Europe Training Center	112
Greenbizz	38	Hydrogen Pipeline Gasunie Dow - Yara - ICL-IP	114
Irisphere	40	Biopark Terneuzen	116
		Flanders Biobased Valley	118
Dordrecht	43	Cleantech Cluster Region Ghent	120
City-port context of Dordrecht	44	Stora Enso Langerbrugge	122
Map	47	Smart Delta Resources	124
Cirkelstad Drechtsteden	48	Beelen Recycling	126
Remanufacturing	50	Heros Sluiskil	128
Duurzaamheidsfabriek	52	Galloo Ghent	130
Boer Group Recycling Solutions	54		
		Ostend	133
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City-port context of Duisburg	58	Map	137
Map	61	Factory for the Future - Greenbridge	138
Start Port	62	Renasci	140
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Cluster 2.0	66		
		Rotterdam	145
Dunkirk	69	City-port context of Rotterdam	146
City-port context of Dunkirk	70	Map	149
Map	73	Makers District	150
Toile Industrielle	74	Groencollect	152





1 Description of location in relation to other (sea/) ports

The port of Amsterdam is considered a seaport in Amsterdam city, located in the former bay named IJ, and connected with the North Sea. The port is characterized mainly as an industrial port, with an intensive presence of steel industries and petrochemical activities. The port of Amsterdam is the fourth largest port in Europe, playing a key role in the cargo transshipments at the European and international level.

2 Description of current activities

The activities taking place in the port are prominently around fossil fuel, import and export, one of the most important players in this sector is the Simadan company. The Amsterdam port is the largest petrol port in the world, at the same time, second coal port in the Europe.

Amsterdam nowadays is specializing in the supply, storage and transit of fuels, in particular gasoline. Furthermore, it is considered an important cruise port. The port of Amsterdam can be reached via the IJgeul off the coast of IJmuiden.

The throughput of the port of IJmuiden, has remained relatively constant during the last decade, at around 20 million tons per year. This mainly concerns coal and iron ore for the Hoogovens steel mill.

In the port of Amsterdam the food industry is one of the largest local job creator and most powerful drivers of the economy in the Amsterdam Metropolitan Area. This can be related to the presence of a number of prominent, successful food companies. From this strong position, the agri-food sector can make a fundamental contribution to the metropolitan challenges within the region.

3 Description demographic/socio-economic dynamics.

The strong and constant demographic growth of Amsterdam city, start to affect the spaces of the port, in which various old areas are being re-developed according to housing program (Buiksloterham, Minerva and Houthaven, etc.)

In the ports there are few entrepreneurs (in relation to Rotterdam, for example) but with a strong international character: Schiphol airport and many international companies have their headquarters here. This

service economy has a major attraction for (large) companies and has grown strongly in recent years (Brexit, tax benefits)

These dynamics leads to a different approach/motives/leverages of the concept of CE & city port

4 Why, and in what way is circularity looked at? Circularity in the port of Amsterdam can find its way through the infrastructure of the “old industry”, which can easily be transformed into a bio-based economy and is referred to as “circular” while the processes behind it (e.g. scale of import biomass) are not necessarily clean or more sustainable. It is possible to identify several projects that look at the valorisation of agri-food residual flows, collecting the food waste stream from the city and using it in their business.

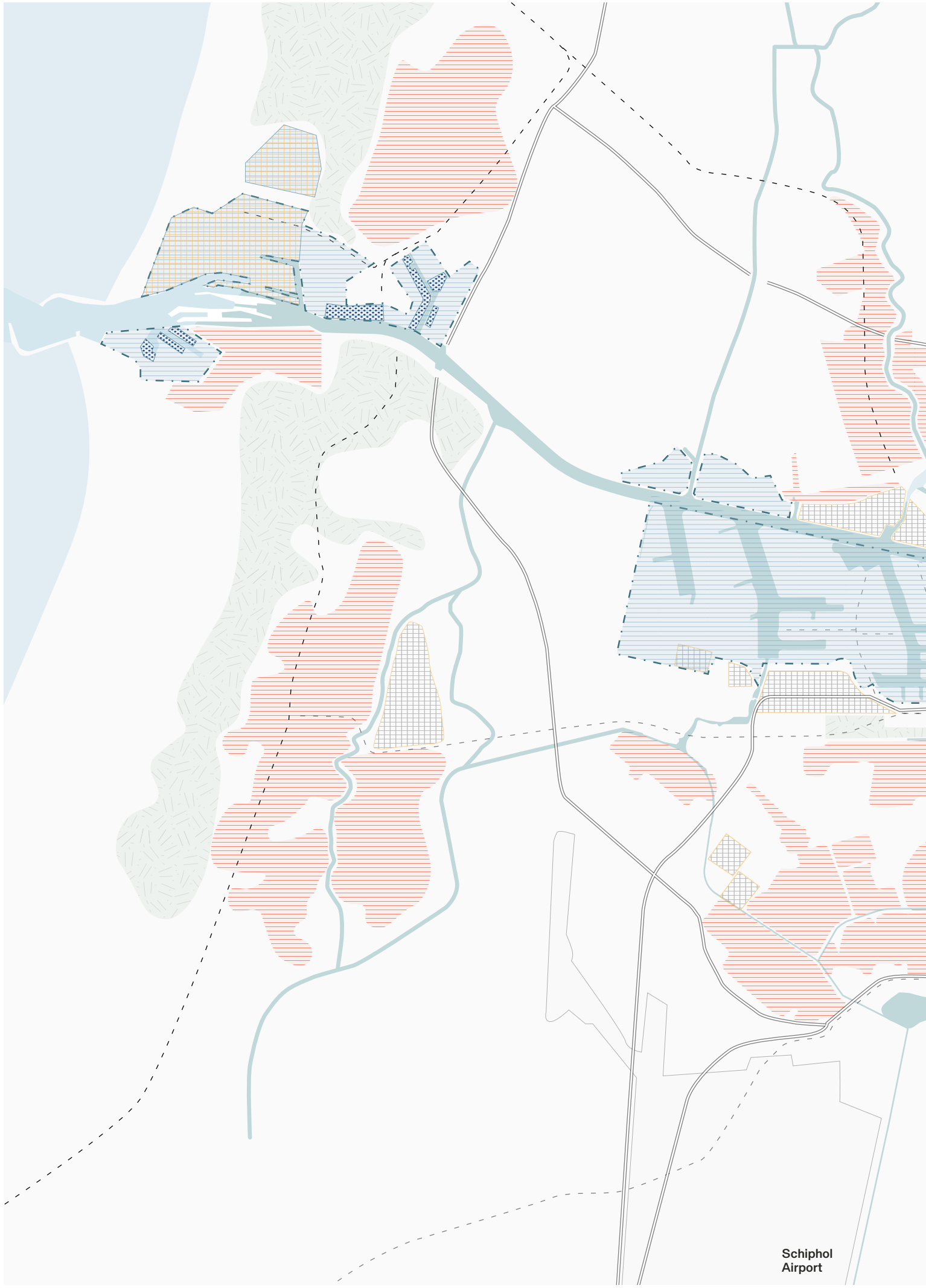
In order to involve old industries in the transition, the Port Authority is committed in attracting new technologies and facilitating start-ups to further develop their product and to allow it to grow into their industrial port.

5 Who gives substance to this, which partnerships/programmes/initiatives are made?

The Port Authority is confronted with its intrinsic limitations as an independent government company, which is neither an operator nor a producer. As a matchmaker and co-creator, the company does have commercial space to stimulate and participate. But they are still customers who have to do it. “If they don’t see a revenue model in it, it won’t happen. We cannot prescribe the law. Unfortunately, there is still no government taxing the use of raw materials and not reusing them.

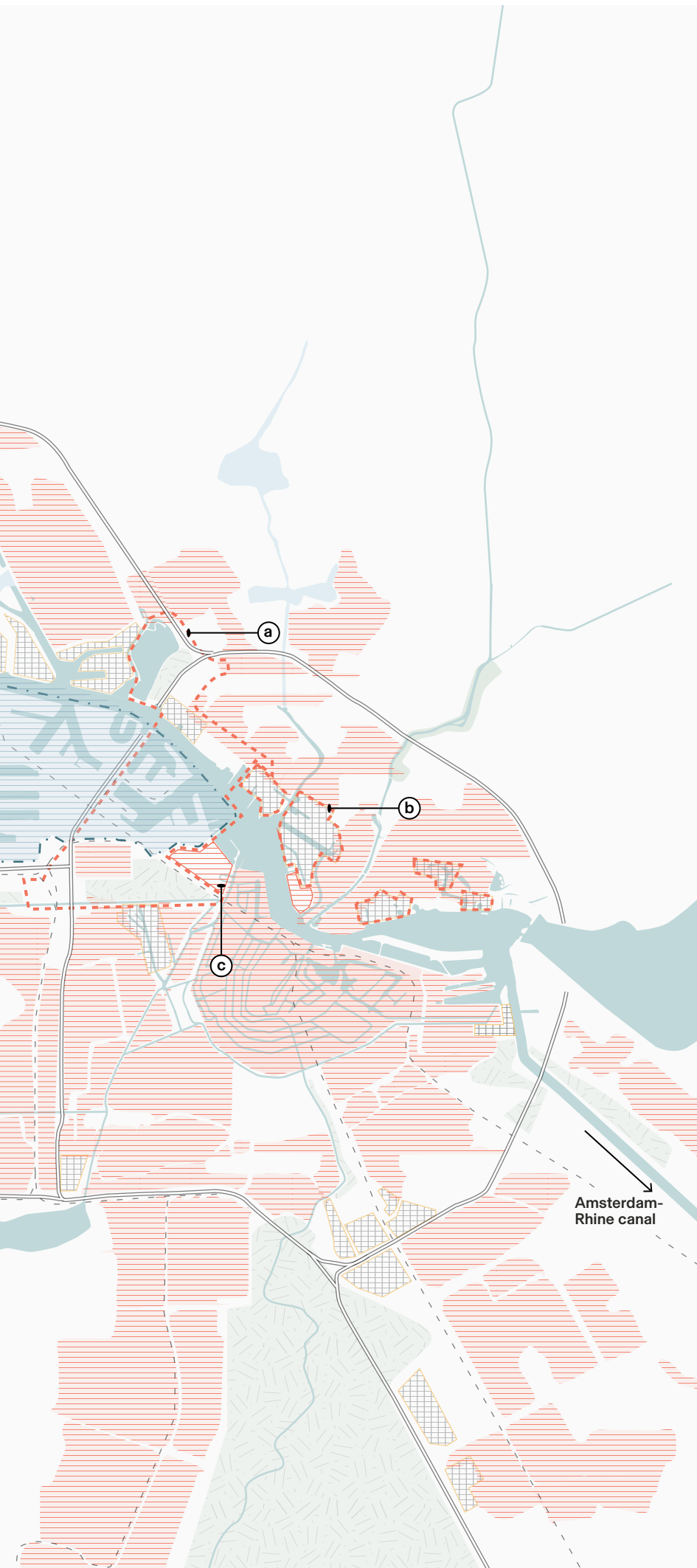
6 Is there already a discourse around cityports? (Yes/no) Who is behind it and what are the ambitions/motives?

The Port Authority is confronted with its intrinsic limitations as an independent government company, which is neither an operator nor a producer. As a matchmaker and co-creator, the company does have commercial space to stimulate and participate. But they are still customers who have to do it. “If they don’t see a revenue model in it, it won’t happen. We cannot prescribe the law. Unfortunately, there is still no government taxing the use of raw materials and not reusing them.



Schiphol
Airport

Amsterdam



- a limits of Haven-Stad development
- b Buiksloterham; circular area development
- c recently developed Houthaven

City

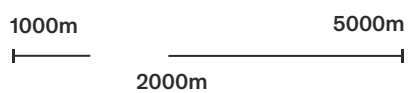
- City
- Planned waterfront development
- Recent waterfront development; housing & services

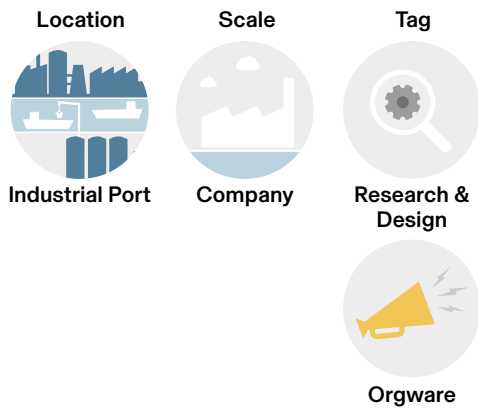
Industrial Port

- Port services (waterbound logistics, terminals, locks, ship repairs)
- Industries inside the port
- Expansion area
- Industries outside the port
- Port limits

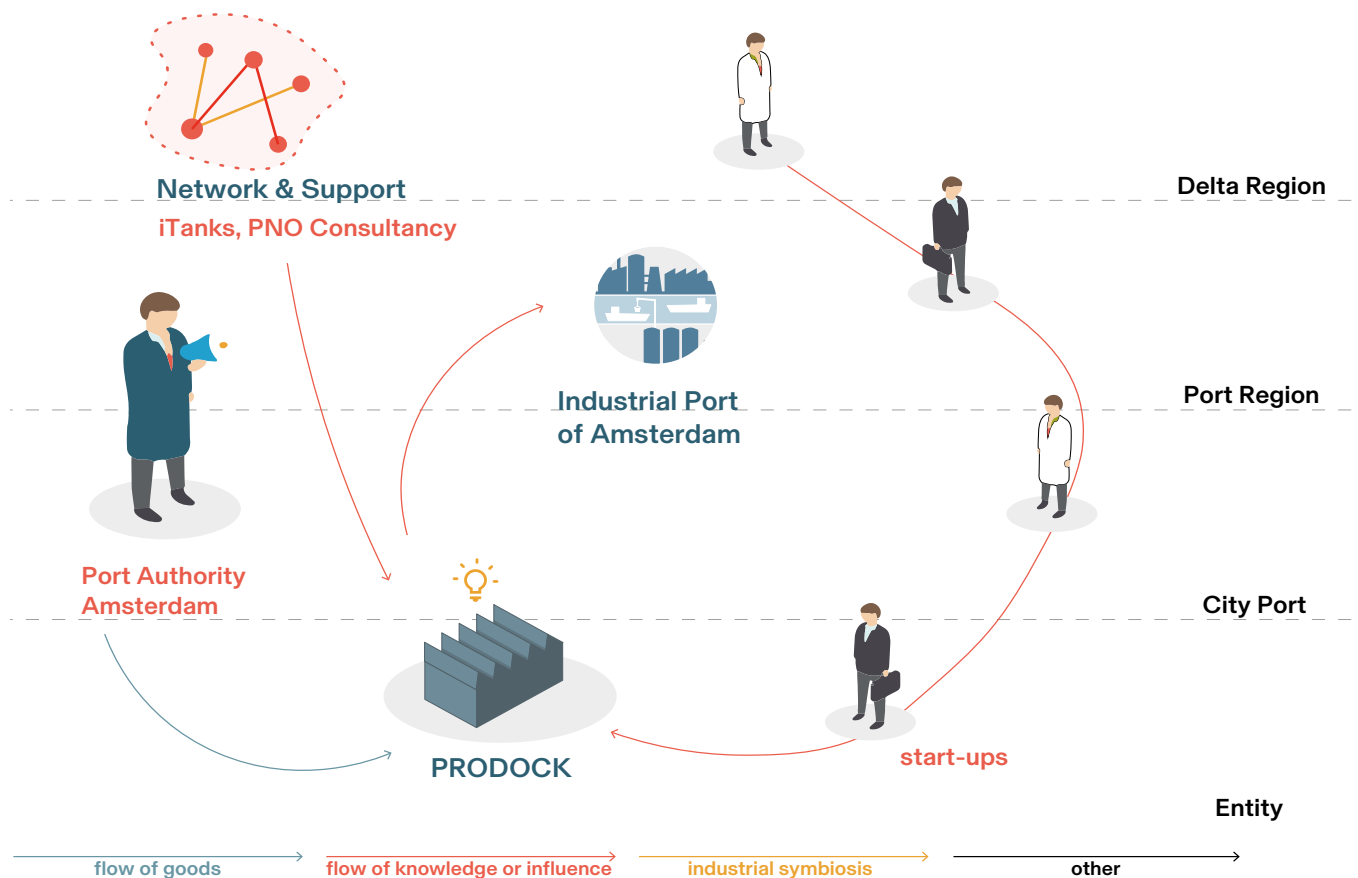
Infrastructure

- Main trains
- Primary roads
- Canals (non-tidal water)





“From startups to corporates, thinkers to doers, and from knowledge to cash, Prodock puts your company in touch with the right partners to achieve your goals.”



What's happening? How does it happen?
Prodock is the innovation hub of the Amsterdam port where entrepreneurs, both growing and established, can develop and roll out their products and processes. Prodock offers 4000m² industrial workshop, office and outdoor space that are rented in a 'plug & play' way. An example of such a company is a spin-off from the municipal company Waternet that wants to soften water with lime granules. In this new treatment process calcite can be obtained as

residue, which in turn can be a secondary resource for glass, floor covering and paint.

Why is this an interesting circular initiative for circular ports?

The port of Amsterdam is rather isolated from the city and industrial in scale and activities. Offering space and facilities for testing attracts new kinds of entrepreneurs that can foster new synergies and symbiosis between port and city.

What is the relation with the port and water?

The Port of Amsterdam is making great efforts to attract small entrepreneurs. These start-ups bring innovation (specifically in the bio-based economy). The port authority also looks a step further and facilitate the start-ups to grow to the industrial scale of the port, reserving specific area's inside the port for this future growth.

What is the relation with the city?

Prodock offers a community with opportunities for cross-pollination and a platform with a lot of exposure. They program and manage the place so 'spontaneous' encounters can trigger exchange and innovations. The connectivity to the airport, reflects the international character and range of businesses they wish to attract.

What are the ambitions?

The development and commercial roll-out of new products and processes in the industrial port. This specifically in the biobased economy, as an alternative to the old, fossil-based industrial processes.

So far, Prodock was a great success and proven the value of having a meeting place inside the port area, close to the companies, that fosters interaction and exchange. Now, the Port Authority is looking at a Prodock 2 for medium scaled enterprises - it appears that there is need for an in-between facility, with adequate infrastructure (high pressure, heat,...), that can bridge the gap towards industrial plants and processes.

Who is behind it?

An initiative of the Port Authority of Amsterdam; to offer an accessible way to establish a (industrial) business. Private partners involved who are responsible for a 'community network' are: iTanks (a knowledge and innovation platform) and PNO consultants (subsidy and innovation advice). There are currently 13 companies present, linked to the biobased or circular economy.

Sources

www.prodock.nl

www.parool.nl/amsterdam/in-havenloods-prodock-mogen-start-ups-herrie-maken~a4316214/

What is the timeframe?

Port Authority of Amsterdam opens Prodock

a few companies have scaled-up to new industrial facilities.
ex: Peel Pioneers, Chaincraft

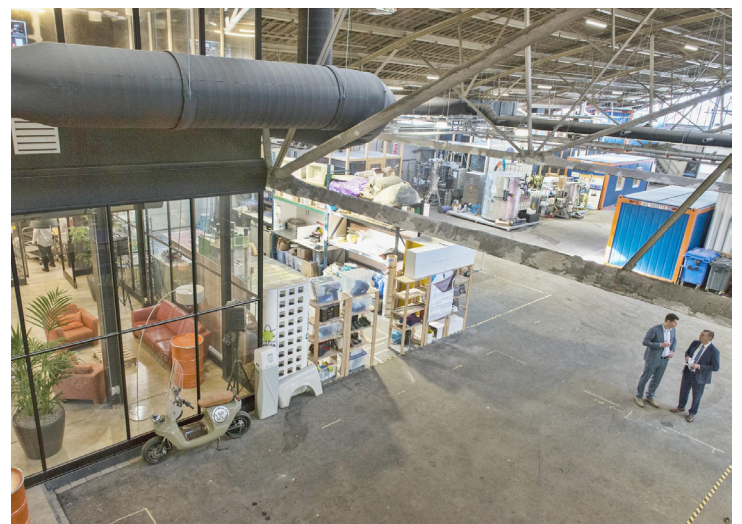
2016

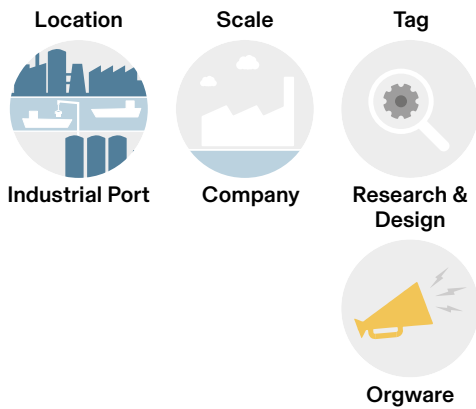
2018

Within the contours of the Port, start-ups and entrepreneurs can test and develop their products.

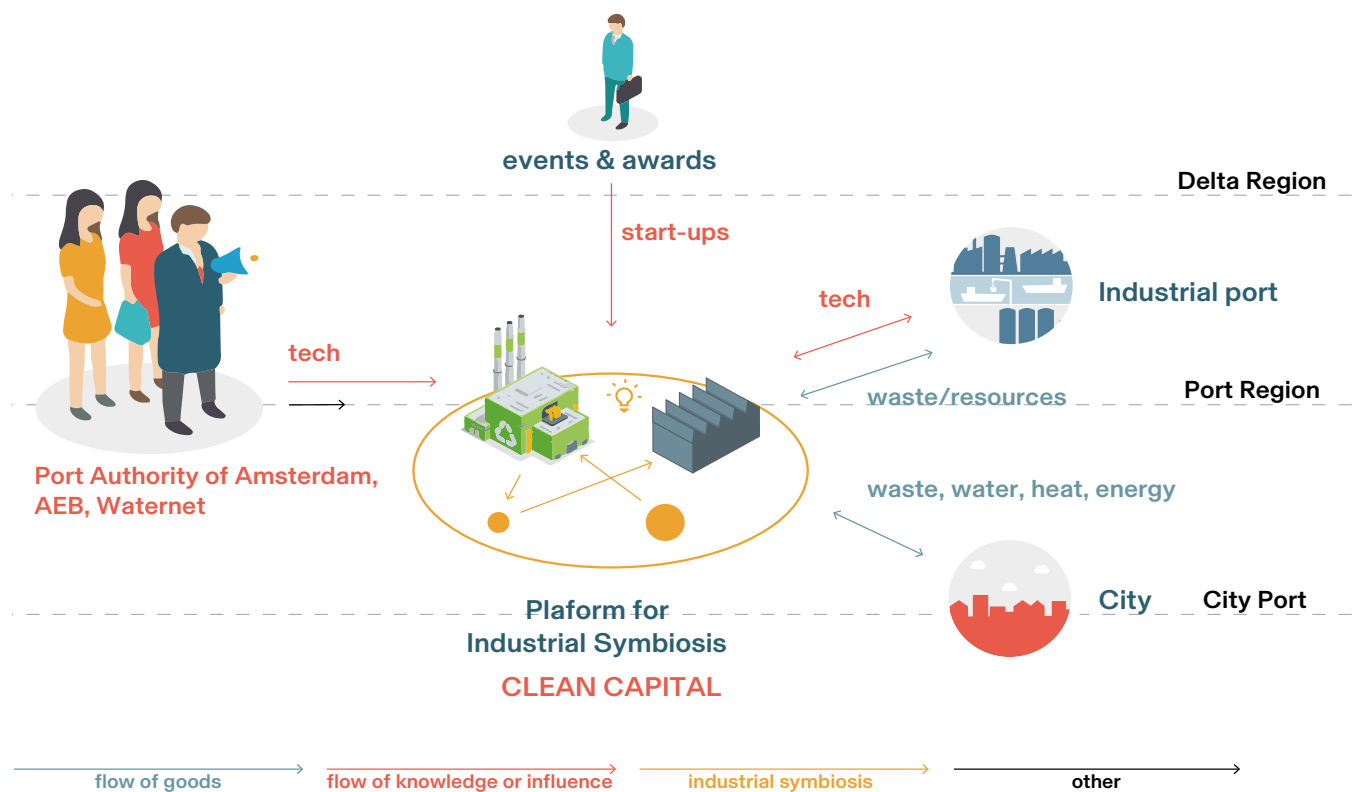


Prodock offers 4000m2 industrial workshop, office and outdoor space where, in a 'plug & play' way, can be rented.





“Clean Capital start-ups benefit in the port area from the innovative climate, the potential of the area due to the presence of the enormous amount of residual and waste streams and the industrial scale.”



What's happening? How does it happen?

An online and offline platform is created to stimulate exchange between industrial companies in the harbour. They focus on processes and know-how related to their existing activities, for example a heat network in connection to the city or the filtering of wastewater for phosphates for the production of fertilizers. Beside the online platform, Clean Capital also organises events, like the Circular Challenge, where startups from an international network are connected to facilities and possibilities in the port.

Why is this an interesting circular initiative for circular ports?

This platform was mainly set up to recruit new companies and was set up during years of economical decline, where the Port Authority was looking for other business-models. Here, collaboration with other semi-public actors made sense to make quick steps towards new economies around the valorisation of the flows at hand. The success was mainly due to the fact that AEB and Waternet quickly (together with Port Authority of Amsterdam) shared knowledge and expertise with each other as there was mutual trust from the beginning. As such, they were able to start projects and exchanges in a quick and disruptive way.

What is the relation with the port and water?

Port activities are addressed for their technologies or material flows for two reasons; to render more efficiency industrial processes, and to steer and initiate innovative projects. What is the relation with the city? Waste streams like used water, organic waste, sewage sludge,... from the consumers in the city, are processed into new products for the port-related industries.

What are the ambitions?

To stimulate and connect industrial processes working with renewable technologies and as such to guide the transition of the metropolitan area of Amsterdam towards new economies. The idea is to match the

right innovators with residual flows to make new resources and energy for the region. This both in the form of pilot projects, and larger industrial processes.

Who is behind it?

Here, 3 semi-public actors worked closely together. The fact they were municipal companies, there was a easiness and trust from the beginning. This helped in sharing information, making quick steps towards setting up pilot projects around the valorisation of municipal waste (water).

Sources

www.cleancapital.nl

www.mvonderland.nl/nieuws/clean-capital-opent-circular-challenge-voor-een-circulair-metropool-amsterdam



The online platform is one of the strategies to attract and connect companies in exchanging materials and technologies.

Clean Capital zet samen met innovators afval- en reststromen om in duurzame grondstoffen en energie

Via deze website kunt u:

- ✓ onze projecten bekijken
- ✓ uw afval- en reststromen aanmelden
- ✓ een innovatie of techniek aanmelden voor duurzame projecten

Ik heb mogelijk afval- of reststromen » Ik wil mijn technologie aanmelden »

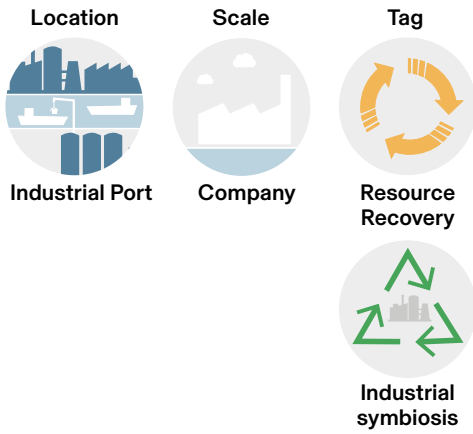
Ontwikkeld door:

- waternet waterschap amstel gooi en vecht gemeente amsterdam
- aeb amsterdam
- Port of Amsterdam

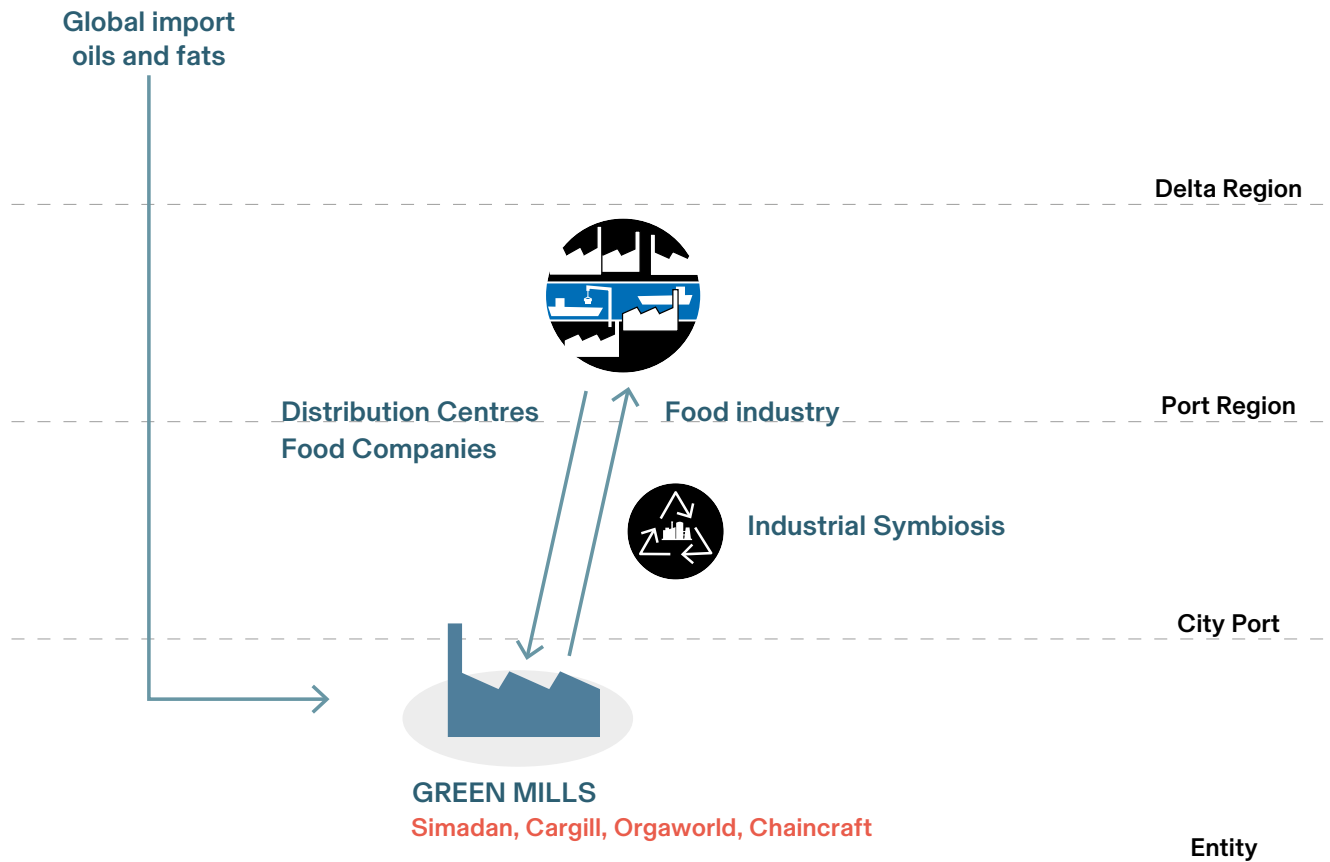
Several topics are put to the fore as important working themes.

WE WERKEN MOMENTEEL AAN:

- Stoomleidingennetwerk
- Groene brandstof voor transportsector
- Bioaromaten uit organisch afval
- Windenergie
- Bioplastics en biocomposiet kansrijke opties
- Groengas van aardgaskwaliteit



“ Biodiesel is again wanted by European commitments. Both Simadan and the new biodiesel factory on the site of Oiltanking produce second-generation biodiesel from waste.. ”



What's happening? How does it happen?
Green Mills is a processing plant for second generation biofuels that uses residual fats and oils (which are imported on a global scale), food waste from supermarkets, and grey water as resources. The combination of different treatment processes provides clean water and gas (which provides electricity, heat and steam), and stands in direct contact and exchange with companies Simadan, Cargill and a juice making company via pipelines. The digestate is transformed into fertilizers.

Why is this an interesting circular initiative for circular ports?
It is exemplary for new technologies that allow to process waste into new resources, in connection (industrial symbiosis) with different activities inside the port area. However, where the logic is gathering large volumes to be processed, a friction occurs as now oils and fats are imported on a global scale. It raises the question on what scale what materials are collected and processed.

What is the relation with the port and water?

The import of residual fats and oils happens on a global scale, supplied via boats over water. On the scale of the port there's a symbiosis with food companies and distribution centres.

What is the relation with the city?

Not that significant: the proportion of the input of waste on the city level is marginal, although some supermarkets are involved. The plant produces electricity, which is delivered to the city net.

What are the ambitions?

To offer an alternative to fossil fuels, the port of Amsterdam is strongly committed to these biofuels.

But if the scale of input is global, it could still be called circular but what is the impact and external costs related to these long distances.

Who is behind it?

The plant is run by Orgaworld, and forms a part of the multinational recycling group Renewi. Greenmills relies on two companies, Orgaworld (subsidiary of Shanks) and Simadan, holding company of Rotie and Biodiesel Amsterdam among others.

Sources

www.duurzaamplus.nl/mobiliteit/havenbedrijf-amsterdam-ziet-natuurlijke-rol-in-circulaire-economie/
www.ad.nl/amsterdam/nieuwe-eigenaren-voor-bedrijven-in-biodiesel-a8c2f23f/

What is the timeframe?

Orgaworld
Greenmills installation
started

2010

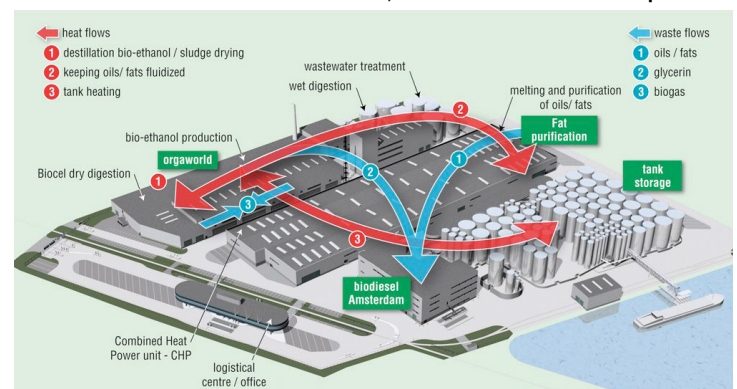
Chaincraft, a spin-off from the
Wageningen University is installed on
the Greenmills site

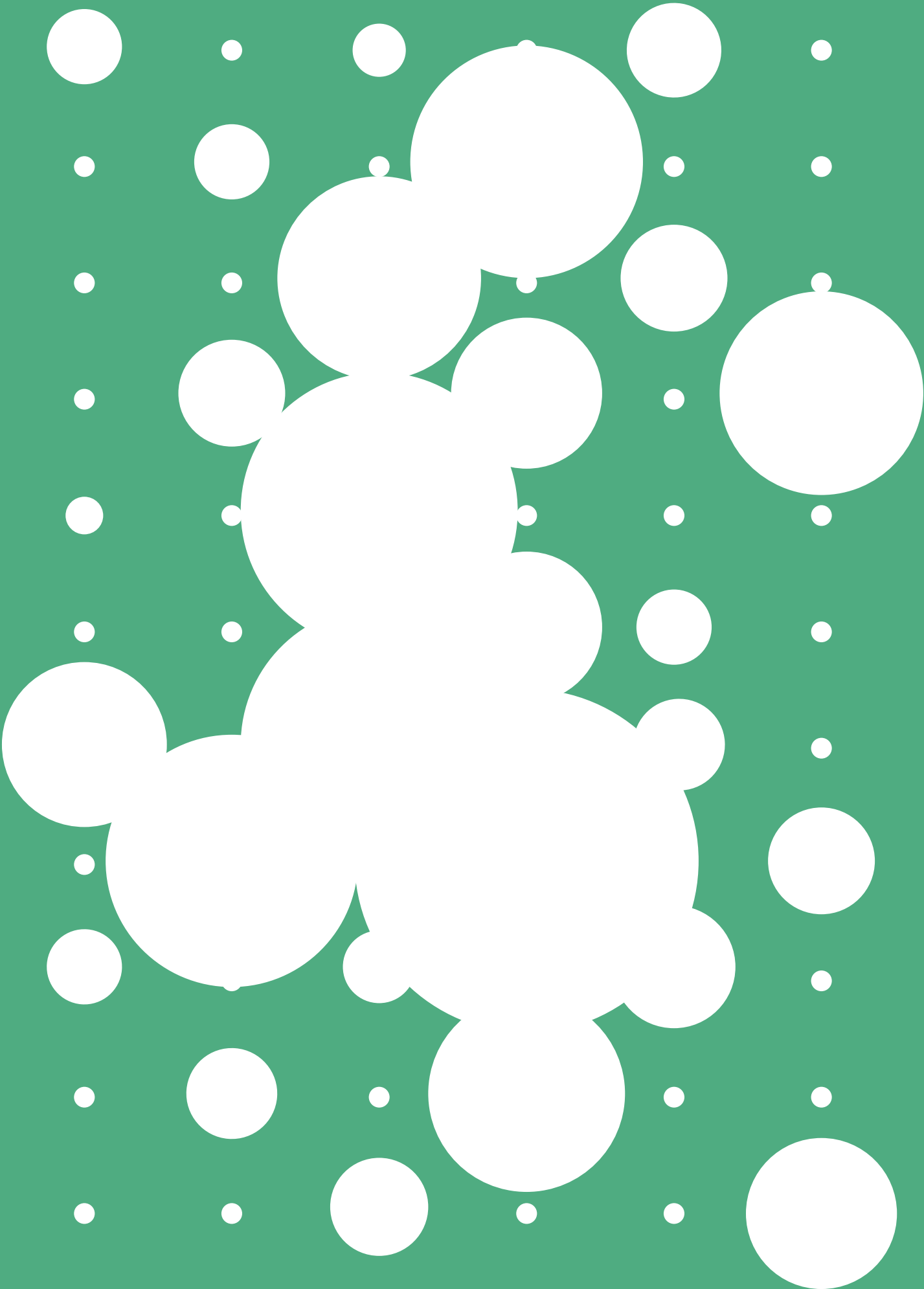
2018

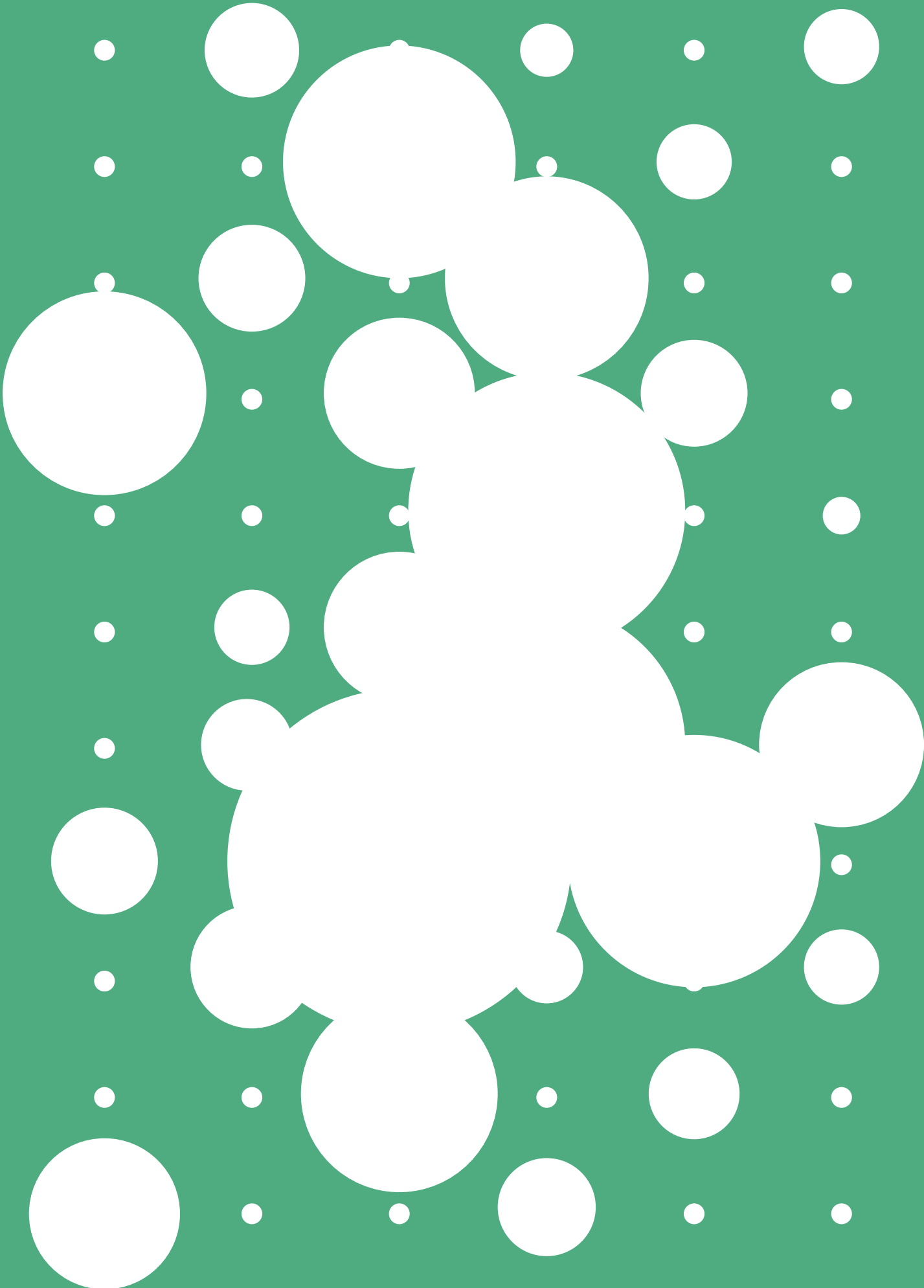
The 'bio cluster' is a high-technological installation where organic wastes are processed into biofuels.



Overview of the different flow shared, inside the borders of the plant.







1 Description of location in relation to other (sea/) ports

Antwerp is the second largest seaport in the Delta and the main economic driver in Belgium. Located along the Scheldt river, it functions as a hinge towards the port of Brussels and the Ruhr area via the Albert canal and train.

2 Description of current activities

The port of Antwerp has large industrial activity counting for over 50% of the added value. This mainly because of its large petrochemical cluster, the biggest integrated cluster in Europe. Furthermore, a large activity around logistics is present, with a big proportion for container, due to its good connection via rail and central position in Europe.

The share of containers in the total transport flow through the port shows a strong increase; the share was 34% in 2000 and 54% in 2014. This was mainly at the expense of the share of conventional general cargo. In 2009, very large container ships, with a capacity of more than 14,000 TEUs, called at the port. Antwerp has thus strengthened its market position and was the second container port in Europe, after Rotterdam. Transport between the port and hinterland is mostly by road, but the importance of inland shipping is increasing. In 2009, almost 35% of all freight was transported by inland vessels.

In May 2011, a rail service was announced between the port of Antwerp and the Chinese city of Chongqing. With 32 million inhabitants, Chongqing is the largest city in the world, located some 1,500 kilometres west of Shanghai. The rail link runs from Antwerp via Germany and Poland to Ukraine, Russia, Mongolia and China. The distance from start to finish is around 10,000 kilometres, making it the longest train service in the world. Only freight is transported, in particular containers. The idea of this service between the two cities was made during a business trip that the Antwerp Port Authority and partners organized to China in 2010. The train journey will take approximately 22 days; cargo that is transported by ship takes about twice as long

3 Description demographic/socio-economic dynamics.

Antwerp knows a strong demographic growth with strong socio-economic challenges. Similar to Brussels (or Rotterdam or Amsterdam), Antwerp is characterized by a young, multicultural and multi-

'Inland' mainport - from expansion to intensifying 15 and connecting (new) circular cityport area's?

lingual population. In the recent years, the water development of het Eilandje (and the Cadix) has provided attractive housing for the young and working generation. Furthermore, Antwerp, the 'City Along the Stream' is known for its fashion industry and diamond trade.

4 Why, and in what way is circularity looked at?

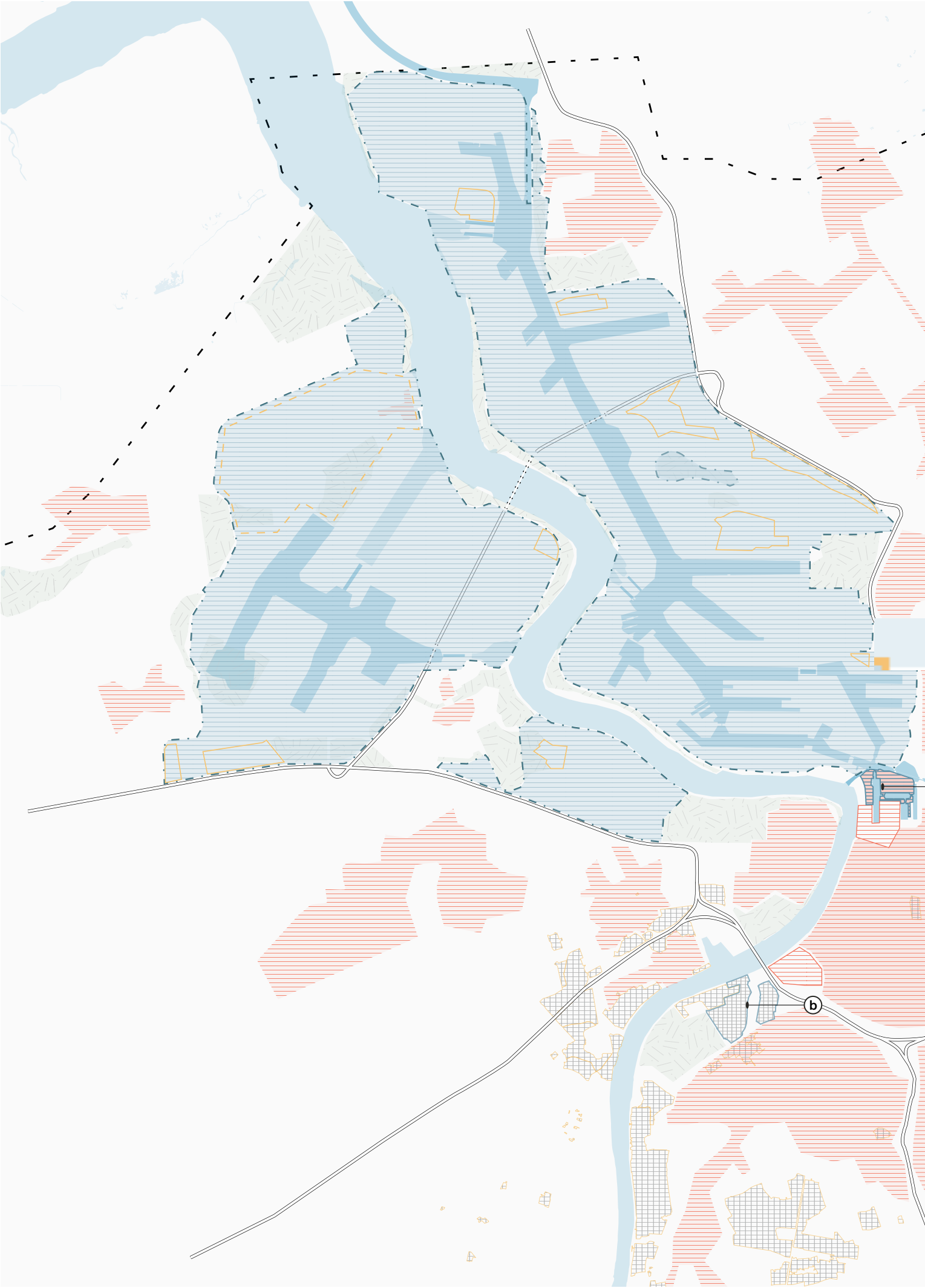
The leading incentive for the Port of Antwerp to look at circularity is due for its BigChem and leading actors in metal recycling like Umicore. They look at stimulating innovation, research and development and collaboration through industrial symbiosis or energy exchange.

5 Who gives substance to this, which partnerships/programmes/initiatives are made?

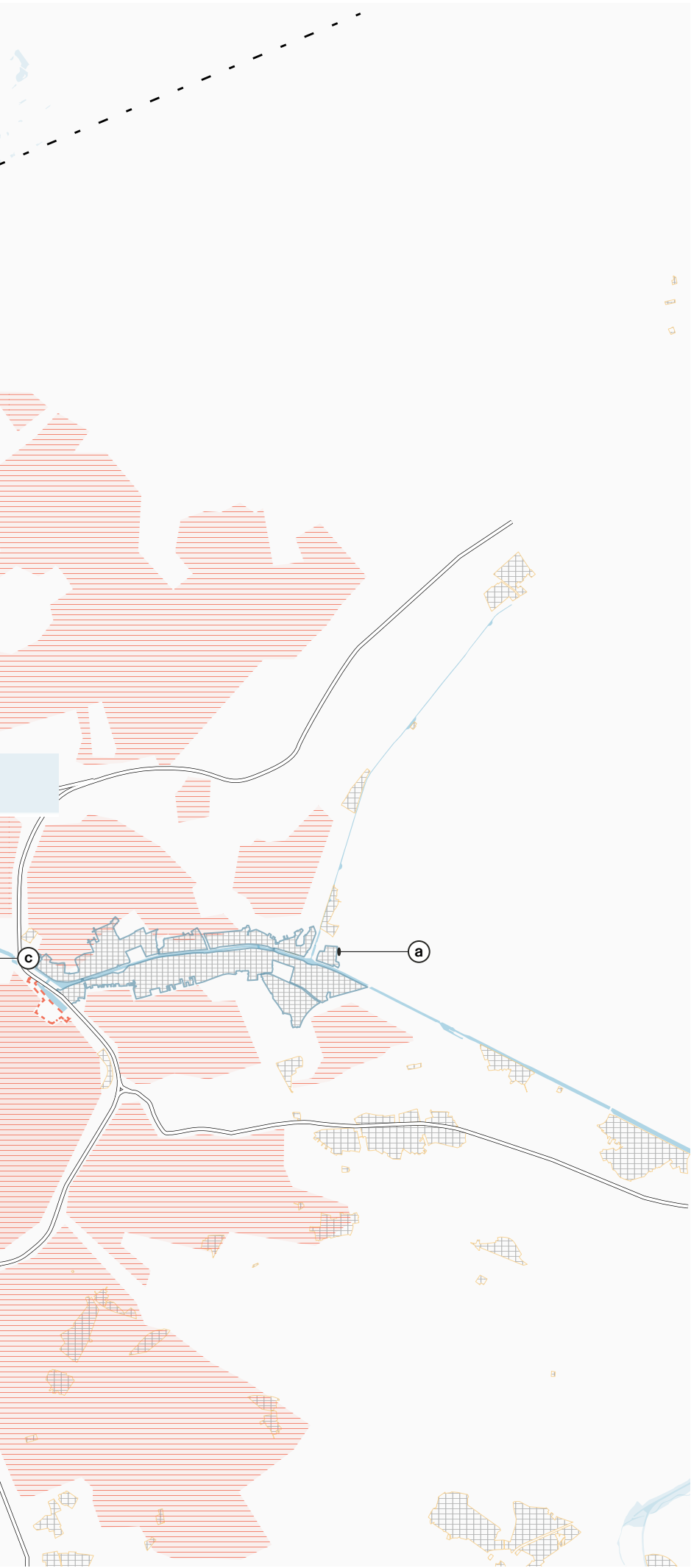
Antwerp Port Authority implied a commission for a Roadmap for Circular Economy in 2017. Here the main focus lies on improving logistical functioning and the high-tech recycling of plastics and metals. Herein, the study has collaborated with leading companies (multinational) around possible pilots. Moreover, AG Vespa is functioning as area manager, involved, together with the port authority in BlueGate and the Innovative City Harbour. Furthermore, a research study has been developed toward the better understand of Circular Economy, "Stad van Stroom", as the result of a collaboration between the Flemish Building master, Flemish spatial department, OVAM, City of Antwerp and Port of Antwerp. Another interesting dynamic is happening around Circular Fashion, leading to a broad coalition like Stadslab2050, designer, fashion brands also funded by the Flemish Circular program.

6 Is there already a discourse around cityports? (Yes/no) Who is behind it and what are the ambitions/motives?

Yes, Kanaalkant, where the focus lies on attracting waterborne logistical activities and defining projects around synergies between housing and industry. Moreover, BlueGate and the Innovative City Harbour, where AG Vespa operates as an area manager and in the first place looks for innovative practices and companies. In both areas there are waterborne logistical functioning/programming in relation to the city or the hinterland (CityDepot in BlueGate). This is a precarious balance as logistics asks for large surfaces and the value of the land is high.



Antwerp



- a Kanaalkant
- b Blue Gate Antwerp
- c Eilandje fase2

City

- City
- Planned waterfront development
- Recent waterfront development; housing & services

Labelling Of City Ports

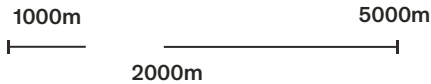
- Potential city port
- Defined as city port

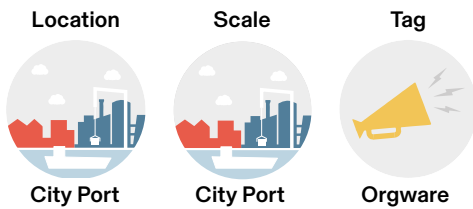
Industrial Port

- Port services (waterbound logistics, terminals, locks, ship repairs)
- Industries inside the port
- Vacant sites
- Expansion area
- Port limits
- Industries outside the port

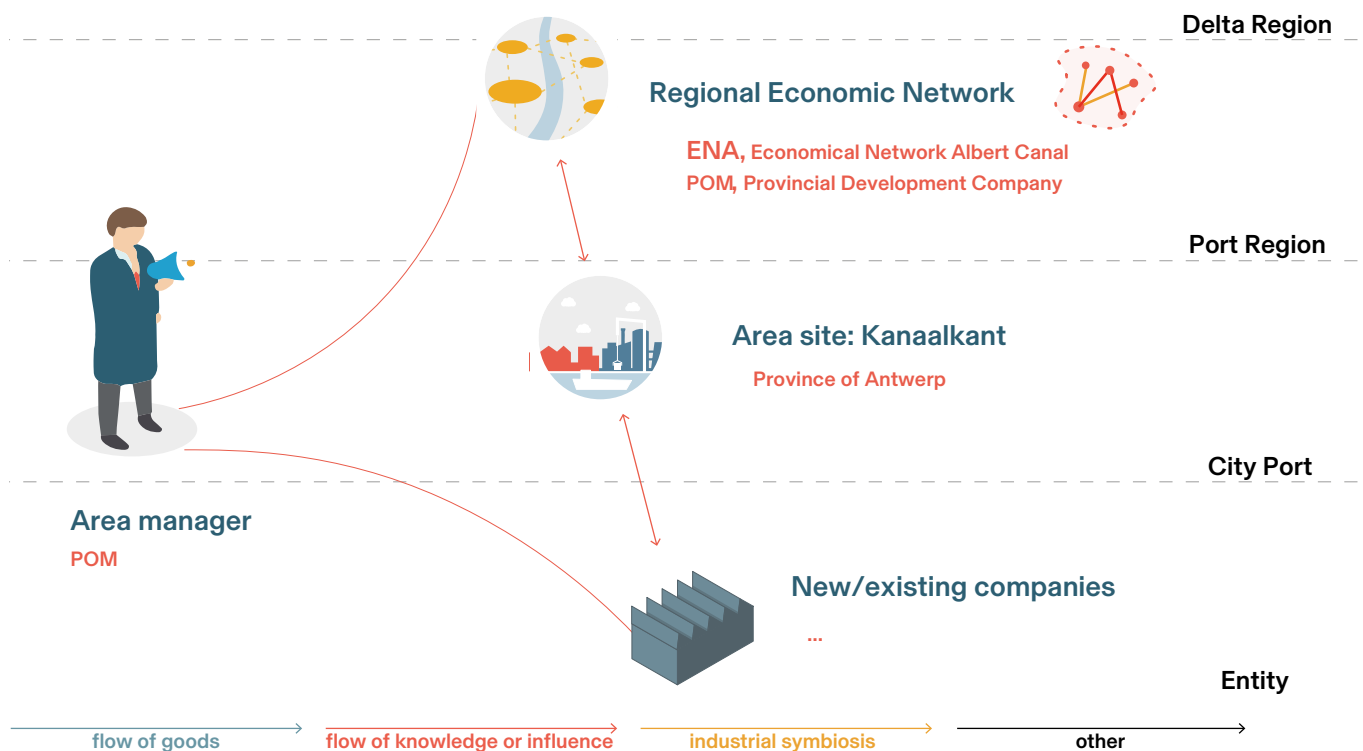
Infrastructure

- Main trains
- Primary roads
- Canals (non-tidal water)





“Next step is to give room to the companies by supporting existing business dynamics, perpetuating them and making future-oriented activities possible.”



What's happening? How does it happen?

The area manager is positioned on the bottleneck between the vision for the area, the 'Kaderplan' from 2014, and the companies inside this area. His task is to be a first contact and bridge the gap between policy and the operational side of the companies. On the border between government and companies, he encourages the right organisations to start projects. Some of his core tasks are: relieving the burden on companies via an information desk; helping to find realisable projects to make companies more sustainable; assisting in the search for location, energy sub-projects, increasing waterborne freight transport, joint purchasing...

Why is this an interesting circular initiative for circular harbours?

In order to become more circular, a good understanding of what is there is crucial to establish new synergies and symbiosis. Trust, sharing information, and talking the same language (business-case check-ups) can help in detecting willing actors, defining next steps and managing projects towards more symbiosis between housing and production and more water-bound activities.

What is the relation with the port and water?

The Albert Canal is an important channel, however not many companies make use of its possibilities. One of the ambitions and mission of the area manager is to increase the waterborne freight transport. Herein, there were already some possible projects tested together with a transport-expert to increase the use of the waterways.

What is the relation with the city?

Housing is situated close to the industry here. A concept study in 2016 explored the possible exchanges between these two functions, mostly focussing on heat exchange or closing of material cycles. Also, in certain area's, they are looking for economical programming in relation to the neighbourhood; this in the form of fablabs in relation to existing technical schools or learning trajectories.

What are the ambitions?

Upgrading of the second largest business park in the province of Antwerp (400ha), located on the Albert Canal. In this process it became clear that economic and area-oriented development must go hand in hand. The plan area is further characterized by a large number of historically outdated industrial buildings, a strong interweaving with the urban area,

problematic mobility and a large fragmentation. An area manager was appointed in this context. By means of projects to make the business park more sustainable, stimulate entrepreneurship and improve access to the site (e.g. transport via water, bridging the gap between industry and housing).

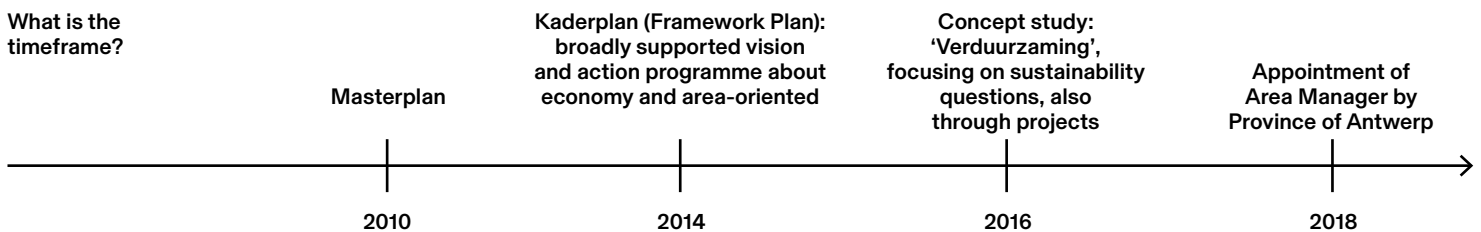
Who is behind it?

The province works together with the provincial development company POM, the city of Antwerp, the districts of Deurne and Merksem, the municipalities of Schoten and Wijnegem, the Flemish government and nv De Scheepvaart, the manager of the Albert channel. The area manager takes care of the start-up, acceleration and follow-up of the (re)development of a large site or a cluster of sites. This is done from the public side on the dividing line with the private sector. As soon as possible, cooperation with the private sector takes place at various levels (directing, facilitating, structuring, financing, acquiring). This cooperation is necessary depending on the project and not with a view to commercialisation by the area manager.

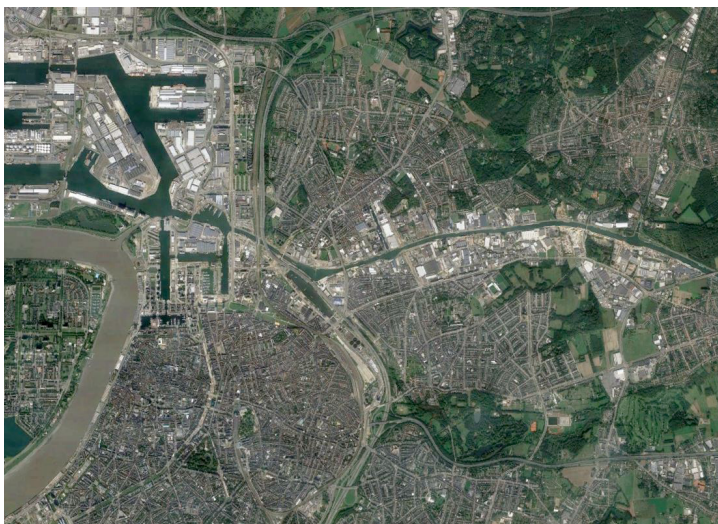
Sources

1. Participatiemaatschappij Vlaanderen
2. De Vlaamse Waterweg nv

What is the timeframe?

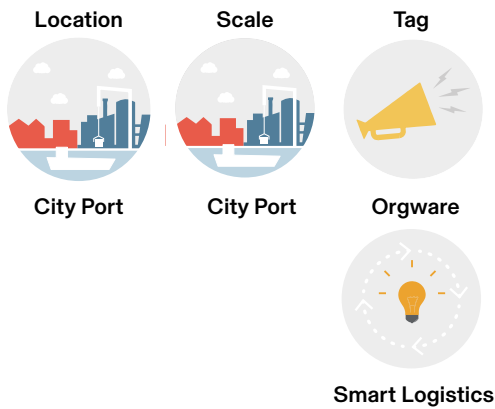


The area is strategically located on the Albert Canal, close to the harbour and is surrounded by residential fabric.

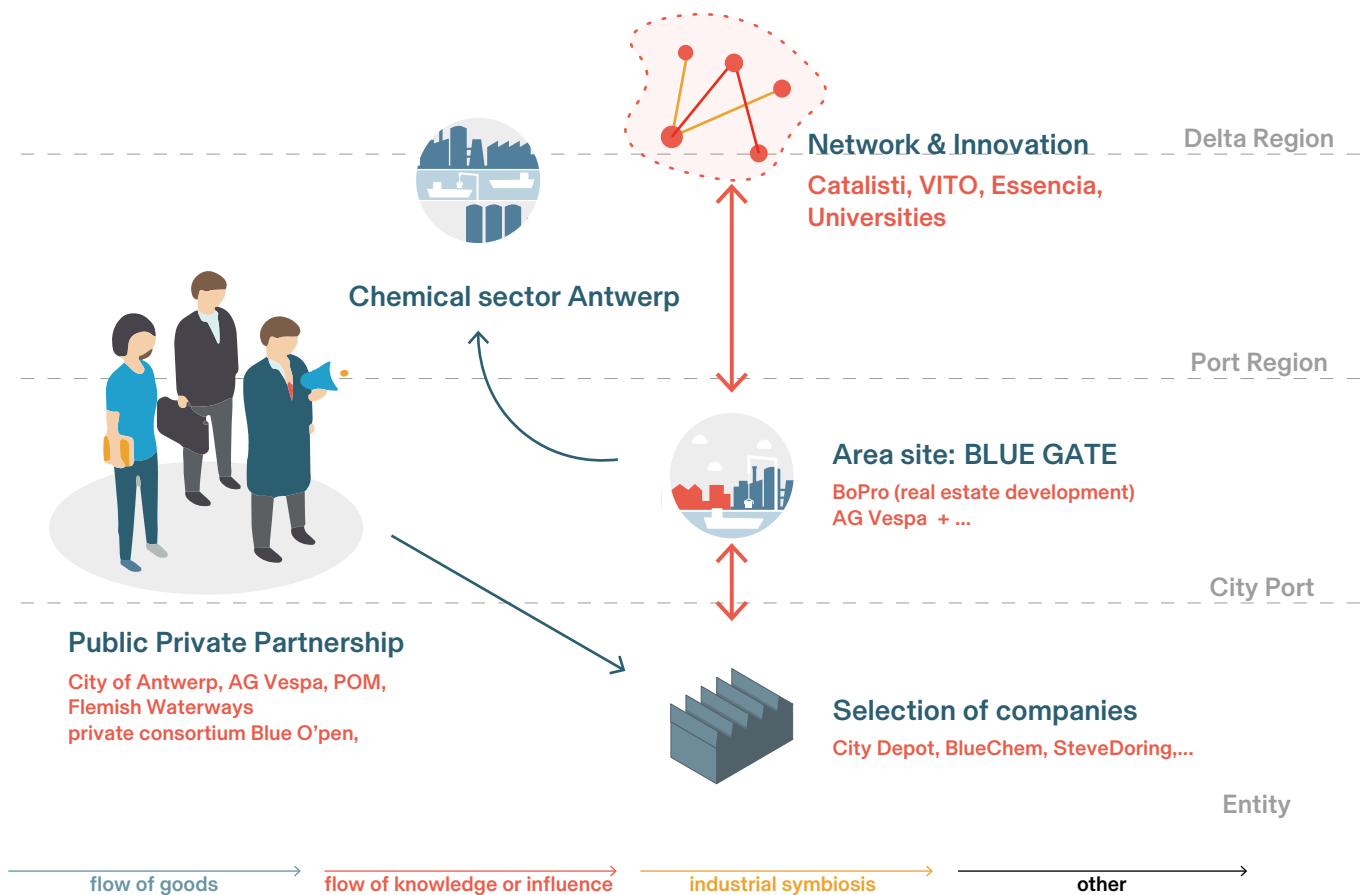


View on a part of the business park, containing industry, the canal and housing.





business park for innovative companies



What's happening? How does it happen?

The Blue Gate site will cover 100ha with companies in the chemical, cleantech and logistics sector. With a loading and unloading quay of 13 hectares, Moer Stevedoring (B2B via trucks) and City Depot (city distribution, see fiche ...) will expand their water-borne transport activities. BlueChem (see fiche ...), an important incubator for sustainable chemistry, is put to the fore as an important catalyst for the site.

Why is this an interesting circular initiative for circular ports?

The location make it an interesting site to establish synergies and connections between companies and larger context. The coalition and clear ambitions for this large site could have sufficient leverage power for new trends of development and programming. However, the selection parameter (and rent-prices due to the high-performance of the built fabric) are of high-standards, making it hard to find companies that can fulfill these ambitions.

What is the relation with the port and water?

Blue Gate has a strategic location close to the city. A logistical quay was built for the delivery of materials for large-scale construction sites: Blue Gate itself, Scheldekaaien, Nieuw-Zuid,... After an agreement with the port authority, the former manager, the area is been lifted of the Wet Mayor – offering companies a competitive advantage. Beside some waterborne logistical companies, the main focus of the business park is around new chemistry.

What is the relation with the city?

Beside the logistical service of a player like CityDepot, no direct links or synergies are created with the (surrounding) city.

What are the ambitions?

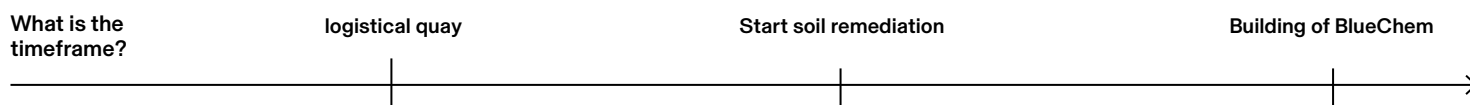
The ambition is to have a cluster around new chemistry and smart logistics – maintaining the competitive stand of the biggest chemical cluster in Europe and exploiting the strategic location of this site next to the city. Together with the Flemish Region, the city of Antwerp wants to turn it into a business park for innovative

companies that attach great importance to renewable energy and the reuse of raw materials. The project is said to create 2000 to 3000 new jobs. In a period of six years, the real estate agency Montea wants to develop and sell the whole site. However, land or rent prices are high and the selection of activities is strict...

Who is behind it?

The Blue Gate was set-up as a collaborative platform between public and private actors. Large investments were made to remediate an old, highly contaminated, industrial estate into the 100ha large eco-business park it is coming to be. Through a PPP, where public partners AG Vespa, PMV1 and W&Z2 work together with the consortium Blue O'pen. Other partners are: city of Antwerp, POM Antwerpen, VITO & Essenscia, Bopro, DEC (DEME Environmental Contractors).

Sources
www.bluegateantwerp.eu

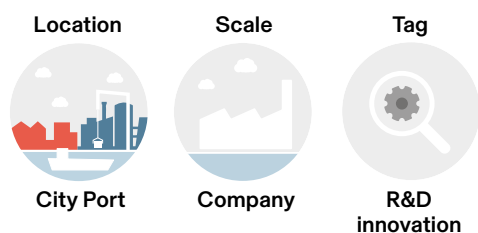


The old Petroleum-Zuid industrial estate is being remediated and developed into an eco-effective, water-bound enterprise park in Belgium.

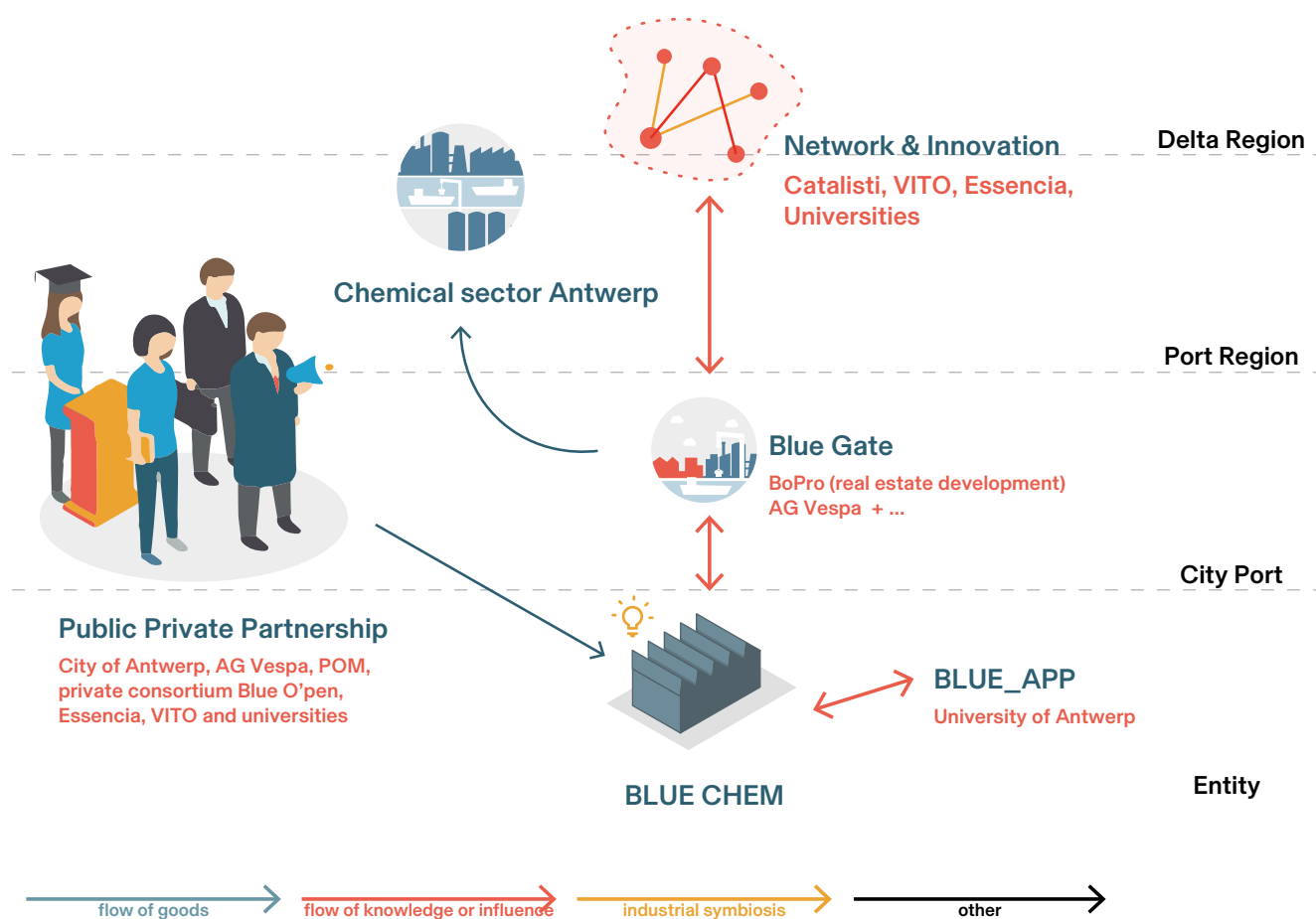


Purple stands for logistics zones (zone on the water and behind zone) and red stands for still available terrains.





“Helping emerging companies to develop sustainable innovations for the chemistry of the future. That is the goal of the BlueChem incubator, a unique collaboration between industry, government and knowledge institutions.”



What's happening? How does it happen?
The incubator will cover more than 3300 m², cost around 11 million euro and will provide a mix of flexible workspaces for starters and individual offices and laboratories for SMEs, sub-projects of large companies and knowledge institutions. The incubator will contain all connections to set up laboratories, the so-called 'plug-and-play' model. Here, renewable chemicals and the valorisation of waste and residual streams are approached in relation to the large scale industrial processes of the port.

Why is this an interesting circular initiative for circular ports?

What is the relation with the port and water?

The port of Antwerp has one of the biggest chemical clusters in the world. (The sector accounts for one third of the added value, one third of the exports and almost half of all industrial expenditure on research and development in Flanders.)

The incubator tries to provide an innovative environment, connecting knowledge networks with these internationally operating chemical companies.

What is the relation with the city?

No direct links or synergies are created with the (surrounding) city.

What are the ambitions?

To accelerate the transition of the chemical industry to a more sustainable circular operation. To connect new innovations (coming from knowledge institutes) with the existing chemical companies active in the port. The target group consists of start-ups and innovative SMEs with growth potential. In the chemical

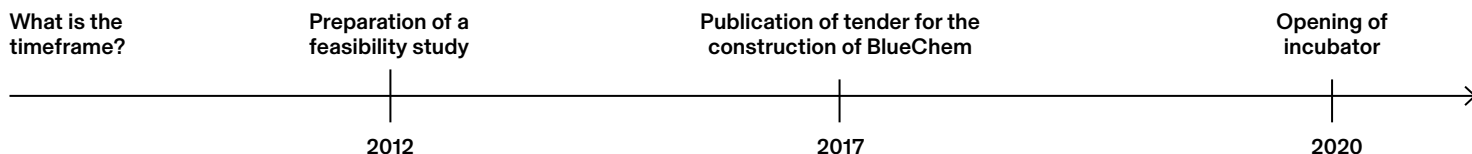
industry in particular, start-ups often encounter difficulties in bridging the so-called 'valley of death', the high-risk period between the development phase of new ideas and effective industrial production.

Who is behind it?

Knowledge institutes, industrial federations and public partners. Through a PPP, with public partners AG Vespa, PMV, city of Antwerp and POM Antwerpen working together with the consortium Blue O'pen, Essenscia (federation chemistry) and knowledge institutes like VITO and universities.

Catalisti, the new Flemish spearhead cluster for chemistry and plastics, is taking an active role in BlueChem to start up and support new promising innovation projects. There is also an important synergy with Blue_App, an open innovation hub for research projects of the University of Antwerp in the field of sustainable chemistry.

Sources
www.bluechem.be

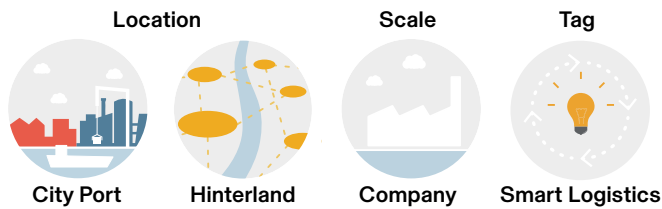


Incubator for sustainable chemistry.

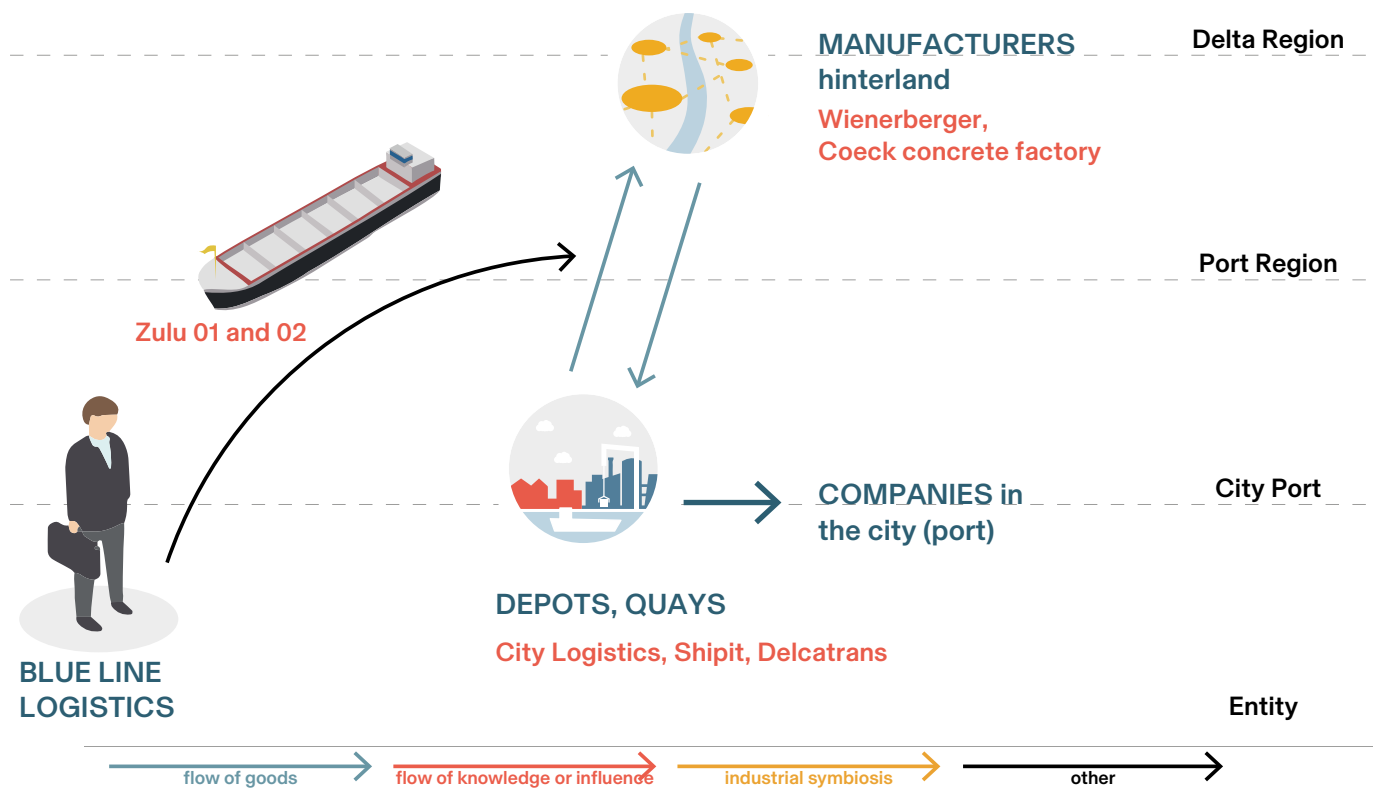


The incubator is the result of a PPP.





“Blue Line Logistics will bring a revolution into inland shipping”



What's happening? How does it happen?

A newly established shipping company that has designed and built boats suitable for palletised cargoes. The design is based on the concept of a catamaran allowing the cargo to be (un)loaded asymmetrically. This is very innovative as the cargo can be driven directly on deck with a forklift or by use of a small crane. In this respect the ship can handle a cargo of 300 tons or 200 pallets and with its relatively limited draught is also very suitable for small waterways.

Why is this an interesting circular initiative for circular harbours?

Waterbound logistics is only strategic and competitive with road transport if you can ship large quantities, thus mainly shipping bulk materials. Costs are mainly related to transshipment as it requires time and infrastructure. The technology of this boat allows for other kind of goods to be transported along waterways. As such, palletized goods can be easily transhipped as it doesn't require specially equipped infrastructure and the impact on the quay stays limited.

What is the relation with the port and water?

The boats are operative on the Scheldt river, the Albert Canal and the canal from Antwerp to Brussels. Also they will be used in ports abroad like Amsterdam or Paris. As such the boat can connect production and recycling sites in the hinterland with producers and consumers in the city (port).

What is the relation with the city?

The goods that can be shipped, are more related to goods that the city consumes or produces. These goods can be transhipped on a quay close to the city, where smaller trucks deliver the goods to consumers or producers in the city (port). From the city, packaging or waste materials can be transhipped to recycling facilities located in industrial ports or sites along the waterway.

What are the ambitions?

Offering an alternative transportation mode, with focus on smaller loads via inland waterways. The first initiatives are starting with building materials,

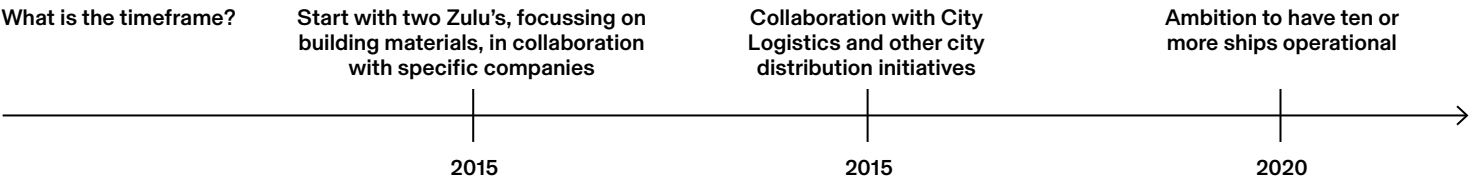
but also the retail sector and urban distribution (daily consumer goods) could transport smaller quantities more quickly and efficiently. These are companies that normally don't look at waterbound logistics as their goods would be too small.

Also, Blue Line Logistics is doing test cases with unmanned inland vessels that will be further explored in the near future in calm trajectories.

Who is behind it?

The ships were produced on the initiative of a private entrepreneur, in the region around Antwerp (Hemiksem and Rupelmonde). City Logistics, a part of Bpost, has started in 2014 with the consolidation of goods of a number of large carriers destined for the city centre or for companies in the port area. From there they will be distributed by smaller trucks on different routes in the city and the port.

Sources
www.flows.be/nl/logistics/city-logistics-en-blue-line-logistics-samen-op-het-water
www.madeinantwerpen.be/nieuws/blue-line-logistics

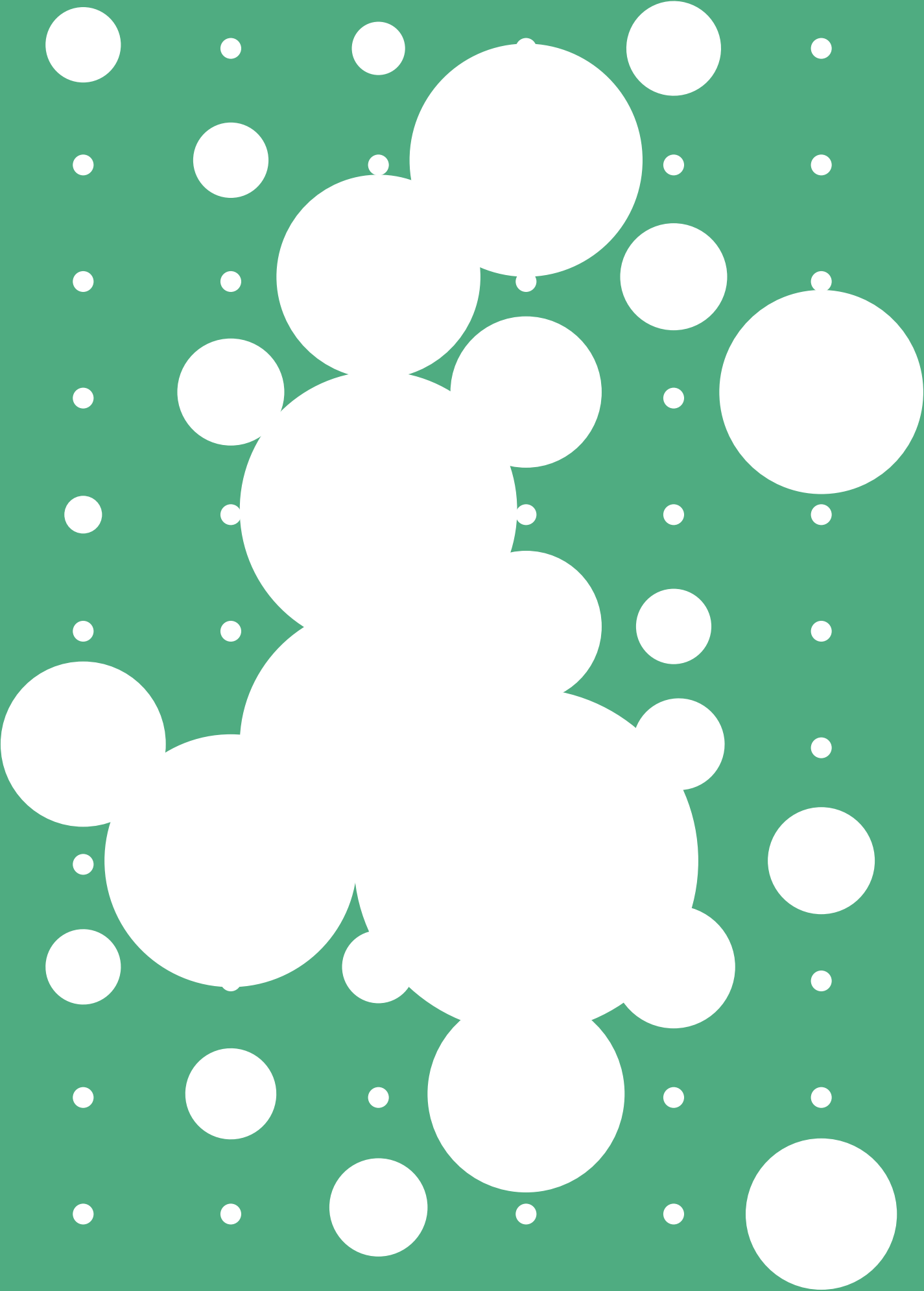


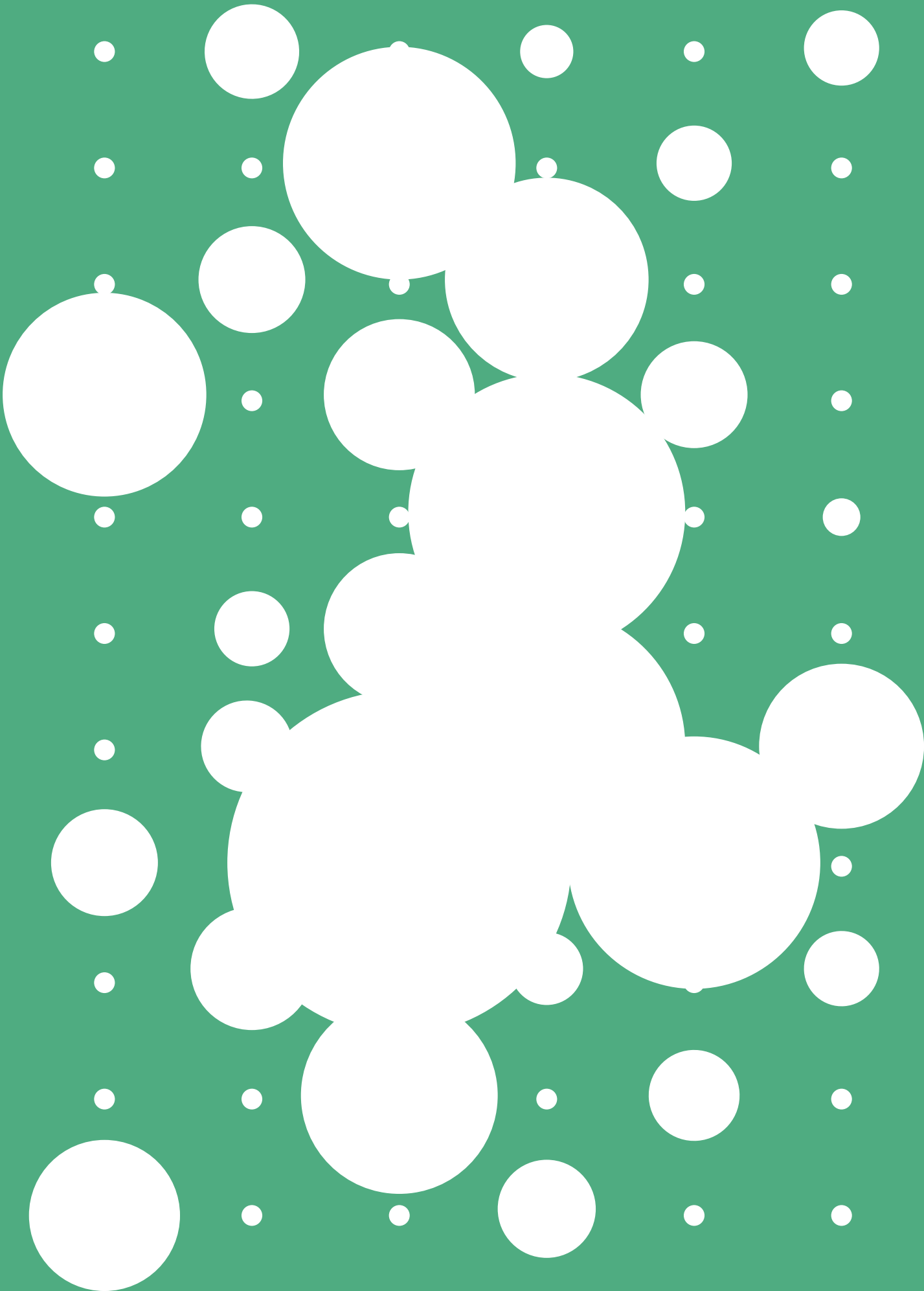
The new inland vessels, Zulu 01 and 02, are well suited for inland waterways and city distribution.



Traditional inland vessels are not suitable for transhipment of palletised goods. Thanks to the crane on the boat, there is no need for large infrastructure on the quay.







1 Description of location in relation to other (sea/) ports

Thanks to its exceptional accessibility for an inland port, the Port of Brussels, located on the Antwerp-Brussels-Charleroi canal, enjoys the status of a sea-port. It is very well located in the heart of European rail, airport and motorway networks. It is an efficient multimodal platform that plays an essential role as a supply and redistribution centre; first for the city/region of Brussels itself, and for its hinterland and economic network along the canal.

2 Description of current activities

In the port of Brussels, we see as main functioning, activity around logistics that work on the scale of the city, region, hinterland and in relation with the port of Antwerp. In the port we see the management of waste coming from the city and the region (demolition waste, metal scrap) to be shipped to recycling sites inside the port, along the canal and to Antwerp, and in the same time, the port is providing the city with goods, building material (concrete,...). The port of Brussels also manages the TIR Logistics Centre, a vast warehousing complex located in the immediate vicinity of the city centre, demonstrating its strategic involvement in the field of logistics.

3 Description demographic/socio-economic dynamics.

The Port is home to more or less 360 differentiated companies that generate 12,000 jobs, including 5,645 direct jobs on the port site. The economic activity linked to the Port represents more than 4 billion € in turnover.

Brussels as a city is growing rapidly with a high demand for new housing. With the deployment of the Plan Canal a position has been taken to develop this zone with respect to the existing economic activities. The Port of Brussels, through its jobs, its added value and its involvement in supplying the region, remains a leading regional economic hub and a sector that promotes growth and employment for the Brussels-Capital Region. Although the Plan Canal provides a workable and welcome framework for development, a clear vision how the different scales and economic networks relate to each other is absent in the vision.

4 Why, and in what way is circularity looked at?

The Port of Brussels aims to promote waterborne transport (the most environmentally friendly mode of transport), develop employment, combat global warming and improve urban distribution.

In this sense, innovative and sustainable logistics projects are widely promoted. Indeed, for the land located along the canal, the Port imposes on its customers the use of the waterway for their activity. Preferential rates are thus granted to customers according to the tonnages transported by waterway. Conversely, penalties may also be imposed on customers who do not respect their inland waterway transport commitments

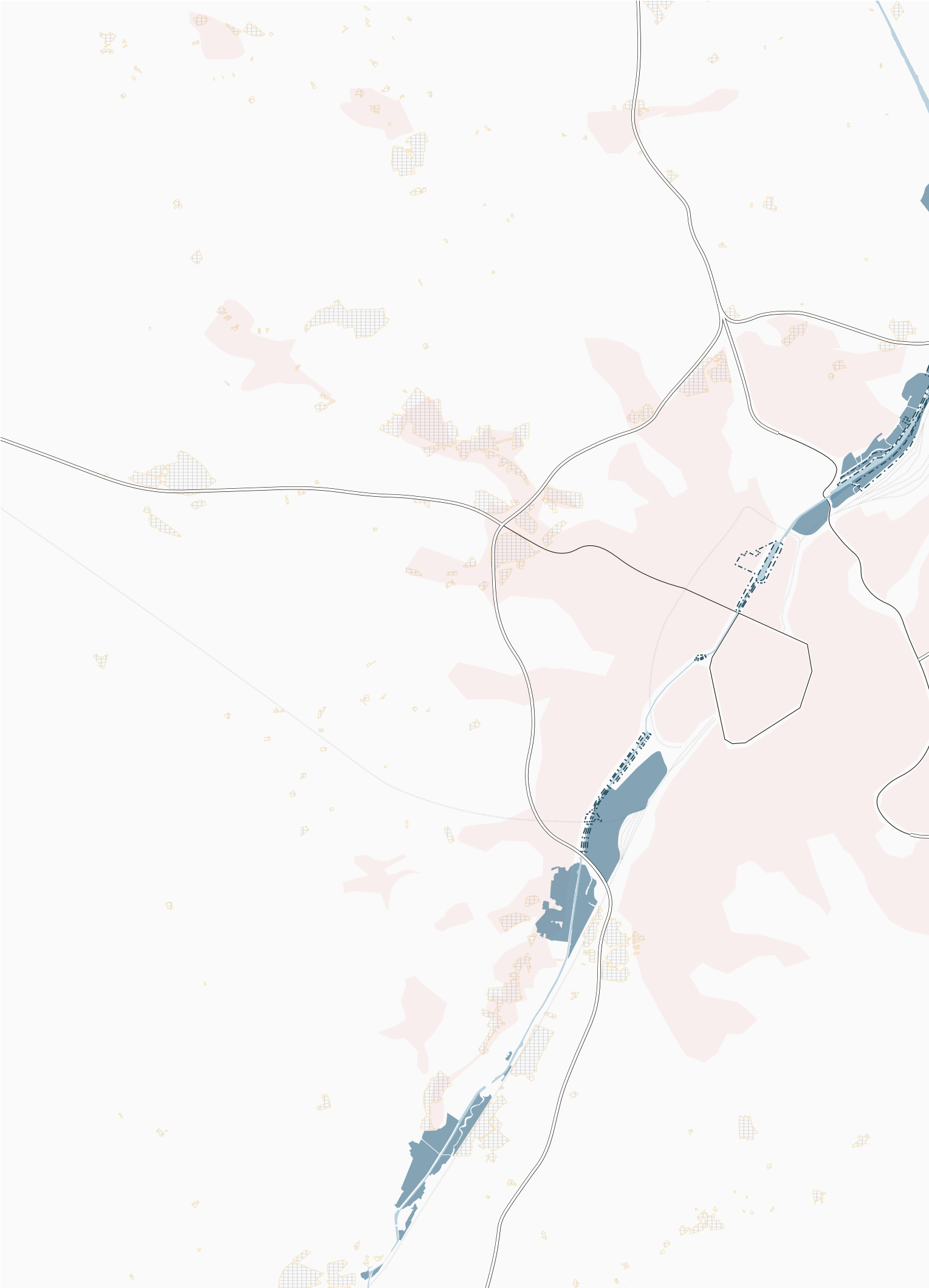
5 Who gives substance to this, which partnerships/programmes/initiatives are made?

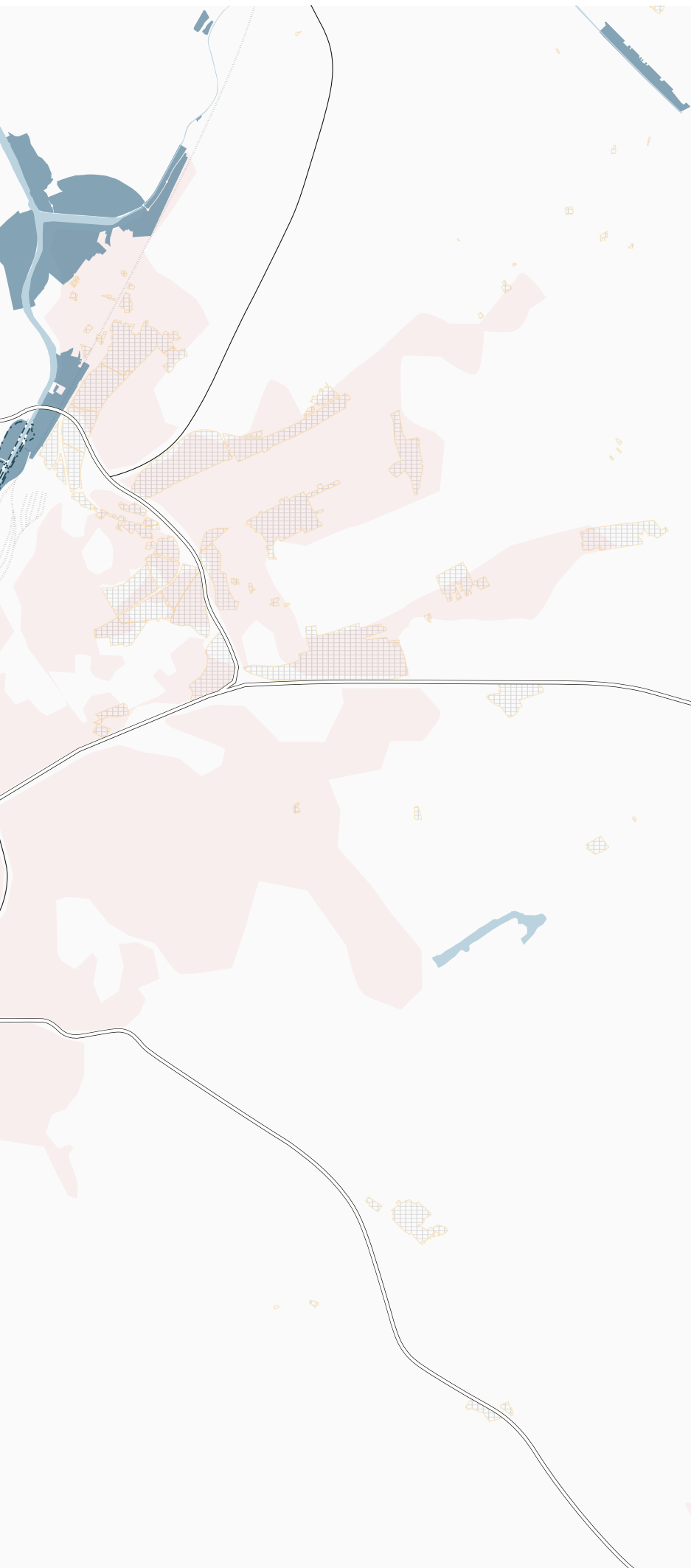
Programmes such as the PREC (Regional Programme in Circular Economy) or the be.circular calls for projects which encourage the transformation of a linear economy into a circular economy within the Brussels-Capital Region as well as the financial resources made available, show a real interest on the part of urban actors in these issues. The main canvassers have developed around logistics (Citydepot, construction village, setting up logistics platforms along the canal...), the creation of industrial synergies (free Irisphere service...) or innovation and research platforms (the Recy-K sorting and reuse platform, the Greenbizz incubator platform...)

6 Is there already a discourse around cityports? (Yes/no) Who is behind it and what are the ambitions/motives?

In the zone of the Plan Canal we can distinguish 3 zones; an inner-city urban fabric with no relation to the water, the city ports around Biestebroek and Vergotedock and the more industrial/logistical port to the north.

For the city port of Vergotedock, the ambition has been made clear to develop this zone in function of a more urban circular economy. For example the site of A.Stevens, a metal recycling company, is looked at to develop towards a more mixed program with ateliers and preservation of the logistical function it has now.





Brussels

Industrial Port

-  Port services (waterbound logistics, terminals, locks, ship repairs)
-  Distribution
-  Industries inside the port
-  Vacant sites
-  Expansion area
-  Industries outside the port
-  Used quays (waterbound activities)
-  Future projects
-  SEVESO sites
-  Wind energy

City

-  City
-  Planned waterfront development
-  Recent waterfront development; housing & services

Labelling Of City Ports

-  Potential city port
-  Defined as city port

Water

- 0m - 10m - 20m > 20m
-  High tide

Green Structure

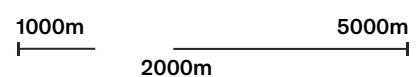
-  Green areas
-  Green quays

Boundaries

-  Port limits
-  Administrative limits

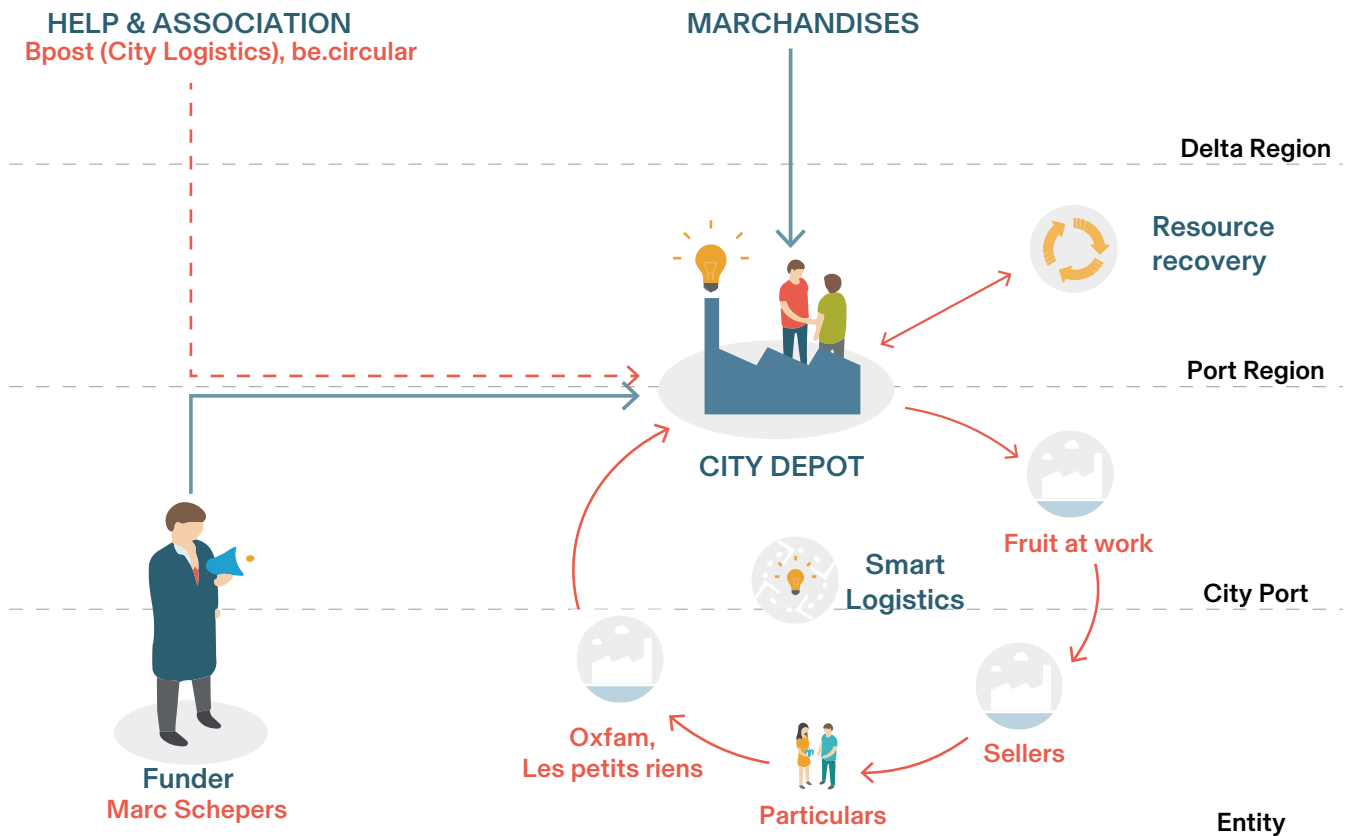
Infrastructure

-  Main trains
-  Primary roads
-  Secondary roads
-  Canals (non-tidal water)
-  Main waterways for classic ships
-  Main waterways for containers, ro-ro ships & bulk carriers





"From its neutral and open platform to all stakeholders, CityDepot offers "carpooling of goods" to and from the city and proves that it can be much more ecological and economical to work together than to transport your goods separately."



Interrelationship

Citydepot collects the goods at the entrance to the city, stores them, organizes them and then delivers them in the city centre to its customers (companies with recurring orders, individuals...)

What happens here?

CityDepot is a Belgian company operating in several large cities that offers a sustainable solution for the distribution of goods. As part of the last mile logistics, it concentrates goods flows at the entrance to cities and delivers them in an optimized and consolidated way to the urban center using more suitable and cleaner vehicles (bicycles, vans...). The company also proposes to collect, store or assemble goods in a flexible way before delivering them to the city. The project aims to close the loop of goods flows by stimulating the integration of reverse logistics among Brussels economic actors.

What is the relation with the port?

CityDepot's strategic position inside the port and at the gateway to the city allows them to store the goods delivered and to operate over large areas. Proximity to water allows them to operate multimodally and to deliver some of the goods ending in the city center by water (unlike in Antwerp, where this practice is rather established, Brussels is still testing this possibility with palletized goods other than construction materials).

What is the relation with the city?

Proximity to the city is crucial for CityDepot because the short distances to be covered by freight transport allow to break-up total volumes into small deliveries that can be transported by alternative vehicles, cleaner because electrically propelled.

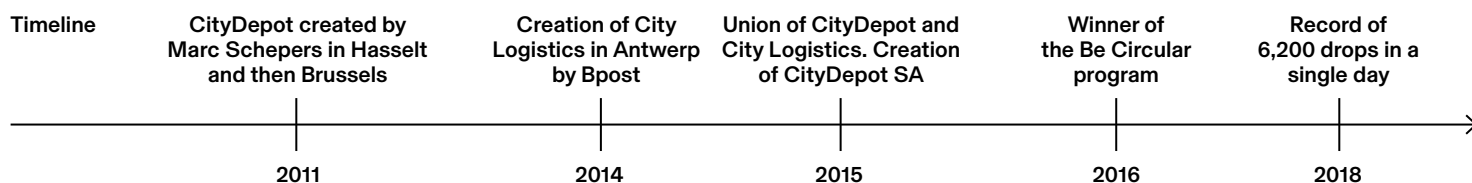
What are the ambitions?

Reverse logistics uses the available space inside the delivery truck once goods have been dispatched and contributes to recovering resources/waste. The final objective is to be able to gather all residual flows at the consolidation center in a sufficient quantity so that they can be valued by local and social economy actors (such as the project partners: Les Petits Riens, Oxfam, etc.). Thus CityDepot's objectives are found in value creation, at the intersection of ecology, social and economic aspects. The efficient distribution of goods in cities reduces traffic and related pollution and increases the safety, quality of life and comfort of local traders. Who is behind it? As a BPost branch, this project is supported by the Brussels-Capital Region as part of the «be circular be.brussels» call for projects of the Regional Programme in Circular Economy (PREC). Indeed, in 2016 CityDepot received financial assistance and was also supported by Impulse.brussels in the search for investors and in the procedure for introducing the environmental permit for the construction of its premises.

Sources

www.citydepot.be

www.circulareconomy.brussels/citydepot-connecteur-de-leconomie-circulaire

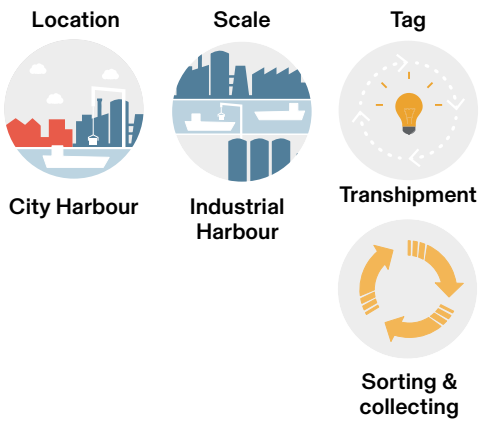


CityDepot's consolidation centre in Brussels.

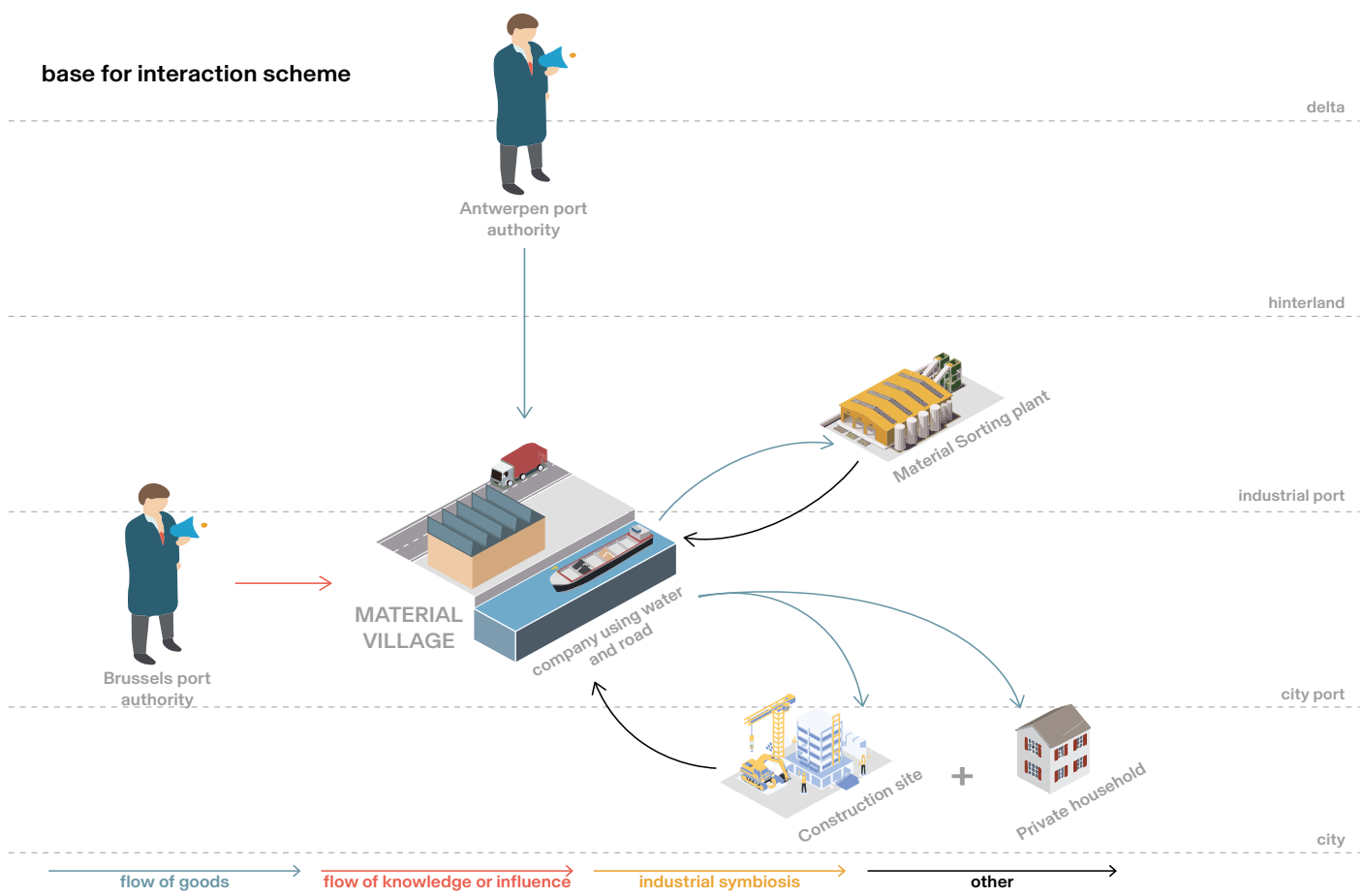


Use of clean vehicles.





“The Port wishes to keep construction companies within its port boundaries and not to move them outside the Brussels region.”



What's happening? How does it happen?

The Material Village includes 3 warehouses built along the canal in the Vergote basin, currently occupied by the company MPro, which offers more than 10,000m² of building materials. The idea is to create a multifunctional and modular space combining storage space, showroom and offices: 7000 m² of sustainable warehouses!

The objective is to make the Material Village the consolidation point for orders from one or more con-

struction sites. Loaded vehicles leave for the sites, depending on the progress in real time of the work, avoiding unnecessary round trips.

Why is this an interesting circular initiative for circular ports?

The construction of these warehouses on the port facilitates the use of the waterway to transport construction materials from other cities or distribute them as close as possible to the worksites in the city.

What is the relation with the port and water?
The buildings belong to the port, but the company MPro, which has been operating in Brussels for 200 years, holds a concession for them. As part of the concession agreement, MPro has secured to the transport of construction materials by water.

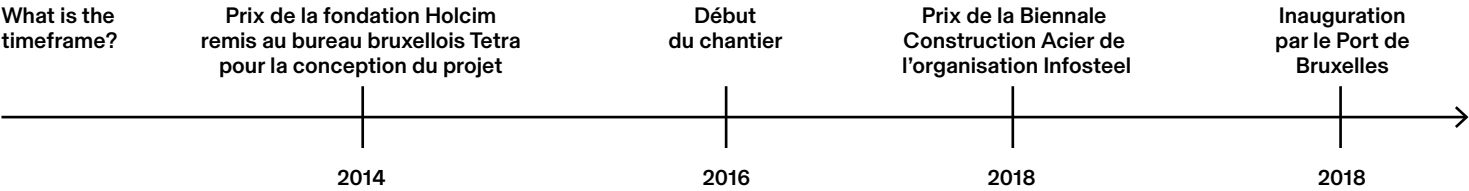
What is the relation with the city?
Due to population growth and the generally poorly conserved built patrimony in Brussels, renovation projects in urban areas will increase in the near future, and with them, the number of small-scale transport flows. The solution passes by placing building materials closer to the urban center since it is home to many construction sites.

What are the ambitions?
The project's ambition is to solve the distribution of building materials to professionals and individuals who carry out major renovation projects by relying on the waterways. Indirectly, it facilitates the man-

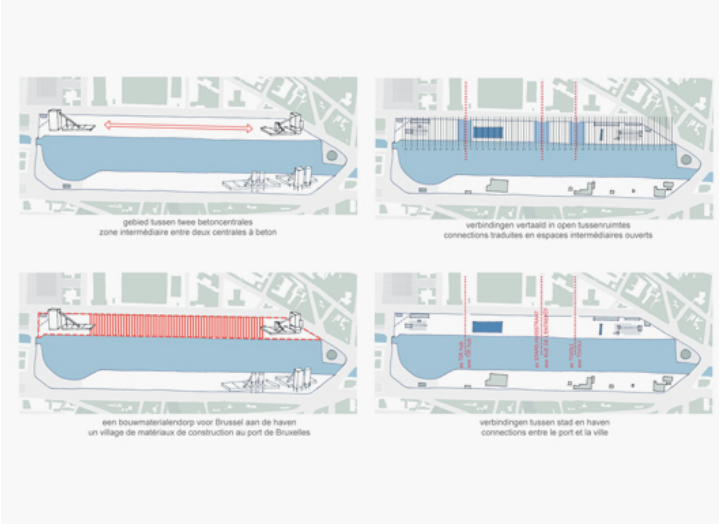
aging of building sites by providing JIT solutions that help spare place and time.

Who is behind it?
The total cost of the project is nearly €8.5 million, including €7.9 million for the Port of Brussels and €600,000 financed by Grafton Group plc. The construction village is a flagship project of the Port of Brussels and an integral part of the Canal Plan, led by the Regional Government. Its construction was strongly encouraged by the city because it clusters all of MPro's Brussels activities on a single site, subsidiarily allowing the construction of the Picard Bridge and the creation of a new regional park on the left bank of the Béco basin, where MPro was previously located.

Sources
www.port.brussels/fr/content/village-de-la-construction
www.canal.brussels/fr/content/inauguration-du-village-de-la-construction
www.tetraarchitecten.com/nl/home/detail/vergotedok

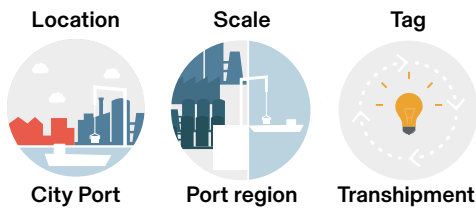


Intentions and spatial contitions of the project for a good urban and port integration. (Tetraarchitecten Office)

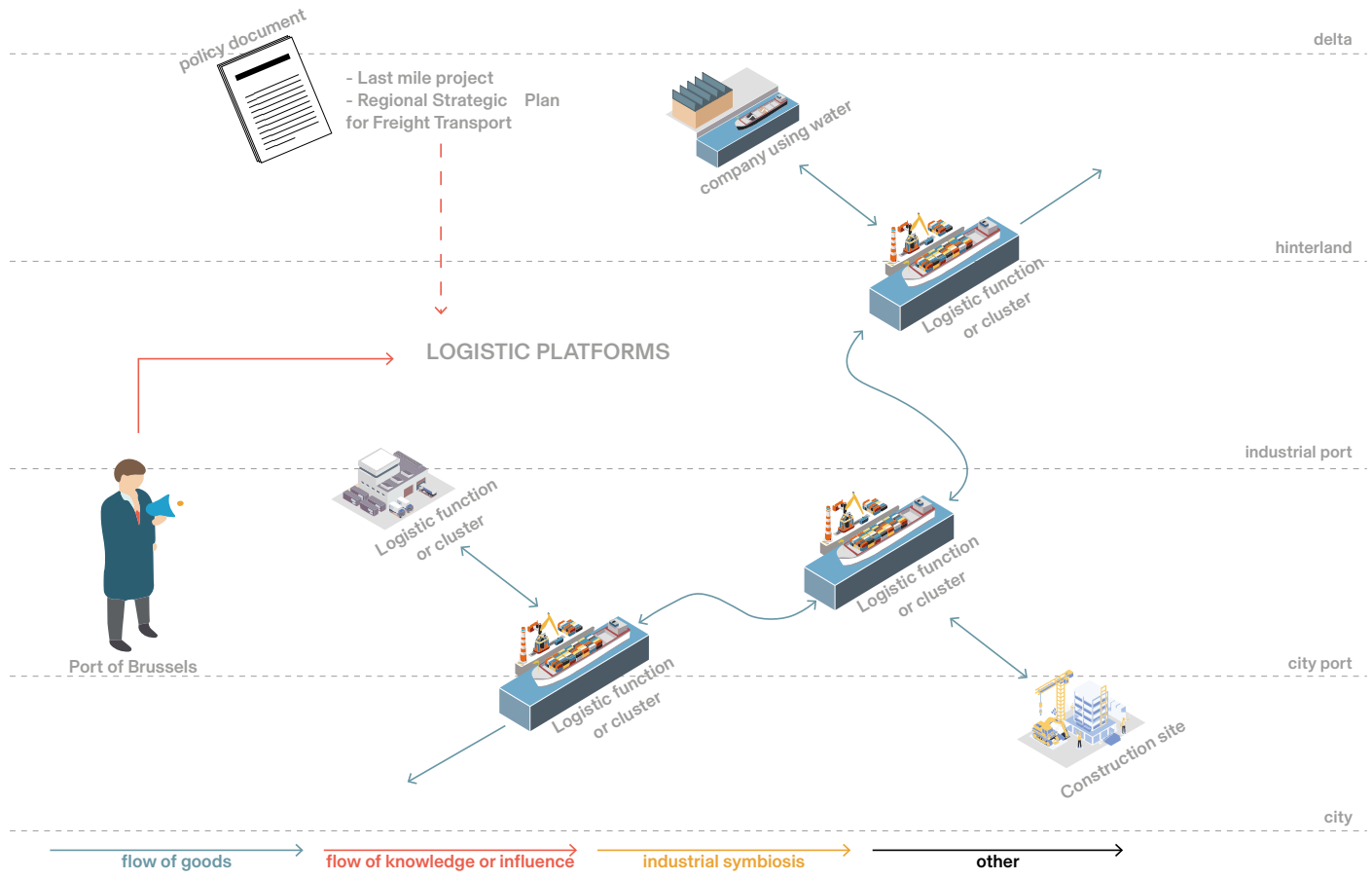


7,000m² covered storage warehouses and 1,500m² self-service exhibition space at the rear





A network of transshipment platforms along the canal



What's happening? How does it happen?

The Port of Brussels is developing a network of transshipment platforms along the canal, in order to organize urban distribution by waterway. The aim behind these platforms is to ensure the delivery of goods as close as possible to the end user and to reduce the costs involved in the 'last kilometre'. However, the longer this post-routing distance is, the more cost-effective it is to use high-capacity vehicles. On the opposite, smaller and greener vehicles that are better adapted to the city can be used when the distance traveled is reduced.

Why is this an interesting circular initiative for circular ports?

This project promotes the use of waterways, reduces road traffic congestion, and offers a realistic alternative to reorganize urban logistics. This platform system makes it easy to integrate intelligent palletized logistics that is better suited to the inland ports where the city-port interface is under constant pressure.

What is the relation with the port and water?

The platforms are located within the port and act as a hinge between the canal and the city. The palletized transport represents a unique solution to urban logistics and helps to create an adapted interface between city and port, as their size allows them to adapt to the city's supply by water.

What is the relation with the city?

Shifting to waterways for transporting goods to the city reduces congestion, improves air quality (provided that the rise of ship traffic entering the city will be accompanied by measures to reduce its emissions), and frees spaces that can be used for other purposes. Increasing the number of transshipment platforms on the canal quays intends to make this modal shift economically interesting for companies, by bringing goods closer to their final destination.

What are the ambitions?

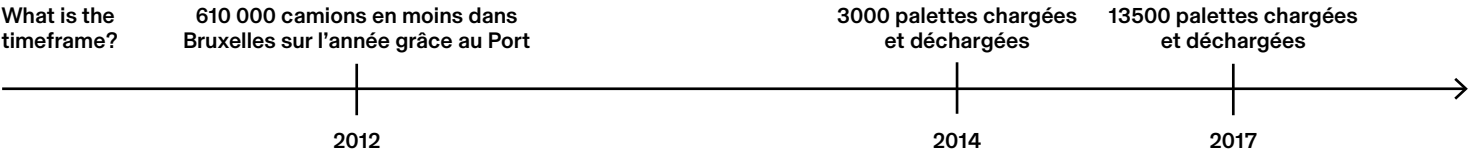
The objective of the Port of Brussels and the Brussels Capital Region is to promote alternative freight transport solutions and stimulate the mod-

al shift towards waterways and rail. Palletized transport seems a viable alternative for Brussels, since goods can be loaded directly from the ship, which is itself equipped with a crane that allows to operate independently of available quay infrastructure.

Who is behind it?

The Port of Brussels is a partner in various European and local projects aimed at improving urban distribution. To fulfill its mission as a logistics facilitator, it works momentarily to set up an adequate urban distribution infrastructure. In addition, the Port is one of the partners in the European LAMILO project (LAsT Mille LOGistics), which has been running an urban distribution service since September 2014, operated by CityDepot.

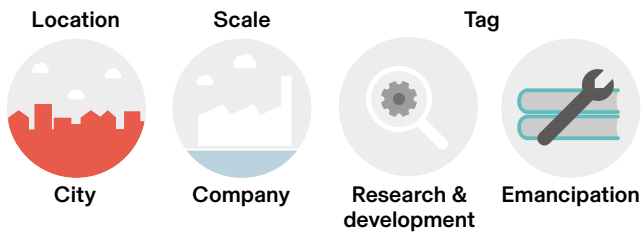
Sources
www.port.brussels/fr/port-de-bruxelles/un-port-au-service-de-la-ville/mobilite-et-environnement
www.port.brussels/fr/content/plateformes-logistiques



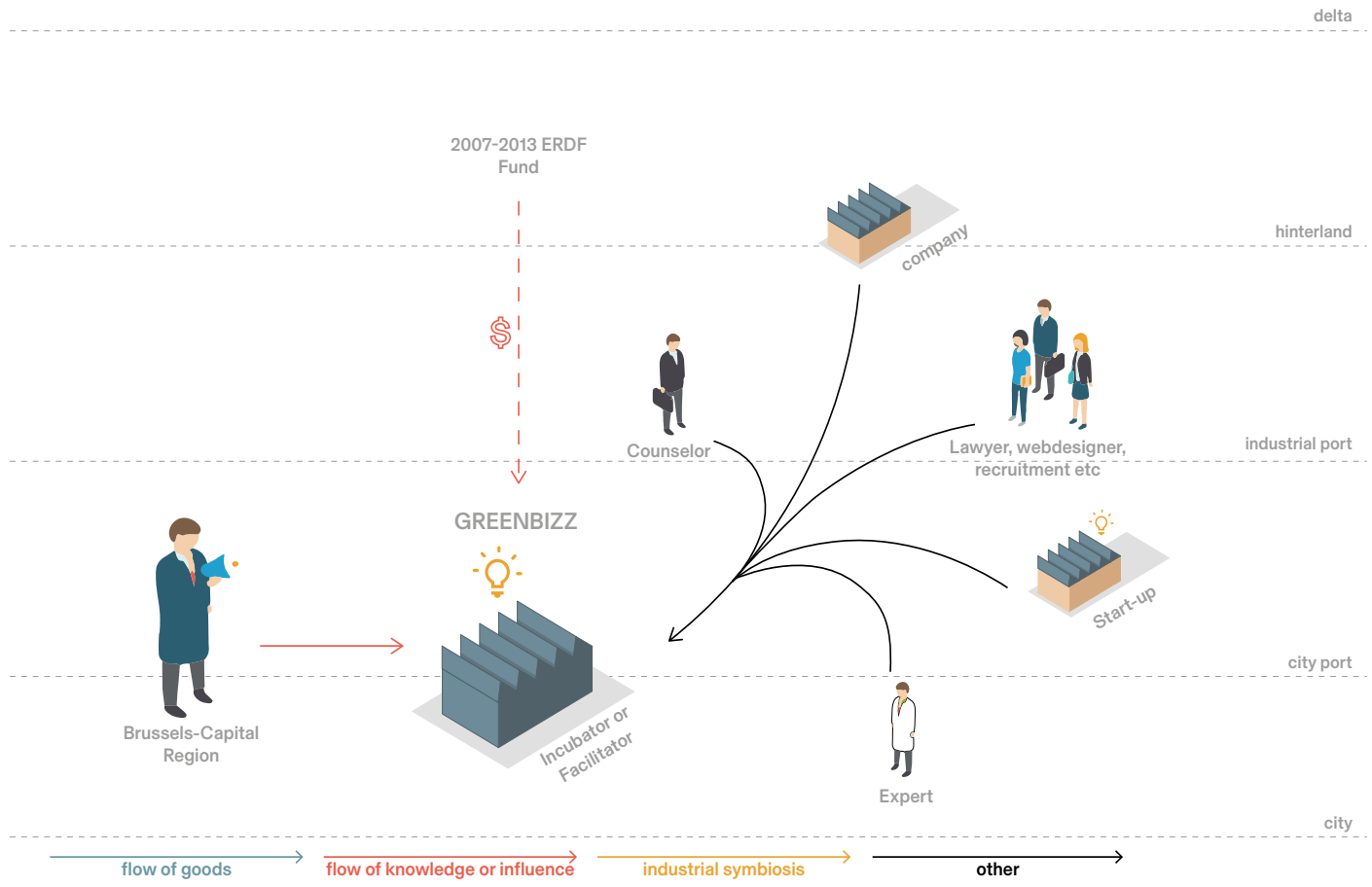
Palletized transshipment platform



Green: temporary storage groupage, repackaging of goods....
Pink: unloading goods as close as possible to their final destination



A cluster of green, sustainable and environmental economic sectors



What's happening? How does it happen?

The Greenbizz incubator offers, inside its massive structure of 8,000m² hosting different units for rent, personalized and free support for the companies it hosts and which wish to develop innovative projects related to the environment, eco-construction or the sustainable and circular economy sectors. In addition to production workshops, companies benefit from many services included in their rental: reception service, meeting rooms, kitchens, collective vegetable garden, bicycle parking with showers,

charging stations for electric cars, next to a whole bunch of services (legal advice, web design, recruitment assistance, interim, graphic design...).

Why is this an interesting circular initiative for circular ports?

Because it offers space and facilities for testing new sustainable projects, this attracts new kinds of entrepreneurs that can foster new synergies and symbiosis between port and city.

What is the relation with the port and water?

Built on a former industrial wasteland near the port, the Tivoli district and the Greenbizz incubator together contribute to the ambitions of the Canal Plan in terms of mixicity. The site also benefits from vast spaces and fluid mobility for trucks, encouraging the implementation of productive functions.

What is the relation with the city?

On the other hand, Greenbizz is located inside a Priority Intervention Zone (ZICH), designated to encourage socially inclusive and sustainable growth. The type of functions it hosts seem apt to create new jobs catering to the skills that exist within the ZICH.

What are the ambitions?

The objective of the approach is to support and stimulate sustainable and innovative entrepreneurship through 3 areas of activity: energy optimization, responsible food, and sustainable construction. The Société de Développement pour la Région de Bruxelles-Capitale (SDRB), which owns the land and

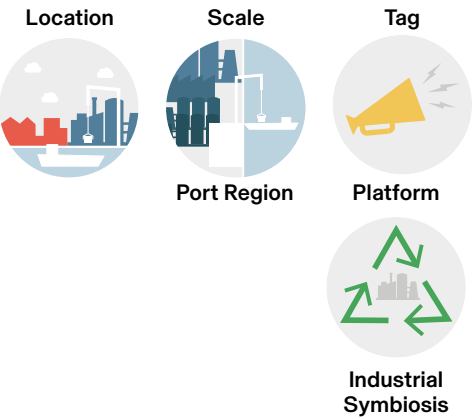
coordinates the project, sees it as a driving force for research and development of clean technologies in the Brussels Region. Greenbizz hopes, in the long term, to be able to accommodate 200 employees on this site entirely oriented towards sustainable development. Who is behind it? Greenbizz.brussels is an initiative of the Brussels-Capital Region and made possible thanks to European subsidies from the 2007-2013 ERDF Fund. Several public actors are partners of the project: citydev.brussels, the greentech.brussels cluster of impulse.brussels, Brussels Environment, Innoviris, and the BBRI (Centre Scientifique et Technique de la Construction). The building is the result of an integrated design process between all project partners: customers, engineers, and architects, but also local, regional, and municipal authorities. This design process has resulted in an open and permeable structure.

Sources
www.greenbizz.brussels/fr
www.circulareconomy.brussels/greenbizz-brussels-un-vivier-didees-qui-repensent

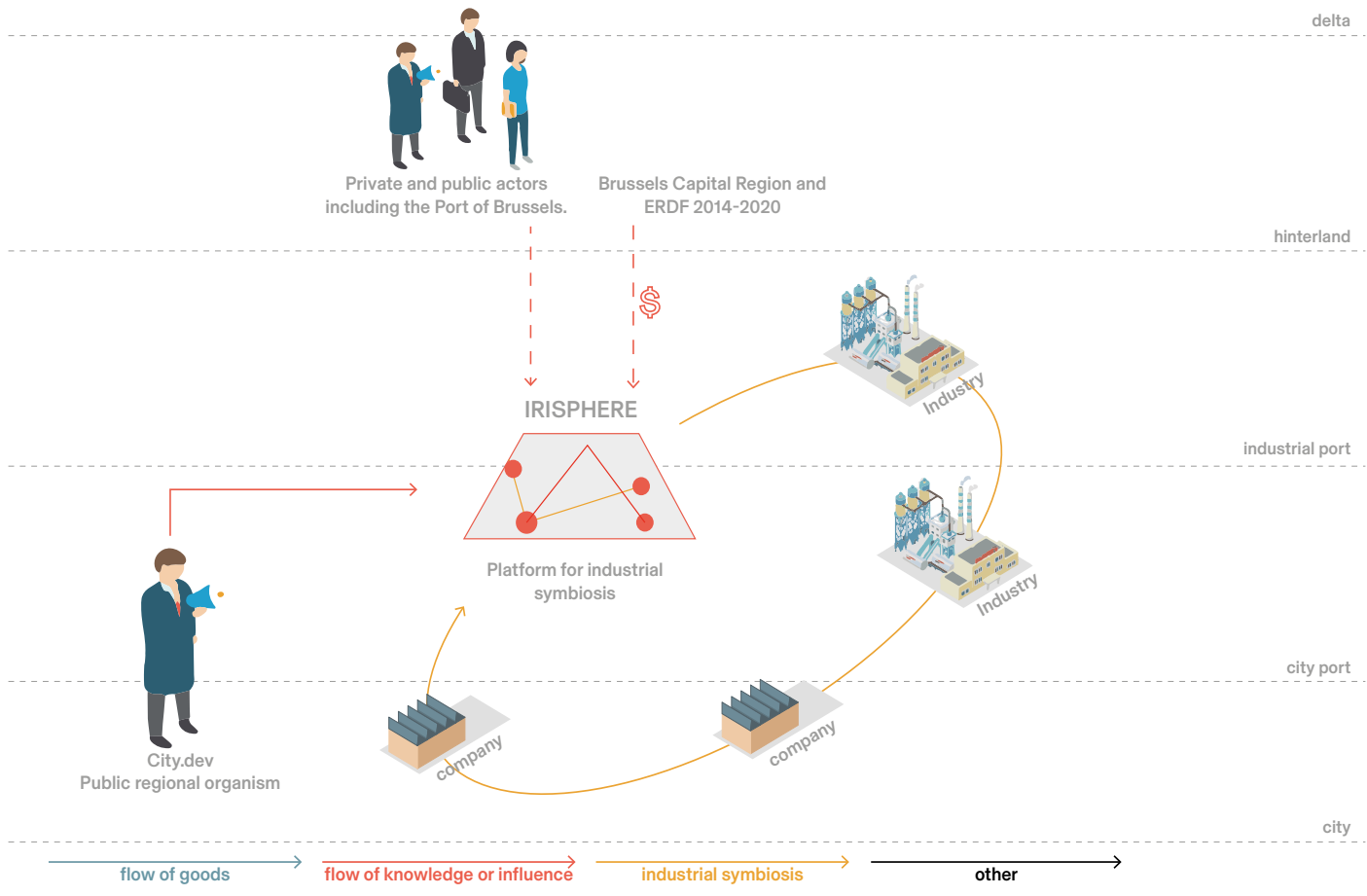


The infrastructure offers two types of premises: 2500 m2 of office space for start-ups in the pre-incubation/incubation phase, and 5000 m2 of workshops where they can then manufacture models and prototypes.





“Its ambition is twofold: to support Brussels businesses in improving the material cycle and to increase cooperation between businesses at regional level ”



What's happening? How does it happen?
The IRISPHERE program aims to stimulate the development of the circular economy in the Brussels-Capital Region. It aims to steer Brussels companies in their efforts to improve the circularity of materials and to increase inter-company cooperation at the regional level. Thus, the program provides free assistance to companies to develop synergies focused on materials and services.

Why is this an interesting circular initiative for circular ports?
This kind of platform is essential for the furthering of circularity in city ports. First, they make contact between industrialists, companies, and public actors. Secondly, they provide expert knowledge of the most significant incoming and outgoing flows of the port. Thirdly, they allow creating synergies between the actors.

What is the relation with the port and water?

The Port of Brussels and the Brussels Port Community (CPB), which bring together companies and actors located in the port sector as well as other major institutions and organizations in the Canal area, are two critical partners in the Irisphere program. City.dev is the leading partner, whose offices are located near the port of Brussels.

What is the relation with the city?

It is part of the implementation of the Regional Programme in Circular Economy (PREC), a vast strategic program set up by the Brussels-Capital Region, by involving regional and municipal partners, the business world and expert consultancies. Through the IRISPHERE program, the aim is to test an urban version of industrial ecology.

What are the ambitions?

The IRISPHERE program also aims to invest in a local materials park for companies. The objective being to collect and treat salvaged materials from local

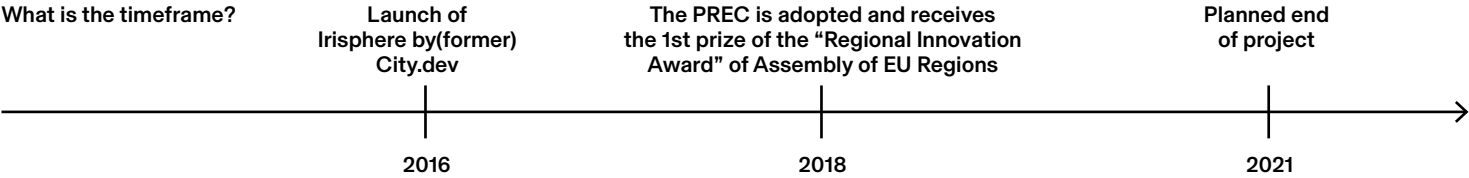
economic actors. One of the pilot projects, a bio-waste collection and treatment service piloted by La Ferme Nos Pilifs, is currently under study to produce a fertilizing material “Made In Brussels.” The idea is to collect the food waste coming from local economic actors and then transform it into a fertilizing product using Eco-Cleaner technology.

Who is behind it?

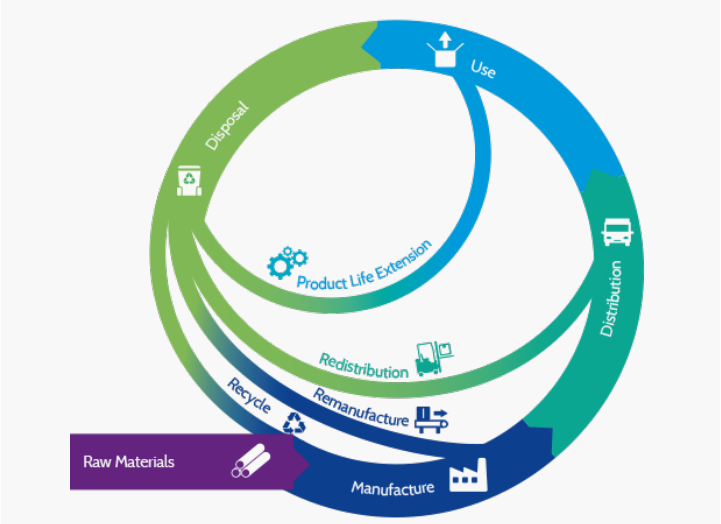
The IRISPHERE program is coordinated by citydev. brussels and is supported by a wide range of actors: EcoRes, Greenloop, Lateral Thinking Factory, BECI, the Brussels Clean Agency, Atrium, Brussels Environment, the Port Community, greentech. brussels by impulse.brussels, the Ferme Nos Pilifs and the Port of Brussels. Besides, the program has received funding from the European Regional Development Fund (ERDF) 2014-2020 with a budget of €1.4 million.

Sources
www.irisphere.be

What is the timeframe?

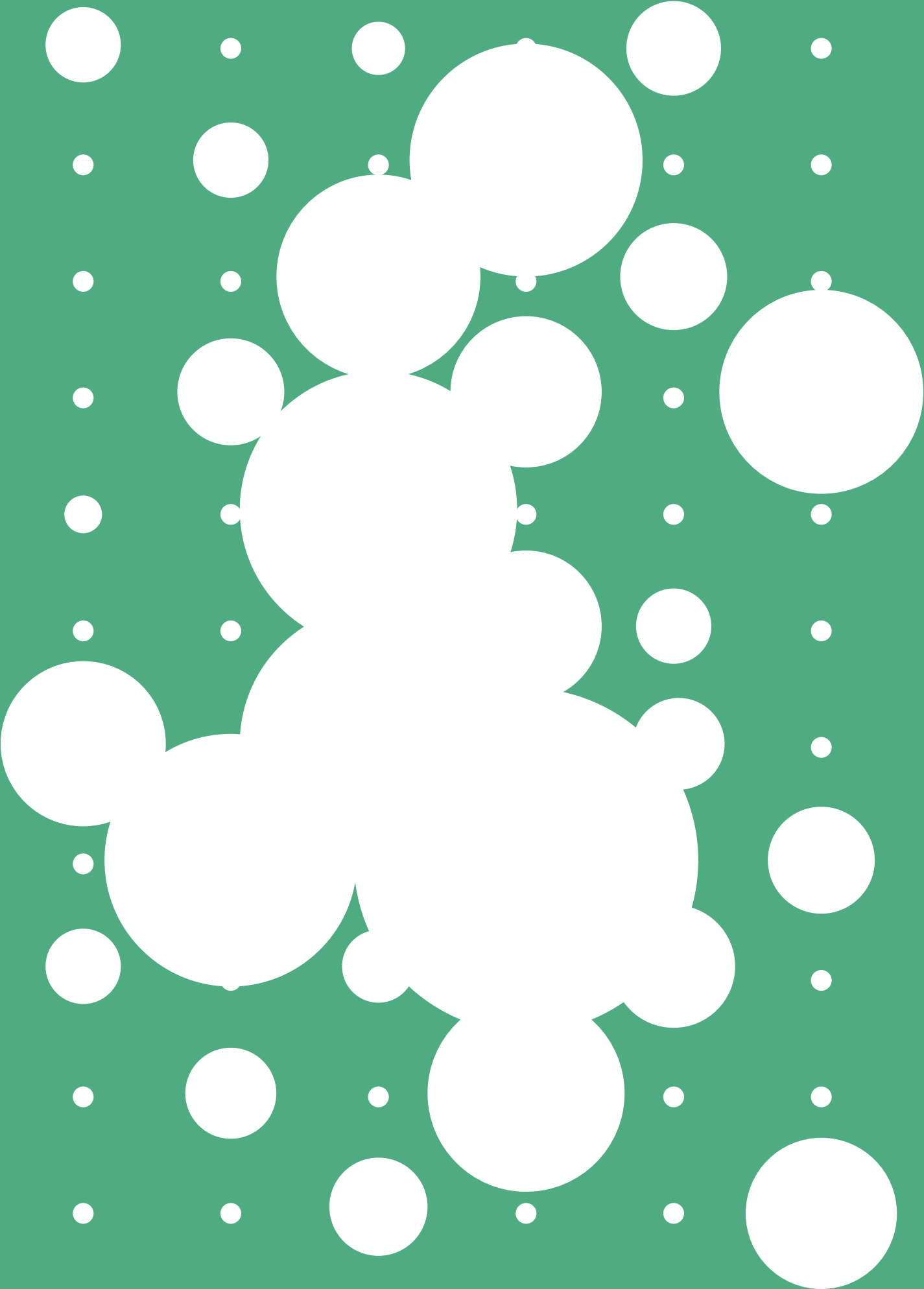


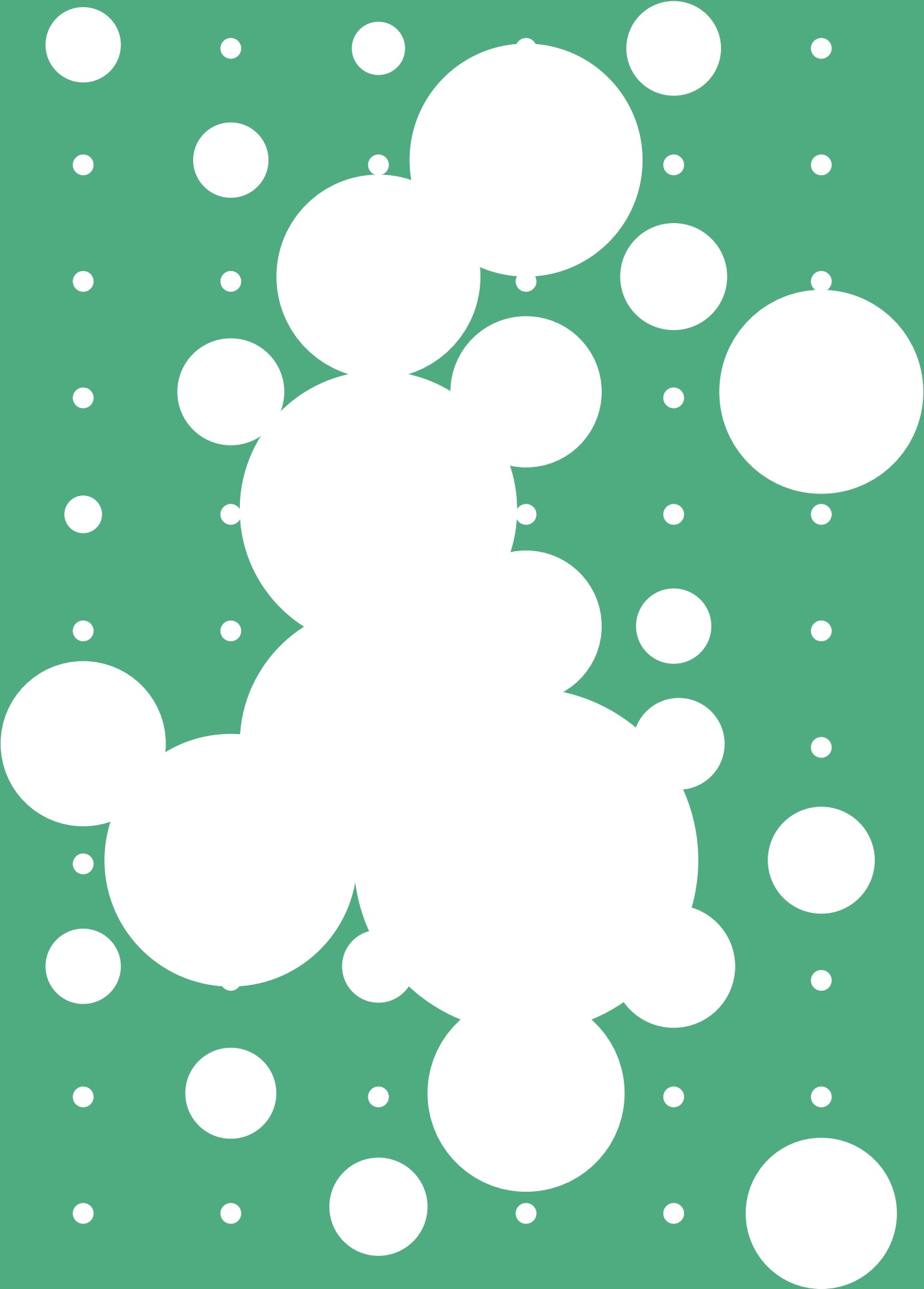
Circularity offers companies in all sectors a source of innovation for the creation of innovative products, services and business models.



The programme provides you with a team of experts to support companies.







1 Description of location in relation to other (sea/) ports

Located between the port of Rotterdam and the European hinterland, the port of Dordrecht has a strategic location, in fact, it represents a Crucial node in relation with hinterland connection, on road and through water for main port of Rotterdam. Furthermore, the port is connected through the main waterways with the port of Antwerp, the Ruhr area, but also Luxembourg and Switzerland.

2 Description of current activities

The main activities taking place in the port are related to the water-based manufacturing industry, construction, trade and logistics. Its strategic location makes it an ideal location for inland shipping, delta technology and maritime services.

3 Description demographic/socio-economic dynamics.

The maritime sector is by far the most important, and best developed inside the port, with 40,000 employees (up to a population of 270,000), which represent a great strength for the port and at the same time for the city.

4 Why, and in what way is circularity looked at? Dordrecht and the region suffer from a 'brain drain' and a relatively low percentage of highly educated people and therefore want to focus strongly on the maritime manufacturing industry as an engine for development, revitalizing business parks (management and interaction), and this is in line with the vision of the Rotterdam The Hague Metropolitan Region. For example, during time they started to build a series of

interfaces with the port of Rotterdam as: make use of the same promotion and marketing agency DEAL, in order to present themselves on the world stage. Furthermore, the seaport of Louterbloesem is managed by the Port of Rotterdam Authority. It is important also to highlight the fact that, the global flux of ships related to a world port like the Rotterdam one, is strongly influencing the activities of the port of Dordrecht, being a supplier

It is possible to state that Innovation and employment are the main motives for looking at circular economies and collaborations in the reality of this port.

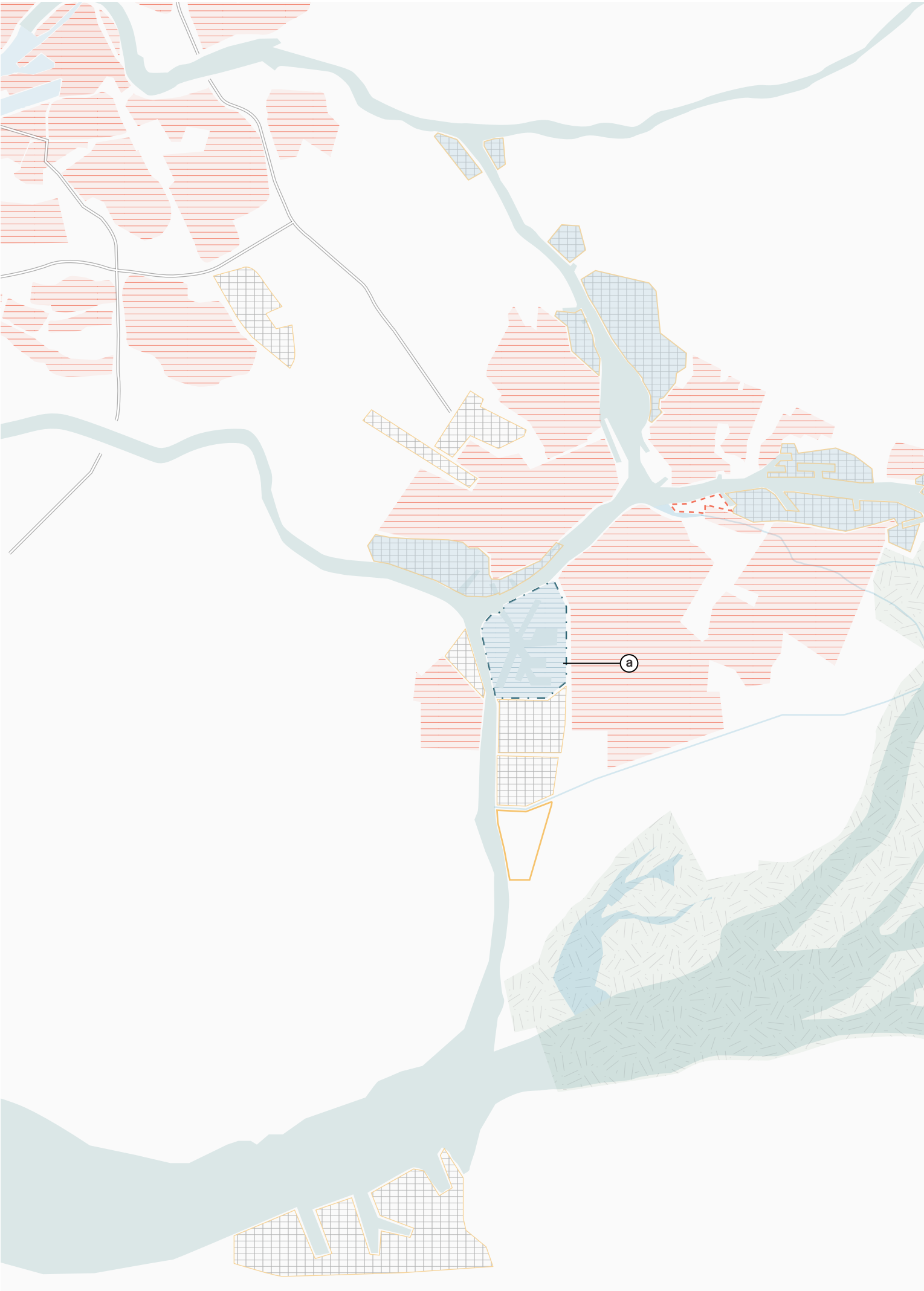
5 Who gives substance to this, which partnerships/programmes/initiatives are made?

Programmes such as the PREC (Regional The Drehtsteden, a group of seven neighboring municipalities, was established to look into the development of connections of waterways, building up important trade routes and urbanization.

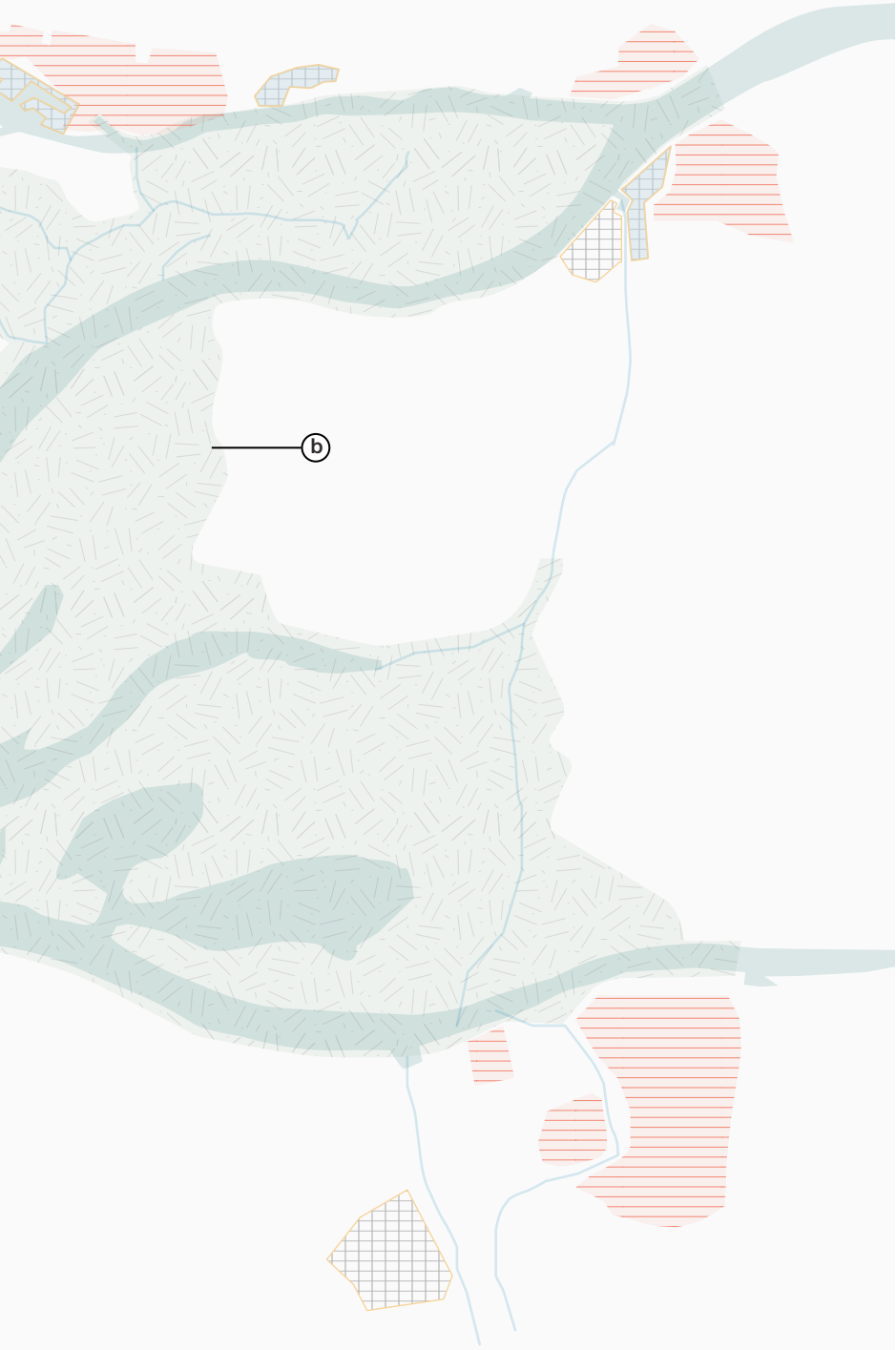
6 Is there already a discourse around cityports? (Yes/no) Who is behind it and what are the ambitions/motives?

Cirkellab has established itself as an important player in a transition to a CE. From two studies (on Dordrecht and Drehtsteden) it has built up a considerable network of companies, institutions and administrators around CE.

Furthermore, Cirkelstad Drehtsteden has been established, which is a platform where these partners work together on concrete projects (initially focused on construction).



Dordrecht



- a Louterbloesem - Port of Rotterdam
- b Bieschbosh - National Park

City

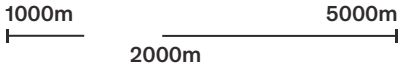
- City
- Planned waterfront development

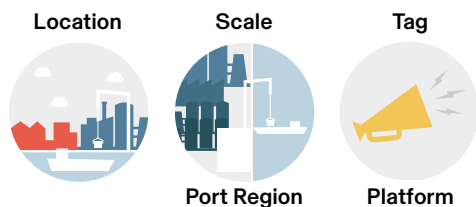
Port

- Port services (waterbound logistics, terminals, locks, ship repairs)
- Industries inside the port
- Vacant sites
- Port limits
- Industries outside the port

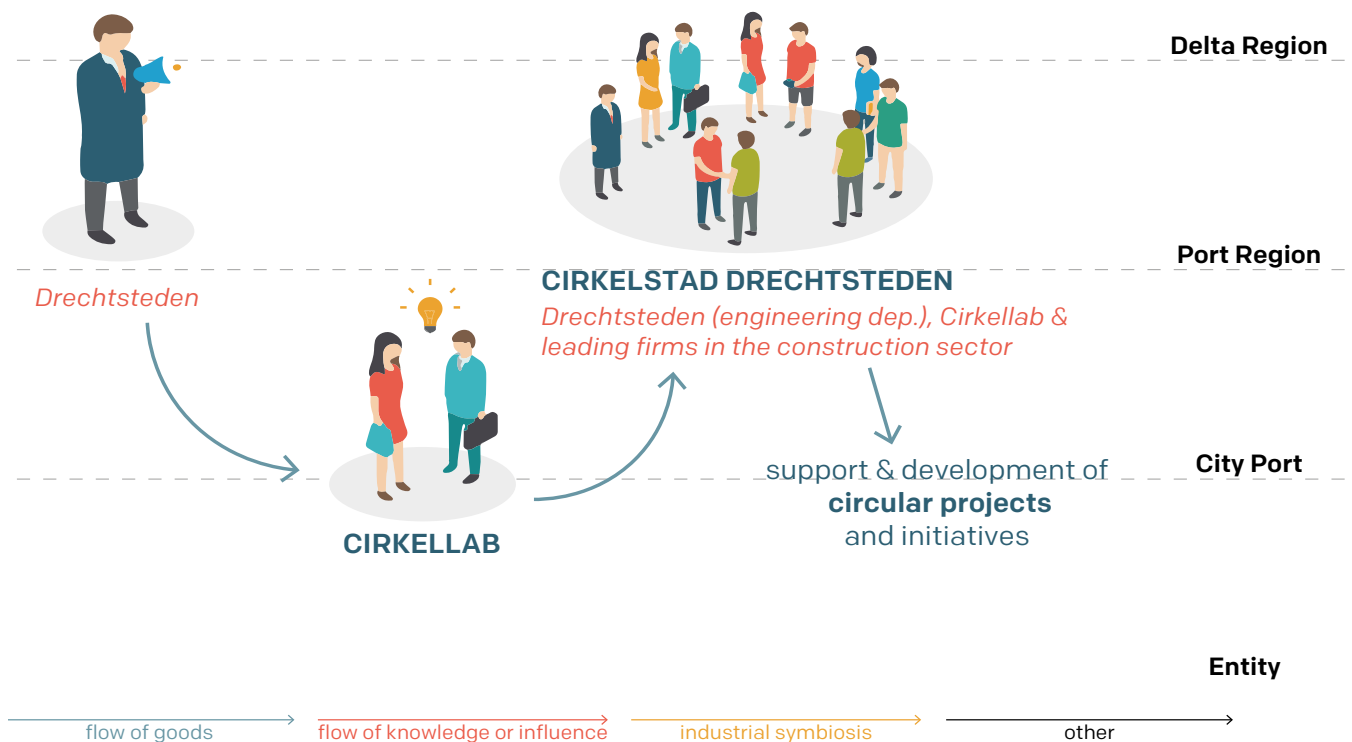
Infrastructure

- Main trains
- Primary roads
- Canals (non-tidal water)





“We are at the beginning of the transition to a circular economy. And that doesn't always make it easy. The Cirkelstad platform shows that we need each other to take steps in this direction.”



What's happening? How does it happen?

In 2016 a research on concrete circular opportunities for Dordrecht was made. Not as an all encompassing scientific analysis, more as a pragmatic concrete proposal that seek for leads of new productive activities. This was done in close collaboration with parties and companies involved. Through the lense of circular economy it explores exemplary cases, On top they also explored promising topics in and for Dordrecht; waste flows, manufacturing industry (electric and maritime), logistics and healthcare. These insights and collaboration resulted, indirect-

ly after a few years, in the platform of Cirkelstad Drechsteden where companies are now testing and developing test cases (focus on construction). The platform is a national organisation but locally monitored by Cirkellab.

Why is this an interesting circular initiative for circular ports?

The preliminary research and platform both start from the believe that companies should be involved from the beginning, to work together on a incremental way towards more circularity.

What is the relation with the port and water?

Most of the companies involved, have a direct relation to the water: either maritime or construction related.

What is the relation with the city?

Companies are searching for new ways of operating. The platform gives the opportunity to share insights and include innovative parties and networks-both business and governmental.

What are the ambitions?

Drechtsteden wants to strengthen their economic position, with a focus on innovation in construction and maritime sector. Working in collaboration with existing companies is made possible by the local operator Cirkellab.

Who is behind it?

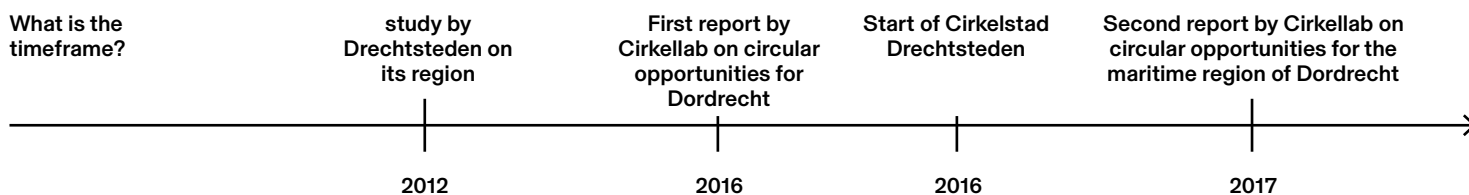
The study research was commissioned by the Urban Development department of Dordrecht to Cirkellab. The companies were requesting parties and played out a strong influential role, giving insight in the operationalisation of their practices.

Later, in line with this research, Drechtsteden (a collaboration of seven municipalities in the region) commissioned Cirkellab to continue their research on circular opportunities, with special attention to the (re)-manufacturing and the maritime sector.

Sources

www.cirkelstad.nl/drechtsteden

What is the timeframe?

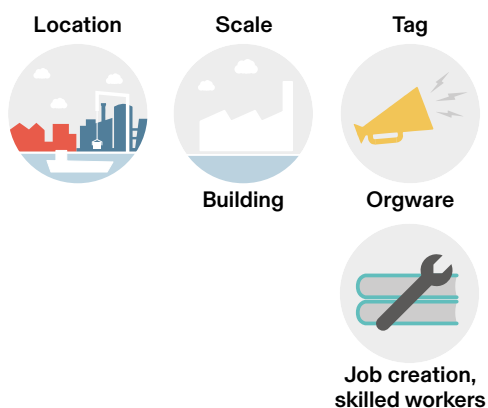


Report on 'Circular opportunities for Dordrecht', made by Cirkellab, led to the development of a learning-by-doing platform Cirkelstad Drechtsteden.

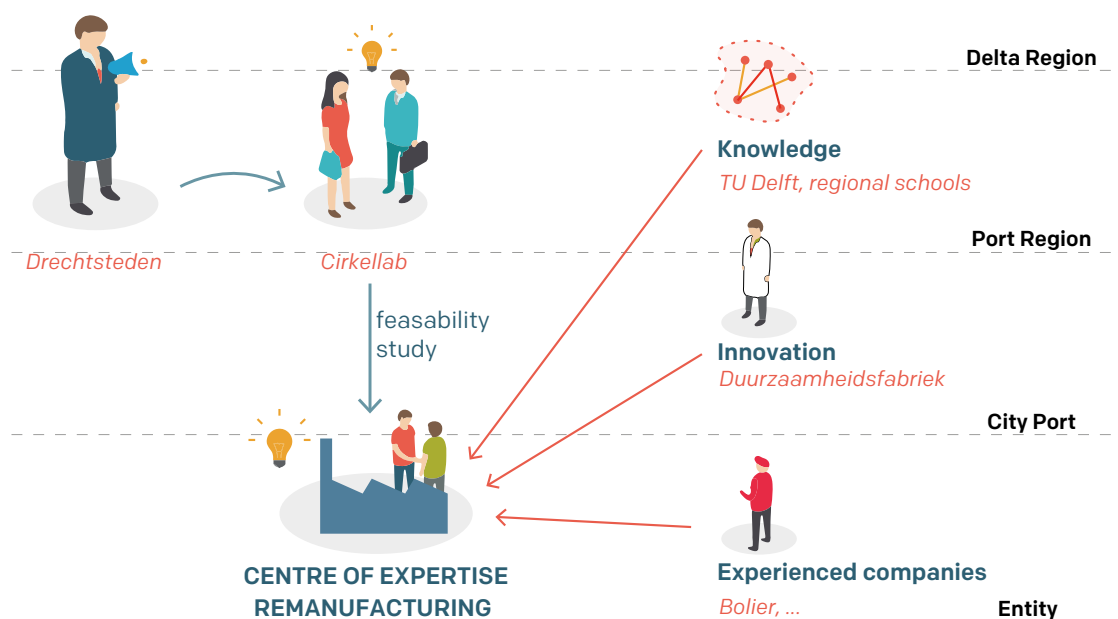


Companies are strongly involved in the studies by Cirkellab and the platform of Cirkelstad Drechtsteden.





“ We offer a centre of expertise as a platform for raising awareness and exchanging knowledge, presenting new initiatives and providing space for experimentation. A place that gives a sustainable and circular image to the maritime top region”



What's happening? How does it happen?
Remanufacturing is an important circular opportunity to repair the (material and capital intensive) machines and motors, mostly related to the maritime sector in the region. The region houses leading companies in the maritime sector, with over 40.000 employees.

Why is this an interesting circular initiative for circular harbours?

What is the relation with the port and water?

The region of the Drechtsteden is characterized by a maritime manufacturing industry.

What is the relation with the city?

This maritime industry is labour- and knowledge intensive. The city has thus all interest in attracting and nurturing these profiles, in order to tackle the braindrain beginning 2000s. Besides worktrajectories, this also includes providing housing and a healthy living environment.

What are the ambitions?

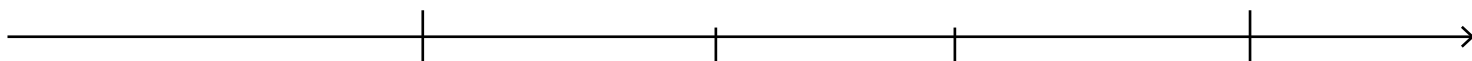
To spark innovation in remanufacturing. They want to put the region of Drechtsteden as top-innovative; therefore they need well skilled, educated people. This could counter the brain-drain in the region and provide jobs for the technical-skilled.

Who is behind it?

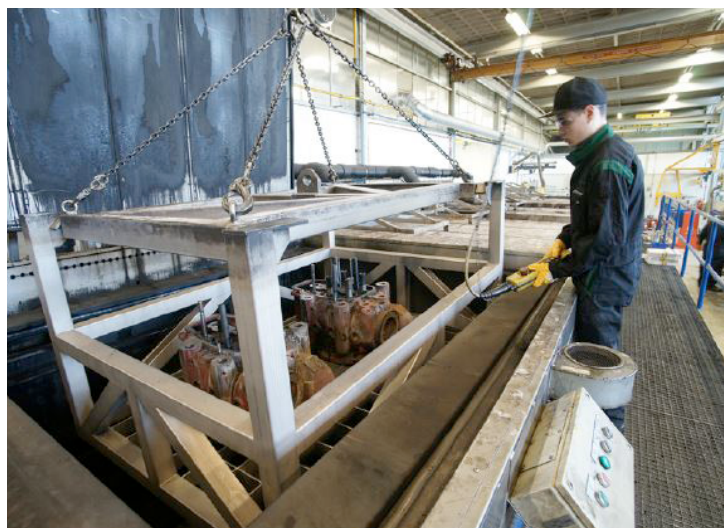
Drechtsteden has assigned multiple studies for circular opportunities in the maritime region. Cirkellab (see fiche Cirkelstad Drechtsteden), proposes a Centre of Expertise for remanufacturing as a vital step for consolidation and innovation in the (maritime) remanufacturing sector. Here, many expertises would come together: scientific knowledge from TuDelft; innovation from the Duurzaamheidsfabriek (see fiche), knowledge from the regional schools and practical experience from companies (Koninklijke Kemper en Van Twist en Bolier).

Sources

What is the timeframe?

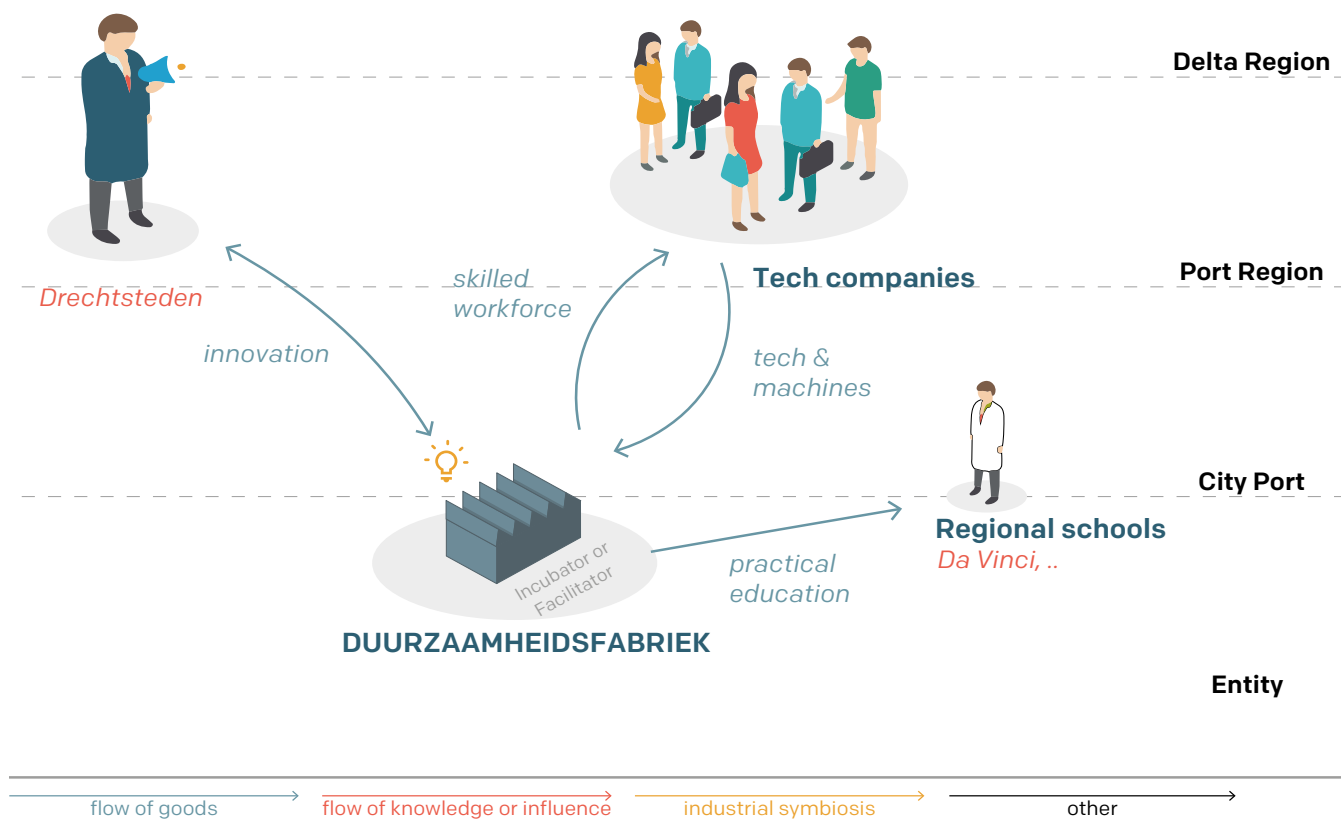
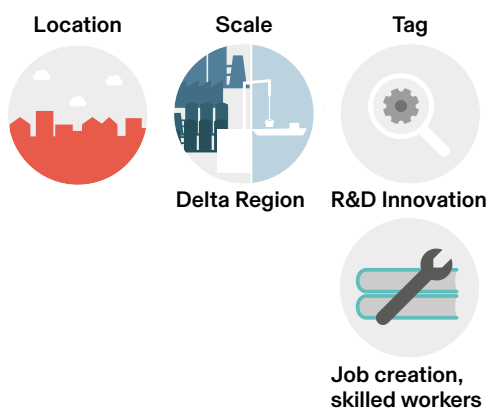


Drechtsteden puts remanufacturing on the agenda, as a vital sector for employment.



Imagination of the Centre of Expertise...





What's happening? How does it happen?
The Duurzaamheidsfabriek is focused on sustainable technology, with maritime technology and energy transition in specific. Here, education is given to young and old. The shared machinery and testing facilities, owned by companies and/or schools, give the opportunity to test products and produce knowledge at a high level. As such, the factory is an important spill in the regional economy that brings in a lot of innovation for and with the maritime making industry.

Why is this an interesting circular initiative for circular ports?
Circular economy requires new jobs and skills. The relation between companies, knowledge institutes and 'new jobs' is relevant to further circularity in city ports.

What is the relation with the port and water?

The region of Drechtsteden houses leading multinational companies in the maritime sector. With over 40.000 employees it is the most important sector and work provider of the region.

What is the relation with the city?

The campus has a central location, just outside the city centre of Dordrecht. Drechtsteden is facing a ‘braindrain’¹ (see fiche Remanufacturing) and therefore puts a lot of effort in making its economy more ‘innovative’. Providing skilled workforce, is a crucial part of it.

What are the ambitions?

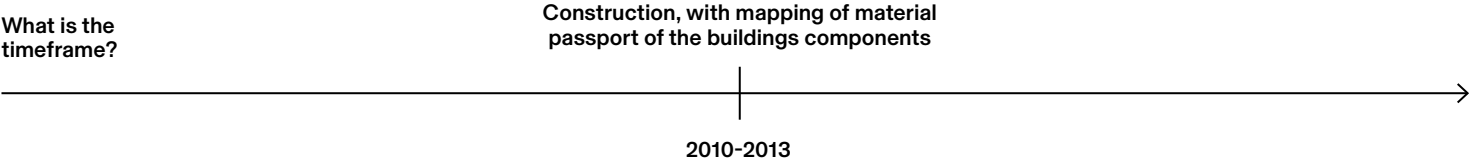
To guarantee skilled workers in manufacturing by bridging the gap between innovation (new technologies), technical schools, the labor market and companies. For the educational institutions, the

Duurzaamheidsfabriek provides an important impulse to increase the attractiveness of technical courses.

Who is behind it?

The Duurzaamheidsfabriek is located in the Leerpark, a technology campus, in Dordrecht and is the result of collaboration between business, education and government. The far-reaching cooperation with the business community enables education institutes like DaVinci to develop new and targeted forms of education. Companies such as Siemens, Krohne, HVC, Verkerk Groep, Sublean, Valk-Welding and IWZH are taking part of their activities to the factory.

Sources
1. Jansen, G., Zichtbaar Samen Maritiem: sociaaleconomische analyse van de Drechtsteden, 1 december 2015.



The corner building is located on a campus, isolated from the city (port).



The building includes working ateliers, class rooms and meeting rooms.



Location



Scale



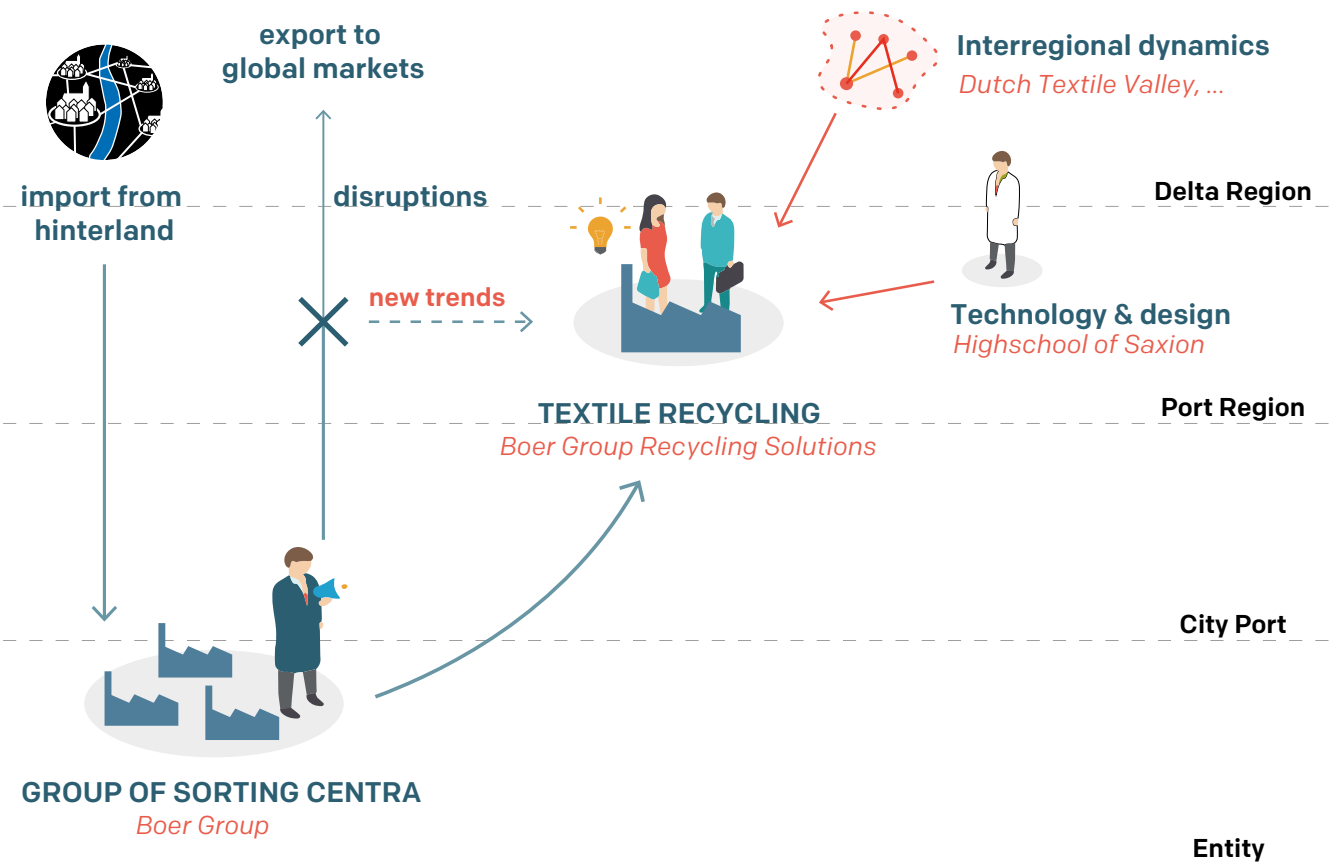
Tag



Delta Region

R&D Innovation

Interrelationship
how is the relation with platorms, institutes, companies...



What happens here?

Boer Group is a constortium of textile sortingcentra in Drechsteden, and sorts 450.000kg a day into 300 different fractions. 50-60% of the clothes are sorted per type and quality (ex. t-shirt type-A). The clothes are being sold from the sortingcentra to market sellers who have connection to the global market. However, a shift is occuring as not all fractions are reusable, global market dynamics are shifting and European policy stimulates the thoroughly sorting of waste streams. This results in a growing pile of used textile, asking for a different approach.

What is the relation with the port?

The port functions as a crucial switch in the chain: clothes are collected throughout the North-West of Europe, transported, sorted and mostly shipped to global markets.

What is the relation with the city?

The required work is labor intensive: these new circular initiatives bridge the gap between new technologies and design, herein offering places of new work.

What are the ambitions?

To recycle the growing pile of non-reusable textiles into new fibers and textiles. Therefore, innovative textile-recycling projects are funded and the Drechsteden consolidates further into an important node in the chain of (mechanical) recycling.

Who is behind it?

Boer Group Recycling Solutions has been a collaboration between sorting centra and the Highschool of Saxion, located in Twente - the hub for mechanical recycling. BGRS provides funding, network and know-how for innovative textile-recycling programs.

importance of interregional network for development!
interreg Retex: <https://www.dotheretex.eu/>
Dutch Textile Valley: platform to steer innovation

Sources

Timeline

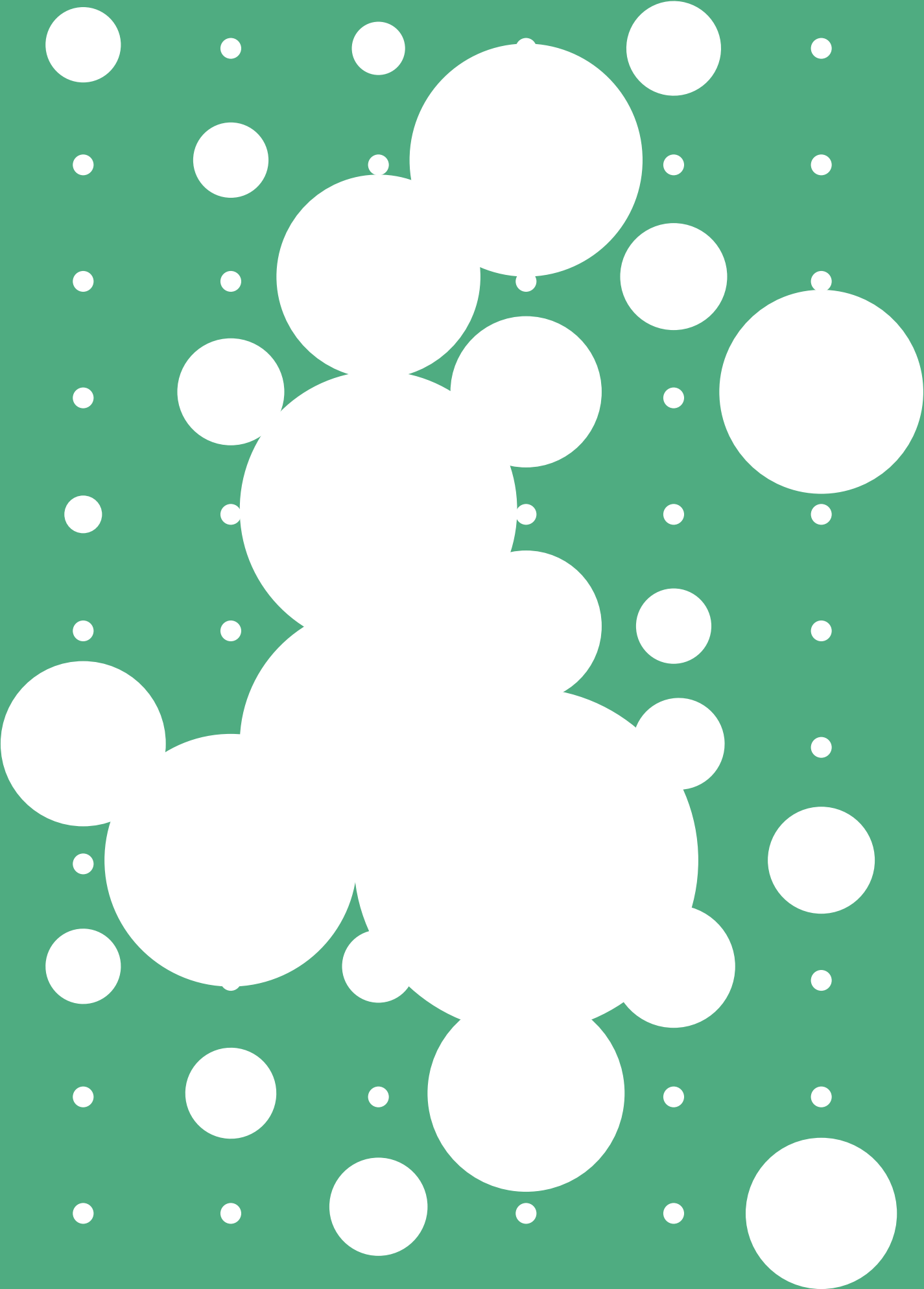


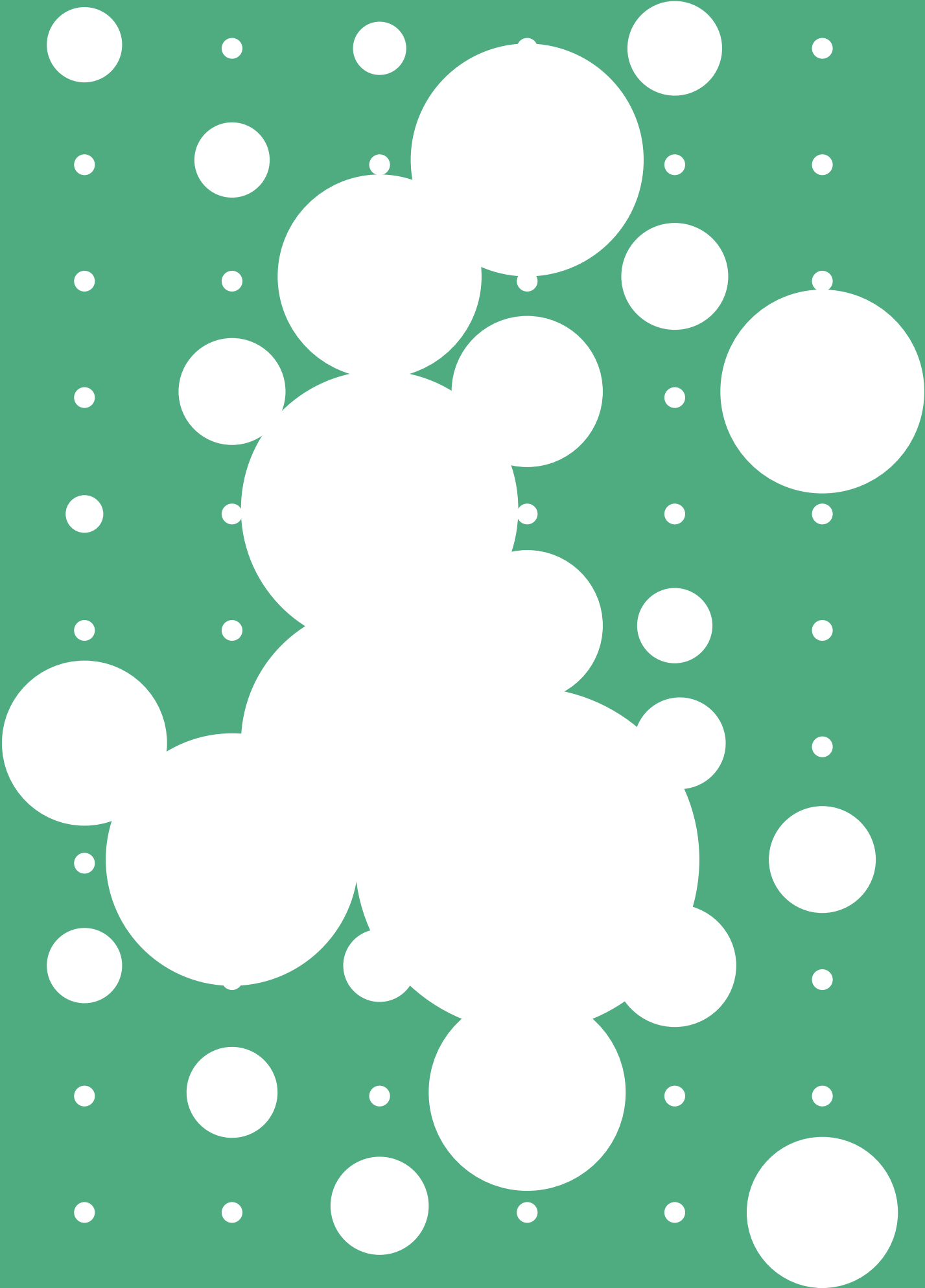
New fibers developed: Saxcell - for 100% gained from cotton waste.



Besides Boer Group, there are many sorting centra in the region of Drechsteden and Rotterdam!







1 Description of location in relation to other (sea/) ports

“Duisport” is the largest inland container port in the world. Being responsible for 30% of Germany’s total foreign direct investment, it juggles 30 million consumers that spend €600 billion, has access to 300,000 companies within a 150km radius, and has connection to 80 destinations in Europe, Asia, and 360 freight trains a week

2 Description of current activities

Throughout the last decades, the port of Duisburg has experienced the growth of inland freight distribution required an increase of flows. The port is strategically fitting into regional economic geography by being the link between the region of the Rhine-Ruhr and the global chain supply.

3 Description demographic/socio-economic dynamics.

The investment and strategies taking place in the port of Duisburg are strictly related to climate change issue. The aim of the port authority is to develop the port role to a more international leading logistical intermodal platform. The port has a strong influence on the economic activities taking place in the city and around the port, creating around 500 employees active in several related organisations.

4 Why, and in what way is circularity looked at?

The Port of Duisburg has been developing its infrastructure and has been tending to conform with climate change and decrease impacts of climate change on a local level. This has been the levers to start up conversations and collaborations between different stakeholders including individuals, civil society, the science community, economical actors, and public administration. The port is involved in the creation of a climate change litigation strategy, im-

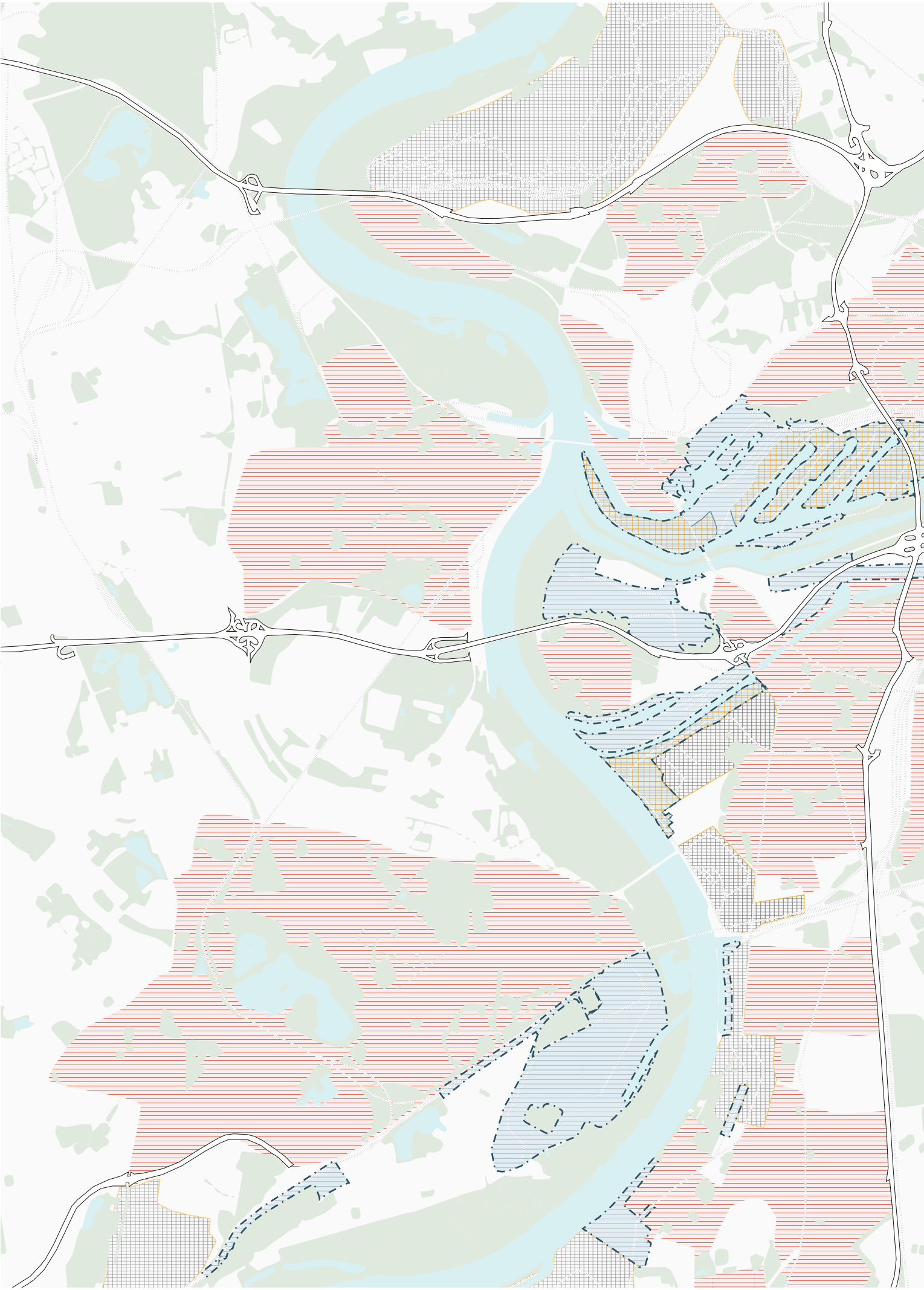
plementing constantly the regime of industrial ecology.

5 Who gives substance to this, which partnerships/programmes/initiatives are made?

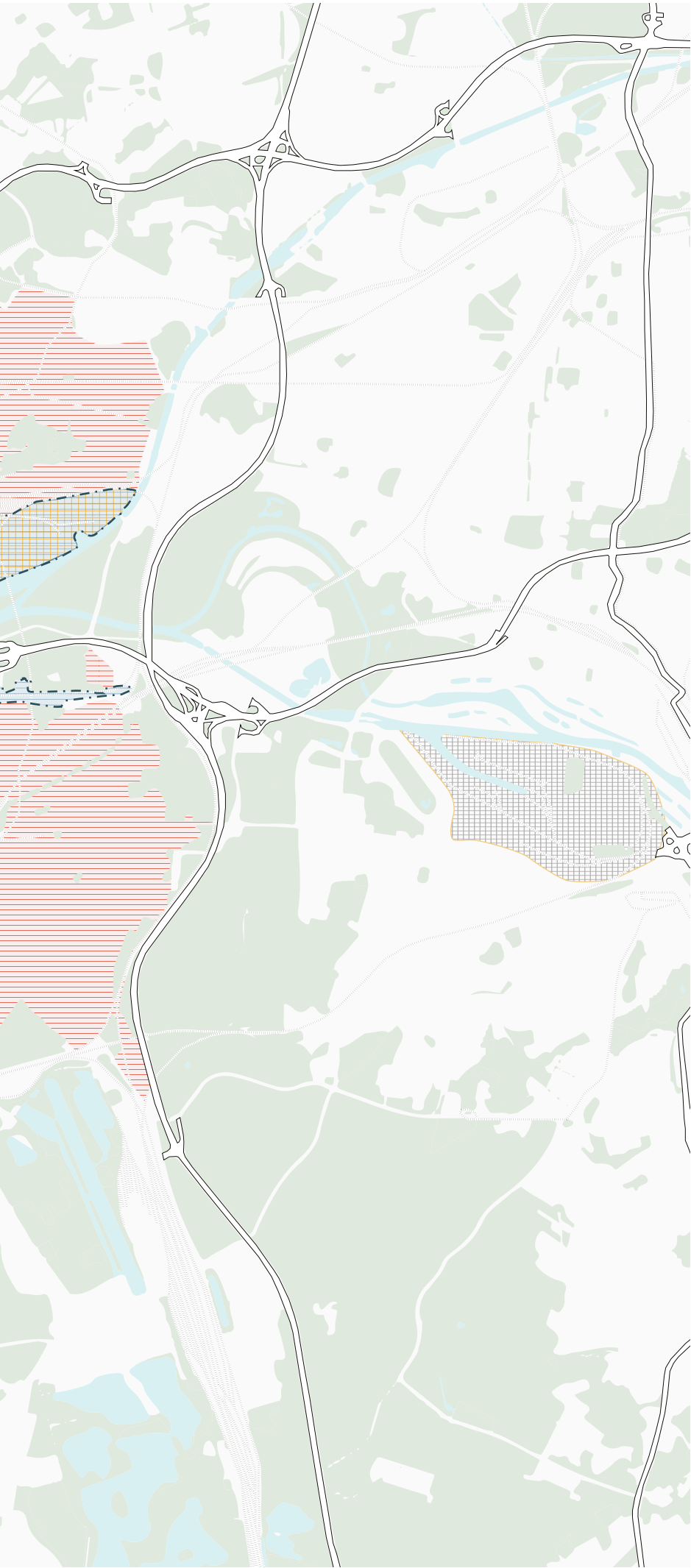
The port management started to strategies around different strategic location within the port area, which were providing differentiated ecosystem services. At the same time, many local logistic actors started to change working toward more sustainable way of actions. Sustainable logistic in part of the business model of “Duisport”, linking technical innovation and sustainable solutions starting to build up ecological transportation chains.

6 Is there already a discourse around cityports? (Yes/no) Who is behind it and what are the ambitions/motives?

Port authority stated to take specific measure to have a more comprehensive strategy toward a more sustainable port, starting build up a green network inside the port in order to filter pollutants and make a cooling effects; they also activate a series of water protection measures, in order to safeguard the quality of water and reuse wastewater. Furthermore, some directions have been set for the use of raw materials and work together with local actors in order to initiate a process of reductions of different kind of pollutions source. Moreover, the port built up its own solar panel system, supplying the energy by solar power to all the port area. “Duisport” is also tackling the transition from fossil-fuel base economy to a more environmentally friendly solution, by investing in LNG-based infrastructure. This was a result of a collaboration between the port of Duisburg and the RWE’s Supply & Trade, designing and installing a mobile fuelling station that a can be easily moved and relocated.



Duisburg



City

- City
- Planned waterfront development;
- Recent waterfront development; housing & services

Labelling Of City Ports

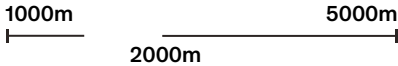
- Potential city port
- Defined as city port

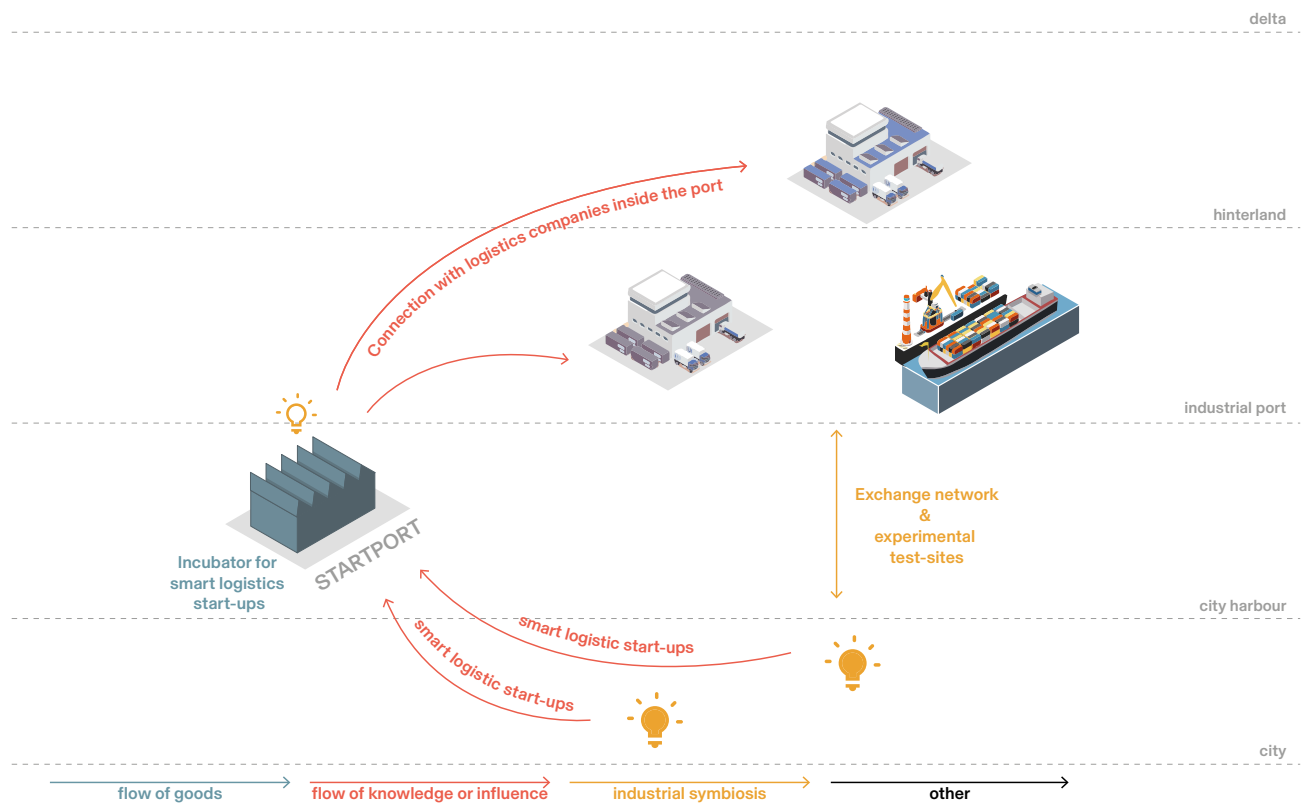
Industrial Port

- Port services (waterbound logistics, terminals, locks, ship repairs)
- Industries inside the port
- Vacant sites
- Expansion area
- Port limits
- Industries outside the port

Infrastructure

- Main trains
- Primary roads
- Canals (non-tidal water)





Why is this an interesting circular initiative for circular harbours?

What is the relation with the port and water?

The Start Port is collaborating with local companies and actors located inside the Duisburg port. There is a strong relation between the research and innovation that is carried out by these initiatives and the development of smart logistic on site. The start-ups are put in communication and in a continuous exchange with active actors inside the port.

What is the relation with the city?

The Start Port initiatives is located inside the city port, in an area that have been recently redeveloped into and mixed use space.

What are the ambitions?

The Start port ambitions are to get further in the development of new innovative solution in the logistic and supply chain filed. Having in mind that the logistic realm is in continuous change, they want to keep undated with the need and the issue that this field of work is facing in order to provide new solutions.

Who is behind it?

The platform is having different typology of partnerships with different companies and authorities. The Exclusive partners are the one that constitute the advisory board, they are part of the start-ups selecting team and lead the future projects. The Network partners are the one providing technical knowledge for the developments of the start-ups, by organizing workshops and coaching services. The Technologies partners offer, instead, technological support, by leading the start-ups in the best use of them for the projects and integrating them in the company's events and workshops. The Financial partners offer to the start-ups direct access to funding and venture capital companies, ensuring that the project receive the appropriate financial support.

Sources
www.startport.net

What is the timeframe?

Start Port was founded

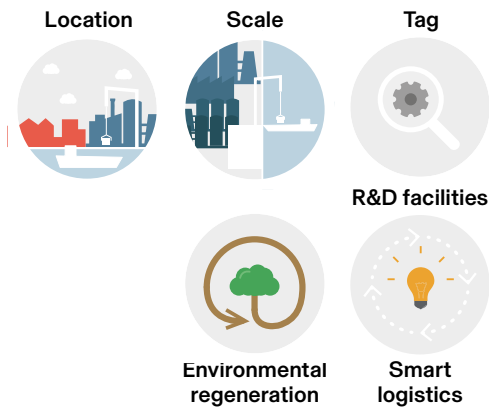


Start Port Head office



Partners involved in Start Port





What's happening? How does it happen?

The LEAN DeR is a joint research project developing multimodal LNG infrastructure for the Duisburg Port. The project develops an integrated and sustainable LNG logistic system, having as a test site the port of Duisburg, in order to shift to a sustainable mobility inside the port. The Demonstration project has the aim of create awareness and increase the knowledge for the use of LNG within the industries. The test will be carries out in Dual fuels operations and, in the same time just with LNG fuels, in order to experiment and develop a long-term business model for transition from fossil fuels to LNG fuels.

Why is this an interesting circular initiative for circular harbours?

This research project is developing new means of mobility inside the port in order to manage and support the transition from fossil fuel to more sustainable and ecological fuels. It is important to recognize the aim of this project to implement the smart logistic within the Duisburg port and in the same time enhance the innovation in the logistic field as a way to strengthening different collaboration within the port.

What is the relation with the port and water?

The LEAN DeR project is developing a system to transform the Duisburg port. In this sense, new typology of infrastructure will be made available inside the port, furthermore an LNG fuel station have been installed, with the aim of being a mobile fueling station providing for port vehicles the necessary support.

What is the relation with the city?

The use of LNG fuel is reducing on one side the operational port costs (estimated to -35%), together with the decrease of co2 emissions (estimated to -25%) especially when used in heavy vehicles with big energy requirement. In this sense the change in LNG infrastructure could have a positive impact on air pollution not only in the port but also in the city of Duisburg. Therefore the positive impact coming from the transition from fossil fuels to the LNG one can reflect also on the general environment of the whole city.

What are the ambitions?

The ambition of this research project is to support the transition in the port of Duisburg, from fossil fuels to more sustainable fuels. In this sense, the experimentation and the tests have been located inside the port in order to monitor and observe the efficiency and the emission of the new LNG vehicles. The aim of this research is to keep implementing the use of sustainable fuels within the port in order to have a more ecological logistic.

Who is behind it?

The research is carried out by the industrial partners as the Duisburg Port Authority and the RWE Supply & Trading, together with the Universität Duisburg Essen (UDE). The research has been funded by the European Fund for Regional Development (EFRE).

Sources

www.duisport.de/unternehmen/unsere-verantwortung/forschung-foerderprojekte/?lang=en
www.uni-due.de/mechatronik/forschung/leanderlng_en.php

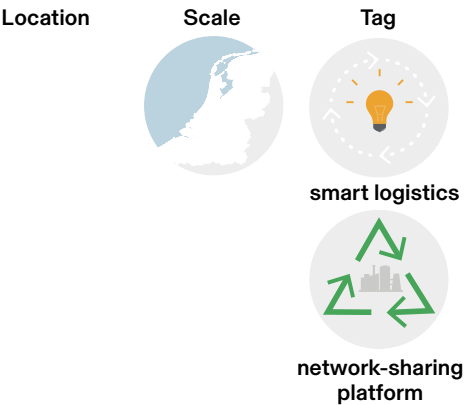
What is the timeframe?

LNG vehicle in the Duisburg Port



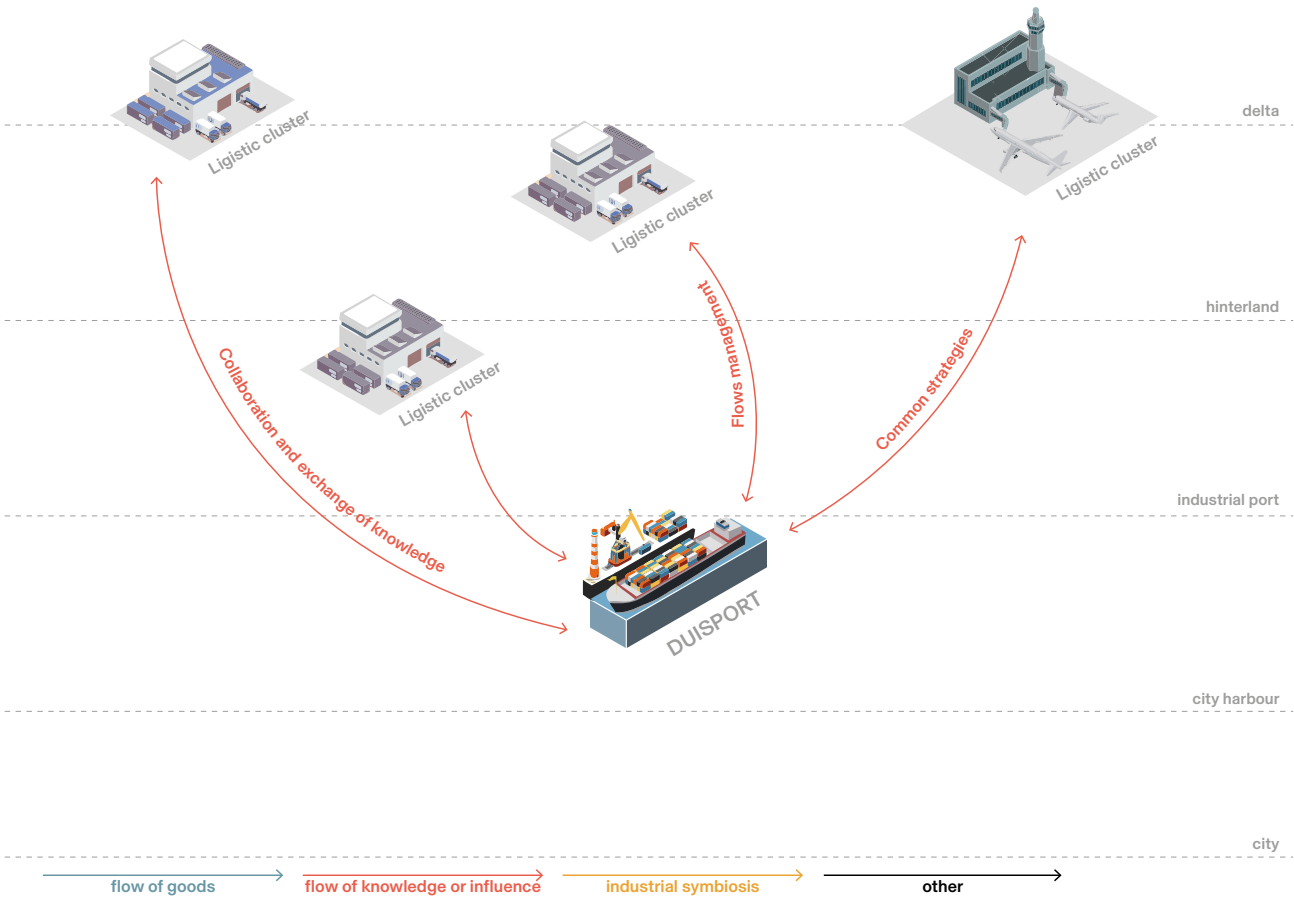
Partners involved in the Lean DeR research project





What's happening? How does it happen?

Usually Logistic cluster do add value in the region in which they are located, where a good presence of differentiated connections are present, and logistic platform together with freight volumes are in place. The CLUSTER 2.0 project is putting in connection different European logistic clusters and it is strategizing for a more efficient and sustainable model of interrelation. The Logistic clusters involved in the projects are: Zaragoza (PLAZA), Duisburg (Duisport), Lille (Dourges), Bologna (Interporto) or London (Heathrow). This platform is enhancing and increasing the intermodal connections between the ports. Furthermore, creating strategies in between of the clusters in order to be more efficient, it is possible to have transportation and handling costs improvement, together with reduction in emissions and energy loss. Why is this an interesting circular initiative for circular harbours? The cluster interrelation and connection are leading to the constitution of a general strategy generating common aims and goals to reach throughout collaboration. In this sense the setting of common strategy is leading the cluster to a more efficient but also sustainable functioning in order to be part of a bigger chain of collaboration.



What is the relation with the port and water?

The port of Duisburg is part of the network of the logistic clusters that the project is putting in connection. In this sense, at the local level the general strategy implemented by the project, is enhancing the intermodal transportation system, having the combination of rail and water ways put in relation and working together in the same location. Furthermore, experimentation of innovation solution for logistic are taking place in other clusters, bringing the results at the local level for the port of Duisburg. Moreover, one of the aim of the project is to enhance the already existing network of actors present at the local level, in this sense, the strategy for Duisburg is bringing to enlarge and straighten the network of collaborations already taking place. What is the relation with the city?

What is the relation with the city?

What are the ambitions?

The ambitions of the project are the integration of logistic clusters in order to constitute a general European strategy and synchro modal transportation network. At the same time, constituting a strat-

egy for low emission transport modes and strengthen freight management among the different logistic clusters. These ambitions can be reached thanks to the cluster cooperation along intermodal transport chains, together with the establishment of a dynamic platform in which could be possible to manage the cargo pooling and optimizing asset usage. Moreover, enhance the collaboration between the logistic cluster through the constitutions of differentiated services and building up new model for governance of smart logistic clusters.

Who is behind it?

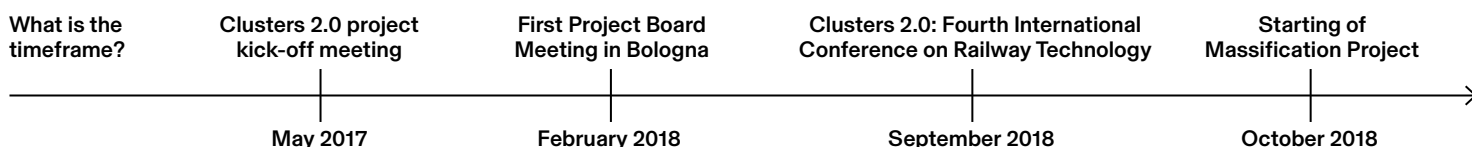
CLUSTER 2.0 is incorporating different typologies of organizations, that play different roles in the local specific context, and have expertise in the field of logistic, in order to create a complete collaboration and defining common goals. In the group of many actors behind this project many different distinctive roles and specific competences can be covered.

Sources

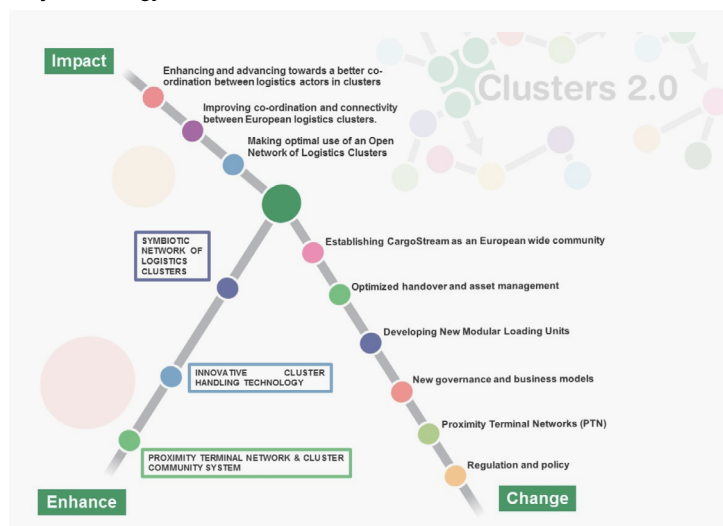
www.clusters20.eu

www.duisport.de/unternehmen/unsere-verantwortung/forschung-forderprojekte/?lang=en

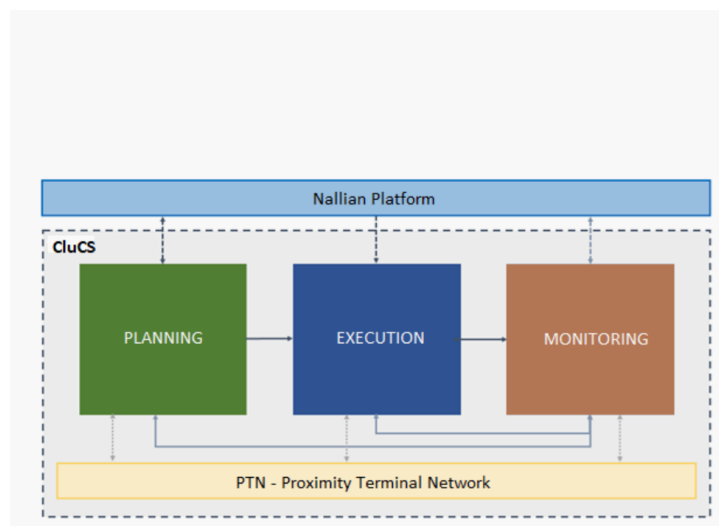
What is the timeframe?

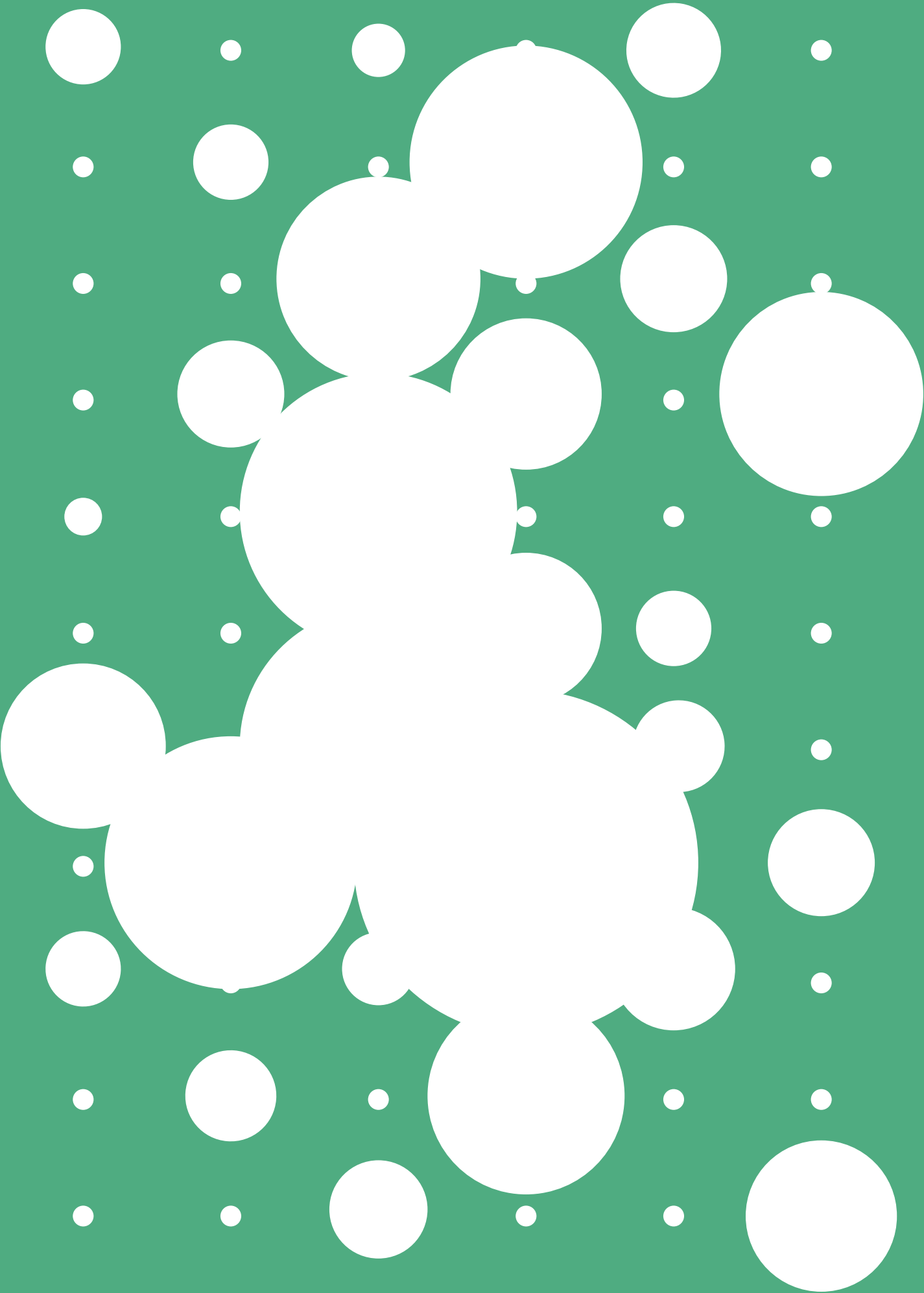


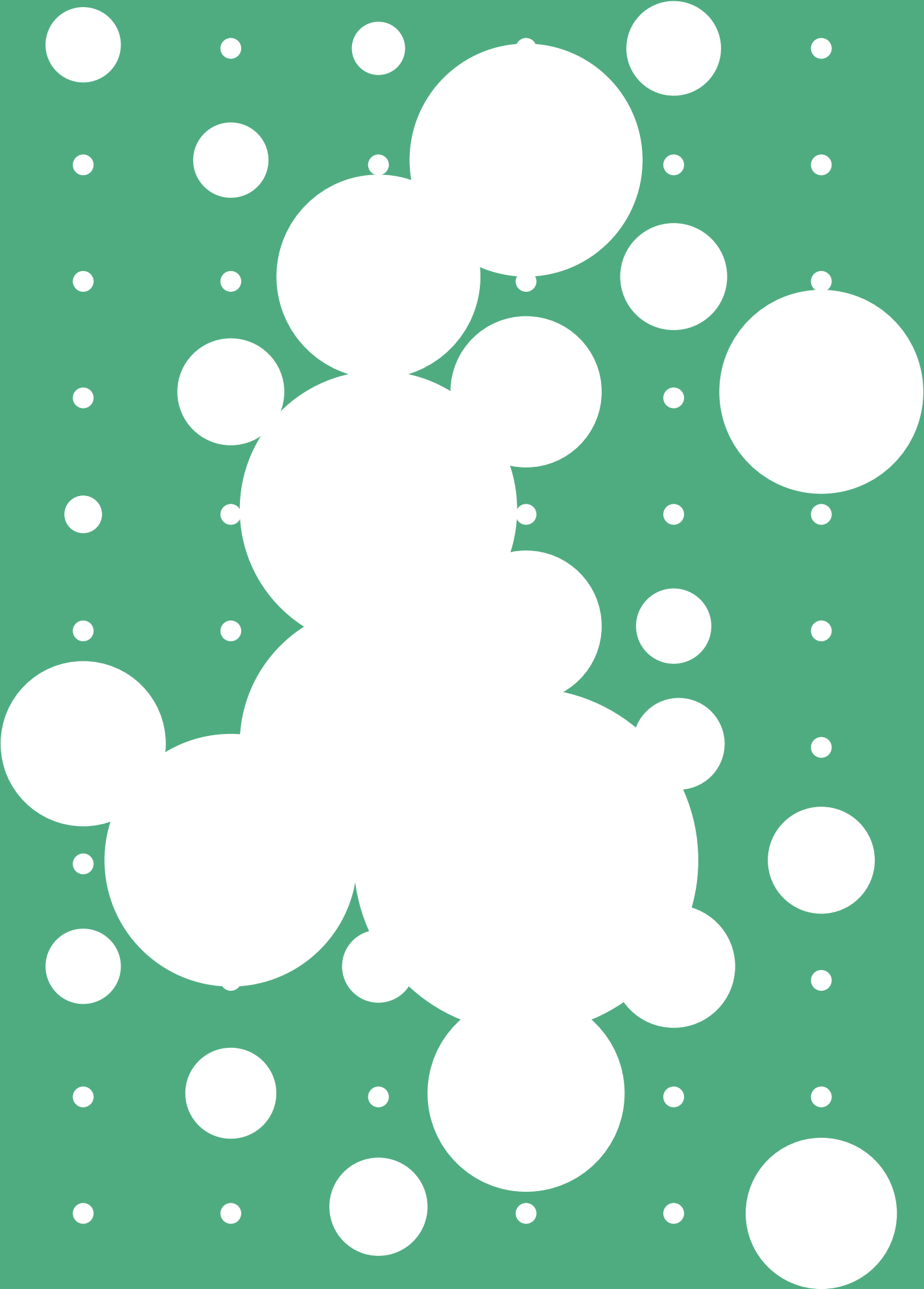
Project strategy



Cluster basic functional relations







1 Description of location in relation to other (sea/) ports

Dunkirk-Port is the commercial port of the new Nord-Pas de Calais Picardie Region, France's leading agri-food and agricultural region, the leading region for the railway industry and the leading region for the automotive industry. It is strategically located on the North Sea, 1h30 by boat from the busiest shipping route in the world (600 ships per day). It has an efficient nautical accessibility (2 maritime entrances, one of which can accommodate ships with a draught of 22 metres) and a large reserve of space. Located 40 kilometres from Dover in England, 10 kilometres from the Belgian border, close to the Lille metropolis, and situated in the centre of the Brussels / London / Paris triangle. One of the main strategies of the port of Dunkirk is the massification and fragmentation of goods in Europe. This territory therefore has strong industrial specializations and constitutes a crucial node regarding different flows (goods, capital). However, although the proximity of the largest European ports is a definite asset for the development of the port of Dunkirk, it is also one of its main weaknesses. The large flows received by the surrounding ports, particularly river ports, leave out the seaport of Dunkirk, whose hinterland is not very influential.

2 Description of current activities

One of the main activities in the port is the steel industry (Europe's leading steel centre). Moreover, the port of Dunkerque is also considered as a real energy platform: Europe's leading nuclear power plant in Gravelines operated by EDF (9% of nuclear electricity in France), the largest LNG terminal (EDF, Fluxys, TOTAL) in continental Europe (storage capacity representing 20% of France and Belgium's annual consumption); DK6 the 1st combined cycle gas turbine power plant in France (operated by GDF SUEZ), landfall of one of the world's largest subsea pipelines; the wind farm operated by TOTAL (notably the 1st installed in France in 1991); the largest French district heating network installed on an industrial heat recovery system operated by Dalkia; biofuel production sites and an industrial pilot for second-generation biofuels (BioTfuel)

3 Description demographic/socio-economic dynamics.

The city of Dunkirk is a maritime city entirely oriented towards the activity of its port, whose influence extends to the whole region. In 2017, it represents more than €3.9 billion in value added (including €300 million in direct value added) and more than 27,000 direct, indirect and induced jobs. It is the "real lung"

of the territory and the city's stakeholders are pushing for the reconversion of port wastelands in order to create jobs.

4 Why, and in what way is circularity looked at? Dunkirk and its port have undergone many upheavals: after the Second World War, 90% of the city was destroyed and the port was abandoned. The State decides and forces the massive industrialization of its strategic port area. Today, the Dunkirk territory, where industry still represents 1 in 3 jobs, has to face the economic crisis and the transformation of industrial activity. For several years now, the players in Dunkerque have been relying on their image as an innovative energy platform to attract potential investors. In addition, industries are willing to do anything to improve their economic income multiplying synergies between them. "There is not a facility that we are not trying to put into industrial ecology," says Stéphane Raison. For the Chairman of the Management Board of the Port of Dunkirk, bringing the companies of the port closer together is a real strategy to attract new businesses to the site, on the one hand, and to make the industrial fabric of Dunkirk stronger and more resilient on the other hand.

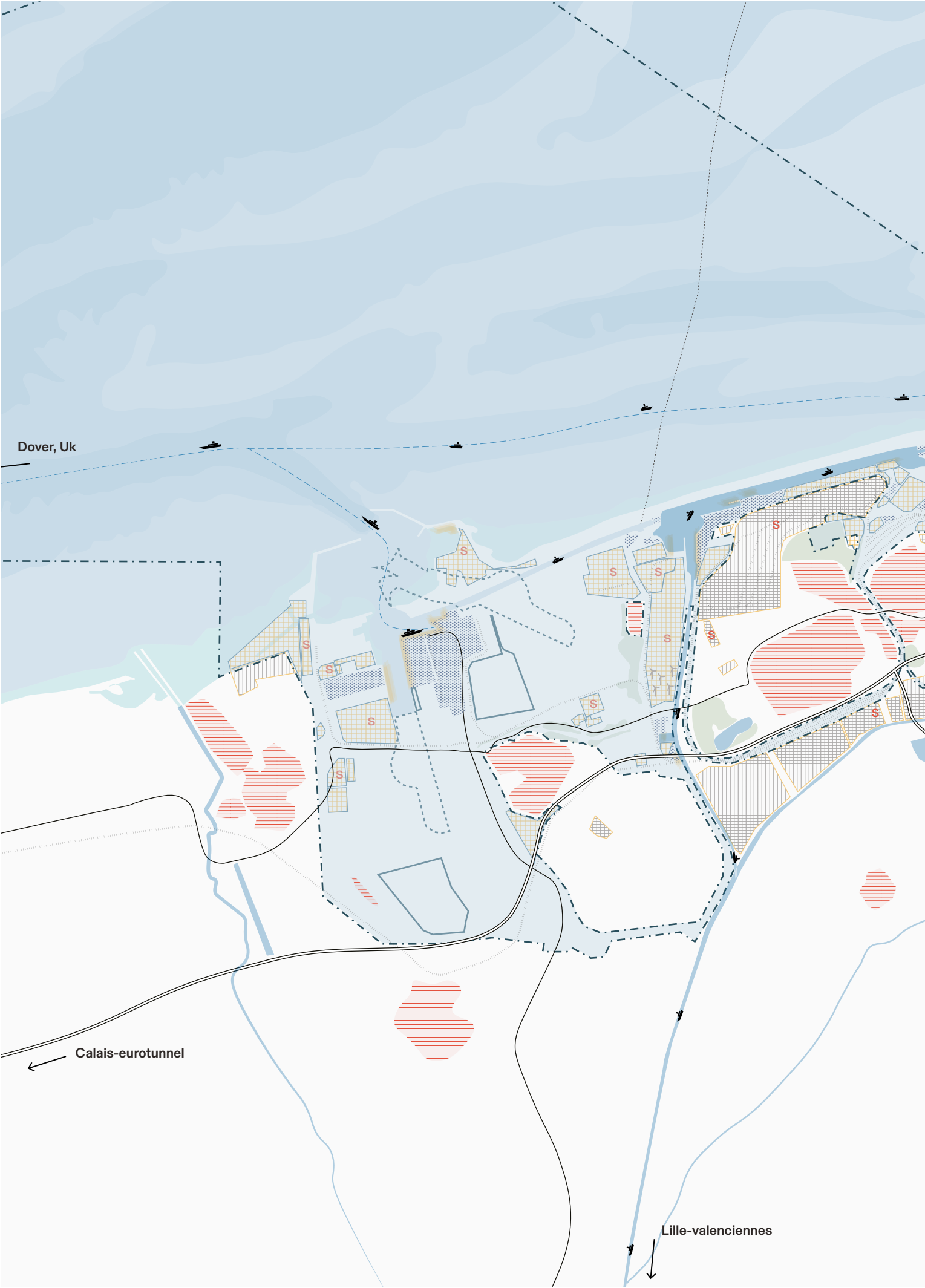
5 Who gives substance to this, which partnerships/programmes/initiatives are made?

In the Dunkerque port, the co-production from the various local industrial sites allow synergies between local manufacturers and attract more and more new companies. ArcelorMittal uses its steel gases from the DK6 combined cycle power plant (790MW) and also the heat from its blast furnaces in the Dunkerque heating network, which has been gradually developing since the 1980s. Managed by Dalkia, this network provides heating for a wide range of equipment and housing in the urban area (hospitals, urban community buildings, town halls, secondary schools, swimming pools and more than 6,000 homes), at a 15 to 20% lower cost for consumers. This example will soon be followed by other industrial local sites.

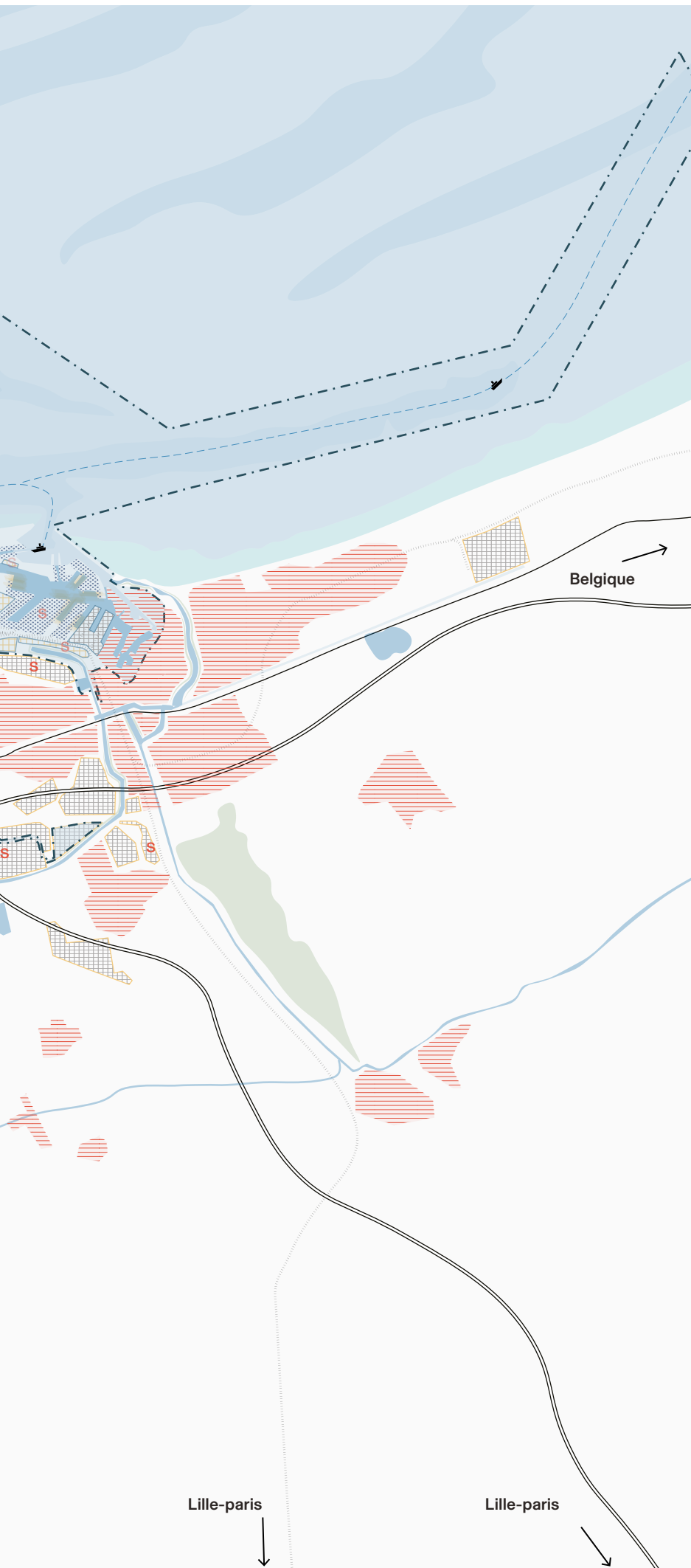
6 Is there already a discourse around cityports? (Yes/no) Who is behind it and what are the ambitions/motives?

The port and industrial fabric of the Dunkirk territory remains apart from any form of discussion. In fact, these 15 Seveso classified sites (high-risk industrial sites) do not allow the nesting of an urban fabric.

Following the closure of the shipyards, only the docks located in the urban heart of Dunkirk underwent reconversion as part of Operation Neptune in 1989, financed in part by European funds, and supported by the city, the Urban Community and the Autonomous Port.



Dunkirk



Industrial Port

-  Port services (waterbound logistics, terminals, locks, ship repairs)
-  Distribution
-  Industries inside the port
-  Vacant sites
-  Expansion area
-  Industries outside the port
-  Used quays (waterbound activities)
-  Future projects
-  SEVESO sites
-  Wind energy

City

-  City
-  Planned waterfront development
-  Recent waterfront development; housing & services

Labelling of City Ports

-  Potential city port
-  Defined as city port

Water

- 0m - 10m - 20m - > 20m
-  High tide

Green Structure

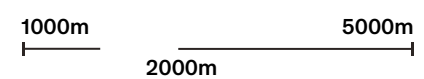
-  Green areas
-  Green quays

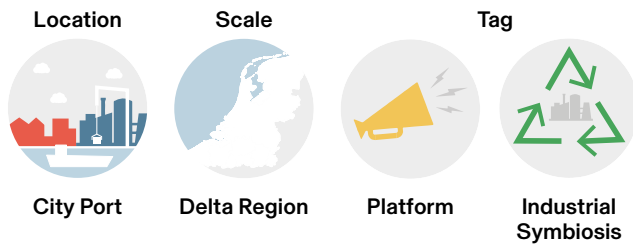
Boundaries

-  Port limits
-  Administrative limits

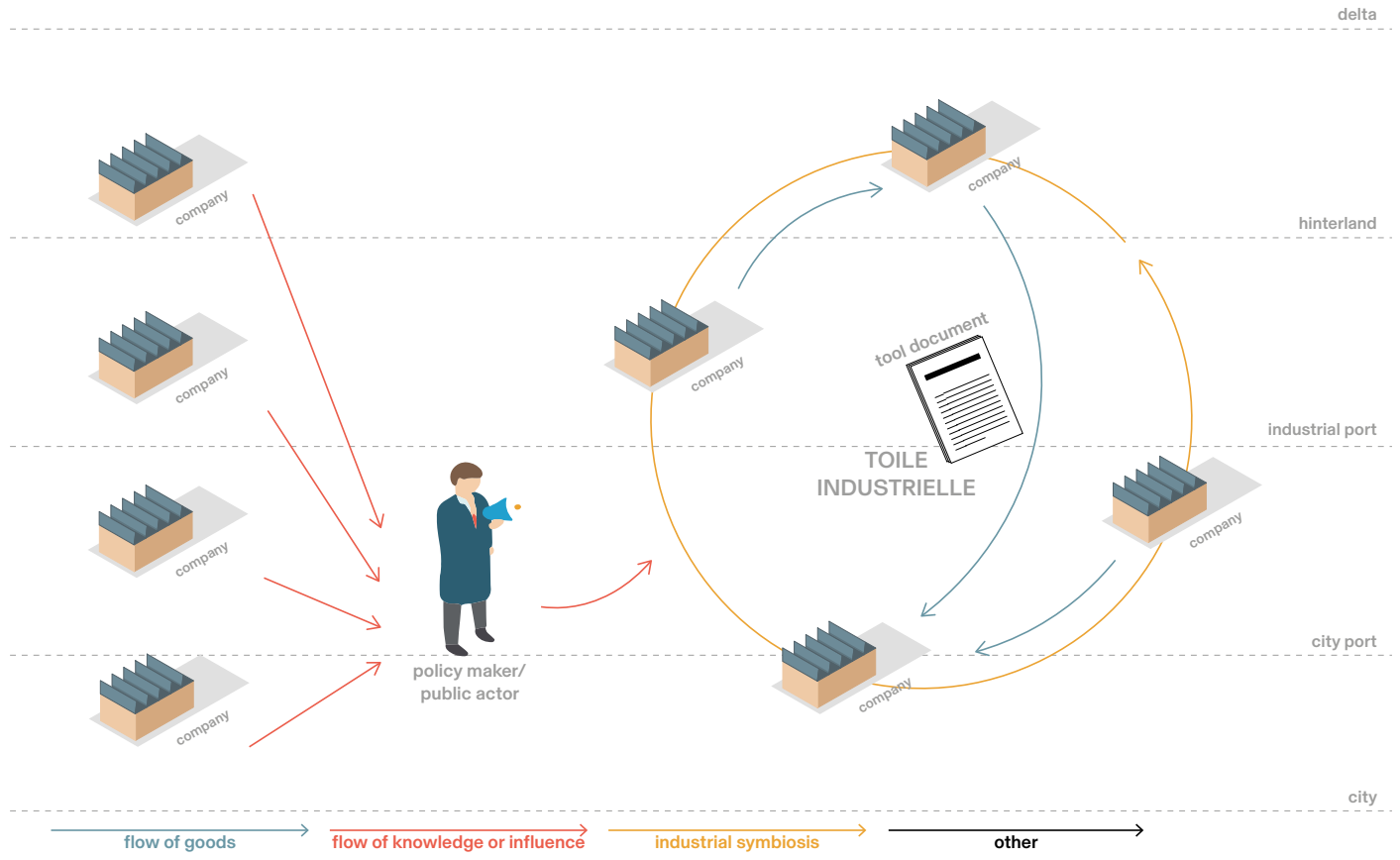
Infrastructure

-  Main trains
-  Primary roads
-  Secondary roads
-  Canals (non-tidal water)
-  Main waterways for classic ships
-  Main waterways for containers, ro-ro ships & bulk carriers





base for interaction scheme



What's happening? How does it happen?

Designed in the form of a flow diagram, the Toile Industrielle® maps the productive ecosystems in the Flanders-Dunkirk region with the goal of creating industrial links inside the region and between it and the neighboring regions. It describes companies by showing the inputs and outputs, their functional linkages and the extent of their local roots. This approach has many advantages: to understand better the interdependencies at play among companies; to identify the potential for territorial development; and to anticipate the impacts of changes on economic markets. "By connecting companies to each other, it is possible to avoid impairment losses, optimize the process of industries already established, reduce their costs and ensure their sustainability." Jean-François Vereecke, general director of AGUR.

Why is this an interesting circular initiative for circular harbours?

"Why does this company, based on our territory, work with the ports of Antwerp and Rotterdam - represented on the web - and not with Dunkirk?" For AGUR (Urban Planning and Development Agency of the Flanders-Dunkirk Region) this is the kind of question that should be asked when analyzing the productive ecosystems. The Toile Industrielle® helps indeed the decision-making process by simulating the foreseeable impacts that some decisions would inflict upon the territory. The Toile Industrielle® is used to look for new circular economy opportunities. In particular, it served as a basis for reflections on the use of iron and steel residues. According to the development agency, "it is the ideal tool to present the industrial ecosystem and the potential prospects of circular economy in the Dunkirk region". It is therefore mobilized during meetings with economic partners likely to invest locally.

What is the relation with the port and water?

The AGUR and the regional economic actors are at the origin of this tool. Because the Toile Industrielle® offers a territorial and schematic view of relationships between industries and their links with national and international markets it is also useful to investors in order to find potential suppliers, customers, and subcontractors. For some projects, it is even used to simulate new synergies, especially in the case of industrial sites.

The port of Dunkirk is one of the main users in the sense that it is a port strategy tool to capture new markets, observe the strategic positioning of competing ports, optimize access to utilities ...

What is the relation with the city?

The regional economic actors are at the origin of this tool: investors find it useful in order to locate potential suppliers, customers, and subcontractors. It also works as marketing support, used the wide use the regional development agency makes of it demonstrates.

It can also be used as a medium of cooperation between institutions, as it makes it possible to ensure the sharing of information, the seizure of opportunities and even the contracting of services and / or exchanges, for the benefit of the circular economy and industrial ecology.

What are the ambitions?

The participatory dimension of the Toile Industrielle® is one of the most innovative. Indeed, the construction of such 'toile' or canvas requires a collaboration because

otherwise, it is difficult to assemble this type of data without crossing the expertise and knowledge of each other. The powerful synergies between the port, the local authorities, and other local actors make it possible to see Dunkirk as a favorable breeding ground. Today, this approach, mainly carried out by municipal planning agencies, is in full development as new experiences in Le Havre, Saint-Nazaire, Grenoble, Besançon... reflect.

Currently, the Toile Industrielle is continuing its digital development with the creation of the Web 3.0 "TOILE MAKER®".

Who is behind it?

During the 2008 crisis, the Urban Community of Dunkirk (CUD) decided to anticipate the domino effects of industrial site closures that were looming on the horizon. It asked AGUR to map the productive ecosystems present in the region as to support the negotiations related to eventual shutdowns -like in 2009, when the government announced the cessation of refining activities of Total. The trade union seized the canvas and, by clearly displaying the synergies existing around the refinery, it made it possible to grasp the disastrous repercussions, in the first place the Port which would lose 15% of its turnover and 17% of its activity.

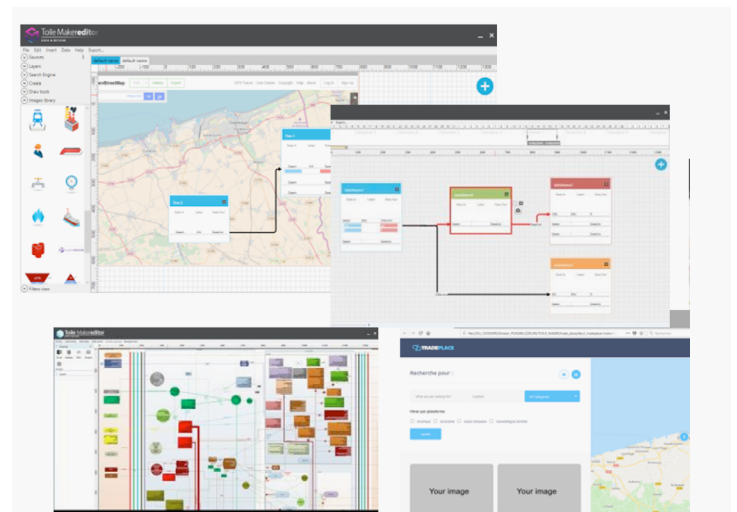
Sources

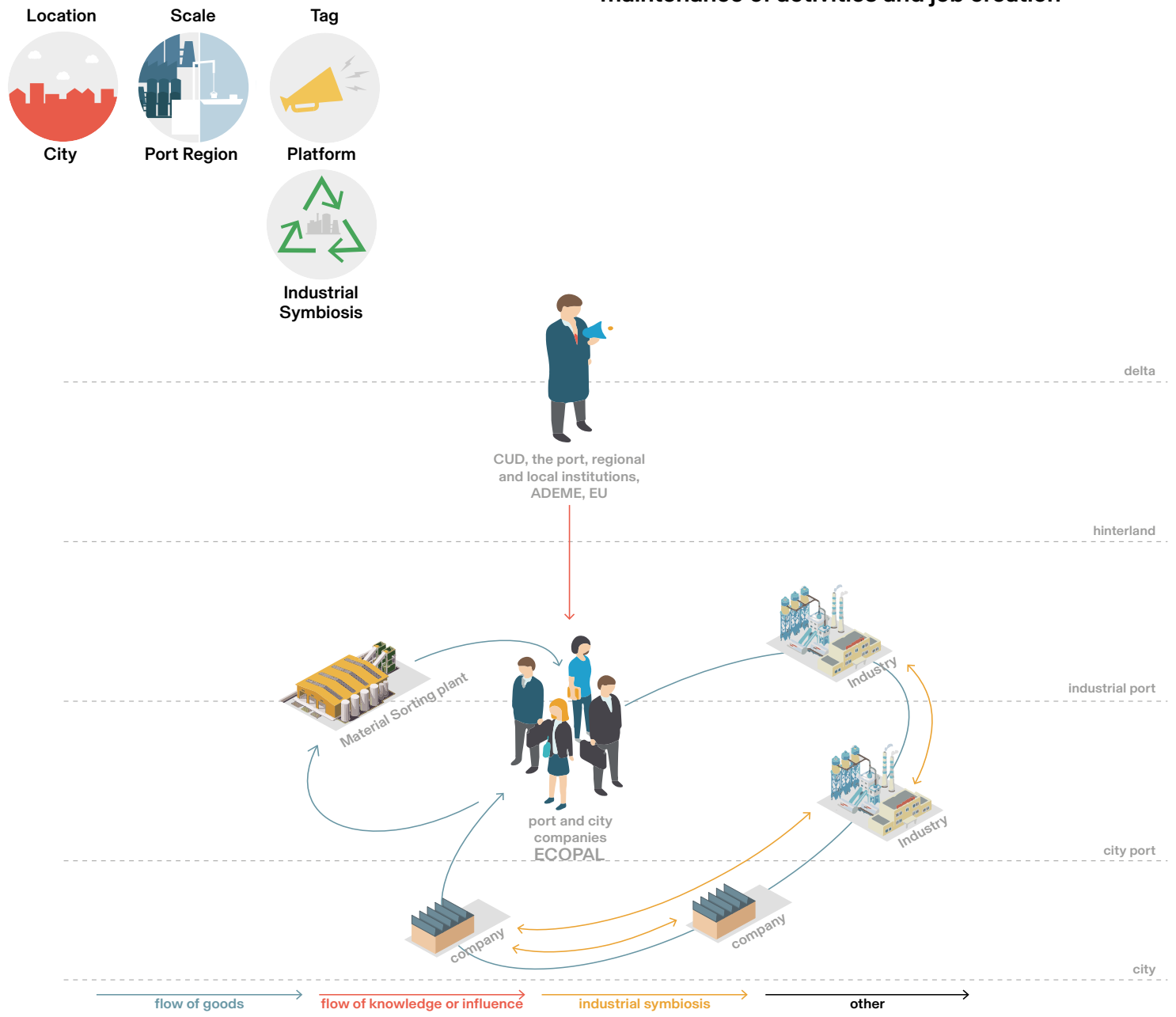
www.agur-dunkerque.org/etudes-projets/article13
www.toilemaker.com/press/

The Toile Industrielle® of Dunkirk basin in paper format 90×120cm



The Toile Maker® in digital format by the Possibilizzeurs





What's happening? How does it happen?

The ECOPAL network (Economy and Ecology Partners in Local Action) includes 480 members, large companies, SMEs, associations or individuals. It supports and offers services to member companies to guide them towards new, more environmental economic models inspired by the circular economy and industrial ecology. The two principles that guide their work are mutualization (optimize the means of collection, transport, and treatment thanks to joint management) and substitution (waste from one customer becomes the raw material for the other customer).

Why is this an interesting circular initiative for circular harbours?

After several years of experimentation with pooling services such as waste collection and other services like improving area signage, ECOPAL decided in 2007 to carry out an Inventory of Industrial Material Flows (IFIM) to identify more broadly the potential and opportunities for synergies between companies. Today it saves 22 tons of CO₂ and more than 210.000€ per year. It recycles about 250 tonnes of waste through a total of 79 collections per year. According to ECOPAL, their approach allows companies to:

- Increase knowledge of waste and material flows
- Apply industrial and territorial ecology
- Preserve the resources that are present within those companies and territories

What is the relation with the port and water?
The industrial actors are at the origin of this approach. The port as an industrial area where many of the companies attached to ECOPAL are located plays a dominant role in the association.

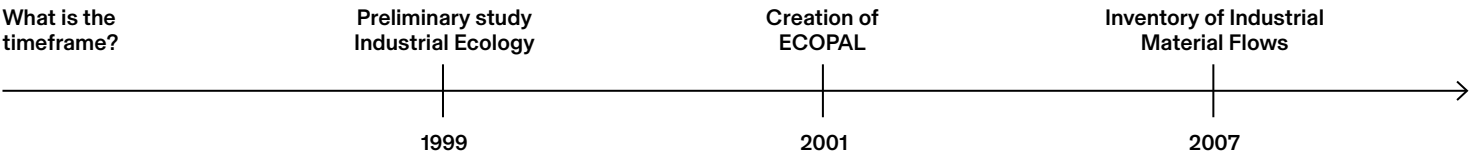
What is the relation with the city?
Ecopal aims at large port industrialists as well as small and medium-sized companies located in nearby towns or even unipersonal light manufacturing companies.

What are the ambitions?
With numerous mutualisation and substitution synergies, Ecopal is now a reference for French industrial ecology projects. Since 2014, the association has been involved in four new projects: the recovery of “refractories” identified in the region (e. g. bricks); the recovery of local fibrous materials for the benefit of local industries; the experimentation of local

recovery of printing cartridges by the Combini consortium (15 manufacturers); and the expansion of the number of participating companies as to diversify the flows and possibilities for synergy.

Who is behind it?
Ecopal was created in 2001, following a preliminary study conducted in 1999 in Grande-Synthe to determine the interest of applying the principles to the industrial ecology. It became one of the first industrial ecology associations to appear in France and a pioneer in the field. Even though Ecopal is a non-profit association created by and for companies in the Dunkirk basin, it receives financial support from public partners :

Sources
www.ecopal.org
www.communaute-urbaine-dunkerque.fr

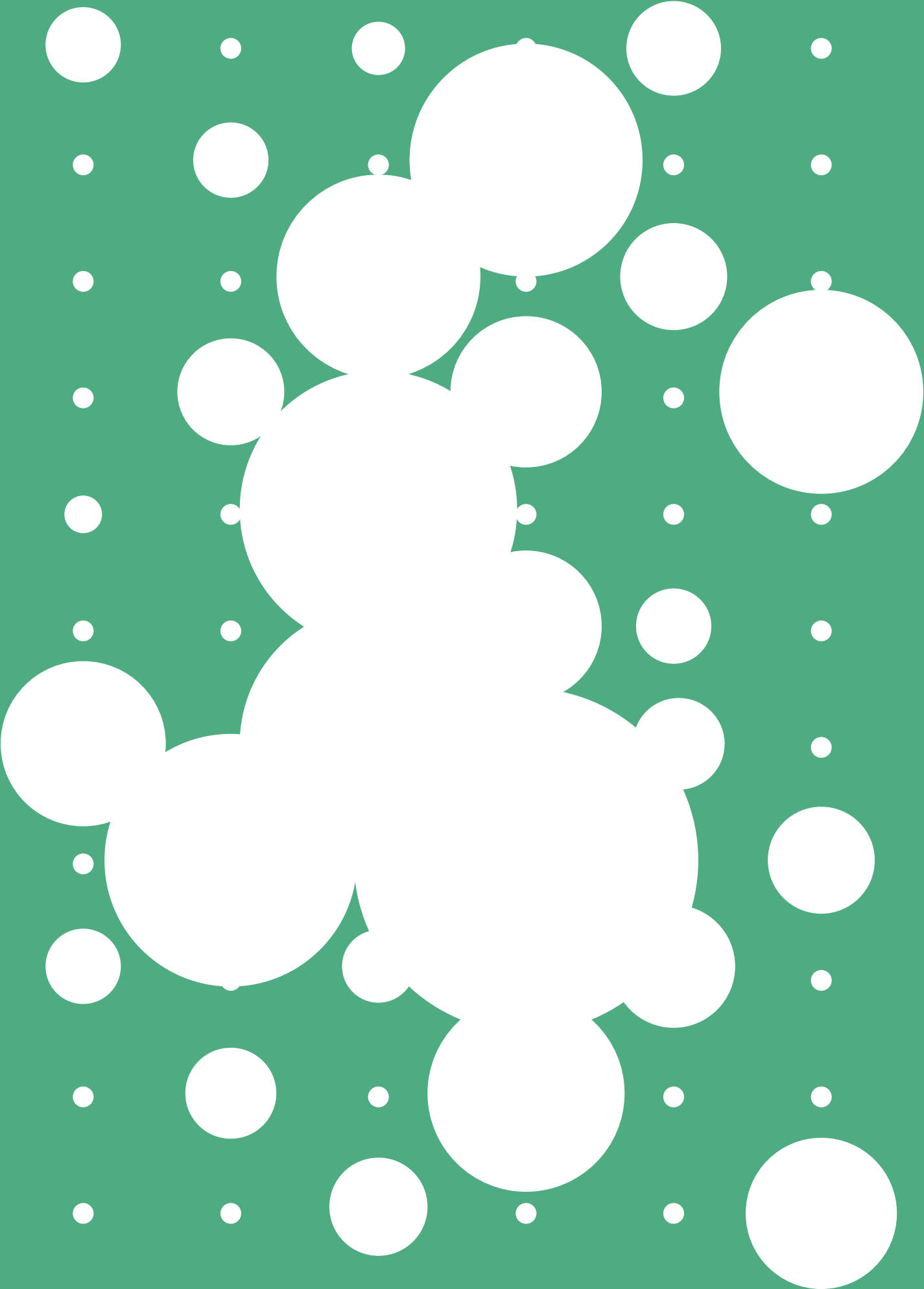


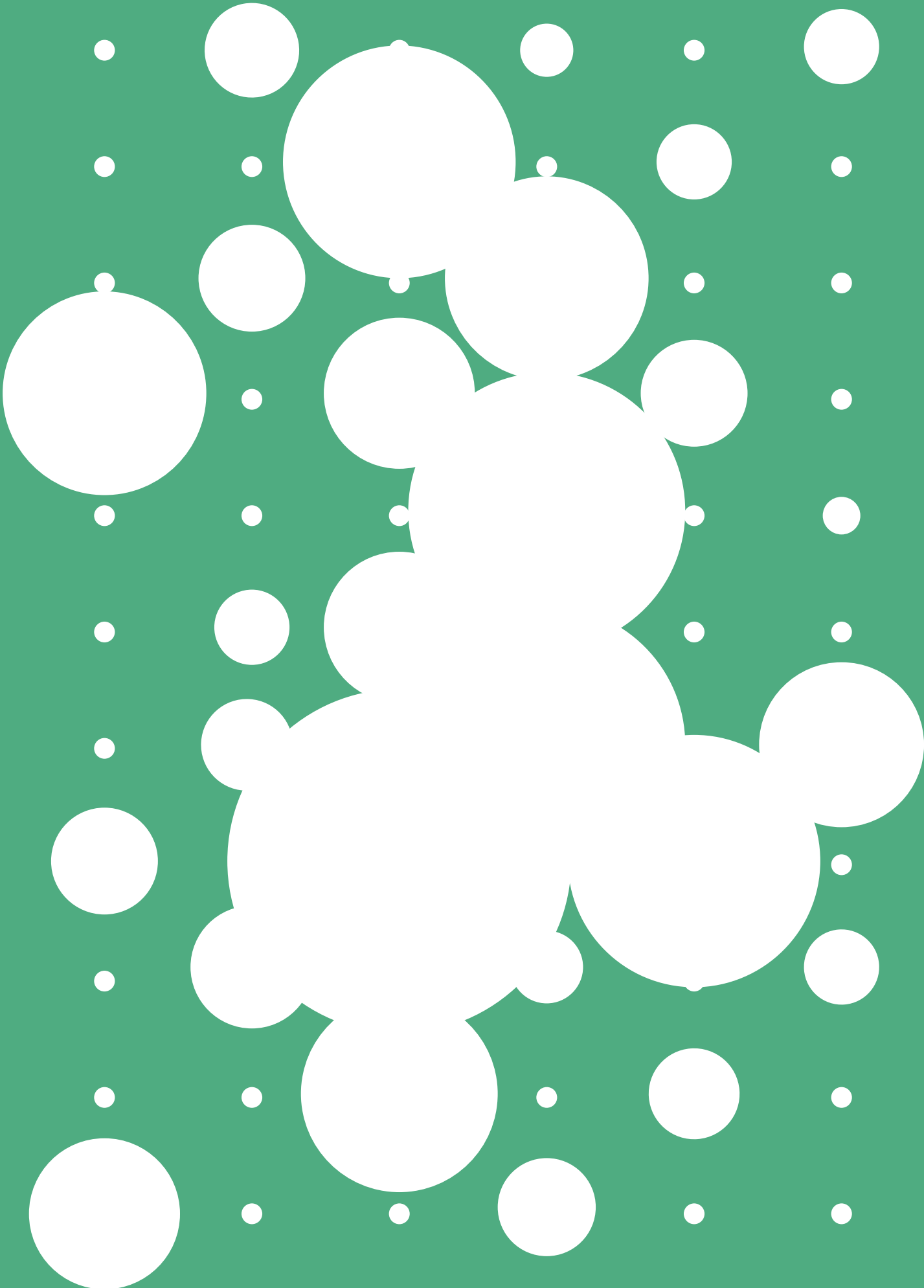
Inventory of Inbound and outbound flows of the company

Annexes				
Flux ENTRANTS de votre entreprise				
Désignation	Procédé	Quantité	Unité	
Eau			15	salaries
Composants Associés	Taux			
Eau potable	100%			
Electricité				
Composants Associés	Taux			
Electricité	100%			
Papier				
Composants Associés	Taux			
Papier	100%			
Matériel électronique et informatique				
Composants Associés	Taux			
Matiere plastique & polymere	50%			
Métal	20%			
Autre corps pur ou composé	30%			
Verre				
Composants Associés	Taux			
Verre	100%			
Palette en bois				
Composants Associés	Taux			
Bois	100%			
Plastique				
Composants Associés	Taux			
Chlorure de polyvinyle	100%			

Grouping, regional pre-treatment and national recovery of materials







1 Description of location in relation to other (sea/) ports

The port of Hamburg is a seaport located on the Elbe river, and it is third busiest port in Europe (in terms of TEU throughput). This port represents a crucial node for transshipment and warehousing, due to its strategic location. The Hamburg port has also an important role regarding the cruise dynamics, in fact, from Hamburg many international routes start. Furthermore, the port represents an important source of employment in the areas (5-10%) and value added.

2 Description of current activities

The main activity taking place in the port of Hamburg is related to container traffic, cargo and container throughput. It is specialised, moreover, in dry bulk materials, it also plays an important role in the short sea shipping dynamics. Hamburg port is part of an international network of ports, playing a key role, building up new connections and exchanges.

3 Description demographic/socio-economic dynamics.

In contrast to many other ports, which grew out of the city, after which they were named, Hamburg has remained a port city until today. Harbour and city are interwoven.

4 Why, and in what way is circularity looked at?

The port authority wants a modal shift, to make every transport mode more sustainable. Energy transition is a key environmental strategic topic and the Hamburg port authority is committed to the initiative SmartPost for a reorientation of energy use at the Port of Hamburg. The port authority is promoting more environmentally friendly mobility. Furthermore, in order to reduce energy consumption, some investments toward a shore-power-supply infrastructure have been done, Hamburg is the first port in Europe to utilise power barges as shore-power facility for

ships.

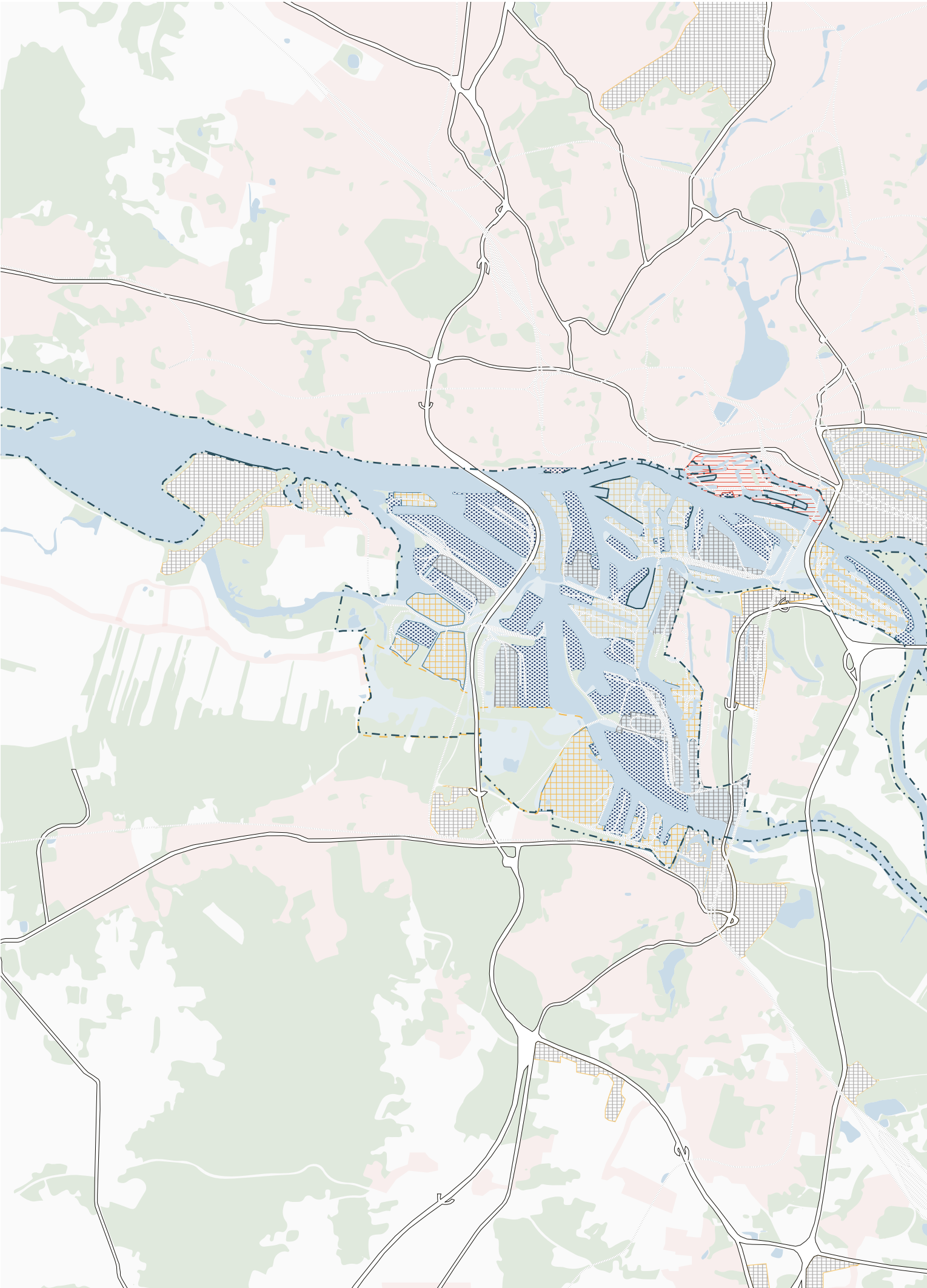
The port authority is also giving the freedom to each single owner to use their own self-generated power, managed by a common energy management system. The port authority has been investing in an additional strategy, investing in e-vehicles for the port logistic, developing the specific infrastructure needed.

5 Who gives substance to this, which partnerships/programmes/initiatives are made?

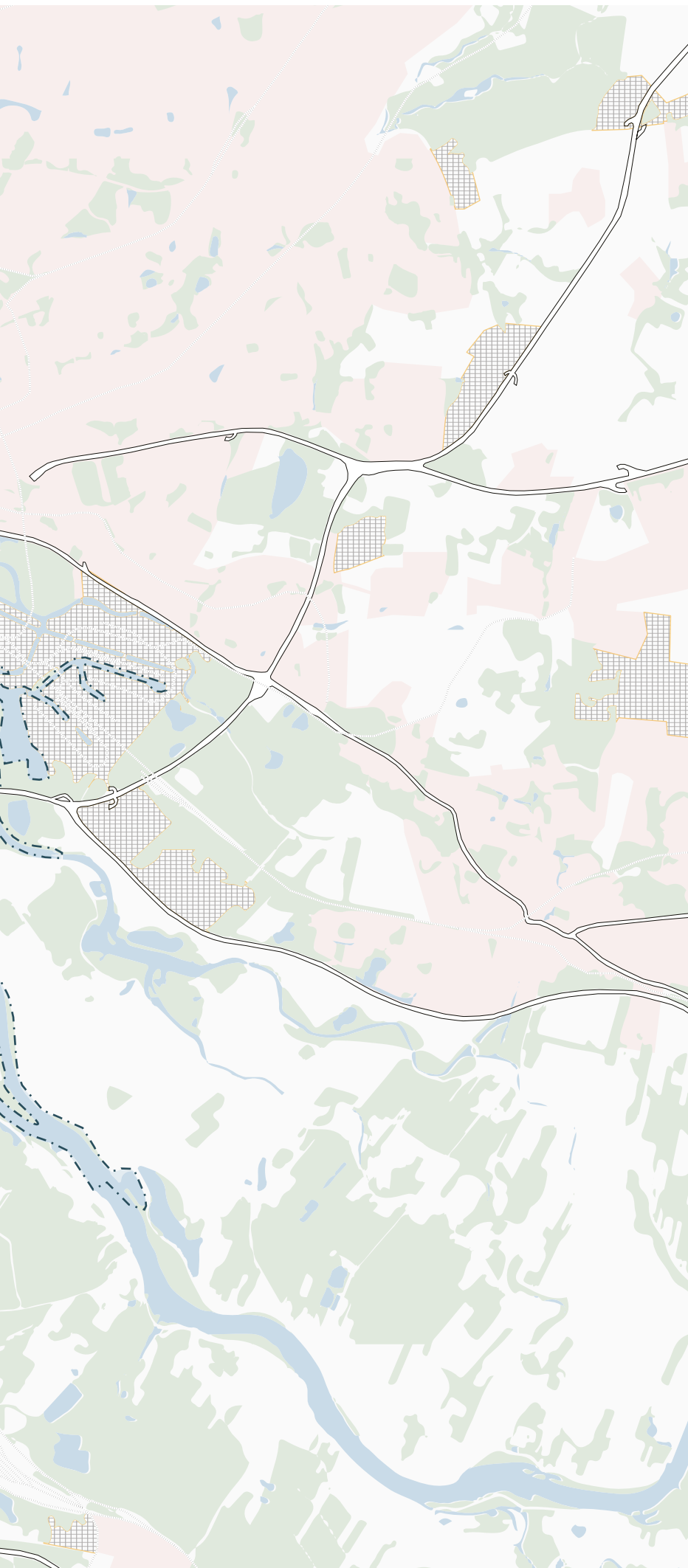
The development of more sustainable and circular initiatives in the port of Hamburg have been mostly sustained by the port authority. They are providing different type of incentives in order to start a transition toward sustainability and circularity. In this sense, the Authority is redeveloping many of the port systems and infrastructure and in a more sustainable way, as a starting point. Furthermore, in order to build a stronger exchange between the city and the port, and the citizens and the production activities, they build up a common agenda, which in taking into account common issues to be tackled, constituting common strategies for the city and the port.

6 Is there already a discourse around cityports? (Yes/no) Who is behind it and what are the ambitions/motives?

In the port of Hamburg many former port areas have been used for larger waterfront development, following a more general European trend. The main example of this dynamic in Hamburg is the "Hafencity" project. It is important to highlight in this case the need for land-use planning, that is keeping industrial activities also in those "left-behind" spaces. The port Authorities are well aware of this imminent need, and they are already looking at new governance mechanisms in order to keep productive activities in the city and not sub-urbanise the rest of the areas surrounding the port



Hamburg



Industrial Port

-  Port services (waterbound logistics, terminals, locks, ship repairs)
-  Distribution
-  Industries inside the port
-  Vacant sites
-  Expansion area
-  Industries outside the port
-  Used quays (waterbound activities)
-  Future projects
-  SEVESO sites

City

-  City
-  Planned waterfront development
-  Recent waterfront development; housing & services

Labelling Of City Ports

-  Potential city port
-  Defined as city port

Water

- 0m - 10m - 20m > 20m
-  High tide

Green Structure

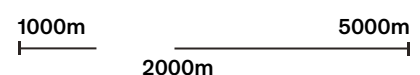
-  Green areas
-  Green quays

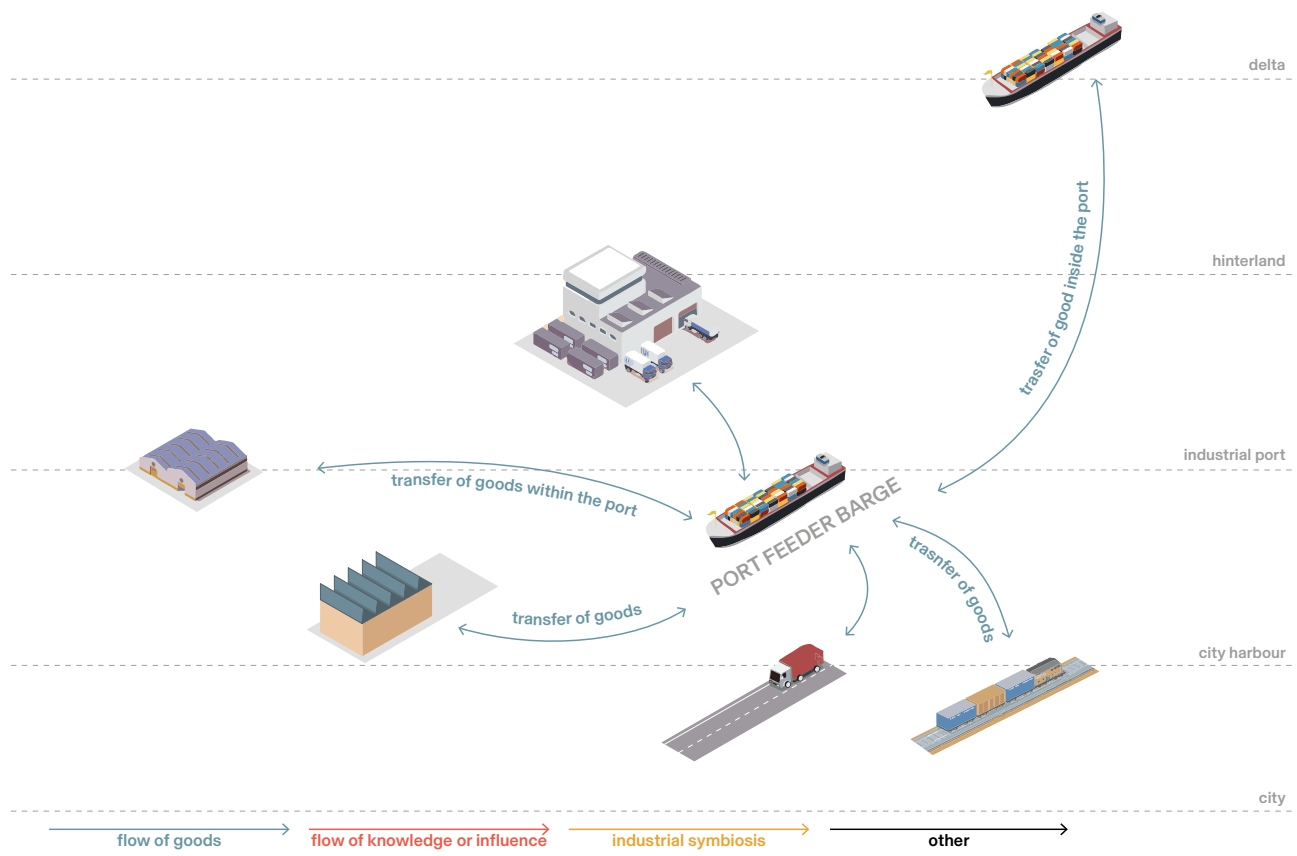
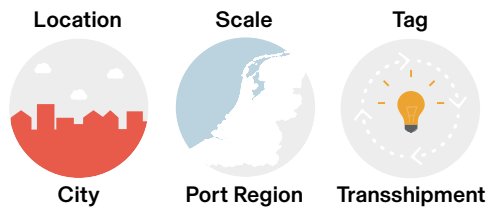
Boundaries

-  Port limits
-  Administrative limits

Infrastructure

-  Main trains
-  Primary roads
-  Secondary roads
-  Canals (non-tidal water)
-  Main waterways for classic ships
-  Main waterways for containers, ro-ro ships & bulk carriers (> 20m of draught)





What's happening? How does it happen?

The port Feeder Barge can be considered a green logistic innovation, in fact this boat typology will make the internal container logistics of the Port of Hamburg more efficient and at the same time significantly more climate-friendly. This means of transportation is an alternative through water, for the movements of the containers between the companies and the port, that usually are carried out by trucks. In this sense, this boat can act as a floating terminal, for the bigger cargo ships that are not able to enter in the port, and in the same time, it can work as vessels for the inland water ways, in order to substitute all transportation by trucks.

The Port Feeder Barge concept is a self-propelled

container pontoon equipped with its own container crane mounted on a high column.

Why is this a interesting circular initiative for circular harbours?

What is the relation with the port and water?

The Feeder Barge can be considered a service port that goes through waterway, its main goal is to better the logistic inside the port and inside Hamburg, in a more environmentally friendly way.

What is the relation with the city? Hamburg is a city with high level of air pollution, one of the future goal that city wants to reach is to work on air quality, the Port Feeder Barge is part of a more comprehensive strategy that the port authority and the City of Hamburg have planned in order to low the air pollution level also by lowing the trucks transportations and finding a more green mobility inside the port.

What are the ambitions?

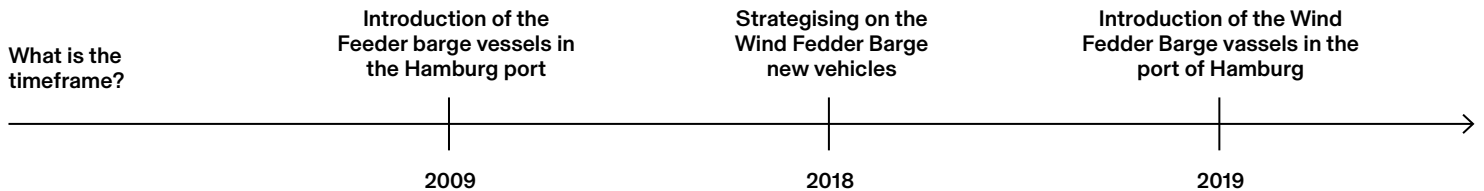
Wind Feeder Barge is a new specialized vessel to carry the voluminous and heavy components for offshore windfarms from their production sites to the assembly port, especially on inland waterways and alongside the coast. This new vessel can start to make also easier and more ecofriendly and the pre-assembly process and the transportation of big parts for offshore constructions.

Who is behind it?**Sources**

www.portfeederbarge.de

www.portfeederbarge.de/files/3163/upload/pfbconceptgen.pdf

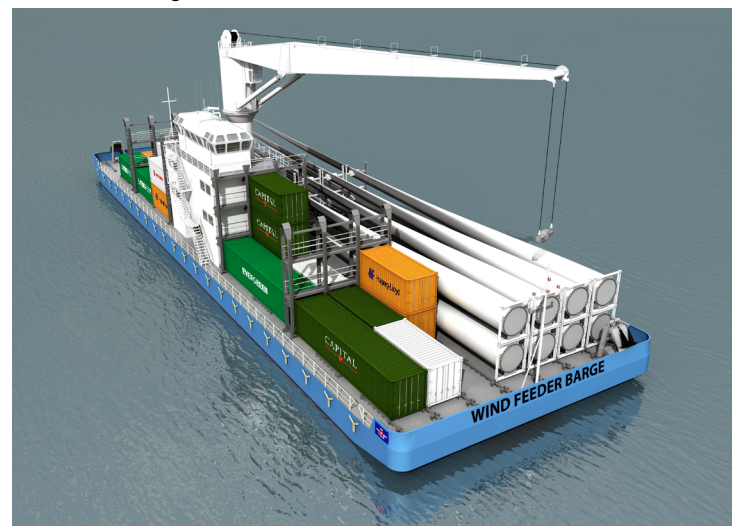
www.portfeederbarge.de/files/3163/upload/Greenport%20Autumn%202018_Lo-Res%20FILE.pdf.pdf

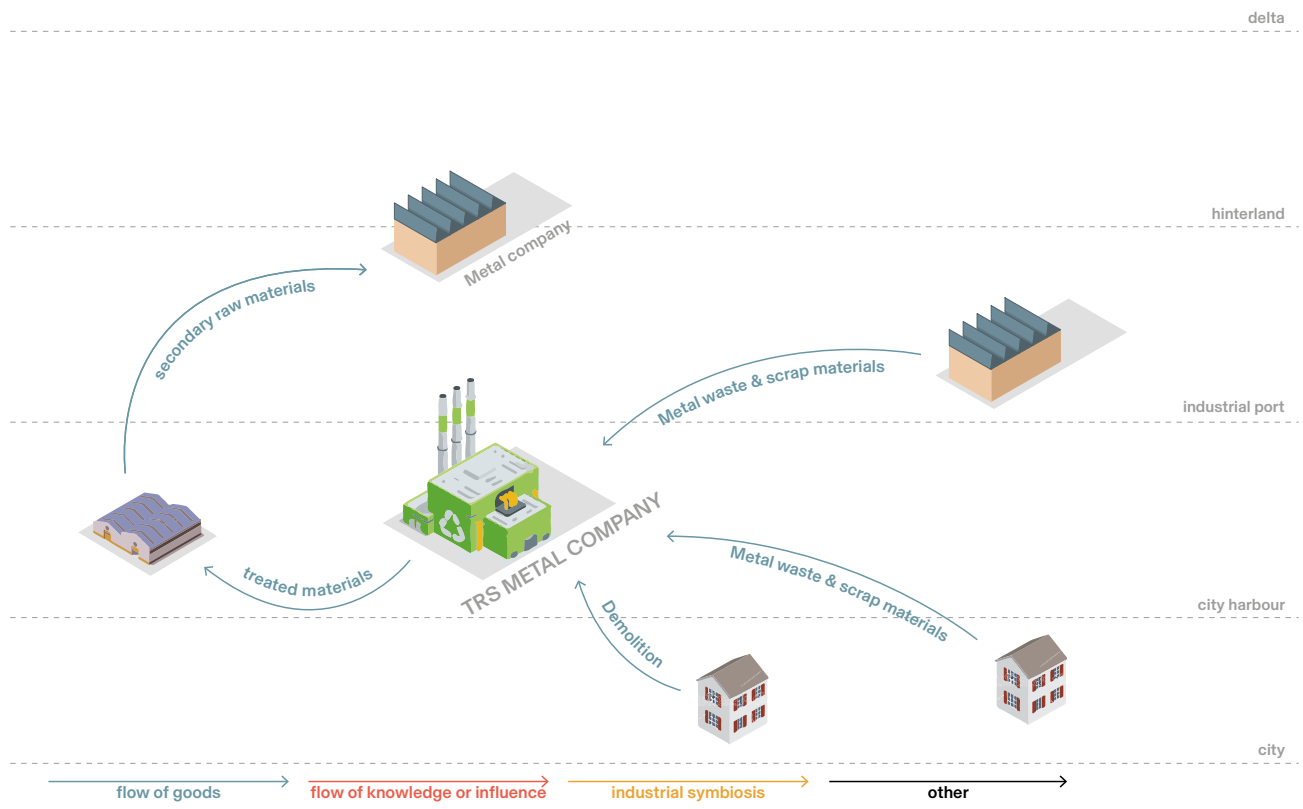
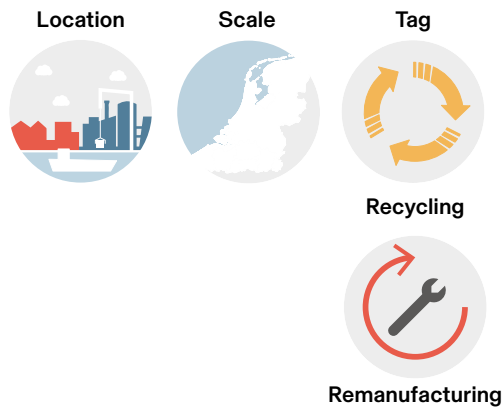


Port feeder Barge vehicle



Wind Feeder Barge vehicle





What's happening? How does it happen?

The TRS company is recycling scrap materials and in the same time remanufacturing metal materials. They are collaborating both with private and public actors, in order to provide a series of services, relating to collecting, providing and selling scrap materials. The company is specialized in the recycling of Ferrous and non-Ferrous materials, in order to produce new secondary raw materials, but also remanufacturing metal products. They are collecting metal waste from big and large companies in the harbor

and in the same time, collecting waste from private households and commercial activities.

Why is this an interesting circular initiative for circular harbours?

The metal recycling operation close the loop between the producers of scrap metal and the one that would like to reuse it, this create a strong circular connection in the harbor with other companies, and in the same time also with the city.

What is the relation with the port and water?

Transportation of scrap materials is happening also by water, in this sense, being located in the harbor is relevant under a strategic but also logistic point of view.

What is the relation with the city?

In collaboration with the public authority the TRS company is collecting scrap materials and metal waste from the city. The company is also providing a series of smaller service from private households on the company site, like for example car demolition and dismantling. Furthermore, for commercial activities also located in the city they provide service for scrap material collecting. Relevant, in this sense, is the role the TRS company plays in closing the loop between city waste stream and reuse of recycled materials from the companies in the harbor.

What are the ambitions?

Who is behind it?

The TRS company is part of the REMONDIS group, which is one of the world's largest recycling, service and water management companies, working within these field with the concept of innovation for the future. The REMONDIS group has a long history in working in the field of recycling together, having smaller branches spread in four different countries.

Sources
www.tsr.eu
www.remondis.com

What is the timeframe?

TRS Recycling
was founded

REMONDIS wins the
GreenTec Award 2016

1890

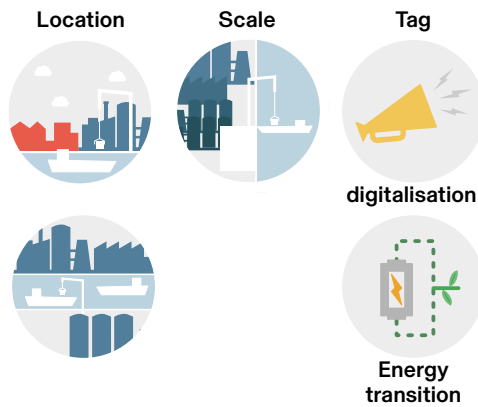
2016

Scrap materials collections plant



Transportation of scrap materials via water





What's happening? How does it happen?

In the port of Hamburg, the HPA (Hamburg Port Authority) changed and invested in a new control system based on digital intelligence which is guaranteeing more efficient operations. Thanks to the SmartPort philosophy the port is achieving sustainable economic growth trying to maximize the benefit for the people of the harbor and of the city and, at the same time minimizing the environmental impact. The port efficiency has been improved thanks to sensor for traffic flows and goods, the SmartPort logistic is combining economic and ecologic aspect in three different strategies: control on traffic flows, improvement of infrastructure and flow of goods. The HPA is promoting environmental friendly mobility within the harbor reducing the energy consumption limiting the dependence of the port from conventionally generated energy therefore reducing emission.

Why is this an interesting circular initiative for circular harbours?

The smartPORT project is focusing on streamlining operations within the Port of Hamburg and is aiming to build on the green energy strategy of the port as well as focusing on intelligent traffic and trade flows. One of the projects introduced by the SmartPort initiatives is the shore power from renewable energy, in fact this is letting the cruises that are arriving in the Hamburg port to be supplied by power sourced by renewable energy, furthermore the ocean-going vessels are supplied with electricity through a transformer station and a mobile transfer machine at the cruise ship terminal. Another strategy within the SmartPort project is focusing on innovative technologies regarding renewable energy, in which the HPA is also experimenting at the policy making level.

What is the relation with the port and water?

The SmartPort initiatives are initiated by the Hamburg port Authority (HPA) which is the public authority in charge for the management and the functioning of the port. These initiatives are born as a general strategy for the whole functioning of the port, trying to impro it from and economical end ecological aspect.

What is the relation with the city?

The strategic vision for the Hamburg port is having a direct impact also to the city of Hamburg. Strategizing on the port mobility is a direct consequence of more general and comprehensive problem in the regards of the city of Hamburg. This means that there is a string relation between the strategic vision and functioning of the city and the port, together with close collaboration of the different public authorities.

What are the ambitions?

The HPA wants to start a series of collaborations with private actors in order to implements the innovative technologies regarding the port mobility and infrastructure. The future of the Port of Hamburg is toward intelligent infrastructure for autonomous driving and AI for system support.

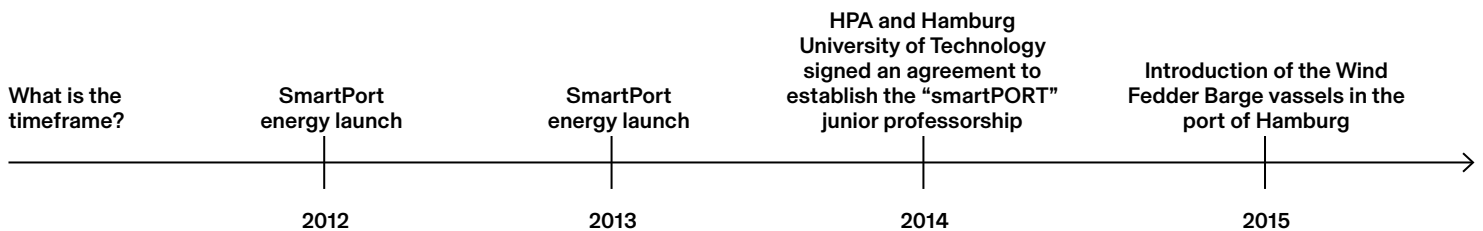
Who is behind it?

The SmartPort initiatives have been planned and proposed by the Hamburg Port Authority, following the guidelines and goals of the city of Hamburg public authority.

Sources

www.hamburg-port-authority.de/en/hpa-360/smartport/

www.governmenteuropa.eu/smart-initiatives-smartport-hamburg

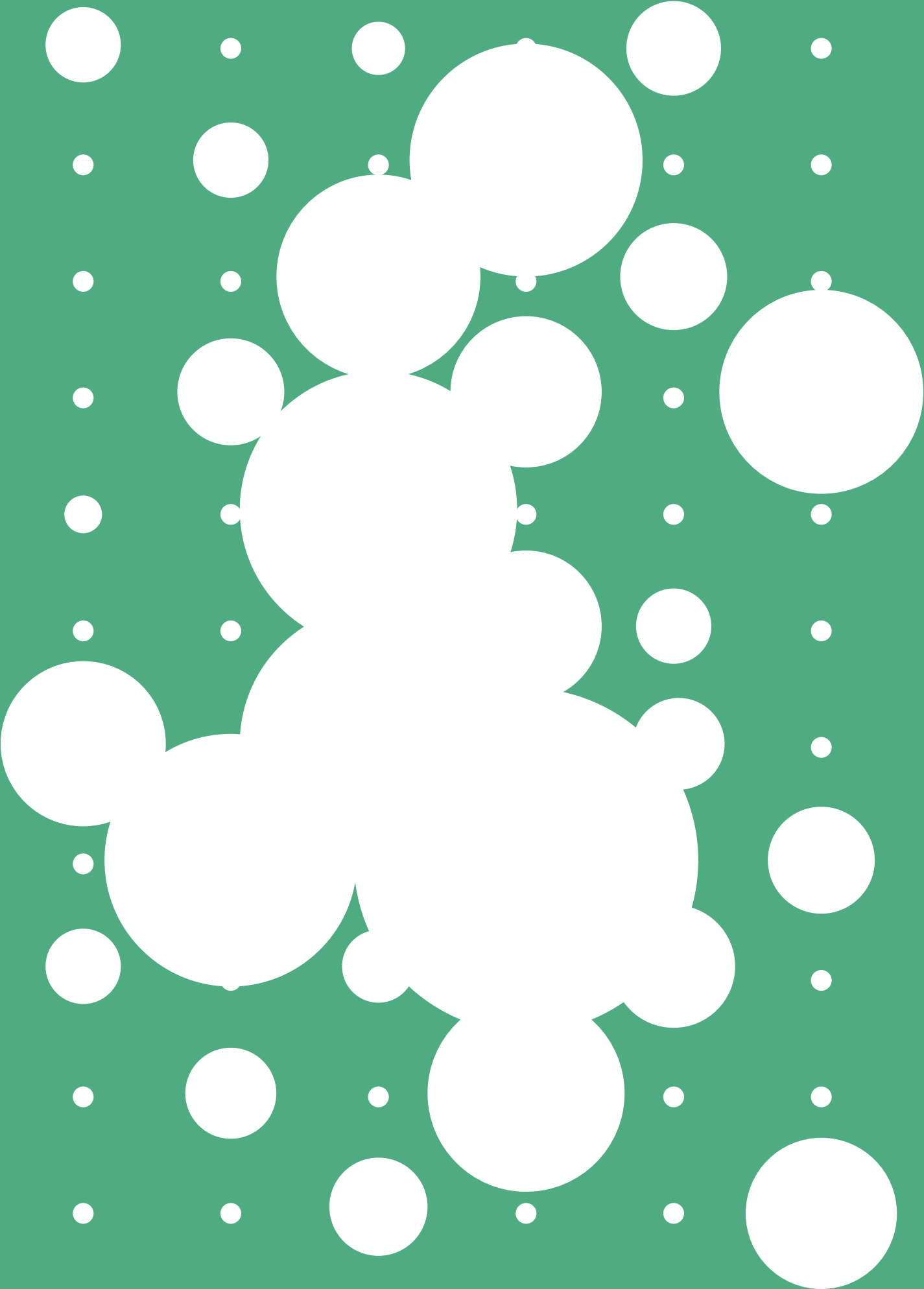


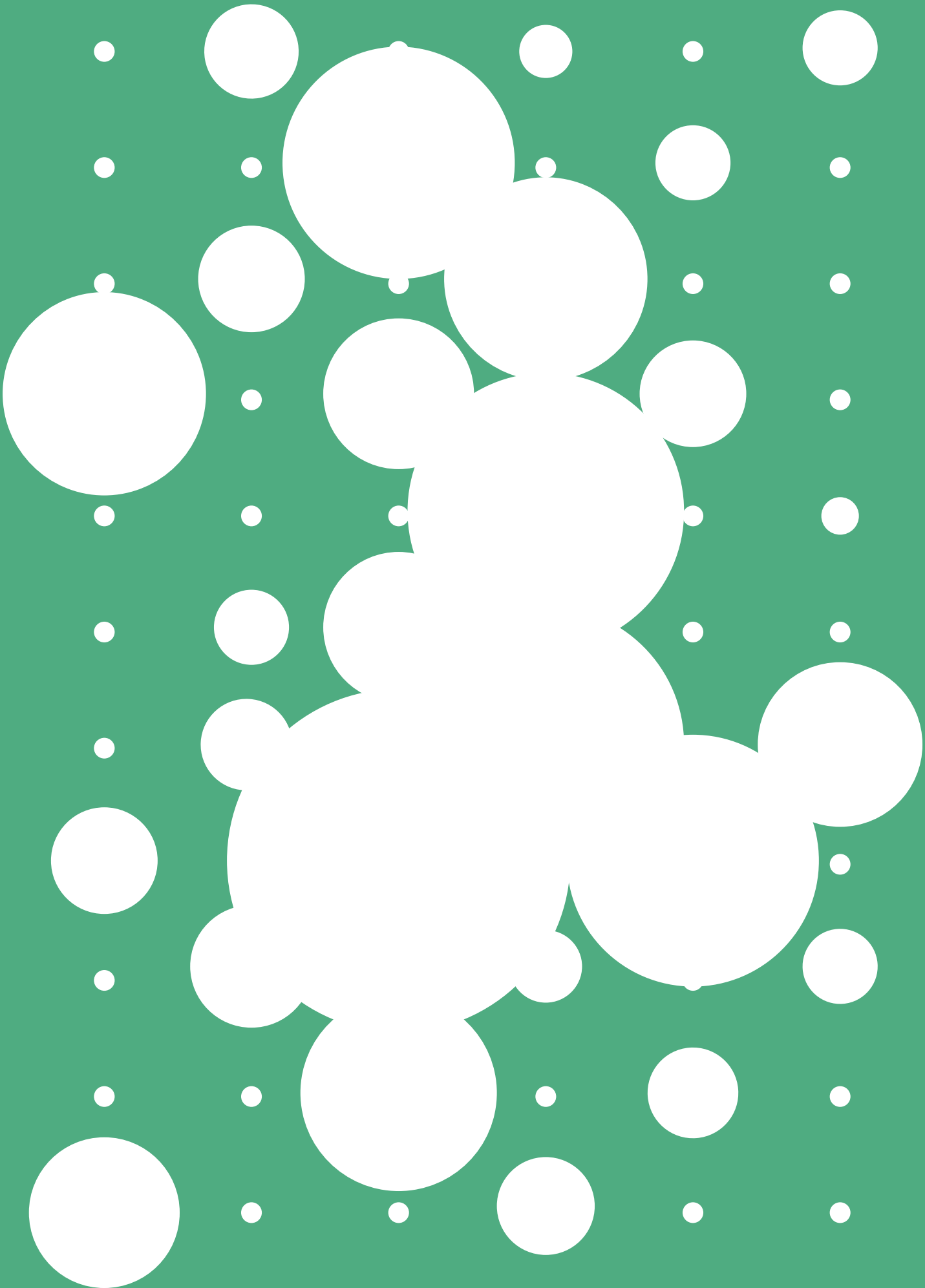
SmartPort Logistic scheme



SmarPort funtioning scheme







1 Description of location in relation to other (sea/) ports

The port of Le Havre is part of a HAROPA port alliance with the ports of Rouen and Paris located on the Seine axis. Located at the mouth of the river, it enjoys a geographical position that makes it a strategic hub for international trade, as it is located between two global cities, London and Paris. It is also the first port of call in the Northern Range, the main commercial interface between Europe and the rest of the world, and above all, it enjoys advantageous nautical conditions with 24/7 accessibility, without tidal or draught constraints. The port leads to the English Channel and is very close to the Atlantic Ocean, but bypasses the North Sea where there are congested sea routes due to the presence of very important European ports such as Rotterdam. However, this advantageous location requires a better connection to European transport networks in the hinterland, which is not currently the case: there is therefore a first challenge for Le Havre to connect to this hinterland (88% of traffic is still carried by road).

2 Description of current activities

The port of Le Havre handles 60% of container traffic and 35% of crude oil imports. The port of Le Havre is therefore a major maritime and logistical platform at all levels. In 2011, 58% of container imports came from Asia. This international recognition is reflected in major investments, particularly in its development zone, where major multinationals such as Total, Total-Petrochemicals, Chevron and Renault have set up operations, for a total of €1.5 billion invested since 2008.

3 Description demographic/socio-economic dynamics.

The industrial activities carried out in the port of Le Havre, are representing the 22% of the city employment. The port is having a key role in the economic

development of the region.

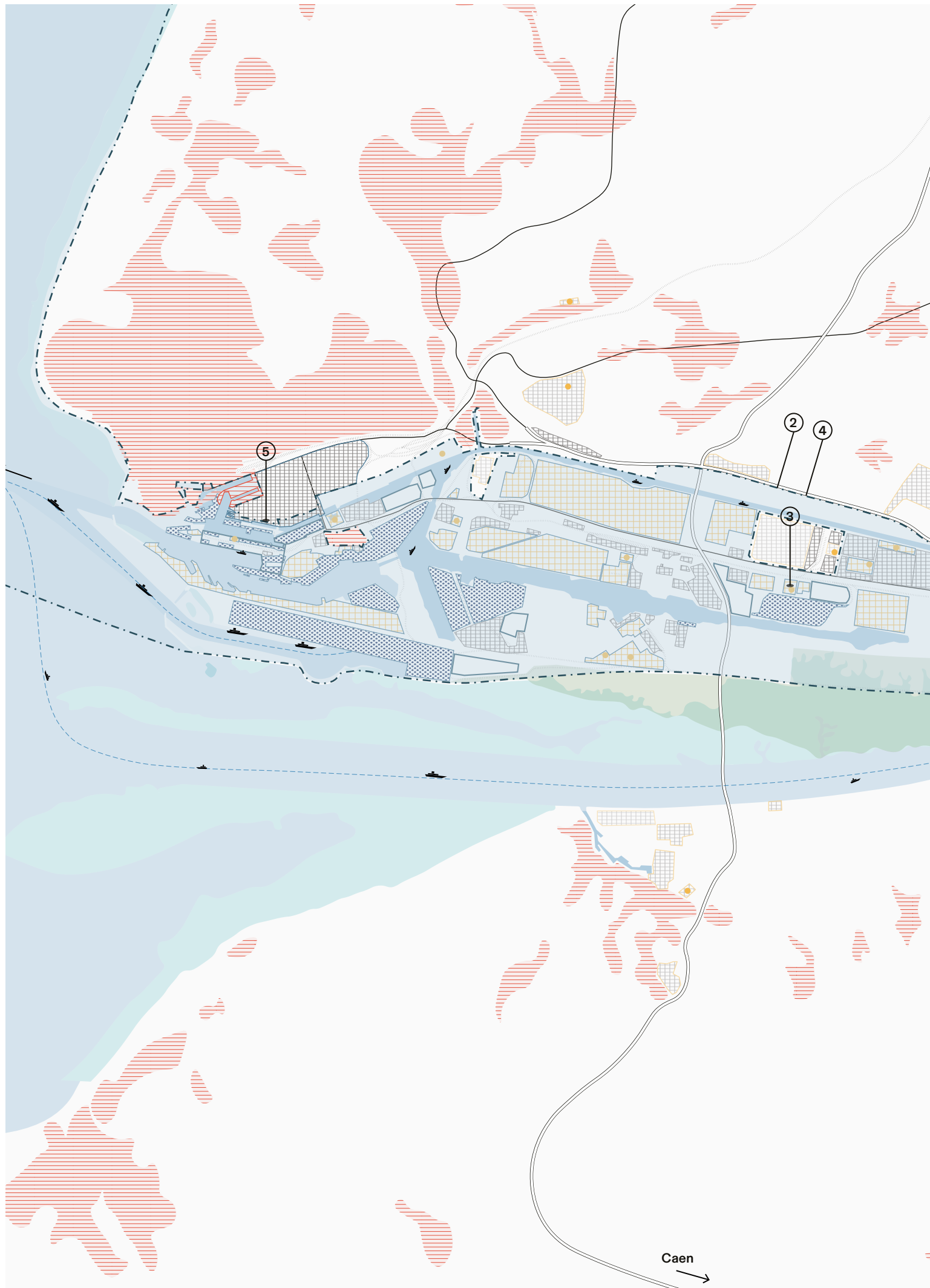
4 Why, and in what way is circularity looked at? The shipping sector plays a prevailing part in the growth of developing countries. The port of Le Havre has to cope with the various challenges related to efficiency of the logistics chains, together with continuous investment in new infrastructure. In this sense, Haropa, composed by the port of Le Havre and the French development agency, is working toward the development of maritime economy accompanying the port actors through the upcoming transition, with provision of know-how and new skills building. Haropa has developed a space of nearly 500 hectares available for conversion. The actors are supported by the port in setting up their sustainable logistic systems.

5 Who gives substance to this, which partnerships/programmes/initiatives are made?

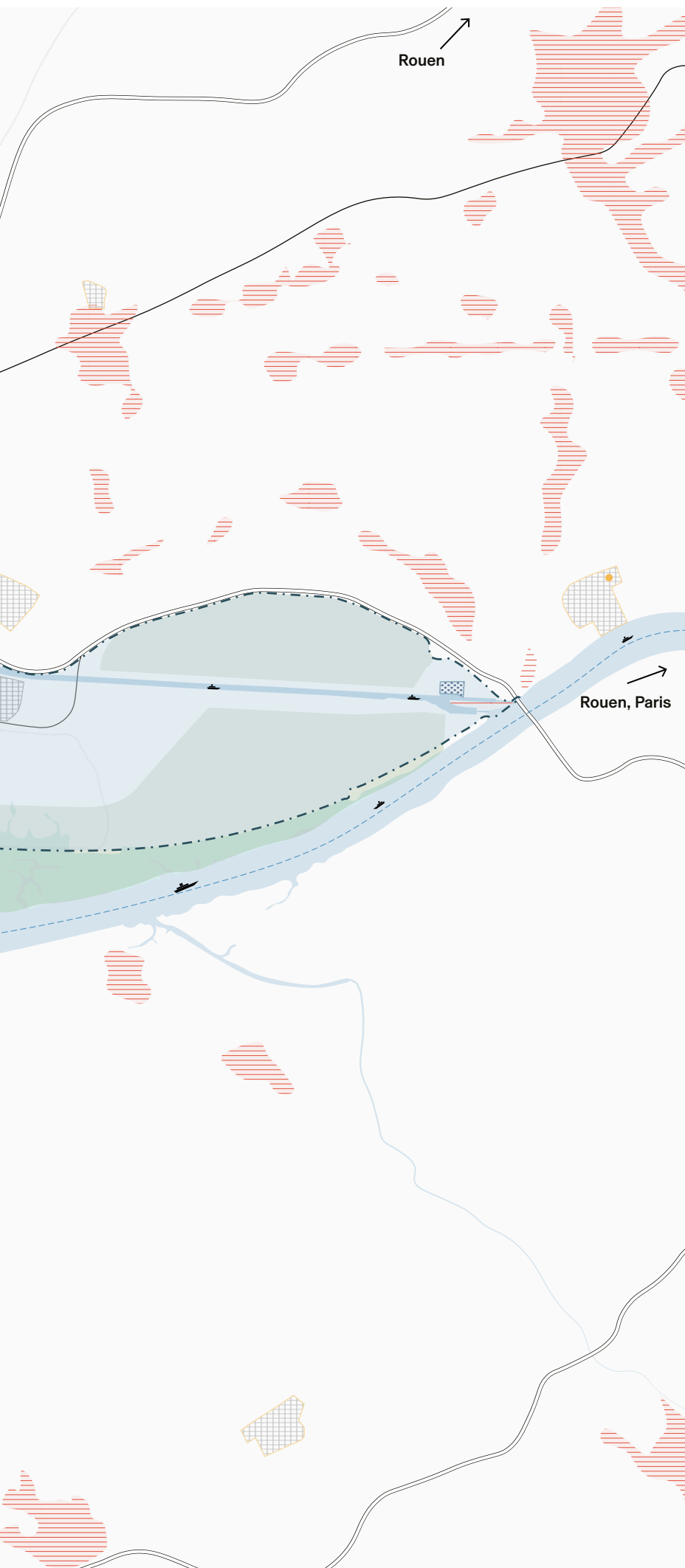
The Haropa is one of the main projects taking place in the port of Le Havre, building up a wider system of sustainable logistics, supported by the local port authority and the French development agency. Interesting is, in this case, the collaboration at the local and supra level, in order to build new strategies in order to support the shift to a more sustainable economy.

6 Is there already a discourse around cityports? (Yes/no) Who is behind it and what are the ambitions/motives?

The development project "Quartiers Sud du Havre", at the city-port border, is placing the emphasis on the interweaving of urban and port functions, in order to create a real area of functional interaction. It contributes to the concrete creation of a city-port interface, as an urban objective around a functional triptych, between residential, recreational and university functions.



Le Havre



Industrial Port

- Port services (waterbound logistics, terminals, locks, ship repairs)
- Distribution
- Industries inside the port
- Vacant sites
- Expansion area
- Industries outside the port
- Used quays (waterbound activities)
- Future projects
- SEVESO sites
- Waste treatment center (collect, sorting, valorisation)

City

- City
- Planned waterfront development
- Recent waterfront development; housing & services

Labelling Of City Ports

- Potential city port
- Defined as city port

Water

- 0m - 10m - 20m - > 20m
- High tide

Green Structure

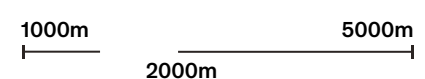
- Green areas
- Green quays

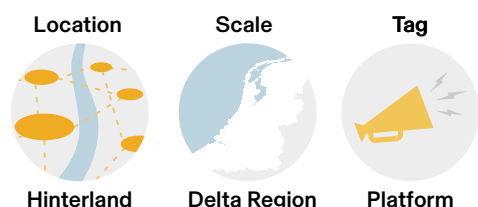
Boundaries

- Port limits
- Administrative limits

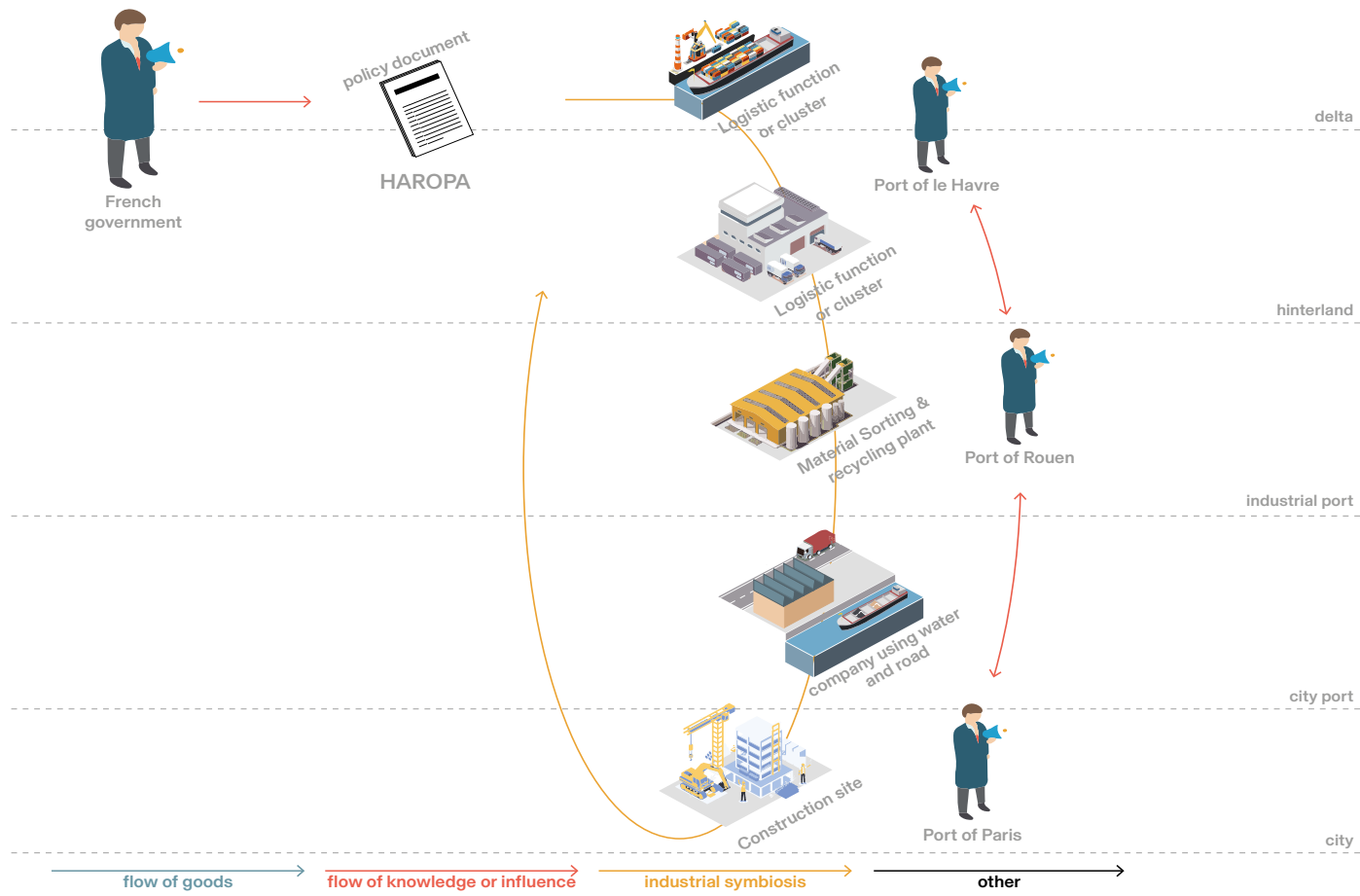
Infrastructure

- Main trains
- Primary roads
- Secondary roads
- Canals (non-tidal water)
- Main waterways for classic ships
- Main waterways for containers, ro-ro ships & bulk carriers (> 20m of draught)





“Haropa’s objective: to prepare a real national port strategy in order to compete with the other major European ports.”



What's happening? How does it happen?

The Seine is the busiest waterway in France with more than 20 million tonnes of goods transiting through it every year. Faced with competition from ports in the northern range of Europe, the ports of the Seine, HAvre ROuen and PAris, have joined forces around HAROPA to pool the essential functions of the three ports (strategy, commercial development, communication, and quality of service from the big ports to their hinterland). One of its main challenges is also to reconcile port activities with the preservation of the environment, a real challenge for the Seine estuary. To this end, regular meetings are organized between the 3 ports and propose joint actions such as the study on industrial ecology along the Seine corridor or the generalization of the ESI (Environmental Ship Index) or the joint Safe SECA project for the use of low-emission fuels in the ports of the Seine.

Why is this an interesting circular initiative for circular ports?

HAROPA role as a developer guarantees the application of circularity measures to the associated ports and industrial areas. Indeed, one of the significant assets of the Seine Valley is the fact of being a leading industrial basin. This singularity offers opportunities to meet some of the industrial ecology and circular economy goals by looking for synergies between the companies therein located. The restructuring of port and logistical activities is thus seen as a significant challenge. The ambition is to bring an overall coherence to this vast strategic space, reconciling the industrial development of the area with the enhancement of the urban amenities, the landscape quality and the environmental characteristics of the Seine Valley.

What is the relation with the port and water?

One of Haropa's main ambitions is to strengthen its transport infrastructure: road, rail, and waterways. Air pollution from ships continues to increase as the sector grows, while land-based emissions have been reduced dramatically. It is therefore not surprising that HAROPA takes on the challenge to significantly cut air pollution from ships by moving into alternative sources of energy including port-side electricity for commercial vessels. Complementarily, the three ports engage themselves in offering river logistics solutions for their customers while HAROPA continues to free up land along the river corridor to attract new companies.

What is the relation with the city?

This “new port corridor complex” needs to guarantee a healthy and beautiful environment to keep the specialized jobs that this industrial redevelopment and the implementation of efficient and innovative logistic chains require. Among other services, specific energy and heat provision for domestic use is organized by HAROPA, as a result of waste incineration or as residual flows derived from some industrial processes.

What are the ambitions?

One of the challenges consists of reviewing con-

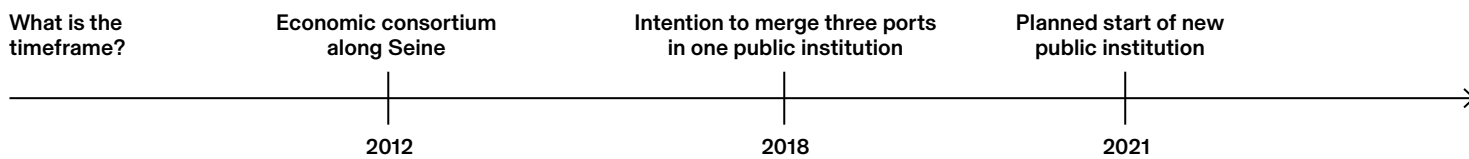
tract arrangements between companies that prevent the collective reuse and recycling of the industrial waste in specific treatment platforms whether newly planned or already existing along the Seine corridor. For financial reasons, industrial groups favor the treatment plant belonging to the group rather than the one located nearby, which blocks the creation of local symbiosis.

Who is behind it?

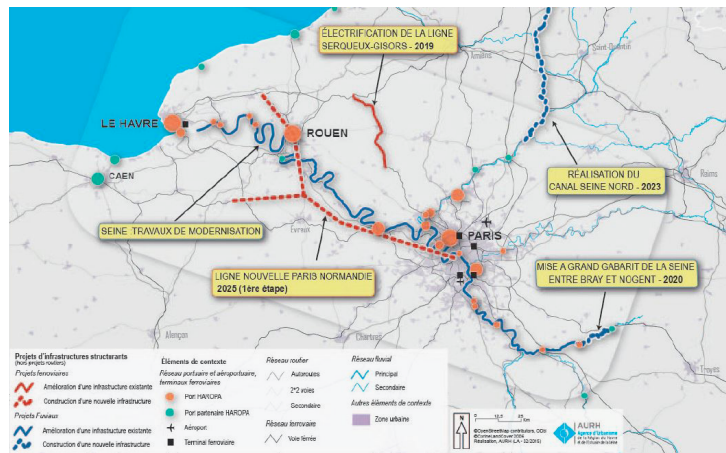
After decades of distrust, and even antagonism, the Le Havre, Rouen, and Paris ports joined efforts to promote the Seine corridor. The wish for close collaboration was born in 2012 with an Economic Interest Grouping (EIG), a flexible and adaptable structure that enables the three ports to have a fair share in the decision-making process (every port director shifts yearly as chair of the EIG) while keeping management costs proportional to their output. In November 2018, the French Prime Minister announced the merger of the three ports into a single public institution to further integration. This public institution should be “operational by 1 January 2021 at the latest,” and it intends to increase the weight of the Greater Paris area within the consortium.

Sources

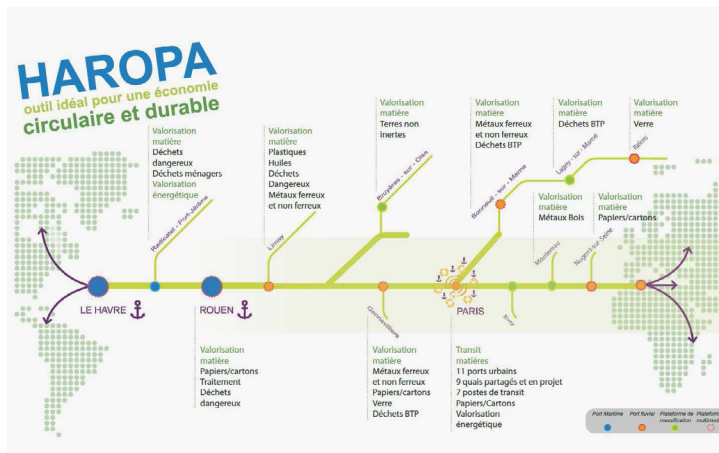
www.haropaports.com/fr/haropa-premier-systeme-portuaire-francais

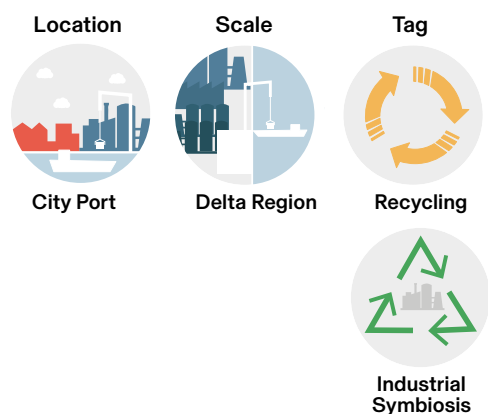


Structuring of the Seine Gateway.

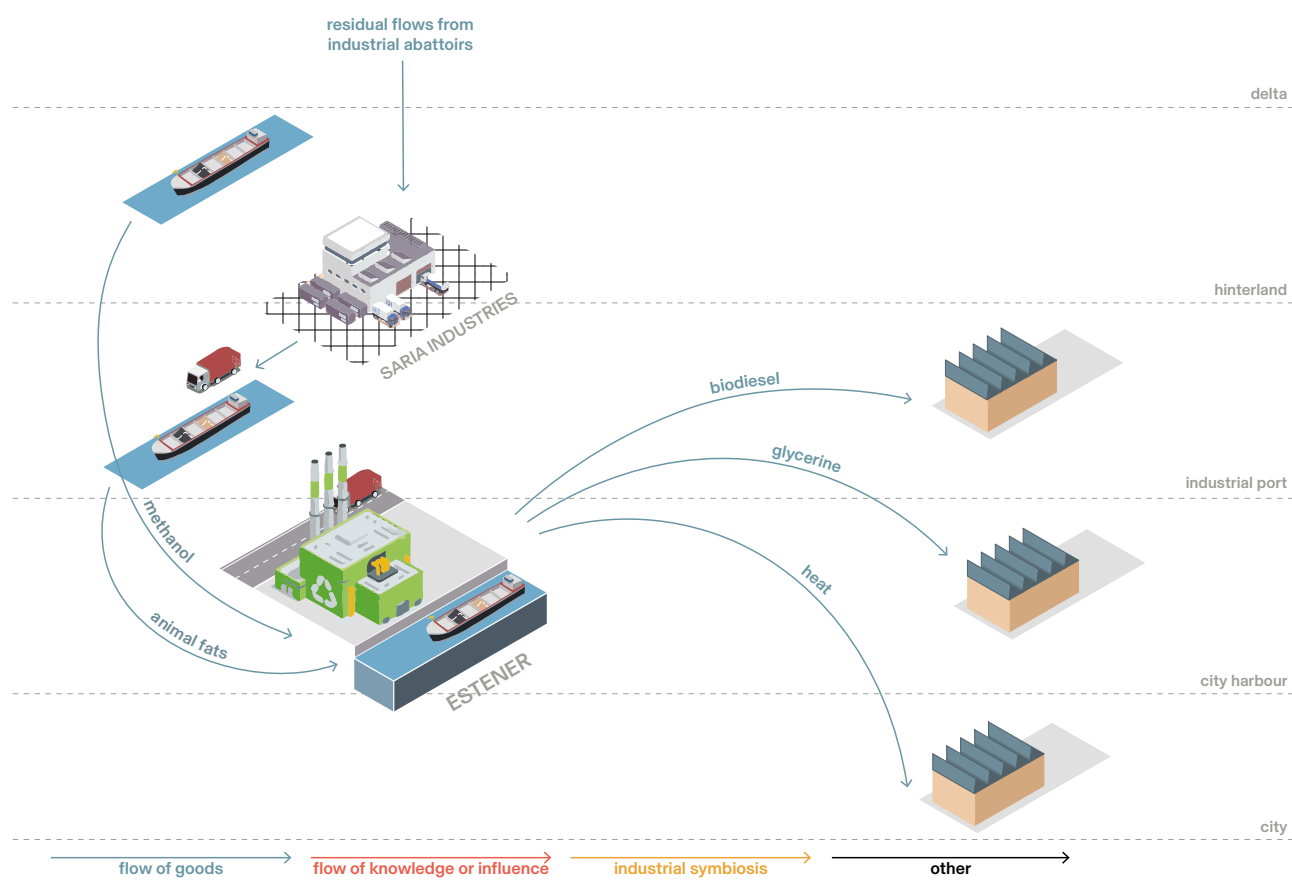


Ambition diagram of the HAROPA network passing through the massification, recycling and treatment platforms.





Recycling complex fats coming from the agroalimentary industry in the production of biodiesel



What's happening? How does it happen?
 ESTENER, is the first French factory producing advanced biodiesel from animal fats unsuitable for food. This major industrial project offers a new avenue of economic development for the French meat sector. Born of the partnership between SARIA Industries and the industrial Group Les Mousquetaires in 2013, this brand new production unit in Le Havre produces around 70,000 tonnes of EMHA (Methyl Ester of Animal Oil) each year for the French market. The implementation of ESTENER in Le Havre meets both logistical and commercial requirements.

Why is this an interesting circular initiative for circular harbours?
 The plant offers an outlet for the valorization of the residual flows created by the meat sector by transforming them into biodiesel, without competing with food or animal feed like it is sometimes the case with biofuels made from plant material. The port authority attracted this project to its territory under the aegis of industrial ecology, one of the priority strategies for revitalizing the industrial fabric of the Seine Axis and to accompany its transition to a new industrial model.

What is the relation with the port and water?

The plant is a multimodal platform for incoming (methanol and animal fats) and outgoing flows (namely biodiesel and glycerine) by sea, river, and truck, which implies a big spatial outreach. This establishment within the industrial fabric of Le Havre and its harbor allows ESTENER to benefit from significant synergies for the use of piers but also for the sharing of means of protection against fires and the use of local hazardous waste incinerators.

What is the relation with the city?

This major industrial initiative is one of the flagship projects of the Grand Maritime Port of The Havre (GPMH), next to SEDIBEX (heat network for the industry), OSILUB (motor oil recycling plant) and BIOSYNERGY (biomass plant). The fact of relying on the principles of the industrial ecology to guide all new port developments is rooted in a more general environmental strategy to reduce the ecological footprint of the activities of the area, but also to cope with the land pressure resulting from its growth and the poor social acceptability that port activities enjoy among the local population.

What are the ambitions?

With this project, the port authority initiated a series of concrete experiments after a first period during which it conducted several flow material analysis

contributing to generate a good knowledge of the global metabolism of the area and the development of a shared understanding of industrial ecology opportunities among the companies based there. The scale of those experiments was the industrial port area first to later encompass the scale of the river corridor (HAROPA) and the estuary of the Seine.

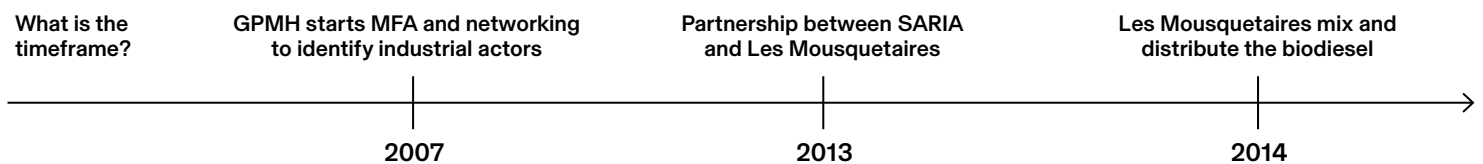
Who is behind it?

The partners behind ESTENER are:

- SVA Jan Rozé, one of today's leading operators in the French meat industry, owning slaughtering premises all over the French inland territory, and affiliated with the Les Mousquetaires Group
- Les Mousquetaires, a privately owned retailing symbol group based in France and operating internationally in many retail sectors (Intermarché, Bricorama, etc.)
- SARIA Industries -part of the SARIA division of the Rethmann Group, a global logistics and environmental company headquartered in Selm, Germany. Only in France, SARIA transforms more than 1,500,000 tons per year of biowaste and by-products from livestock and meat industries.

Sources

www.estener.com/fr/estener-emha-biocarburant.html



ESTENER in numbers

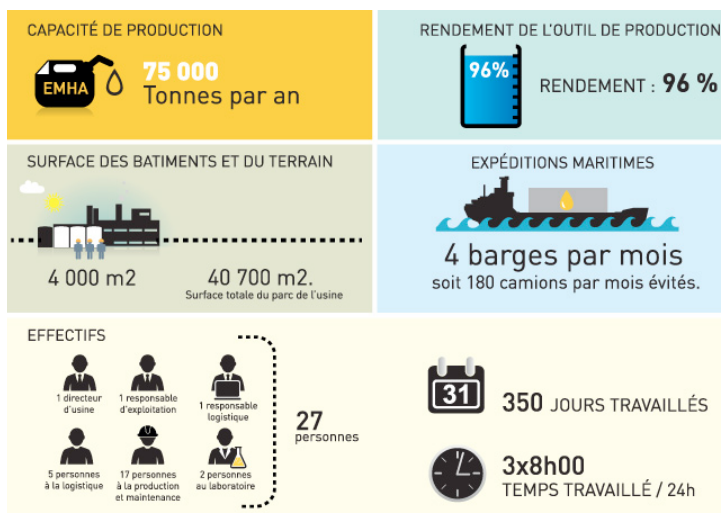
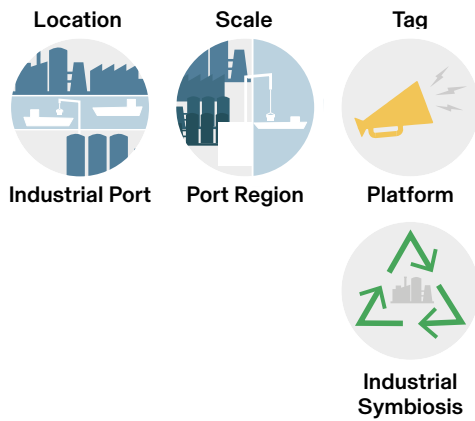


Image of the ESTENER factory in Le Havre





Interrelationship

The industrial fabric® project was launched in 2014 in the Seine Estuary. To achieve this, the AURH has been inspired by the approach initiated and developed by the Flanders-Dunkirk Regional Planning and Development Agency (AGUR) since 2009. Industrial fabric® is a registered trademark of AGUR. In December 2016, the AURH published the first results of the analyses based on the industrial web®: The industrial ecosystem of the Seine Estuary.

“Knowing your neighbours better is important to identify local resources, create synergies and launch or develop a circular economy or industrial ecology approach.”

What happens here?

The industrial web of the Seine estuary offers a territorial and schematic vision of the relations between the companies of the territory and with the national and international markets to which they are connected. The relationships highlighted are the “material” links, the “logistical” links and the “contractual” links creating the necessary ground for the development of a circular economy on a territorial scale.

What is the relation with the port?

What is the relation with the city?

What are the ambitions?

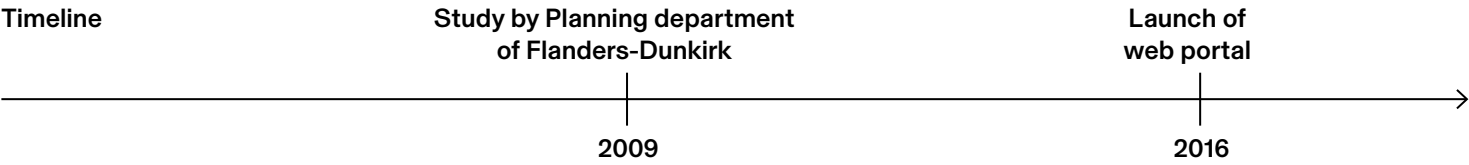
In 2016, AURH proposed a web portal giving its partners access to a dynamic tool for consulting and enriching the industrial web. The portal makes it possible to understand the economic organization of the territory (through the location of companies and existing or planned relationships between the

Estuary’s industries as well as with external markets), design a foresight tool (to understand industrial change and simulate possible developments for the territory) and share a common culture (of the territory’s industrial ecosystem through a detailed knowledge of the Estuary’s industrial fabric). The web portal is accessible after registration reserved for those concerned from the address <https://toile.aurh.fr>.

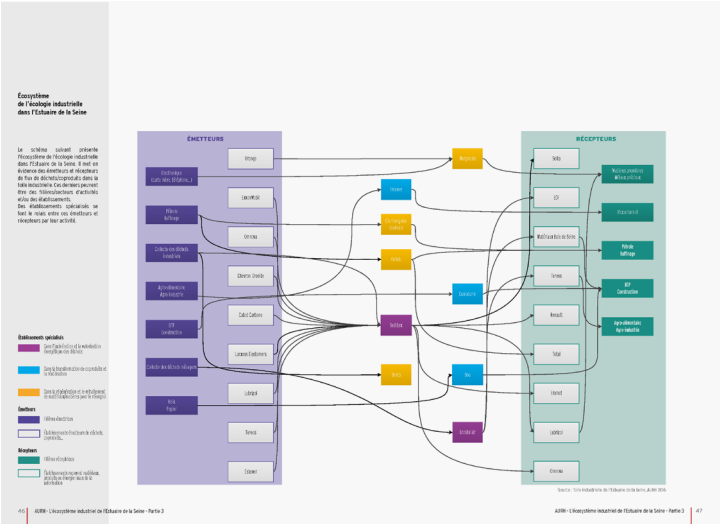
Who is behind it?

The Urban Planning Agency of the Le Havre and Seine Estuary Region (AURH) is the prime contractor for the project. Its partners are the major seaports of Le Havre and Rouen, the Seine Estuaire Chamber of Commerce and Industry, economic development agencies, the association for the creation of a metropolitan centre in the Seine estuary and HAROPA.

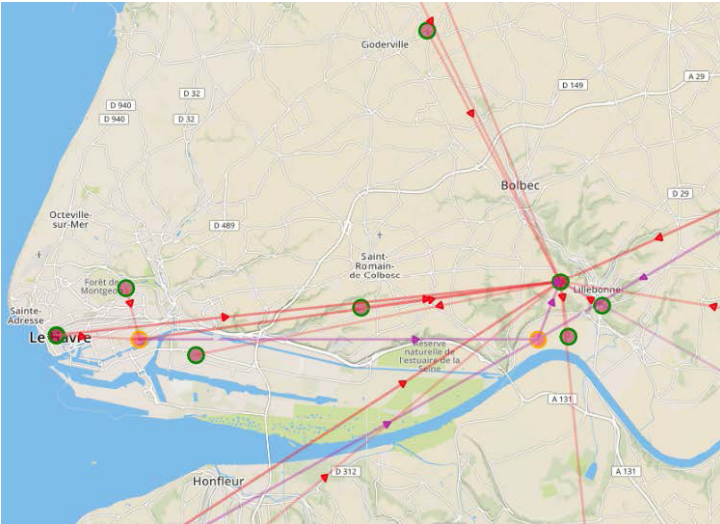
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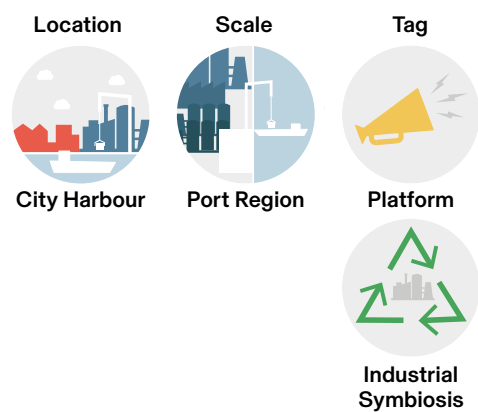


Analysis of the industrial web on the flow of materials between the various actors in the ZIP of Le Havre.



Connections highlighted by the web portal between the Le Havre sites and the surrounding ports.





“It is a question of allowing the actors of this territory to get to know each other and to make their skills known. Many, of a smaller size, would not dare to knock on the door of a Total, Renault or Safran. Our goal: to irrigate”

What happens here?

Synerzip-LH is a federating association of 80 companies concerned around operational industrial port actions, particularly in terms of safety. It aims, around a common language, to create synergies between the 230 companies of the Le Havre ZIP in terms of safety, hygiene, environment, utilities or material flows. All this by pooling services, networks and know-how with the main objective of increasing attractiveness in a globalized competition. Synerzip-LH thus forms an ecosystem mobilized around ecological and economic efficiency.

What is the relation with the port?

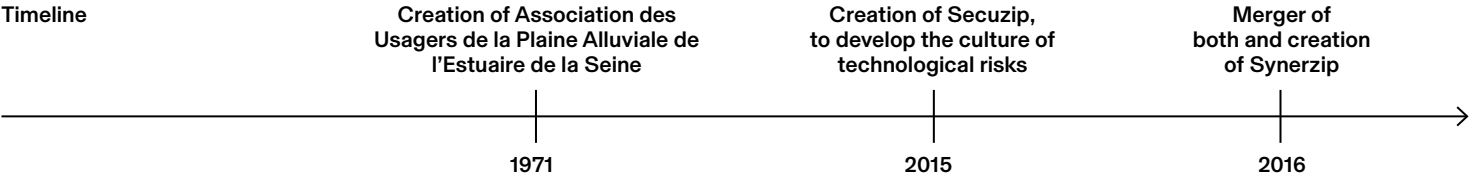
Bringing together directly all the port and industrial actors of the port area around a common discussion, the Synerzip platform is in direct contact with port issues. What is the relation with the city? What are the ambitions? The main ambitions are therefore to respond to the PPRT of the Le Havre ZIP approved in October 2016 through meetings and debates in order to manage the coordination of emergency measures but also the creation of synergies between port actors with a view to pooling common

approaches. This renewal of local governance was seen as “an important step forward” in the implementation of industrial ecology.

Who is behind it?

In France, some public policies support the implementation of industrial ecology initiatives at the scale of industrial complexes, suggesting a multiplication of eco-sites within major economic platforms. This is the case in particular with the circular of 25 June 2014 on the treatment of economic platforms in the context of technological risk prevention plans (PPRT): in targeted areas such as the Port of Le Havre and the Port of Dunkirk, among others, the rules relating to the preparation of PPRTs can thus be adapted in order to facilitate direct technical links with the companies on the platform, in the form of sharing equipment, utilities or services, or an exchange of raw materials or process materials.

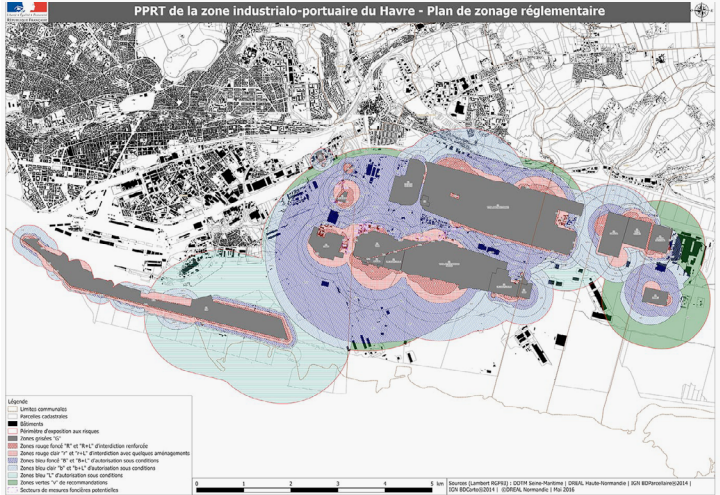
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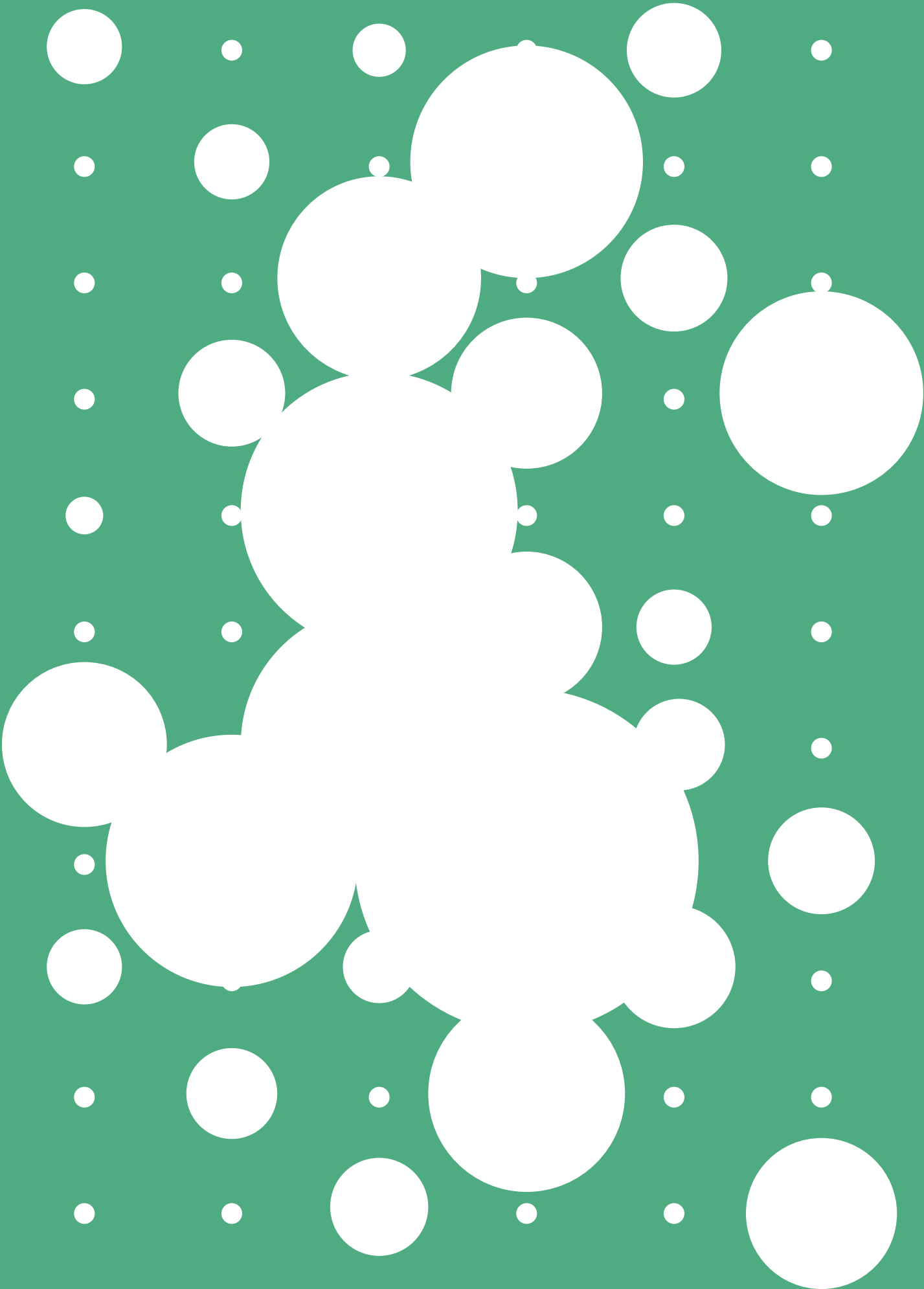


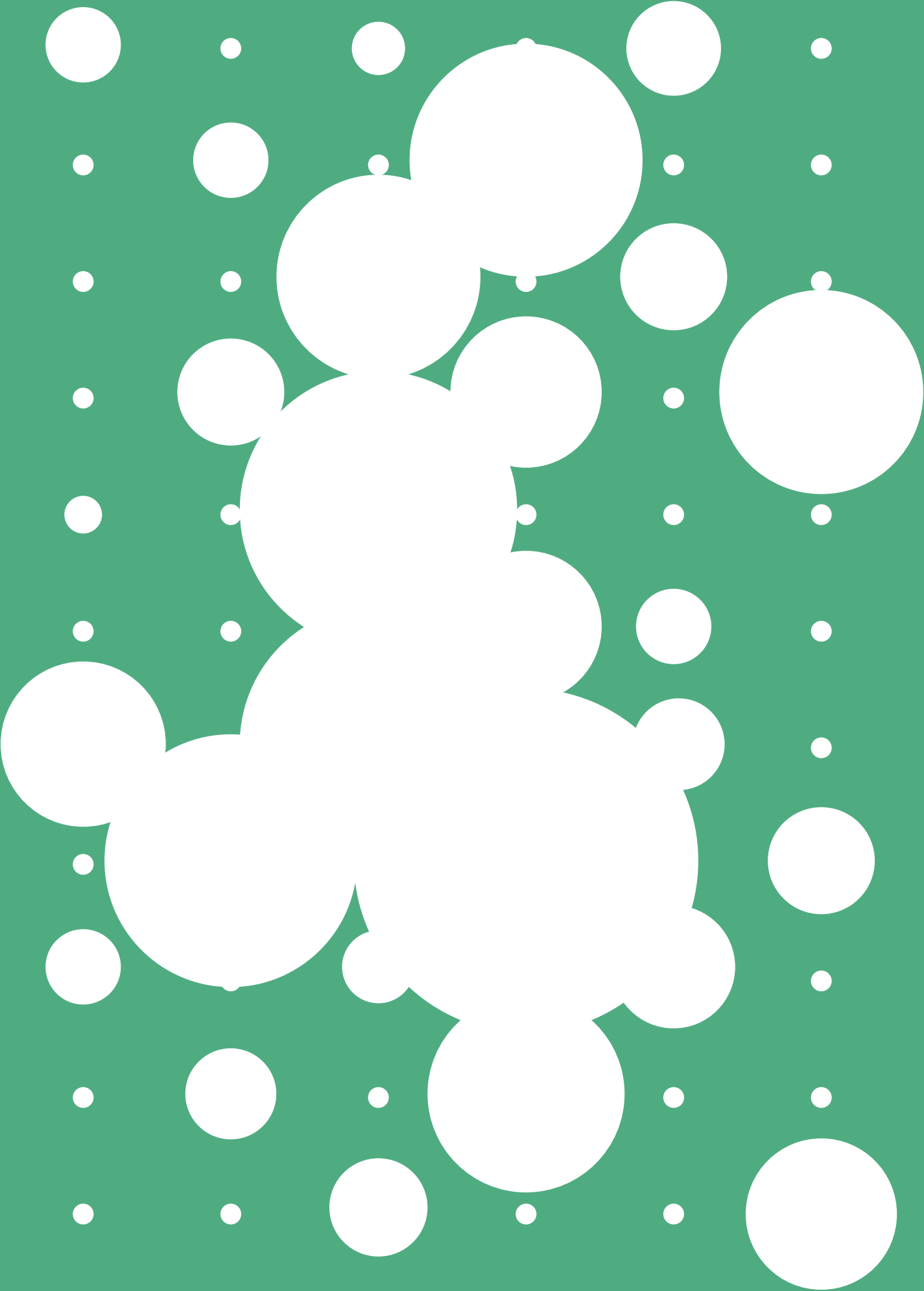
Meeting in October 2018 of the economic actors of the Le Havre ZIP organised by Synerzip to enable them to familiarise themselves with the PPRT.



Regulatory zoning plan for the PPRT (Technological Risk Prevention Plans) of the industrial port area of le havre.







1 Description of location in relation to other (sea/) ports

The North Sea Port is based on the fusion of two important ports, Zeeland Seaports and Port of Ghent, which happened at the end of 2017 and is a good example of economical beneficial collaborations between different ports. The port is both an important industrial zone with many multinational companies as well as a crucial logistical platform with good hinterland connections. The proximity of three important highways, the presence of good railway connections on each quay and the connection of the port with the main European inland waterways makes the port an important player on all sorts of goods.

2 Description of current activities

The industrial activity in the North Sea port is counting for 60% of the added value. Many global leaders in steel, automotive, chemical, agribulk and bio-energy industry are based along the 35 km long canal. The focal point of the port is shifting towards the more bio-based products, since they are now the number one bio-port of Europe with the largest production of bioethanol and biodiesel production.

3 Description demographic/socio-economic dynamics.

In total the port gives direct employment to almost 100 000 jobs of which 43% direct. Each year this numbers keeps rising or stays stabile. Also investments are hitting each year new records. The fusion of the two ports has made a good economic climate, where each year these numbers will keep rising. The presence of the University of Ghent, which is an important research institute for bio-based technology, plays a leading role in the implementation of more bio-based economies.

4 Why, and in what way is circularity looked at?

The bio-based industry is a crucial motive for further development in the North Sea Port. Many bio-based platforms use this aspect to implement their economies in the port or to establish new incentives. Together with the presence of the University

of Ghent, many platforms search for research & development, training, creation of new jobs... in this certain sector. Together with this, the industrial symbiosis in the port is rising, since both bio based and non-bio based multinational companies see the benefit of collaboration via smart linking.

Another important characterization of the north sea port, could be defined by a wide presence of many recycling companies, which are focused mostly on the re-manufacturing of raw materials coming from different sources, as building demolition and dismantling of ships, but also recuperating the city waste. Also in this branch of the port is possible to see the willing to have a more sustainable and conscious relation with the waste, but also with the environment, trying to research in different innovative ways to collaborate, recycle and reuse.

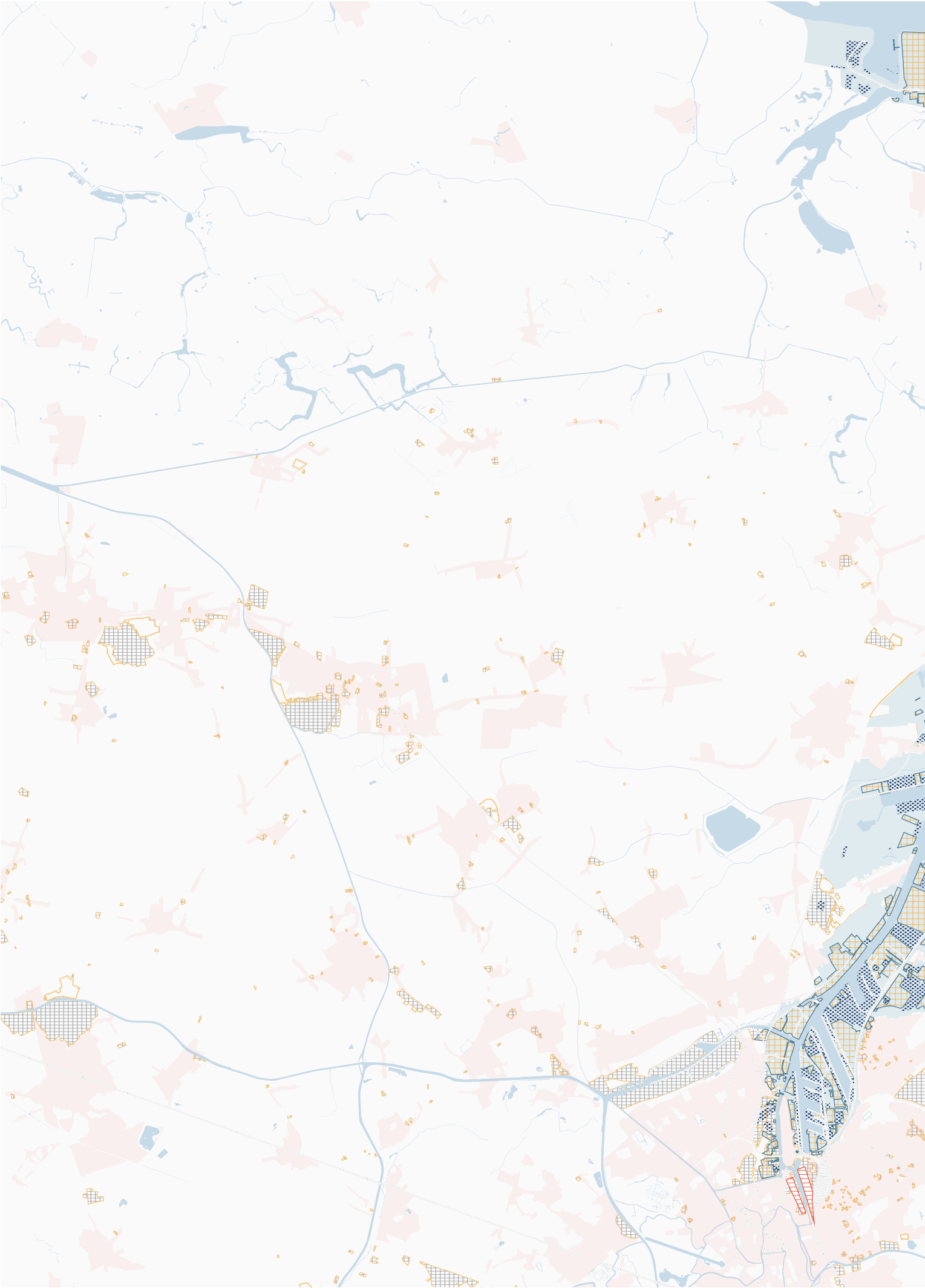
5 Who gives substance to this, which partnerships/programmes/initiatives are made?

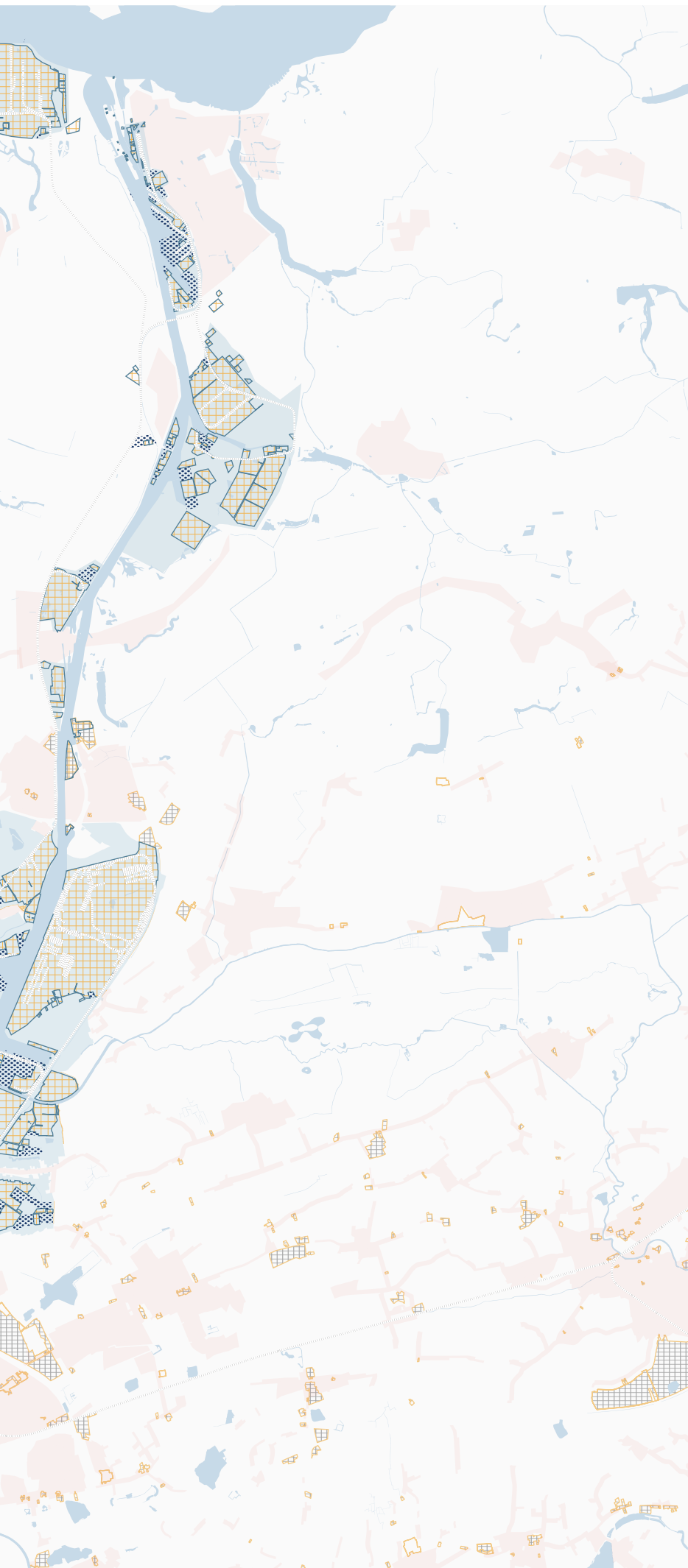
Over the years, many bio-based platforms started, evolved and launched new initiatives. Biopark Terneuzen and Flanders Biobase Valley (first Ghent Bio-energy Valley, later Ghent Bio-economy Valley) were the initiators of Bio Base Europe, which is a leading platform in the research&development and training in the bio-based economy.

Many waste recycling companies are based along the canal, ranging from ship demolishing to 'circular demolition'... Some of these aim for an implementation in a more industrial symbiosis

6 Is there already a discourse around cityports? (Yes/no) Who is behind it and what are the ambitions/motives?

In Ghent, there is no real ambition about city ports. Since the Oude Dokken is converted to solely a residential program with no thought about any economical function, new sites need to be found. Defining concrete areas which can be labeled and used as city ports is difficult, since the whole of the North Sea Port can be seen as a long canal, at which several cityports are potentially located: Sas Van Gent, Terneuzen...





North Sea Port

Industrial Port

-  Port services (waterbound logistics, terminals, locks, ship repairs)
-  Distribution
-  Industries inside the port
-  Vacant sites
-  Expansion area
-  Industries outside the port
-  Used quays (waterbound activities)
-  Future projects
-  SEVESO sites

City

-  City
-  Planned waterfront development
-  Recent waterfront development; housing & services

Labelling Of City Ports

-  Potential city port
-  Defined as city port

Water

- 0m  10m  20m  > 20m
-  High tide

Green Structure

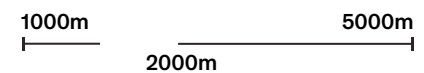
-  Green areas
-  Green quays

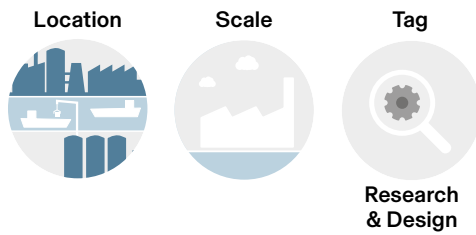
Boundaries

-  Port limits
-  Administrative limits

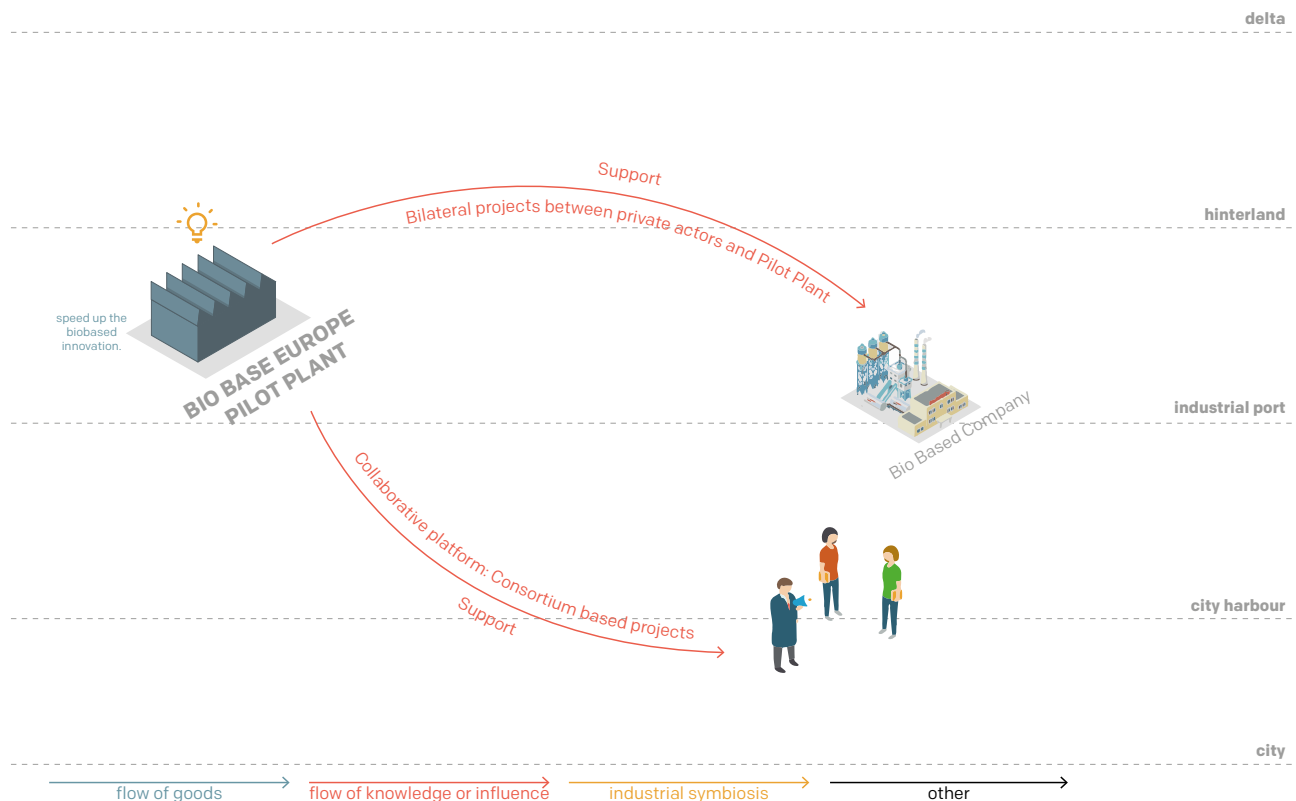
Infrastructure

-  Main trains
-  Primary roads
-  Secondary roads
-  Canals (non-tidal water)
-  Main waterways for classic ships
-  Main waterways for containers, ro-ro ships & bulk carriers (> 20m of draught)





“Process development, scale-up and custom manufacturing”



What's happening? How does it happen?

The Bio Base Europe Pilot Plant is working on the field of innovation and research in the reconversion of biomass to biochemicals, biomaterials, biofuels and other bioproducts. The main goal is to speed up the bio-based innovation. Most importantly this organization is also providing service to other companies for process development, scale-up and custom manufacturing; the projects developed are mostly following two main way: they can be bilateral projects, in which the Bio Base Europe Pilot Plant is following a specific private company; or Consortium based project, in which a series of different actor gather together in order to work on research and innovation.

Why is this a interesting circular initiative for circular harbours?

Bio Base Europe Pilot Plant is a state-of-the-art facility that operates from a laboratory level to a multi-ton scale. The main goal is to speed up the bio-based innovation. They provide services for process development, scale-up and custom manufacturing of bio-based products and processes. The Bio Base Pilot Plant enables the reconversion of biomass into biochemicals, biomaterials, biofuels and other bioproducts. A strong aspect of the bio base plant is that the entire production chain is in one single plant. They combine technologies utilizing a wide spectrum of modular unit operations, making it possible to work from small to big scale processes. The team consists of engineers, operators and technicians.

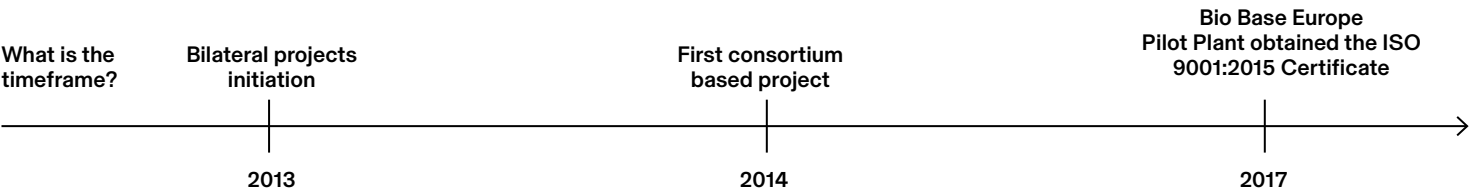
What is the relation with the port and water?
The relationship with the port is not that linear and evident, but the practice carried out from Bio Base Europe Pilot Plant has a strong potential to be in relation with many activities taking place within the port, since the biobased economy places an important role in the Ghent harbour.

What is the relation with the city?
The university of Ghent is known as a well advanced biotechnology researcher. However, no direct link with the Base Pilot Plant is found.

What are the ambitions?
The gained experience over the years makes it possible to translate lab processes and ideas into viable industrial processes.

Who is behind it?
Bio Base Europe Pilot Plant is an independent facility, they have no industrial shareholders and work in full confidentiality. They have private, bilateral projects but also many consortium-based projects.

Sources
www.bbeu.org

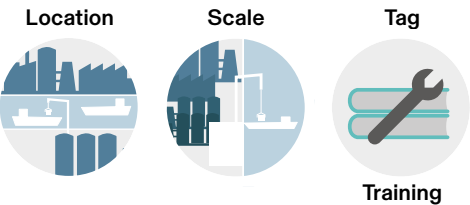


Bio Base Europe Pilot Plant



Bio Processing research plant





Interrelationship

As part of Bio Base Europe, the training center wants to connect to all kinds of people. Schools can have an interactive tour in the training center with different themes as sustainability, biomass, overpopulation, technology and job orientation, together with a workshop. Also other groups can be trained and informed here with interactive parts and subjects. As an important player in the biobased economy, the training center also wants to connect different actors in the biobased economy, sustainability and innovation sectors. Also the Bio Base Experience, the exposition in the center, wants to connect biobased ideas and technology to the greater public.

“Information, training and networking in the biobased economy field”



What happens here?

Based in Terneuzen, this location is important for all events and education on sustainability, mainly in the biobased economy and techniques. Bio Base Europe Training Center gives information, training and the possibility to network. Bio Base Europe is the first open innovation and training center in Europe for biobased economy. The aim is to accelerate an economic growth, to innovate capacity and have a sustainable development of our society.

Conferences can be held here, expositions take place or there is a lab where they can have a hands-on experience. Themes are biobased economy, circular economy and other economy related activities in the region.

What is the relation with the port?

The training center has no direct connection to the water or port life, but its location is crucial since biobased economy in Ghent is growing. It is evident that the training center, together with the Bio Base Pilot Plant, will help to strengthen this trend in the port of Ghent.

What is the relation with the city?

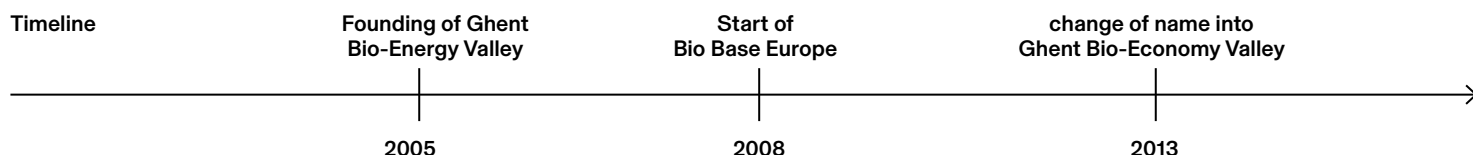
The university of Ghent is known as a well advanced biotechnology researcher. However, no direct link with the Base Pilot Plant is found. What are the ambitions? The training Center is an important place for people interested in sustainability, since collaborations and the network of Bio Base Europe play an important role in bringing together biobased actors.

Who is behind it?

The Bio Base Europe Training Center is initiated from the Province of Zeeland, Municipality of Terneuzen, North Sea Port, Province of East-Flanders, Biopark Terneuzen and Scalda, a school for vocational education and adult education.

The basis of Bio Base Europe are Ghent Bio-Economy Valley and Biopark Terneuzen.

Sources
www.bbetc.org

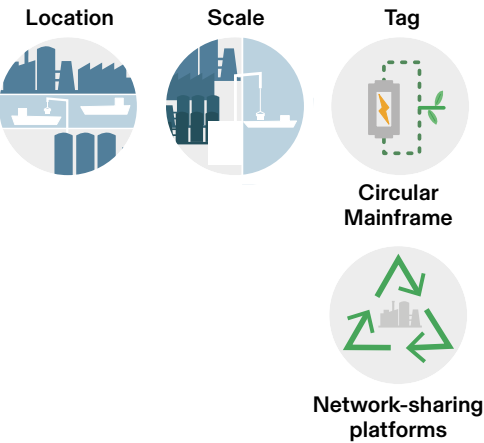


Expositions



Workshop in the laboratory

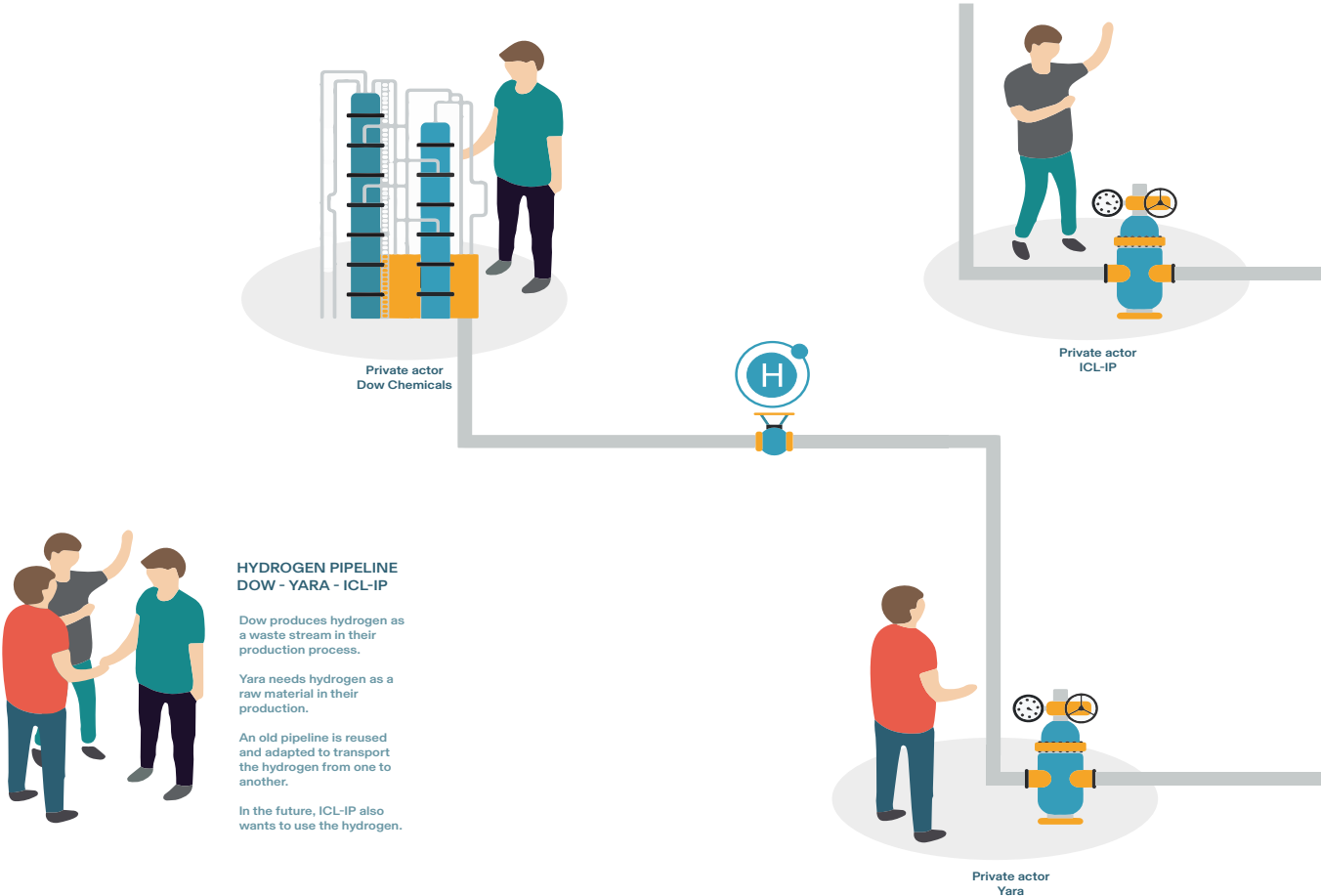




Interrelationship

As part of the Smart Delta Resources, the rethinking of infrastructure and the usage of waste streams is part of a sustainable future. The hydrogen pipeline between Dow and Yara is the start of a process in the Netherlands and Flanders which can extend between different companies. By transporting the hydrogen from Dow, where it is now extracted from their production process, to Yara, where it is used as a raw material, a circular initiative is made. Yara found hydrogen closeby instead of importing the hydrogen via sea. In the future, other companies can attach themselves to the pipeline.

“This is the first time that an existing main gas transport pipeline has been modified for hydrogen transport.”



What happens here?

For the first time, an existing gas transport pipeline is modified and used for hydrogen transport. The hydrogen for industrial use is transported between Dow Chemicals (Terneuzen) to Yara (Sluiskil) and makes a 12 km long pipeline. The connections between the companies and the pipeline had to be made and a few points had to be made suitable for transporting the hydrogen.

What is the relation with the port?

The two companies connected to the pipeline are two important chemical multinational players in the port. With the reuse of the old gas pipeline for hydrogen, it is a good example on how the port could convert their old infrastructure towards more sustainable means of energy use. This project is the start of Smart Delta Resources to reuse waste streams between different companies.

What is the relation with the city?

This project of Smart Delta Resources is focused on diminishing the CO2 emissions of industry by reusing the waste streams between the companies. However, the city of Terneuzen is located next to the port and its industrial companies, so it would be possible in the future to find a similar story for to use waste streams such as heat to diminish CO2 emissions for households.

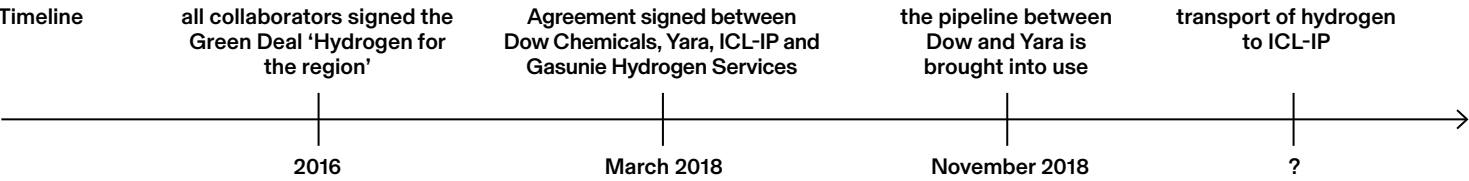
What are the ambitions?

For the moment, the pipeline transports four kilotons of hydrogen per year. By 2030, the ambition is to have a network with the capacity of 10 gigawatts or more in all the major industrial clusters in the Netherlands. It would play a great role in the energy transition and is a good example of regional industry clustering and inter-company collaboration. In the future, more hydrogen and green gas pipelines will be used. Energy consumption is reduced by 0,15 PJ per year, which is approximately the annual gas consumption of 3000 households. This saves 10 000 tons of CO2.

Who is behind it?

Dow Chemicals wants to enhance circular economy by closing raw material chains. The hydrogen gas released at Dow is used as raw material (ammoniac) in the production of the high-quality products of Yara, which are fertilizers and chemical and environment solutions. This makes it a cross-sectoral collaboration. It is a project from Smart Delta Resources, facilitated by the company 'Impuls'. The collaboration is with North Sea Port, the province of Zeeland and East Flanders.

Sources
<https://en.northseaport.com/gasunie-hydrogen-pipeline-from-dow-to-yara-brought-into-operation>

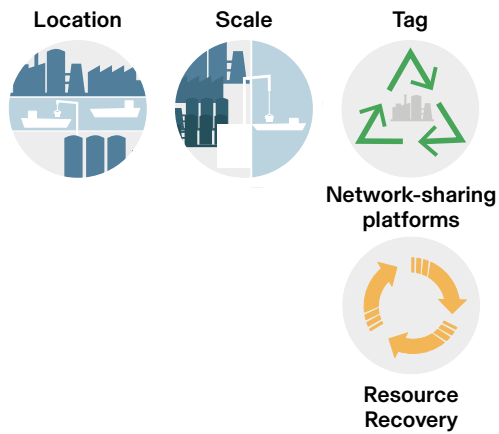


location of the hydrogen pipeline



caption of the picture





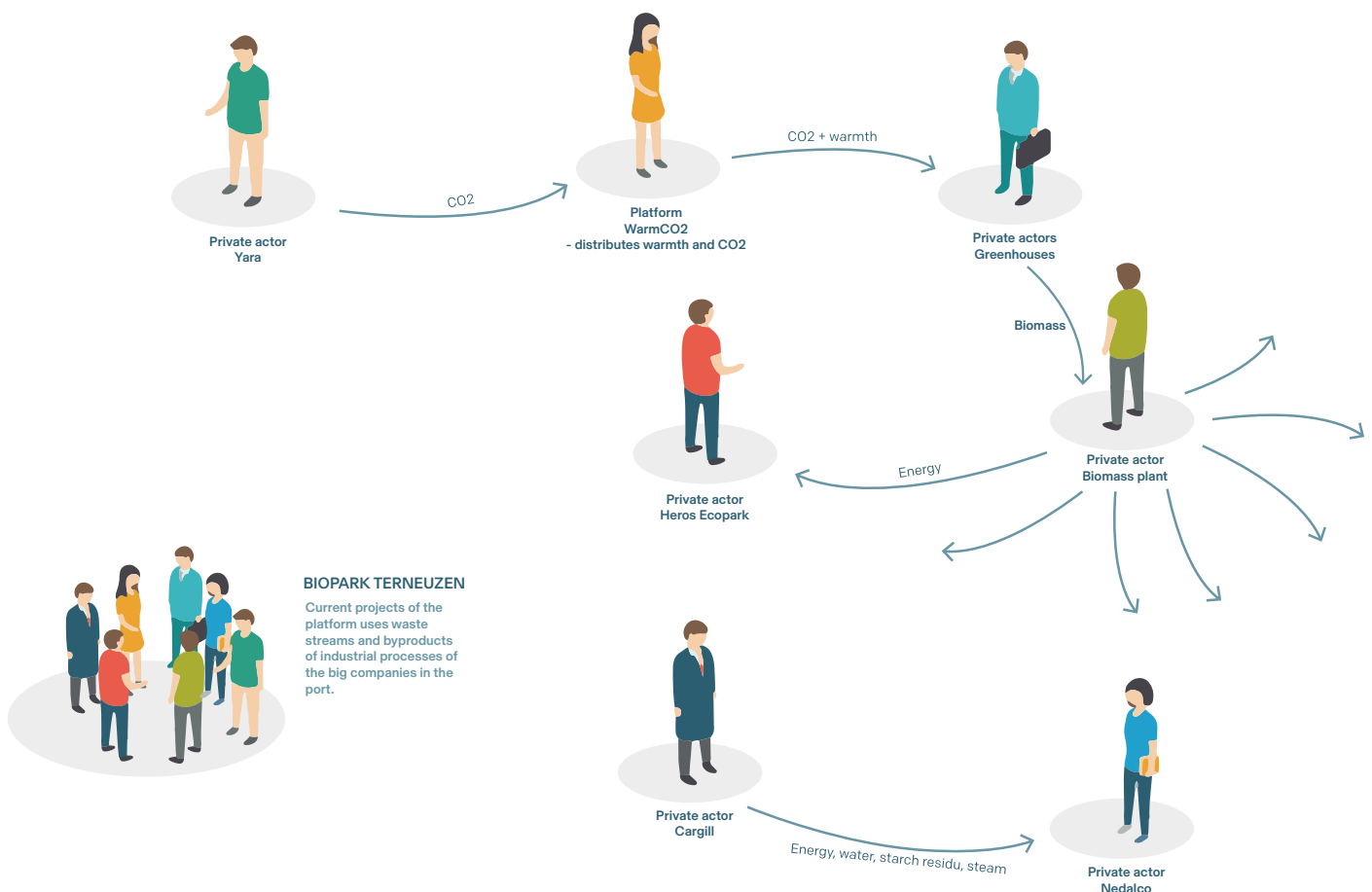
Interrelationship

Big companies are situated in the port. To make sustainable growth possible, they needed a way to cluster. In that way, they can make Smart Links between themselves. Interrelationships between companies, municipalities and science have been made, chances are investigated and companies start to make the facilities or look for investors.

By building new facilities such as greenhouses, bioplants, pipelines, they can benefit much more from the presence of each other, which makes this platform an exemple case.

Current projects work with waste streams, such as CO₂ or biomass. The interrelations between the companies can be expended more, and it is therefore important that new companies keep connecting to the platform, to extend the potentialities...

“This is a unique cluster on the scale of Netherlands and Europe.”



What happens here?

Biopark Terneuzen is a initiative to find a unique and innovative solution to facilitate sustainable industrial growth. The biopark represents a new way of thinking to create agro-industrial sustainability. ‘Smart Links’ explores the synergies between companies in the same region. They seek for potentials of each other waste streams and byproducts. Therefore, it is always a work in progress, where other companies or initiatives can link themselves on the platform. It follows the idea of clustering. Biopark Terneuzen is founding father of Bio Base Europe, together with Flanders Bio-Economy Valley.

What is the relation with the port?

Many important multinational companies are located in the port. It is evident that they can benefit from each others waste streams, since current projects prove to be valuable. Good opportunities can be found, just because of the combination of port-related functions and these industrial companies. But apart from these big companies, the important connection with the hinterland is present.

What is the relation with the city?

Rethinking the ‘Smart Links’ asks for skilled workforces. The story of Biopark and Bio Base Europe is only possible because of good education in technical schools and in training centers. Currently, ‘Smart Links’ connects only the different companies, but it is also possible to connect the cities to heat networks of companies in the future. What are the ambitions? Current projects are: WarmCO2, where the CO2 and heat of company

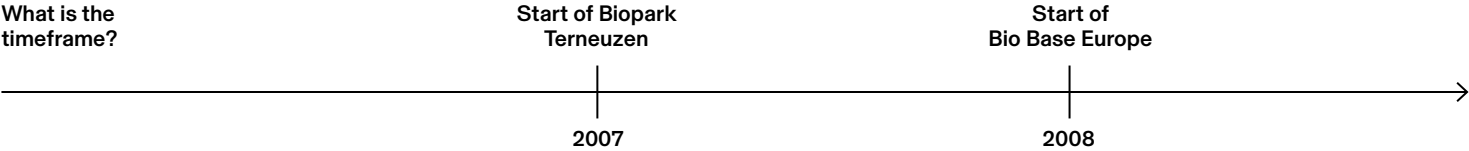
Yara is used in the greenhouses; Cargill gives energy, steam, water and starch residu to Nedalco; biomass plant gives water to Heros recycling.; biomass from greenhouses is used to make energy... The aim is to create more jobs, attract new industrial activities, make profit for the companies and diminish the ecological impact.

Who is behind it?

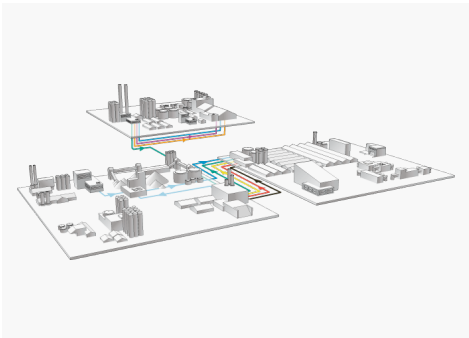
The platform consists of companies, but also research institutes, platforms and municipalities. Zeeland Seaports is the initiator and program manager of the redevelopment of the canal area.- Biopark Terneuzen

BER / Holland Innovation	Heros Sluiskil
Biomass Trading & Handling BV	ICL-IP
Cargill	Lijnco Green Energy / Schücking
DELTA NV	Nedalco
Dow	Provincie Zeeland
DSD	ROC Westerschelde
Econcern / Evelop	Sagro
Economische Impuls Zeeland	Valuepark Terneuzen
Express Energy / Bio2E	Wageningen UR
Gemeente Terneuzen	WarmCO2
Ghent Bio Economy Valley	Yara
Goes on Green	Zeeland Seaports
HZ University of Applied Science	

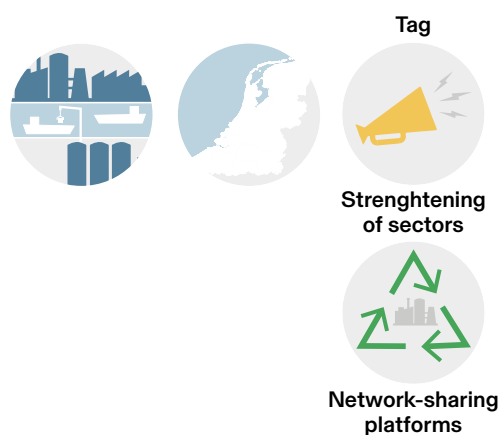
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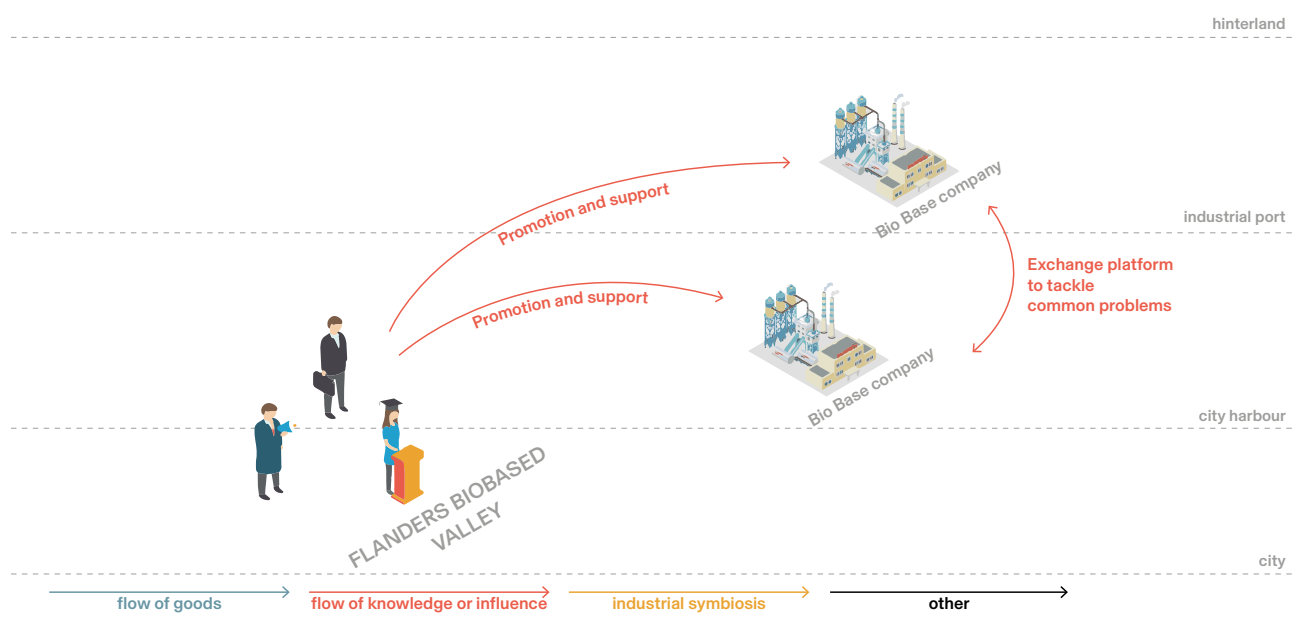
Triptych of smart links



Scheme of current and future interrelations of the Biopark



“Port of Ghent has reserved 80 Ha of industrial sites for biobased industries.”



What's happening? How does it happen?

Flanders Biobased Valley is an important cluster organization which promotes and supports biobased economy in Flanders. While it is initiated by Ghent and its local actors, it is now evolved into a platform for all Flanders. The port of Ghent is already an important player in this field and has an extensive know-how and experiments in bio-technology. It is still growing since the bio-economy in the port of Ghent will expand: a new dock 'Kluizendok' is made, where many more bio-economies can take place. The driving force for the establishment of Ghent Biobased-Economy was mainly political.

Why is this a interesting circular initiative for circular harbours?

Ghent Bio-Economy Valley is a non-profit organisation supporting the development of sustainable biobased activities and the economic growth in the region of Ghent. Through collaborative programs, initiatives and synergy creation between the partners in Research & Development, structural measures and policy, industrial integration and communication, they want to promote biobased economy. Companies wanted to obtain the Belgian production quatum for biofuels, in addition with using the partnership to tackle common problems related to production, feedstock and infrastructure. Also, the platform is a way to communicate to the general public on these new products and technologies. The platform is part of the Flanders Biobased Valley

What is the relation with the port and water?

The port of Ghent wants to attract many more bio-fuel production sites, next to the already existing ones. Many big companies in bio-economy are positioned along the canal Ghent-Terneuzen. The new Kluizendok has the aim to facilitate more bio-economy, with the connection of water for the import of raw materials via sea or to transport end products inland.

What is the relation with the city?

Because of the development of biotechnology in Ghent, they give attention to the development of science parks. (22ha of 100 ha is already developed). New biotech companies are still welcome in the science park, but also a new science park will be made. The city of Ghent also provides space for business development in different strategic areas: The Loop, Eiland Zwijsnaarde, Artevelde Soccer Stadium... It is, however, not clear if any of the bioproducts are yet used in the policy making of the city.

What are the ambitions? It all started from the government's demand to start producing biofuel: Ghent launched in 2005 then a biofuel production facility. Now, the Flanders Biobased Valley is one of the biggest integrated production sites for bio-en-

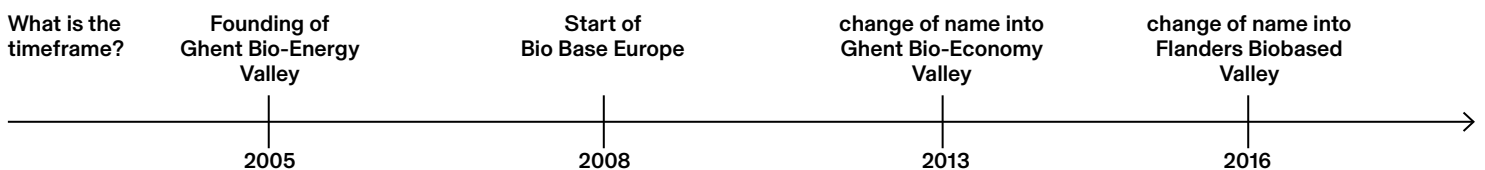
ergy. Nowadays, the main goal is the promotion of biobased economy through technological innovation, cluster formation, public awareness and provision of services.

Nowadays, it represents 90% of the biofuel production in Flanders. The aim is to extend the know-how to all of Flanders, to make it one of the most competitive regions in Europe. Who is behind it? Flanders Biobased Valley is a joint initiative of Ghent University, the City of Ghent, the Port of Ghent, the Development Agency East-Flanders and a number of industrial companies related to the Ghent region that are active in the fields of generation, distribution, storage and use of biobased products and bio-energy. Companies which are located in the North Sea Port are: Alco Bio Fuel, ArcelorMittal, Biopark Terneuzen, Bioro, Electrabel GDF Suez, Oiltanking Ghent, Oleon Biodiesel, Sea-Invest/Sea-Tank Terminal and Stora Enso Langerbrugge. Inbiose is located in the technology park of Ghent-Zwijsnaarde, south of the city.

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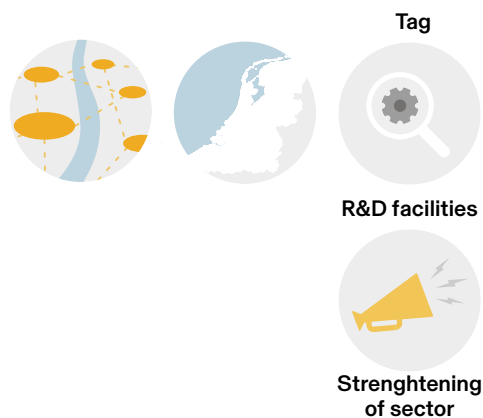
www.fbbv.be/en

www.flandersinvestmentandtrade.com/invest/en/news/ghent-bio-economy-valley-becomes-flanders-biobased-valley

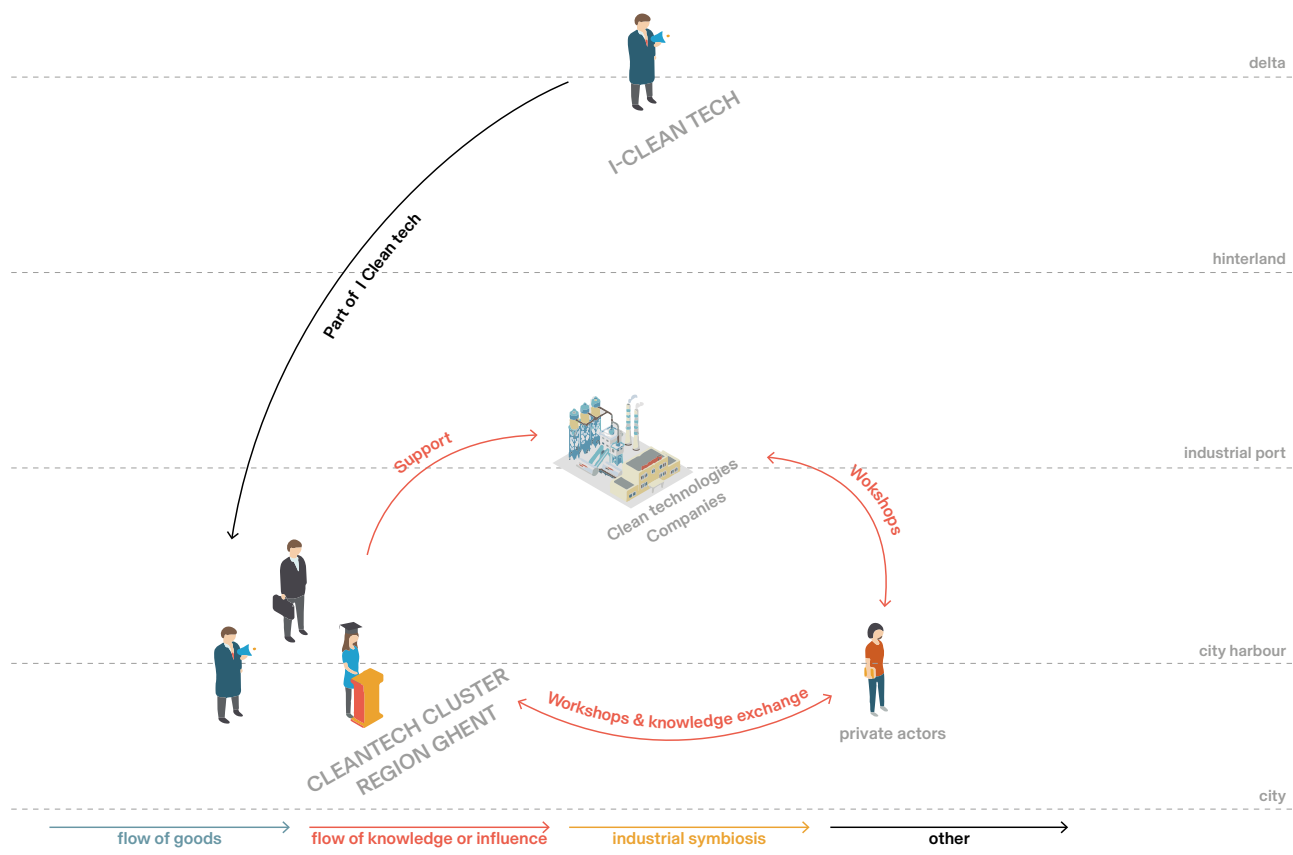


Flanders Biobased Valley





“Doing business with attention to energy, materials, water and mobility”



What's happening? How does it happen?
 Cleantech, short for 'clean technologies', searches for ways to make use of technologies to better use our natural resources and minimise the impact on the environment. All this combined with economical added value and environmental gains. The main aim is renewable materials and energy resources together with stimulating the switch from a linear to a circular economy.

Why is this a interesting circular initiative for circular harbours?
 Cleantech Cluster Region Ghent wants to connect economical, social and ecological considerations with clean technologies and therefore stimulate the switch from linear to circular economies.

What is the relation with the port and water?

The region of Ghent has strong actors to make this transition, where the port plays of course an important role in order to enlarge collaboration with private companies and also to carry out the field research.

What is the relation with the city?

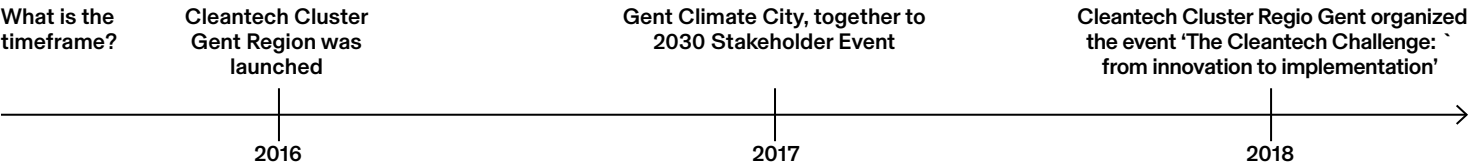
What are the ambitions?

Cleantech Cluster Region Ghent wants to connect economical, social and ecological considerations with clean technologies and therefore stimulate the switch from linear to circular economies. The region of Ghent has all the assets to be a world player in cleantech, resource recovery and circular economy: many materials in the region can be used differently (building materials, plastics, CO2, textile...); strong actors in the field (companies, knowledge institutes, public actors and civilians); ambition to handle the transitions...

Who is behind it?

Cleantech Cluster Region Ghent is initiated by the city of Ghent, North Sea Port, University of Ghent, Province East-Flanders, Development Agency East-Flanders and Clean Flandres. Furthermore a research of the flows and value chains of building materials and plastics is done by VITO, with the aim to make new chains.

Sources
<https://stad.gent/ondernemen/ondersteuning-en-premies/cleantech/cleantech-cluster-regio-gent>
<https://stad.gent/sites/default/files/page/documents/Cleantechcluster%20regio%20Gent%20infographic.pdf>

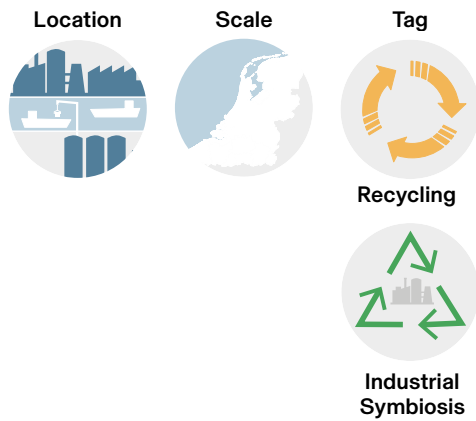


Workshop with companies



Companies collaboration





Interrelationship

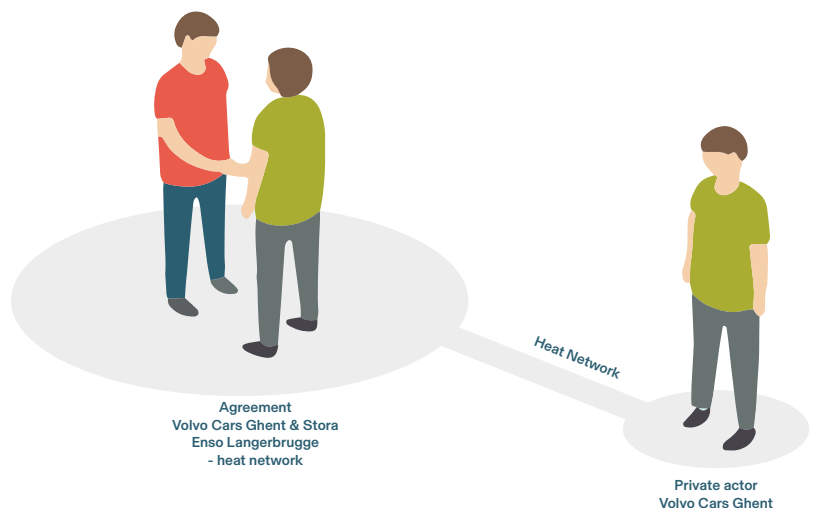
Stora Enso Langerbrugge is part of the Scandinavian group of Stora Enso Group. This company aims to be find smart solutions for packaging, paper and wood materials. The aim is to find more sustainable solutions. Stora Enso Langerbrugge is also part of this story. They have two own bio-cogeneration plants, which produces 70% of the electricity needs. Their heat is used for Volvo Cars Ghent via a heat network. And in the future, 3 windmills will be realized on site. Sustainability is a main goal!

“Stora Enso Langerbrugge is one of the most productive newspaper machines in the world”



STORA ENSO LANGERBRUGGE

Stora Enso Langerbrugge is one of the leading world companies in recycling paper. 100% recycled paper is made here for newsprint and magazines. Besides, they aim to be more sustainable!



What happens here?

Stora Enso Langerbrugge is a company which produces newsprint and magazine paper made from 100% recycled paper. They focus on recycling of waste paper and the development of renewable energy.

Stora Enso Langerbrugge operates two high quality bio-cogeneration power plants which produce all the necessary process steam and more than 70% of the electricity needs.

The Stora Enso Group is active in more than 35 countries and specializes in the production of paper, packaging materials and wood products. They focus on solutions based on renewable raw materials.

What is the relation with the port?

Stora Enso Langerbrugge and Volvo Cars Ghent, also positioned in the port, have made a deal to make a heat network. Volvo will reuse the heat from the paper production process in Stora Enso to use in their production process (CO₂ diminishes with 40%!).

What is the relation with the city?

how is it using the port and the water? why is it at the port? what is the scale it is working on?

What are the ambitions?

Stora Enso group in general is always in search for new innovative solutions in their working field. The group focusses on the bioeconomy and forestry agendas.

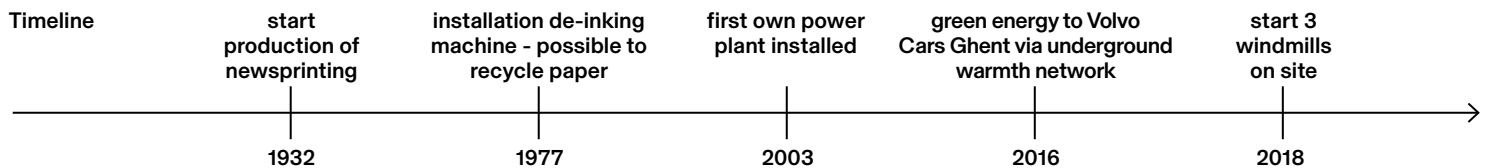
Stora Enso Langerbrugge is one of the most productive newspaper machines in the world and also way ahead in the search for sustainable solutions: the building of the three new windmills on their terrain proves this.

Who is behind it?

Stora Enso Langerbrugge is part of the Stora Enso Group. It is also part of the platform of Flanders Biobased Valley.

Sources

www.fbbv.be/en/members/stora-enso-langerbrugge
www.northseaport.com/stora-enso-verwelkomt-drie-windturbines-op-zijn-terrein-in-north-sea-port#
www.werken-bij-storaenso.be

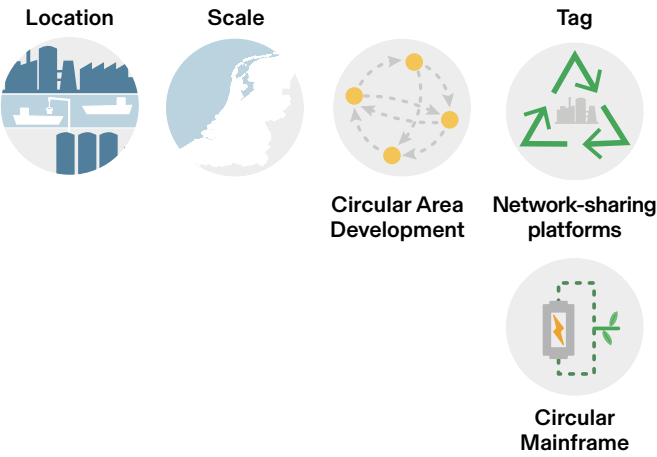


Stora Enso site at the port of Ghent



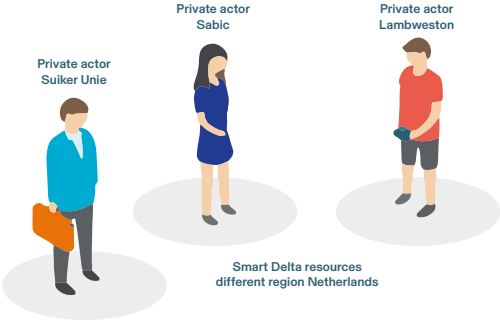
Stora Enso site at the port of Ghent





Interrelationship

The platform of Smart Delta Resources is looking for an industrial symbiosis to reduce CO2 by 2050. It is therefore evident that many big multinational companies are part of the platform. To make sure that the industrial symbiosis is possible, a research is done by the Energy research Center Netherlands to look for the potentials. The aim is to connect these companies with each other to profit from each others waste byproducts. Topics are waste streams as hydrogen, heat, CO2...



SMART DELTA RESOURCES

Smart Delta Resources has done first a research by the Energy Research Center Netherlands to see where the potential is. The result is 8 private actors in the port and 3 in the rest of the Netherlands.

What happens here?

Eleven companies in Zeeland, Brabant and East-Flanders, who use a significant amount of energy and resources, want to reduce their usage of these valuable resources by having an industrial symbiosis. Industrial connections will be made and interesting business cases come to the foreground. Production processes and infrastructure has to be rethought to be CO₂ neutral by 2050.

What is the relation with the port?

Big companies are using the port as their basis, therefore it is evident that the focus of CO₂ reduction is positioned here.

What is the relation with the city?

There is no direct relationship with the city found. In the future, it is possible to connect the big companies waste streams to the network.

What is the relation with the city?

There is no direct relationship with the city found. In the future, it is possible to connect the big companies waste streams to the network.

What are the ambitions?

With the creation of the platform, they want to establish two goals: contributing to the climate change

and all transitions and establishing the region as a strong international economical position towards other industrial regions. A strong business case is the core of the platform.

Who is behind it?

All participating companies play a leading role in the chemical, steel, energy or food industry. Research by Energieonderzoek Centrum Nederland/Energy research Center Netherlands (ECN) of the waste, energy and resources, affirmed the potential of industrial symbiosis.

Companies in the North Sea Port:

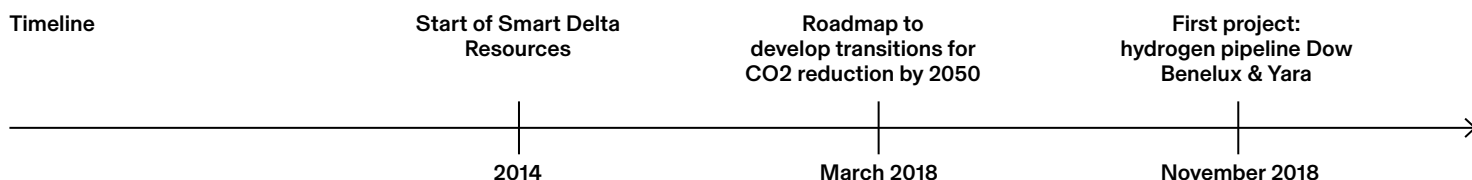
Dow Benelux
Trinseo
Yara
ICL-IP
Cargill
ArcelorMittal
Engie Electrabel
Zeeland Refinery (Vlissingen)

Other companies in the Netherlands:

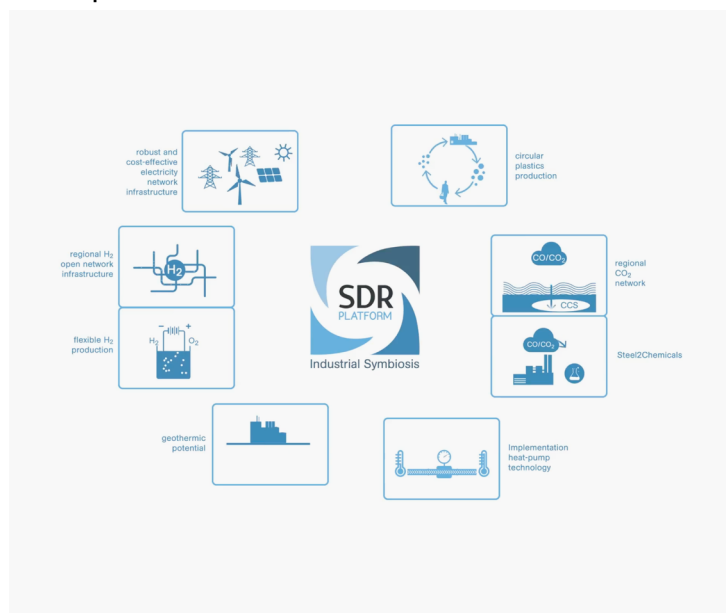
Suiker Unie
Sabic
Lamb Weston

Sources

www.smartdeltaresources.com/nl

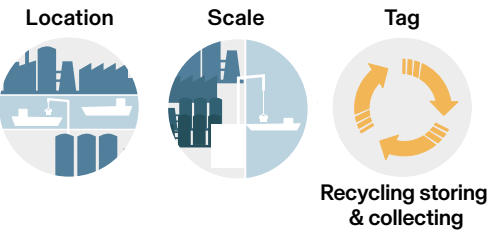


Roadmap to transitions



Companies connected to Smart Delta Resources & located in the North Sea Port

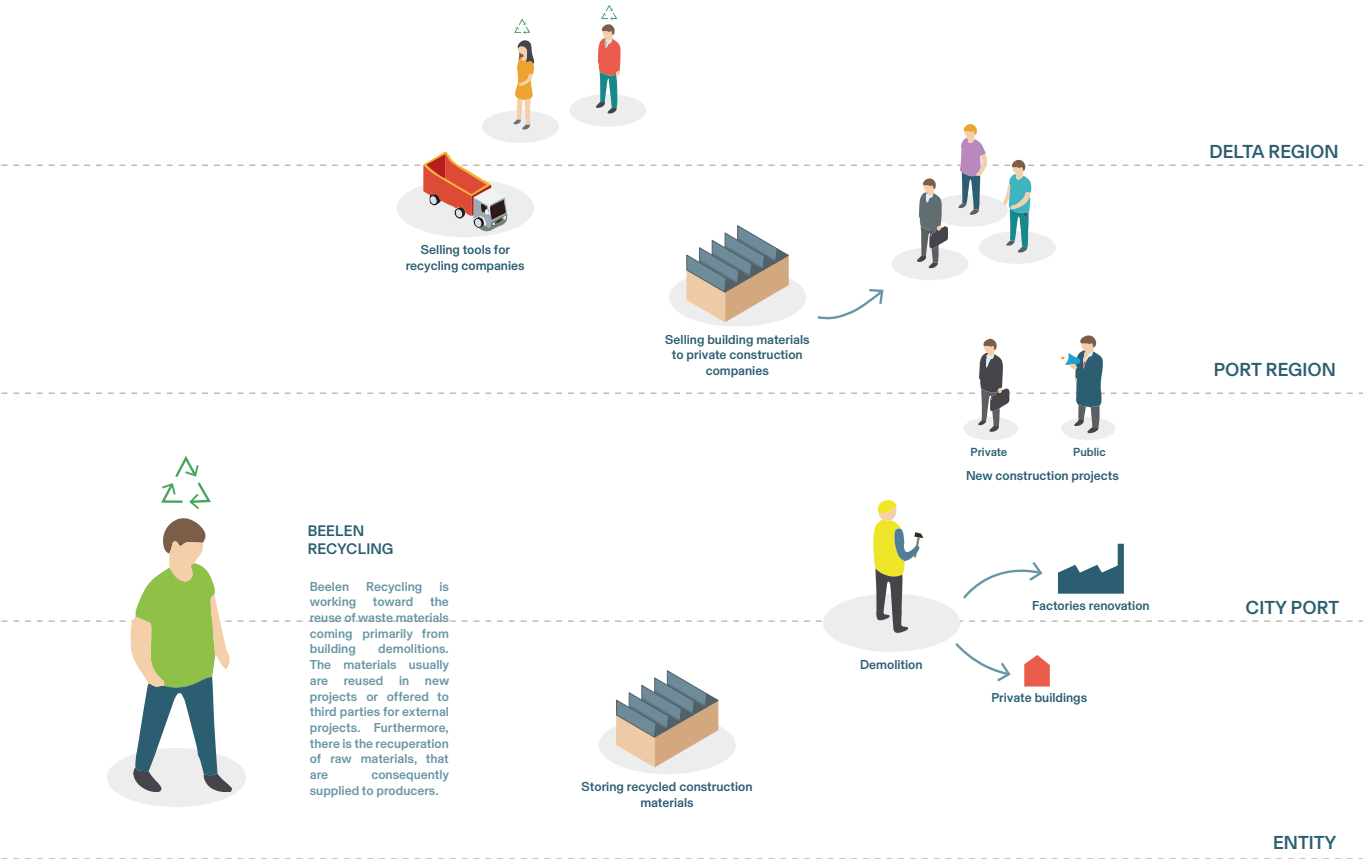




Interrelationship

The demolition materials usually are reused in new projects or offered to third parties for external projects. Furthermore, there is the recuperation of raw materials, that are consequently supplied to producers. Beelen Recycling is now working on circular demolitions, trying to reuse the higher amount of building, demolition waste, in them project, or transforming them in raw material. The organization is also dealing with a series of innovative solutions in order to sort and recycle different kind of industrial wastes, furthermore it is also selling specialized tools and equipment for other companies in order to recycles specific materials.

“No less than 99.45% is usefully used again!”



What happens here?

Beelen Recycling is working toward the reuse of waste materials coming primarily from building demolitions. The materials usually are reused in new projects or offered to third parties for external projects. Furthermore, there is the recuperation of raw materials, that are consequently supplied to producers. Relevant is social role that Beelen is having, employing people that are outside from the labor market, but also through their training activities through the Vocational Education, Business and also the Beelen Academy.

Beelen is also dealing with a series of innovative solutions in order to sort and recycle different kind of industrial wastes, furthermore it is also selling specialized tools and equipment for other companies in order to recycles specific materials.

What is the relation with the port?

Recuperation of demolition materials from industrial renovation site along the canal is part of the relation of this company with the port life.

What is the relation with the city?

The relation with the city is the starting point of the company aim, in fact, demolition and new projects construction happens most of the time in the city.

What are the ambitions?

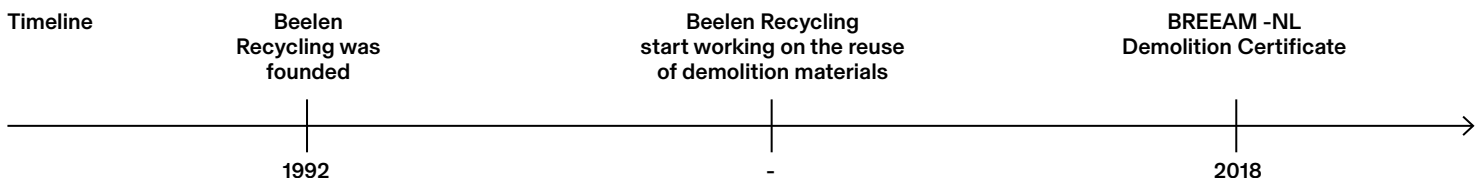
The Beelen Recycling is working toward finding new collaborations in order to find new form of innovation for the recycling and reuse of waste.

Beelen Recycling was founded in 1992 as supporting agency in demolition, infrastructure and construction sector. Throughout time the company grown toward construction material recycling specializing in removal of asbestos and industrial waste. Beelen Recycling is now working on circular demolitions, trying to reuse the higher amount of building, demolition waste, in them project, or transforming them in raw material.

Who is behind it?

no information found

Sources
www.beelen.nl

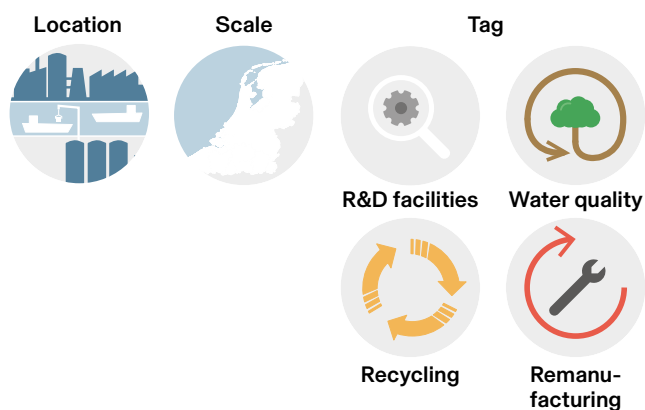


Sorting materials



Sifting of materials

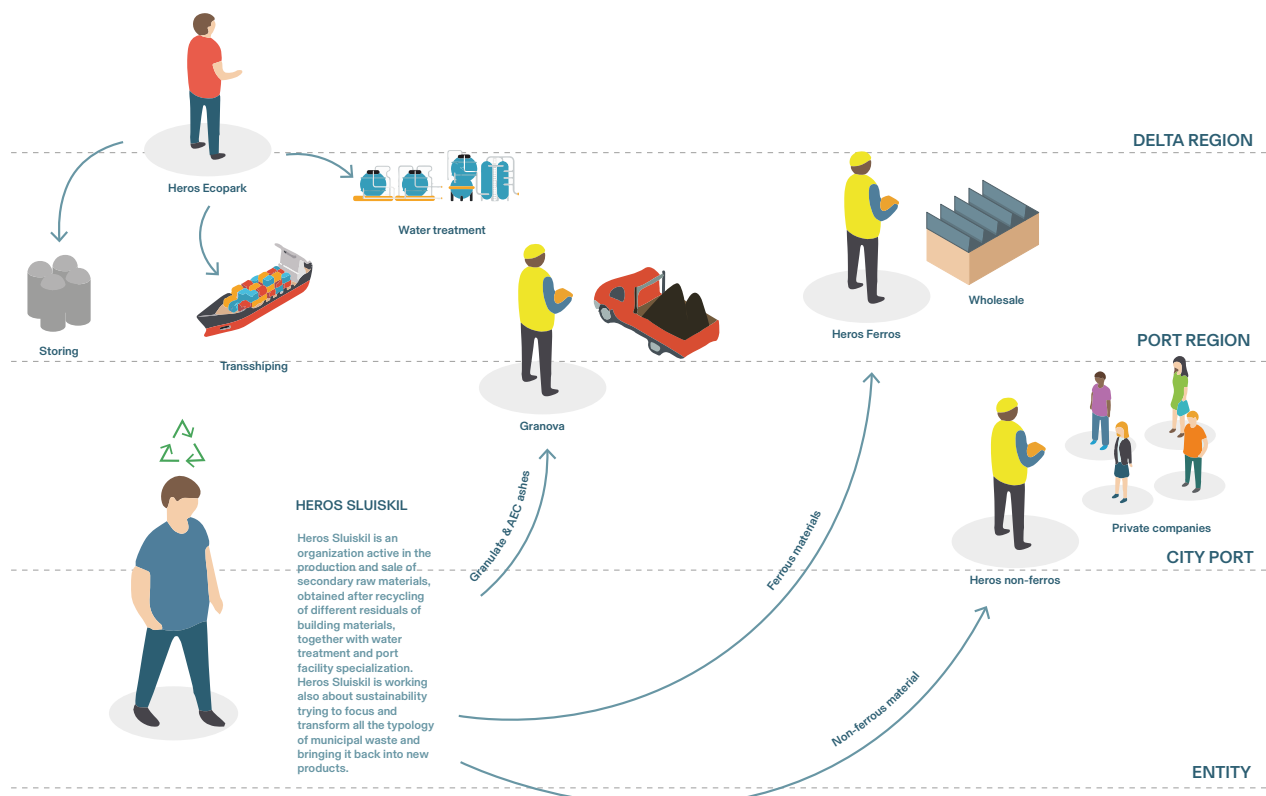




Interrelationship

The work of this organization is based mainly on three kind of waste: granulate, non-ferrous and ferrous. These three main categories of waste are the basis of the processing and transforming of materials, also through collaboration with other organizations. Furthermore Heros Ecopark Terneuzen is ideal for the transfer from shipping to barge, and for temporary storage of bulk materials in silos. Within is sustainable-based company site is facilitating a series of other companies along the canal.

“At HEROS, sustainability means a continued focus on letting ‘nothing’ go to waste and recycling this in new products. We call this ‘urban mining’”



What happens here?

Heros Sluiskil is an organization active in the production and sale of secondary raw materials, obtained after recycling of different residuals of building materials, together with water treatment and port facility specialization. Heros Sluiskil is working also about sustainability trying to focus and transform all the typology of municipal waste and bringing it back into new products. The work of this organization is based mainly on three kind of waste: granulate, non-ferrous and ferrous. These three main categories of waste are the basis of the processing and transforming of materials, also trough collaboration with other organizations. Heros Ecopark Terneuzen is situated on the 45-hectare site on the Ghent Canal to Terneuzen, the strategic position of this initiative of the organization, is ideal for the transfer from shipping to barge, and furthermore for temporary storage of bulk materials in silos. Within is sustainable-based company site is facilitating a series of other companies along the canal.

What is the relation with the port?

Important is the relation with the port and the water in two main ways: on the water treatment system, whiwh is connected also with other companies working in different sectors, along the canal; through the strashipments and lovements of materials, in this sense the ^port plays a key role for the organization.

What is the relation with the city?

The Heros Sluiskil organization is recuparing buildign

waste coming from demolition in order to recycle them and to reuse them in differet ways depending on the specific materials.

What are the ambitions?

Heros organization is researching for alternative raw materials to replace the residual waste. The organization is aiming for the future to be certified for the CO2 Performance Ladder, in order to keep monitoring the company emission and keep working to reduce it throughout different initiatives. Another important aspect in which Heros is working toward the future is on new reprocessing techniques for AEC Bottom ash.

Who is behind it?

Since 2012 Heros have been part of Remex Mineralstoff GmbH (specialist for high-quality construction material recycling of mineral waste), which is part of the Remodis Group. Furthermore, the organization is collaborating with Afval Energie Centrales. There is also a strong collaboration with Granova, which is a certified brand for granulate materials, which is produced by Heros. Since 2017 the TTS (Tank Terminal Sluiskil) have been part of the Heros Ecopark focusing their work on waste water, raw materials and products market, this last organization is the result of a co-ownership of three main organization: EcoService Europe, ATM and Heros Sluiskil.

Sources
www.heros.nl

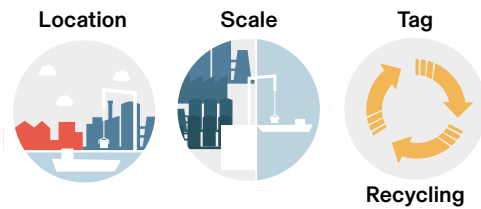


Recycling of granulate at Heros Sluiskil

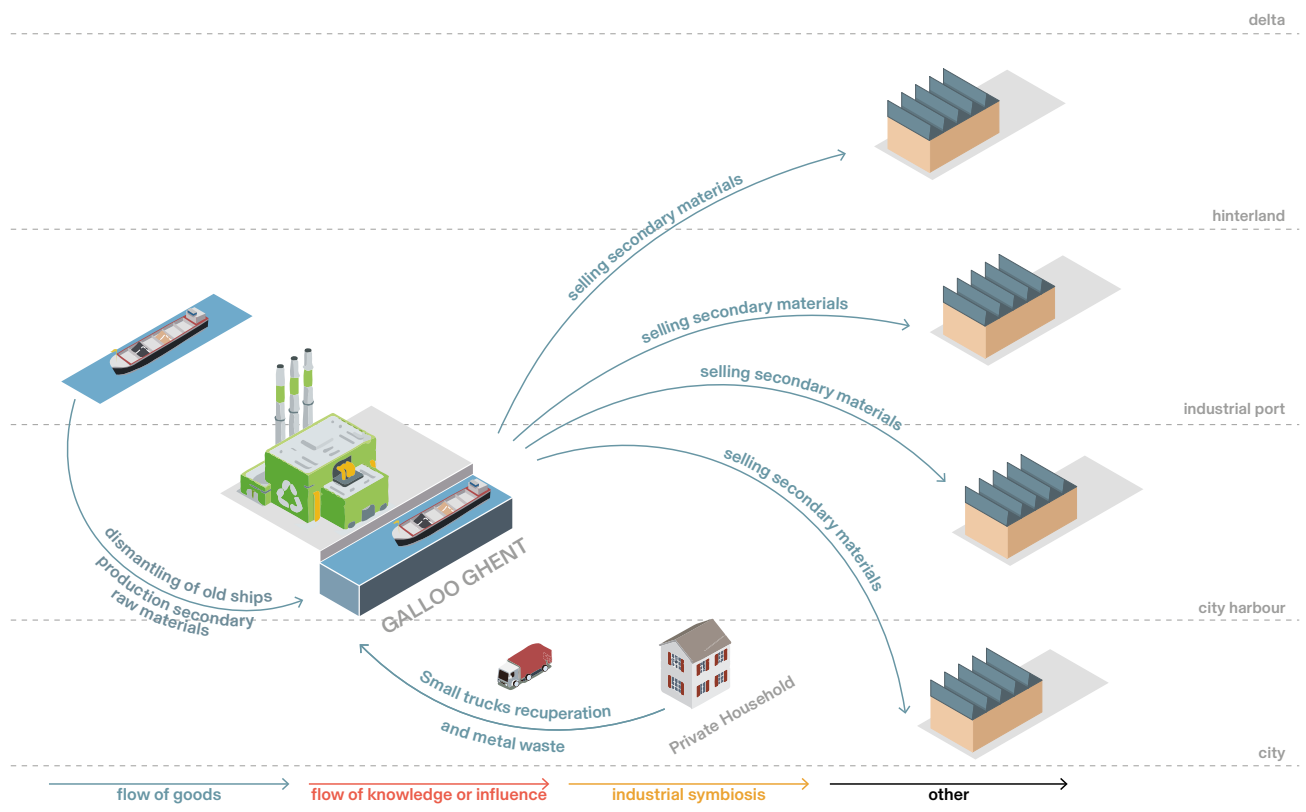


Heros Ecopark Terneuzen





“Galloo creates an uninterrupted recycling chain of scrap metal, ELVs, and other metals.”



What's happening? How does it happen?

Galloo Ghent is recuperating ships from private and public companies along the canal. Furthermore from the process of recuperation we have as outcome secondary raw materials, which are after sold to private companies in order to using them in different projects.

Galloo is a recycling company, which is located in Belgium, France and in the Netherlands. The Ghent organization is specialized in ship dismantling and recuperation of the materials coming from these actions. Freight trucks, coaches and other metal structures are also processed by Galloo in Gent. They are operating not only in the dismantling process, but also identifying and sorting valorisable flows in or-

der to initiate the process of making raw materials again. Galloo has coined an industrial converting process to recycle scrap from consumer goods and factory scrap in an ecological way, by converting waste products into secondary raw materials

Why is this an interesting circular initiative for circular harbours?

The cluster interrelation and connection are leading to the constitution of a general strategy generating common aims and goals to reach throughout collaboration. In this sense the setting of common strategy is leading the cluster to a more efficient but also sustainable functioning in order to be part of a bigger chain of collaboration.

What is the relation with the port and water?

Every year an average of 40 ships are dismantled at the shipyard in the port of Ghent, accounting for around 30,000 tons of scrap. In this sense the Galloo company is recuperating one typology of waste of the port itself, and transforming it to secondary raw material, possibly used for other purpose.

What is the relation with the city?

Galloo company is also recuperating small trucks and metal materials from private households and commercial companies located in the city.

What are the ambitions?

The company is aiming for the future to reduce, as much as possible, the fraction of the waste to be dumped. Plus maximizing the valorisation of the incoming products and minimize potential nuisance to neighbouring properties.

Reduce the consumption of energy, raw materials and consumables.

Who is behind it?

information not found

Sources

<http://www.galloo.com>

What is the
timeframe?

Galloo was
founded

Galloo-France
was born.

The new LTBR starts production and
is able to process both heavy and
light shredder residues. LCDs are now
also being recycled.

Bureau Vertitas
Certification

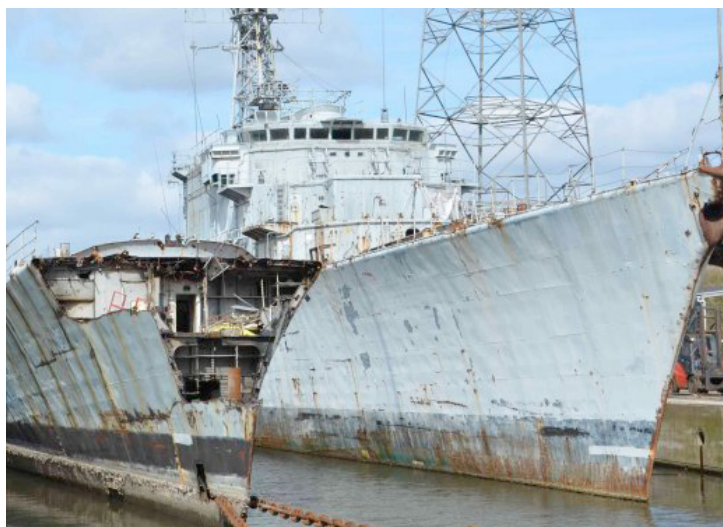
1939

1889

2010

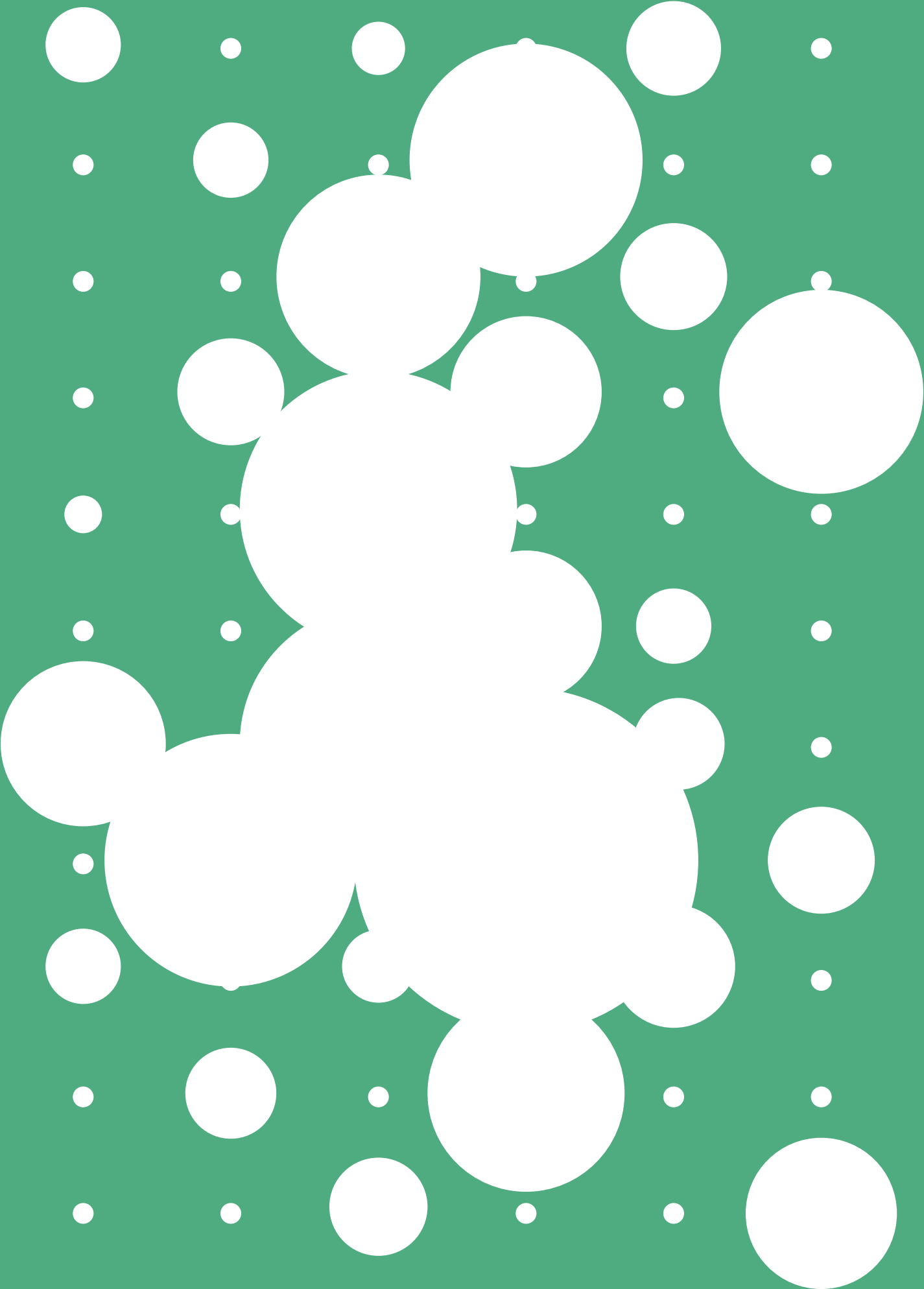
2018

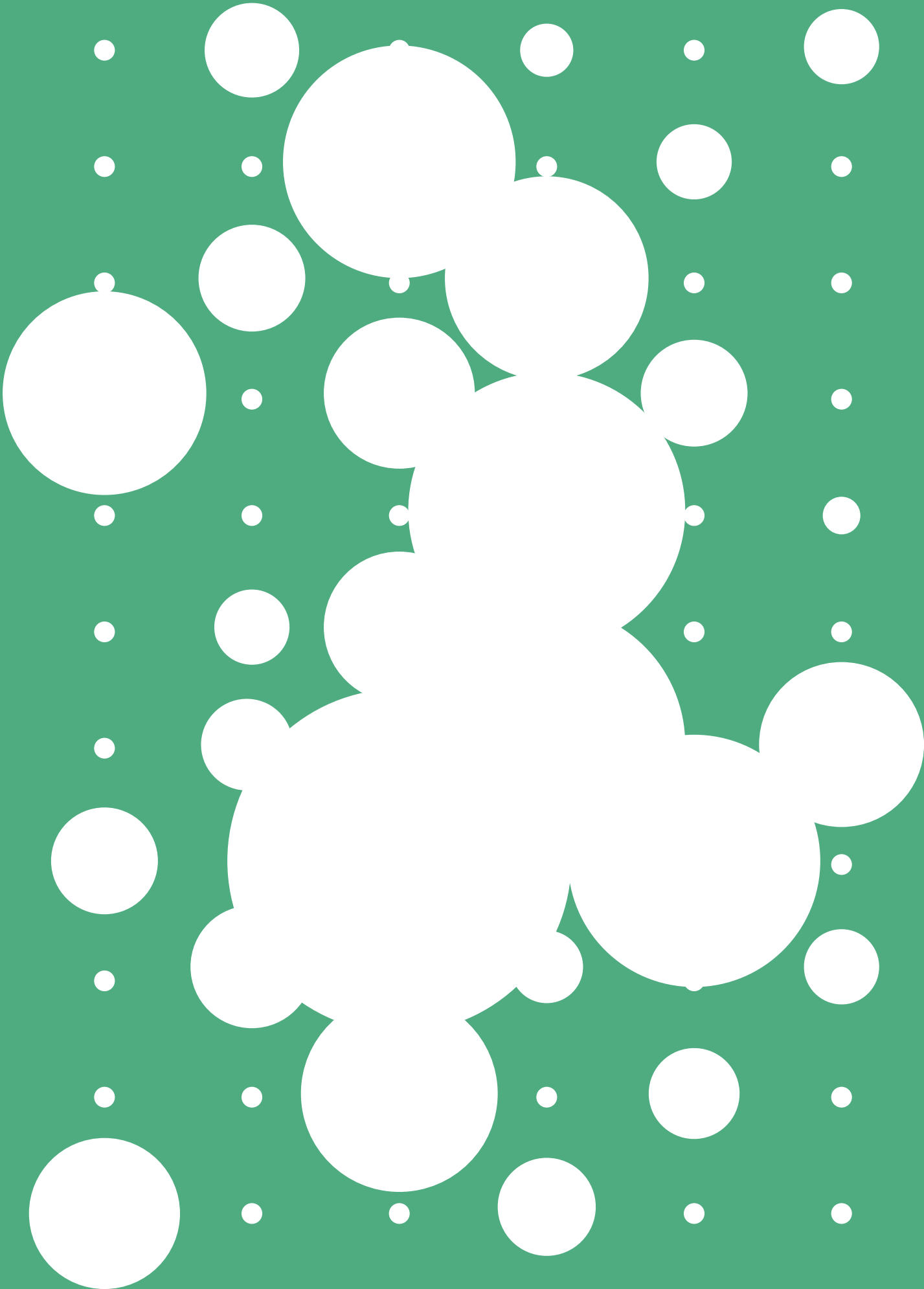
Ship dismantling



Material collection







1 Description of location in relation to other (sea/) ports

The port of Ostend is, in comparison with other ports, rather small and not accessible for the largest ships. There is also not a lot of extension areas to expand the port activities. This makes the growth of the port not possible and, at the same time, this means that the port cannot be competitive in the usual transshipment aims of ports. Therefore, Ostend focused on an alternative way to use the sea as a source of income: the blue energy is a potential for economic growth. After the first windmill park was established in 2007, Ostend positioned itself as an energy port.

2 Description of current activities

Ostend developed itself into a port where all services were positioned to support the Blue Energy and the Blue Growth Economy in general. Since the start of the windmill parks in the North Sea, Ostend invested in the required infrastructure and research institutes started to position themselves in or next to the port (Ghent University). This makes that experiments and new technologies concerning offshore activities are developed here: energy from waves, currents, tides... Apart from energy as the core port business, Ostend still has bulk cargo economy and also small ferry connections with the UK.

Another aspect in the port of Ostend, is the implementation of aquaculture and marine biotechnology. Other vital services for the well-functioning of all marine based activities is done by Flemish public services, which have their home base in Ostend.

3 Description demographic/socio-economic dynamics.

The port of Ostend plays a significant role in the regional economy, and the employment rate of the harbour is increasing year after year. After the world crisis, the port has to face a shift in activities, moving from a more fishery-based seaport, to a blue

energy producer. This important economic change made the port to work also toward innovating and research, starting to attract a differentiated kind of labour.

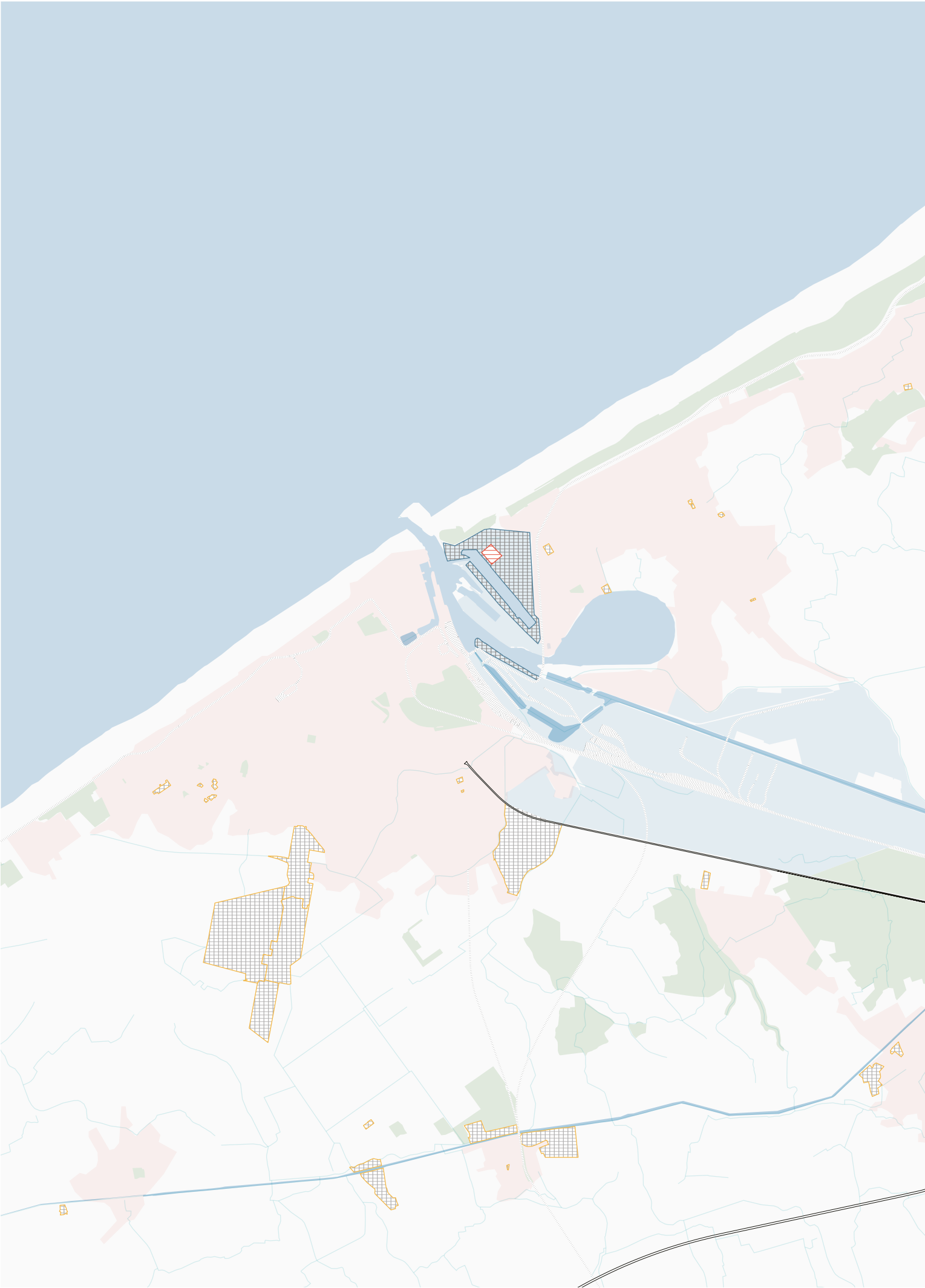
4 Why, and in what way is circularity looked at? The important economic shift that the port of Ostend faced in the last years, made them look at circularity as mainly considered in the aspect of the energy transition. Furthermore is possible to see other initiative within the port related to circular economy, concerning the reuse of waste and raw materials, and there is an intention to establish a "Circular economy cluster" focusing mostly on the treatment of demolition waste and the recycling of Airplane from the Ostend Airport.

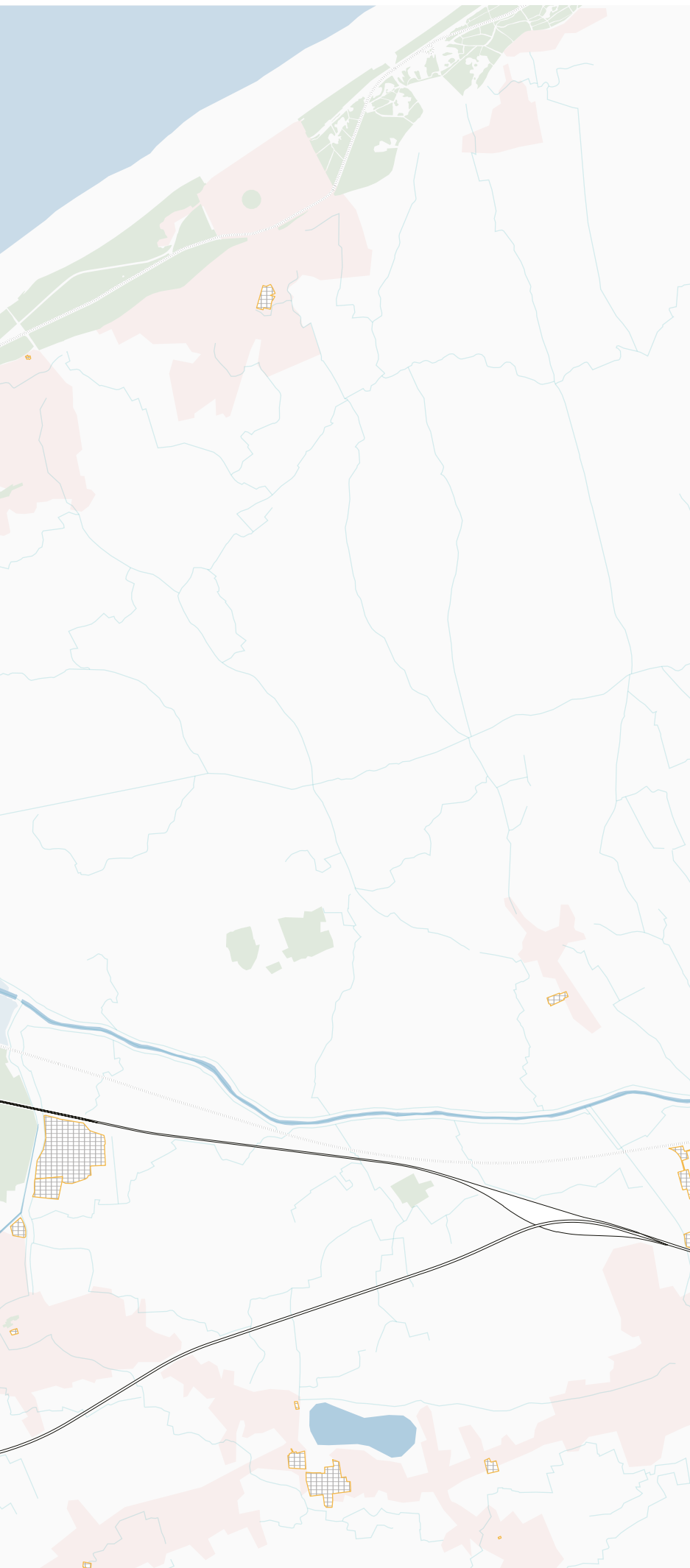
5. Who gives substance to this, which partnerships/ programmes/initiatives are made?

The integration of new activities in the port of Ostend related to energy production, required very specific kind of infrastructure. The port authority immediately invested in the necessary infrastructure as heavy load quays, starting to develop what is now known as the Blue energy cluster. The port of Ostend is considered now as the service port to support activities taking place in the sea.

6 Is there already a discourse around cityports? (Yes/no) Who is behind it and what are the ambitions/motives?

The proximity between the city and the port areas in Ostend is crucial, but it is not possible to recognize an area which has been defined as "city-port". Surely, exchange between the dynamics of the city and the production of the port are crucial and it is possible to draw clear interdependencies.





Ostend

Industrial Port

-  Port services (waterbound logistics, terminals, locks, ship repairs)
-  Distribution
-  Industries inside the port
-  Vacant sites
-  Expansion area
-  Industries outside the port
-  Used quays (waterbound activities)
-  Future projects
-  SEVESO sites

City

-  City
-  Planned waterfront development
-  Recent waterfront development; housing & services

Labelling Of City Ports

-  Potential city port
-  Defined as city port

Water

- 0m - 10m - 20m > 20m
-  High tide

Green Structure

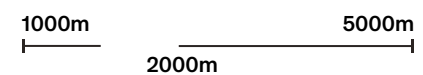
-  Green areas
-  Green quays

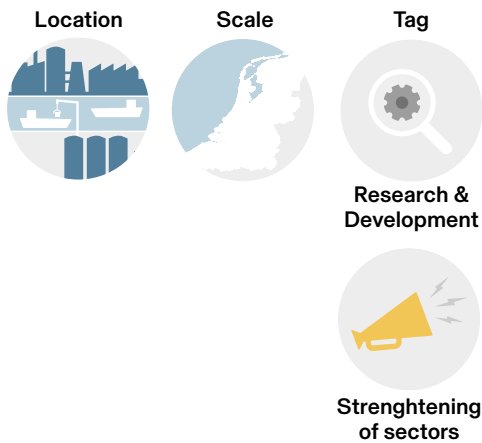
Boundaries

-  Port limits
-  Administrative limits

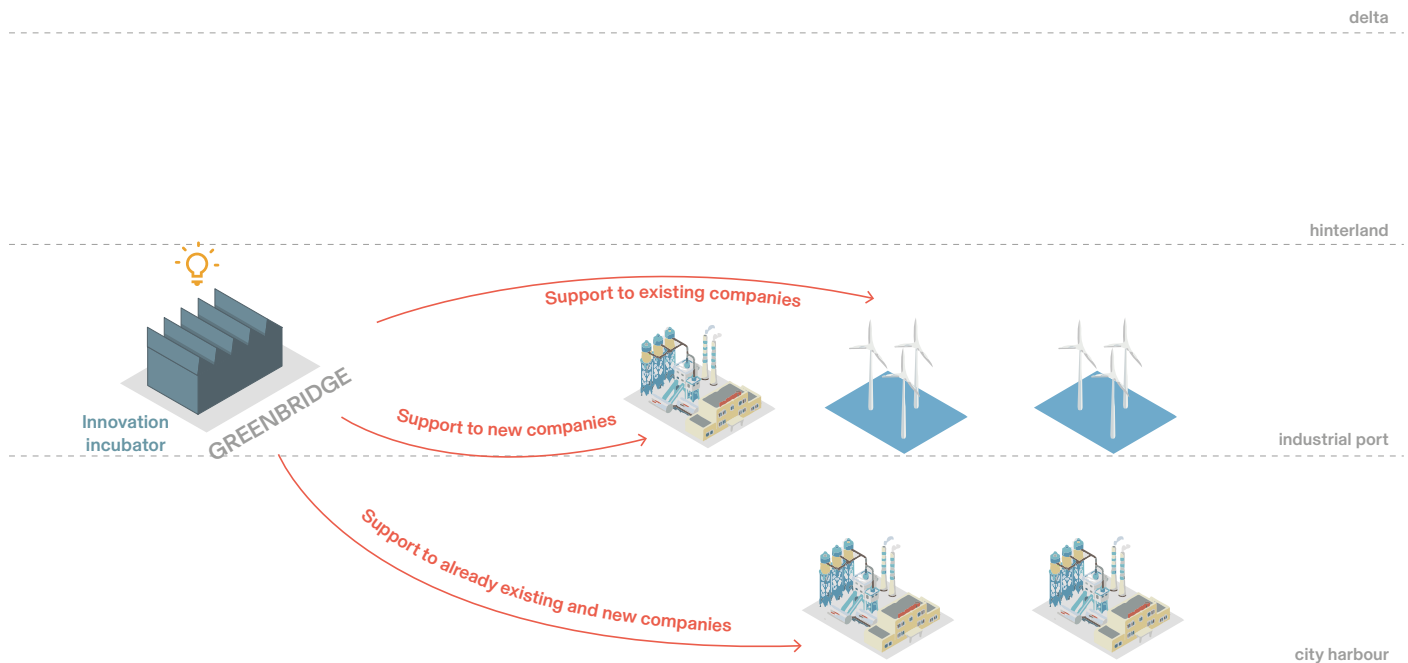
Infrastructure

-  Main trains
-  Primary roads
-  Secondary roads
-  Canals (non-tidal water)
-  Main waterways for classic ships
-  Main waterways for containers, ro-ro ships & bulk carriers (> 20m of draught)





“By 2020 the offshore production will cover 10% of all electricity demand in Belgium.”



What's happening? How does it happen?

Factory for the Future Blue Energy is based in GreenBridge, located in the port of Ostend. With the main aim to attract and help small and medium enterprises to work in this new energy sector and to research and develop new technologies, this location is a real innovation hub. The North Sea is a source of energy: wind, tides and waves can deliver continuously energy. This makes West-Flanders, and especially Ostend, the place for energy production. This new sector creates a big amount of em-

ployment and opportunities to develop new technologies. The Factory for the Future Blue Energy helps small and medium companies to develop themselves in this sector, both on national as international level. The base of the Factory for the Future is in Ostend at Greenbridge. This is a Blue Growth incubator: knowledge center, demonstrator, advisor... The research center focusses on research & development in making new products in the blue energy. Why is this a interesting circular initiative for circular harbours?

What is the relation with the port and water?

Since the port of Ostend is profiling itself as a energy port, with good connections to the windmill parks in the North Sea, many companies want to be based there. Greenbridge/Factory of the Future aims to attract and help new companies in this energy sector. This will make that Ostend will evolve as a blue-energy specialized port.

What is the relation with the city?

Ostend has a high unemployment rate. Attracting new companies and invent new technologies will ask for specific skills/work. New employment created will be welcomed by the city.

What are the ambitions?

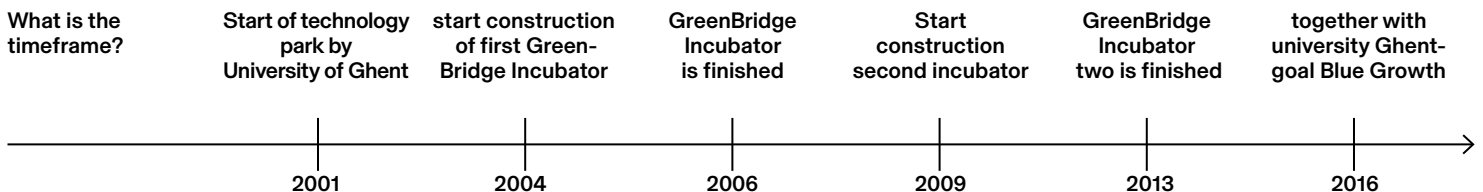
By 2020 the offshore production will cover 10% of all electricity demand in Belgium. Greenbridge/Factory of the Future invests in research, development and infrastructure with the aim to also have more jobs, expertise and international acknowledgement.

Who is behind it?

Ostend is the main basis for establishing the 'blue energy' activities. With the Factory of the Future companies, knowledge institutes and authorities combine their knowledge and establish a experimental platform on international level. New technologies and idea's can be developed on a worldly level. This creates opportunities on the level of research, advice, engineering, financing, logistics, building, exploitation and maintenance. All this creates again new jobs and specialization on all fields. With a technology park of the university of Ghent based in Ostend, there is a new research centers for testing on maritime constructions. OWI-lab, platform for research & development/innovation.

Sources

www.pomwvl.be/fabriek-voor-de-toekomst-blue-energy
https://issuu.com/pomwest-vlaanderen/docs/pom_fvt_blue_energy?e=28759921/55654016
www.fabriekenvoordetoeekomst.be/fabriek-voor-de-toekomst-blue-energy

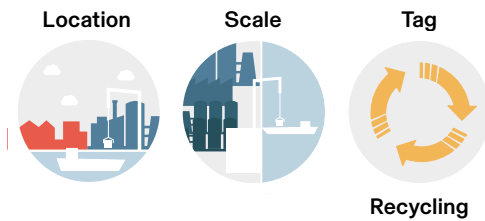


logo of 'Factory for the Future' and 'GreenBridge'

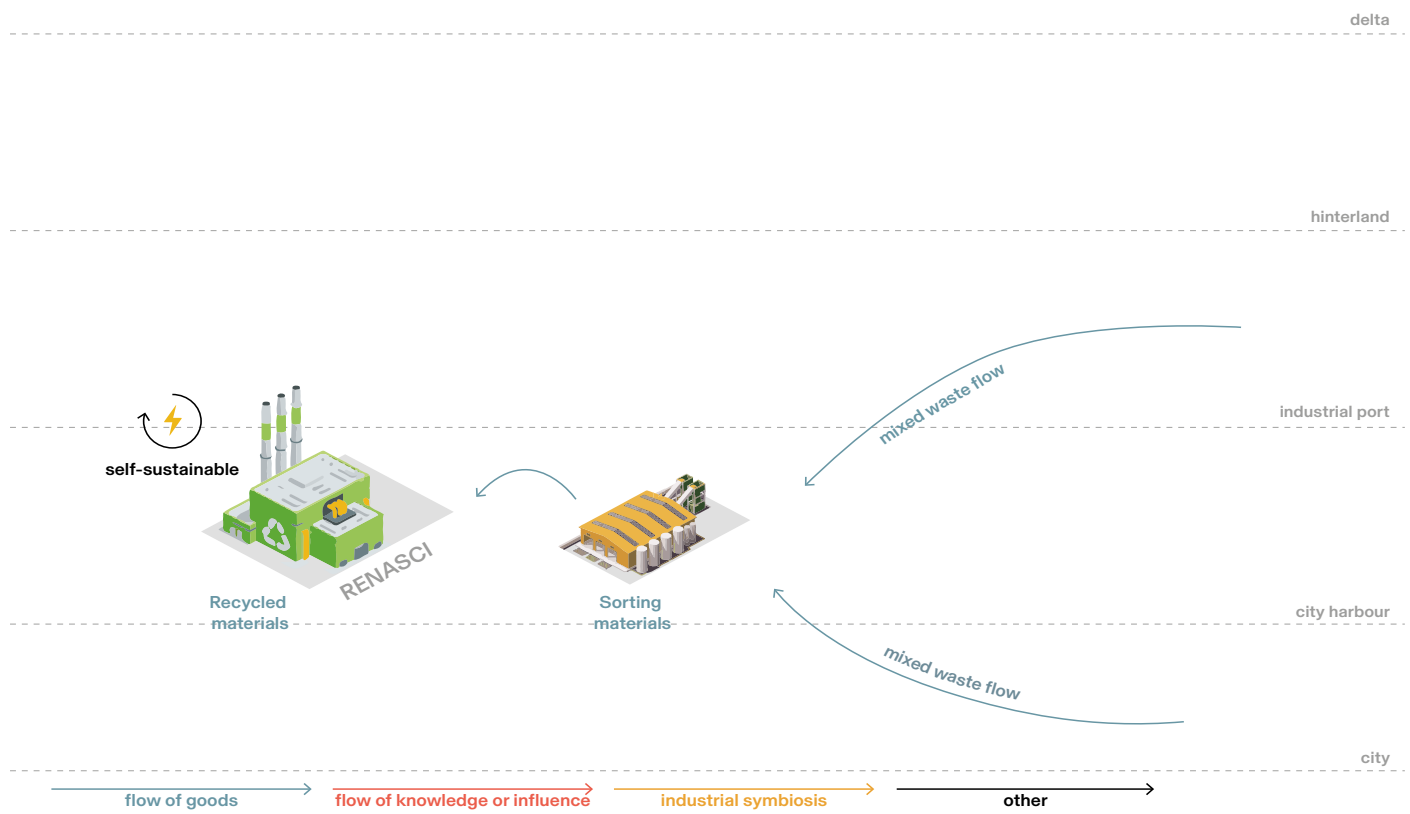


Innovation Hub of Greenbridge





Recycling all the typology of waste recuperating the maximum amount of energy and secondary raw materials.



What's happening? How does it happen?

Renasci is a Flemish initiative which introducing a new method for converting waste into energy and raw materials, creating the smallest possible amount of waste. The recycling process recovers 78% of the energy and results in 100% reusable raw materials and immediately usable products. Furthermore, the whole process is energy-independent, recuperating all the energy needed from the waste itself.

In order to meet the challenge of recovering the maximum of energy and raw materials from waste in an energy-independent manner, Renasci uses existing 'best practices', combined with 'new practices' it has developed itself, in a single integrated process.

This initiative offers recycling solution which respond

to the local waste problem, promoting throughout the smart chain processing, a further step in the circular economy of the Ostend port.

Why is this an interesting circular initiative for circular harbours?

The aim of Renasci initiatives is to recycle all the typology of waste recuperating the maximum amount of energy and secondary raw materials. The fact that the Renasci initiatives is based on the local waste flows it is relevant for enhancing the circularity at the local level. Furthermore, the location of the Structure it is also relevant since is in the city port area, and it is creating an interesting connection with the city.

What is the relation with the port and water?

The recycling implant need for certain steps along the process water. It is relevant the fact that Renasci initiatives, do not produces waste water, since they re-clean the water they use during the recycling process.

What is the relation with the city?

Renasci is collecting the waste from the city in order to recycle them in secondary raw materials and also energy.

What are the ambitions?

The ambitions if this initiative fir the future is to produce zero waste going along with the European guidelines planned for 2020, developing also new technologies and strategies to follow the European guidelines for 2025 and 2030.

Who is behind it?

information not found

Sources
www.renasci.be

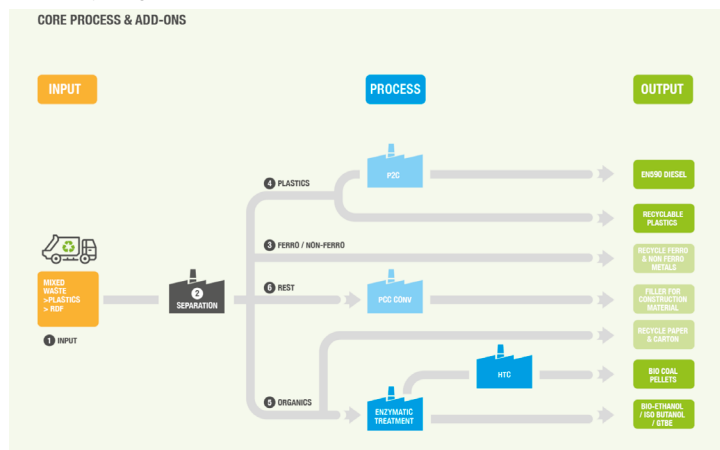
What is the timeframe?

Beginning of constructing the site in the Ostend Port

Test installetion in Ostend become operational

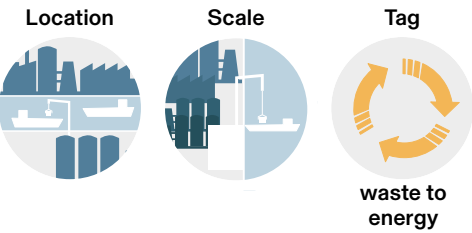
2018

2019

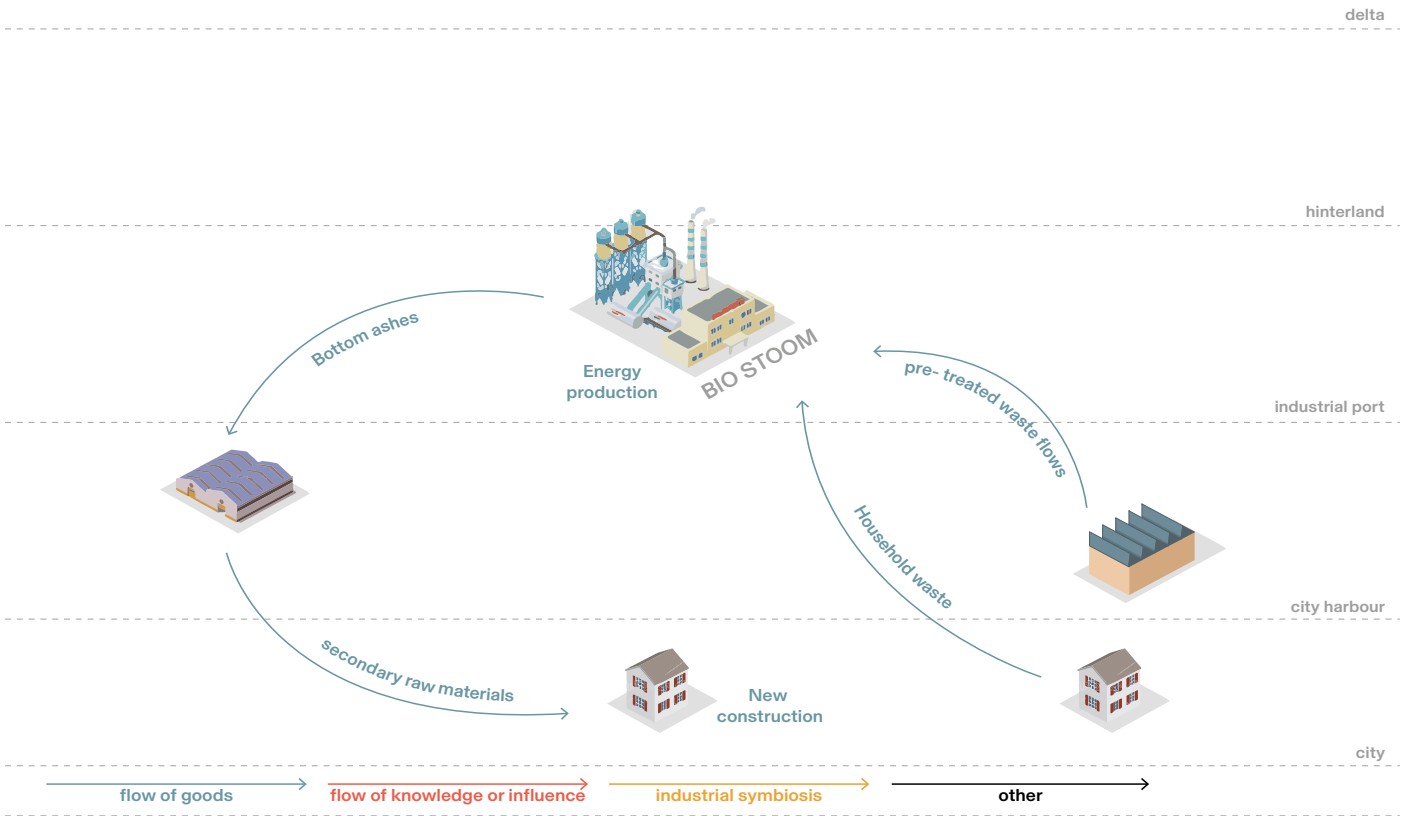
Core recycling process

Renasci plant





Renewable energy from residual waste



What's happening? How does it happen?
BIOSTOOM Ostend produces green electricity from residual waste originating from pre-treated commercial waste or household waste. Steam is produced with the heat that is released during the combustion process and it is producing electricity by driving the turbines. The bottom ash is completely valorized as a secondary raw material.

Why is this an interesting circular initiative for circular harbours?
The energy production throughout the steam turbine is powered by pre-treated commercial waste and household waste. It is relevant to highlight the circularity of this initiatives, since the bottom ashes coming from the combustion of the waste are reused as secondary raw material, and since the steam is re-transformed again in water and reused in the process in order to produce energy.

What is the relation with the port and water?

The initiatives it is located in the industrial port of Ostend. It does not have a close relationship with the water port, but it is relevant part of the port system.

What is the relation with the city?

The connection with the city is related to the waste streams, in fact, the waste burned in order to produce heat is coming from commercial activities and households located in the city.

What are the ambitions?

information not found

Who is behind it?

The company is owned by two different big initiatives: Bionerga which has been recuperating raw materials and energy from non-reusable waste streams for more than 30 years in a socially responsible manner; and NIBC.

Sources
www.renasci.be

What is the timeframe?

Was established under the name of Electrawinds Biostoom

2007

Electrawinds decided to sell the assets of the well-functioning biosteam power plant

2013

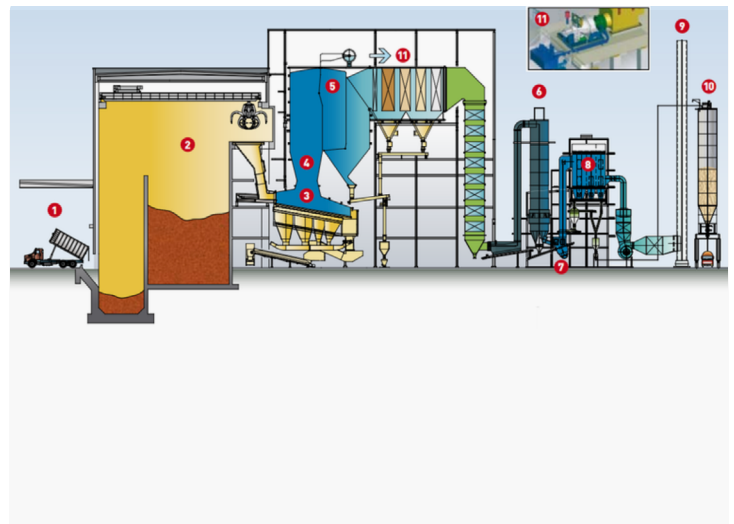
Opening of a new Steam plant in Ravenshout

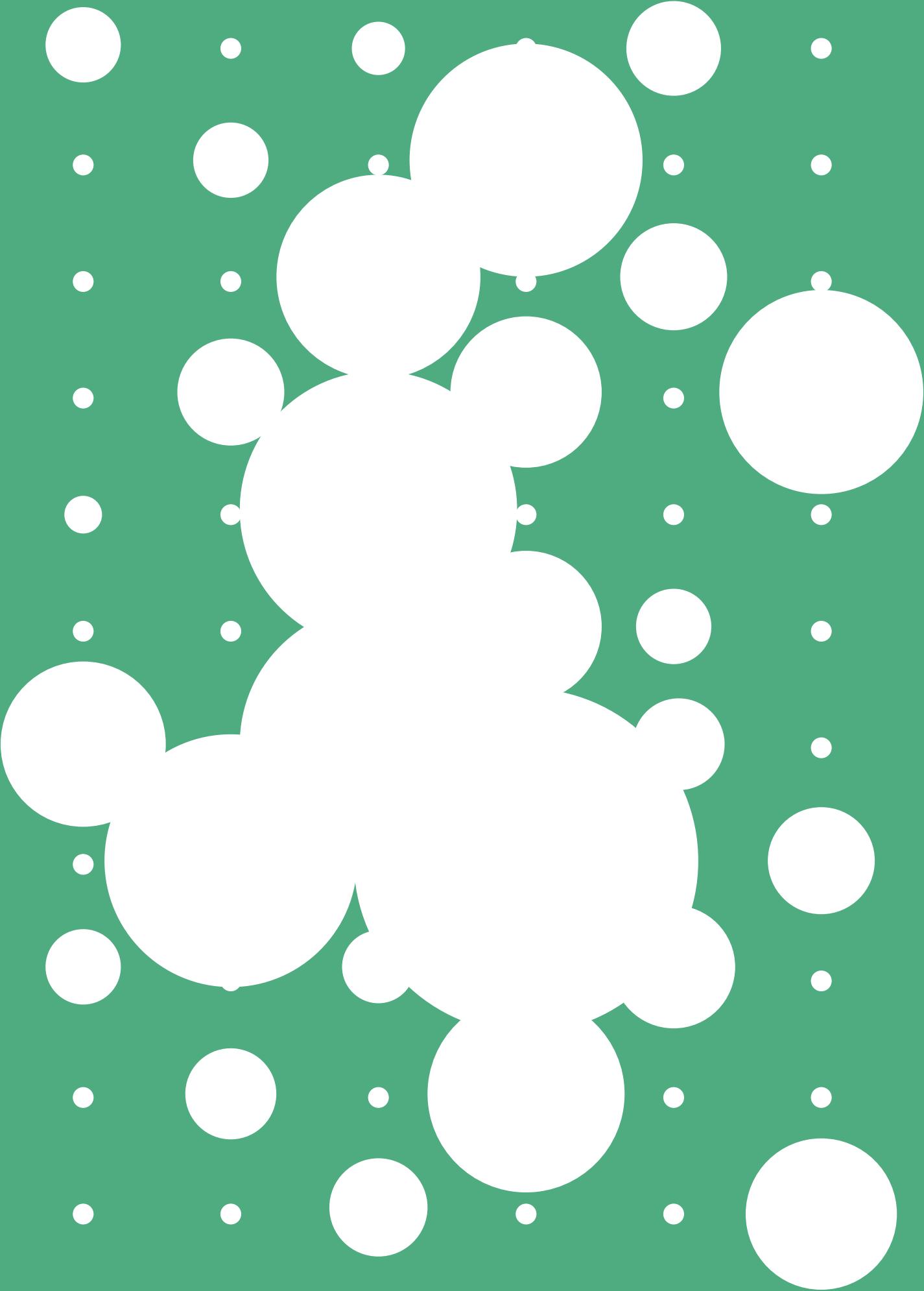
2016

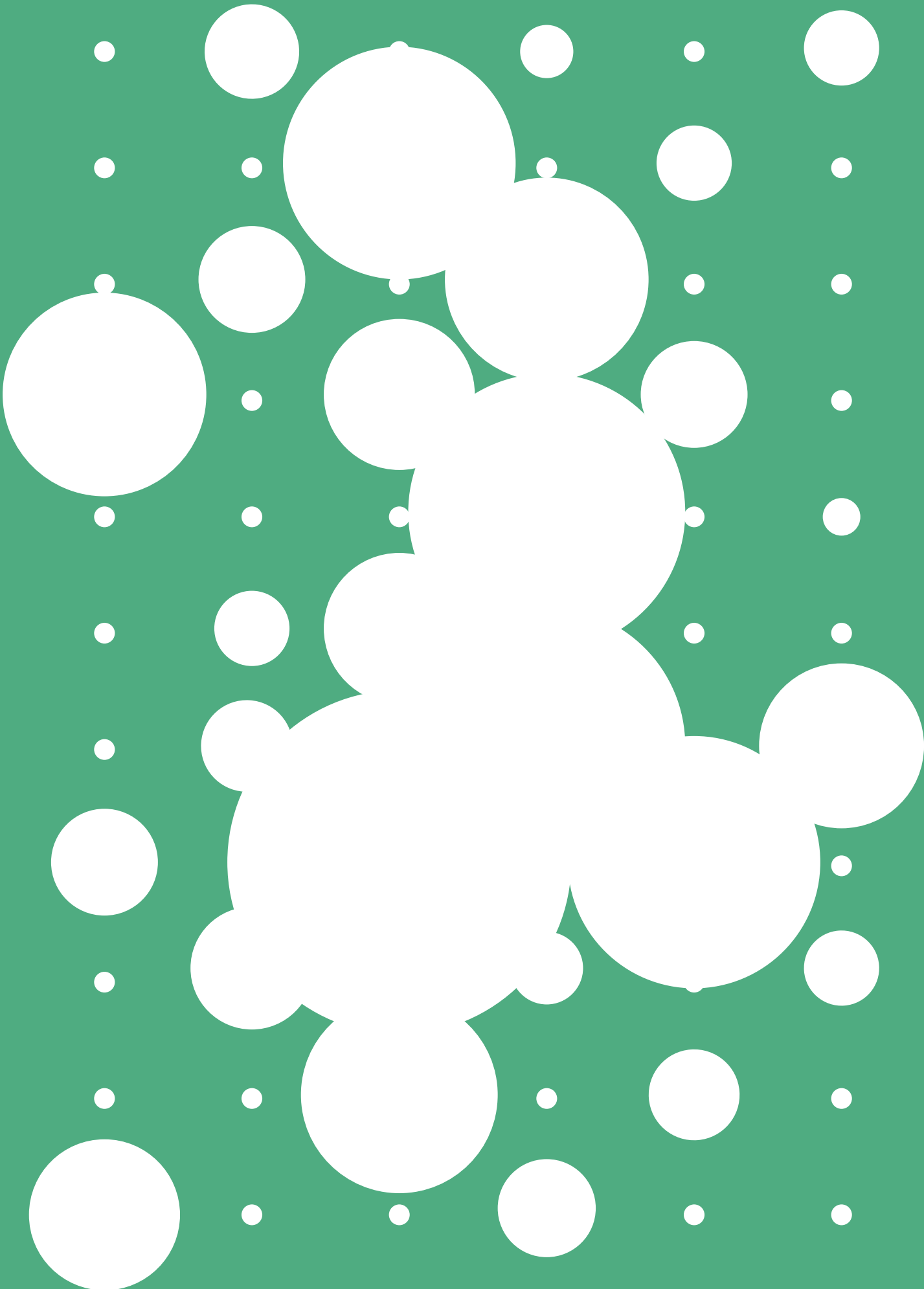
Biostoom Ostend



Energy production plant







1 Description of location in relation to other (sea/) ports

The port of Rotterdam is the largest port of Europe, and it stretches over a surface of nearly 40 km. the port of Rotterdam is in close relation to Dordrecht, which represent a big potentiality for connections with a vast inland network of waterways

2 Description of current activities

The activity taking place in the port of Rotterdam are especially related to container transshipment and transport. Furthermore, the second mayor activity present in the port is related to the chemical industry, in close relation with the port of Antwerp.

3 Description demographic/socio-economic dynamics.

The demographic growth of the city is increasing the housing demand. This phenomenon is putting under risk some of the port areas close to the city. At the same time, at the policy level, there is not much facilitation and regulation regarding the transition toward a more circular economy for the port.

4 Why, and in what way is circularity looked at?

Rotterdam has a large industry lobby at the table that is difficult to move, the transition to a more circular economy is read as paying for the transition to industrial symbiosis. The port of Rotterdam strives to transform its current petrochemical sector into a sustainable industry that recycles materials and greatly reduces CO2 emissions. The port already has a large cluster of recycling and bio-based materials and raw materials production. By offering "plug and play" infrastructure for new locations and for the development of new production processes, it has a

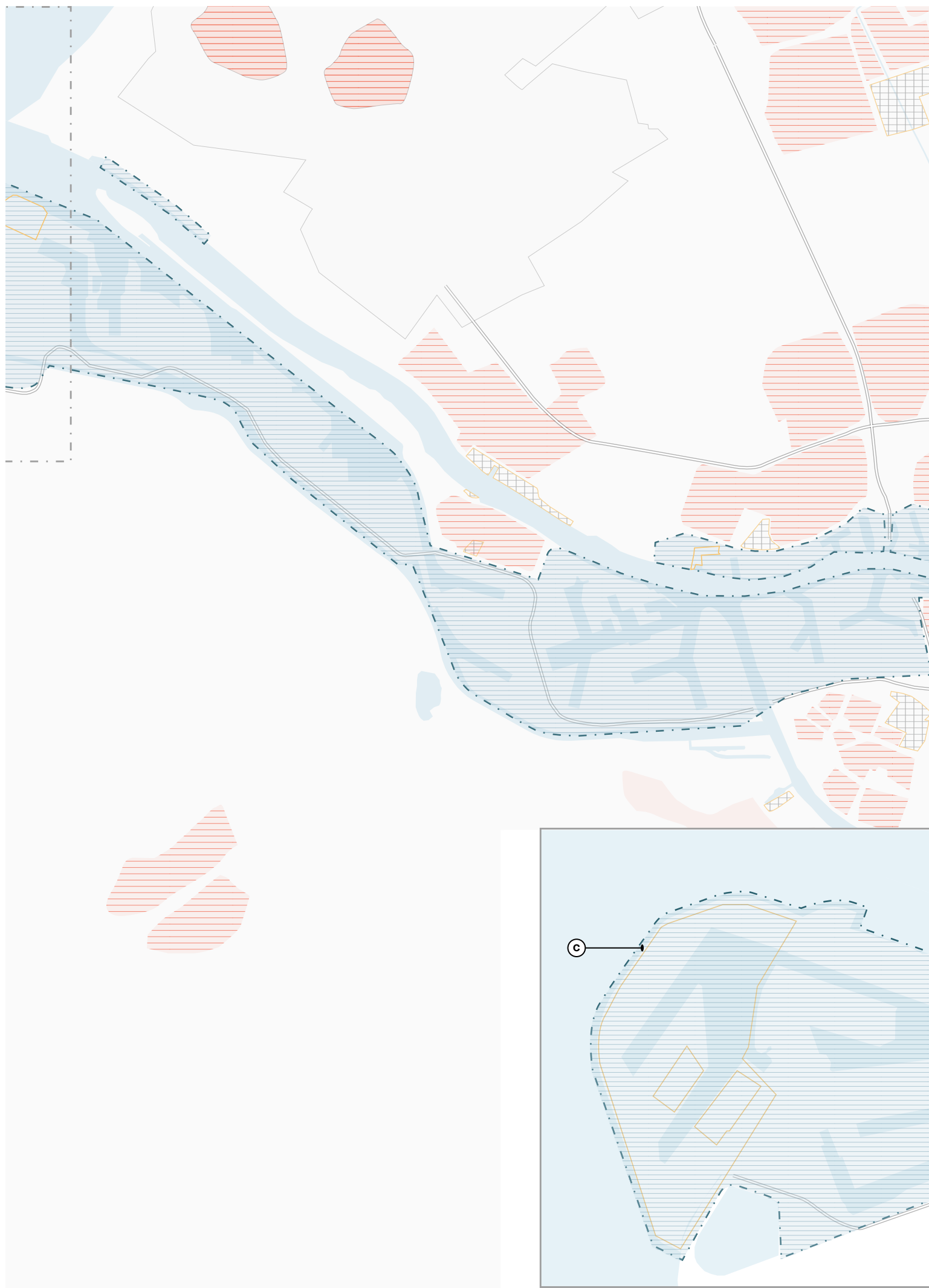
facility in "Plant One" for the rapid implementation of pilot and demonstration projects. In addition, it stimulates start-ups in various ways and the interaction of these start-ups with established companies. In four transition scenarios that she has drawn up, she shows how, together with other transition paths, such as waste-to-chemicals, CO2 storage, and renewable energy, the bio-based industry can make the port almost completely circular in 2050.

5 Who gives substance to this, which partnerships/programmes/initiatives are made?

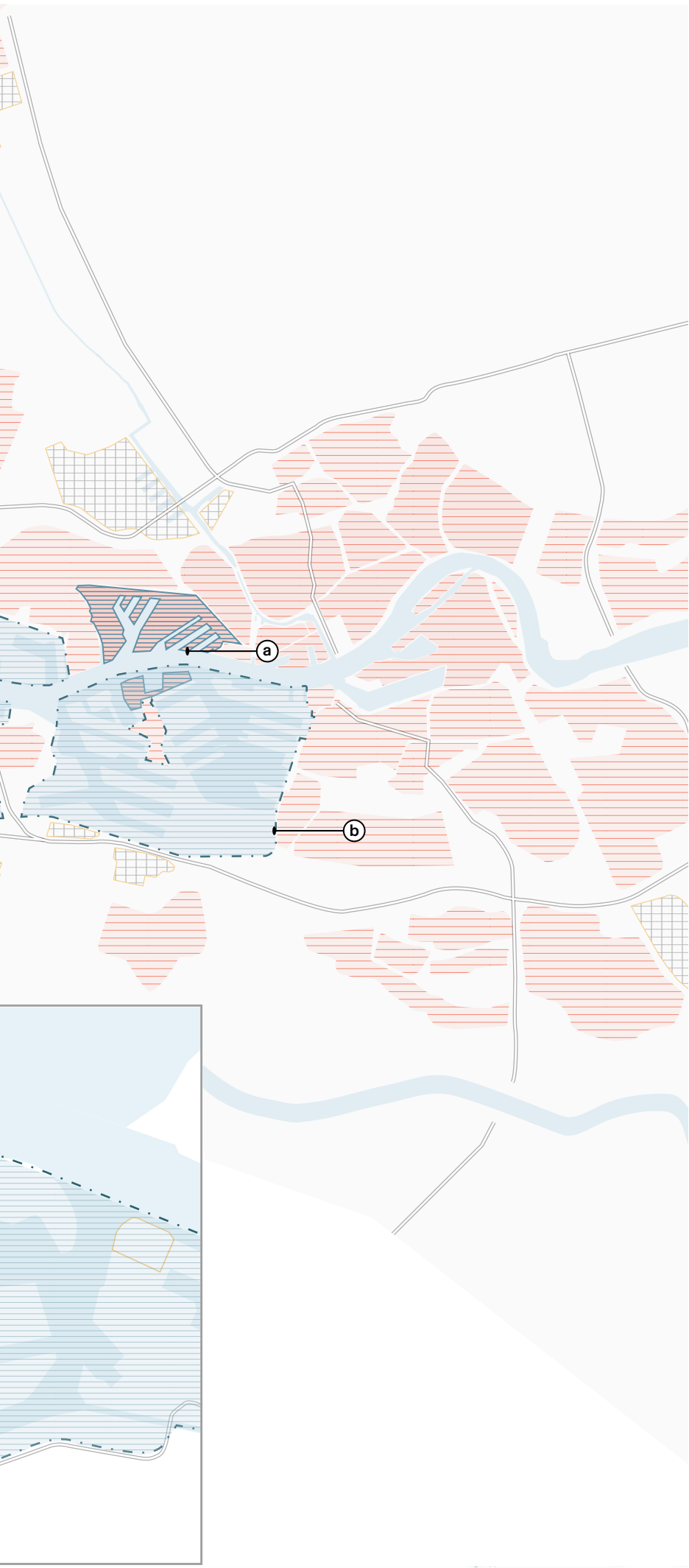
The overcapacity in bio-fuels can be compared with the excessive waste incineration capacity in the Netherlands. The incinerators run below their optimum and sometimes even loss-making. As long as that situation continues, the market is primarily interested in filling that gap, and not in achieving high-quality (re) use of waste or biomass. The stalemate that these yields becomes a new concern for the government, which then seeks to mitigate industrial suffering with subsidy and trade instruments.

6 Is there already a discourse around cityports? (Yes/no) Who is behind it and what are the ambitions/motives?

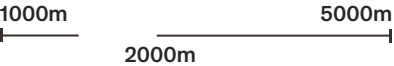
In 2011, a vision for the city port of Rotterdam was built by the port authority in collaboration with the municipality of Rotterdam. With the city ports, and specifically RDM and the Makers District, a route has been chosen to better facilitate makers, they do this primarily from a kind of growth process in which "innovative" makers are given a platform to grow. (not much programming or concrete infrastructure work; on the other hand, development of M4H + will come with some new building codes, legislation)

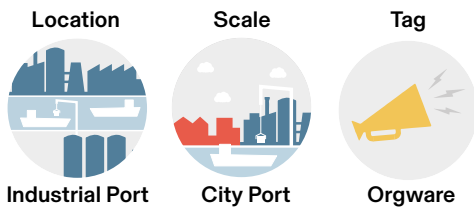


Rotterdam

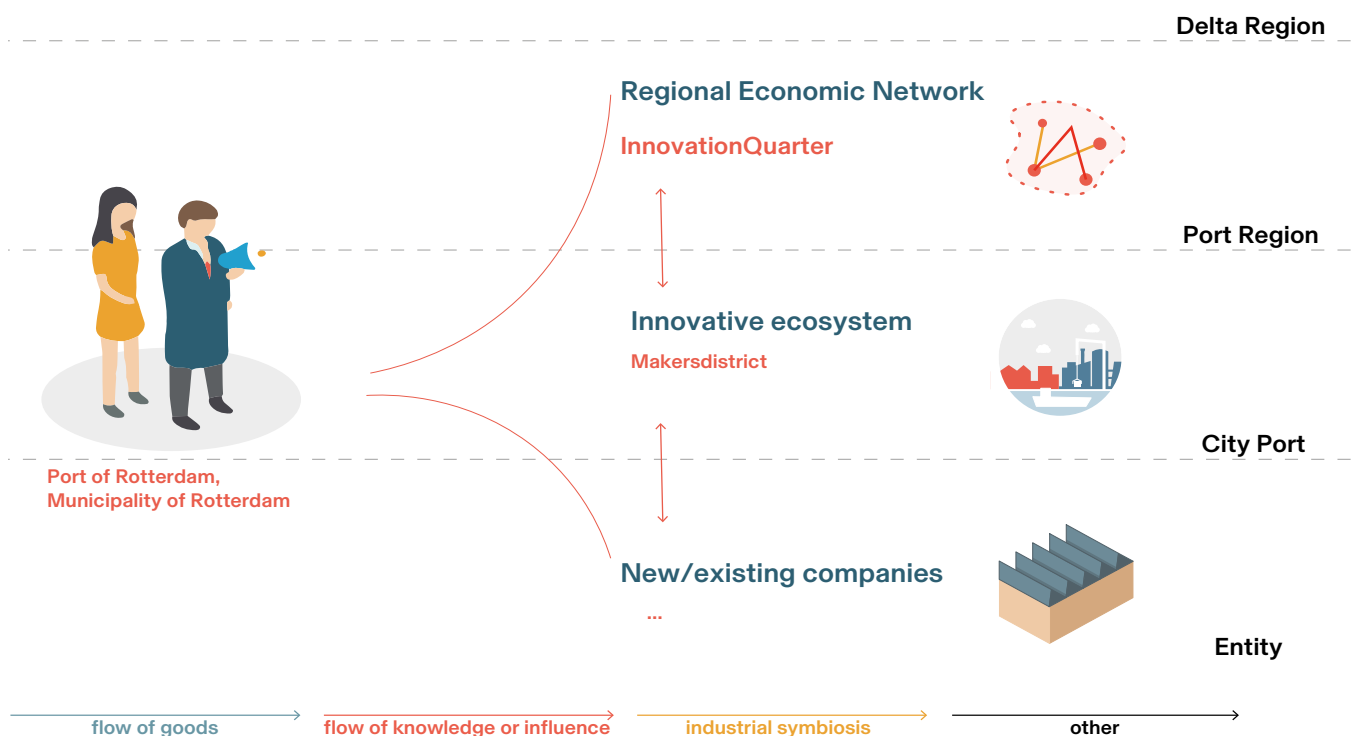


- City**
- City
 - Planned waterfront development
 - Recent waterfront development; housing & services
- Labelling Of City Ports**
- Potential city port
 - Defined as city port
- Industrial Port**
- Port services (waterbound logistics, terminals, locks, ship repairs)
 - Industries inside the port
 - Vacant sites
 - Expansion area
 - Port limits
 - Industries outside the port
- Infrastructure**
- Main trains
 - Primary roads
 - Canals (non-tidal water)





“The further development of the Makers District fills a gap in the regional and national innovation ecosystem. This ecosystem consists of overlapping, interactive and open networks in which companies, investors, knowledge institutions and public parties support each other.”



What's happening? How does it happen?

Formulation of vision and strategy for a specific area of the Stadshavens: the M4H (Merwe-Vierhaven) area and the RDM on the other side of the Maas. The large-scale port-related activities that have marked the area so strongly (fruit port & juice cluster in M4H, the shipyard in RDM) are gradually moving to other locations further on in the (industrial) port. In the wake of this transition, smaller, more innovative makers have settled here - because of cheap rental costs, low noise or odour nuisance requirements, good accessibility,... In the coming decades M4H will be developed into a mixed living-working area, therefore a Spatial Framework is being drawn up.

Why is this an interesting circular initiative for circular ports?

On the one hand this port-city area is interesting and inspiring for its strategy how to development the area. The ambition was to do this in an incremental way, looking at different time slots (now-5 years, 5-10 years, 10-30 years, >30 years) so existing and new dynamics are brought together leaving room for changes and unforeseen opportunities. Also the ambition was to develop a variety of different milieus that sometime exclude housing or industrial activities.

On the other hand, circularity was a guiding concept that allowed for a development framework based on circularity principles, both for materials (buildings) as for infrastructure and people (agents of change).

What is the relation with the port and water?

The industrial port of Rotterdam knows some of the most biggest fossil based multinational companies. These 'abandoned' port area offer an opportunity as it holds the ingredients (available space, proximity to the city,..) for a new kind of economies that brings back production to our cities and ports.

What is the relation with the city?

Innovations towards such new economies need an urban environment. Also the ambition is to develop some parts of M4H for housing developments, bringing new life, ideas and perceptions into the area and the port-city interface.

What are the ambitions?

Develop the area as a living and working environment and attract innovative manufacturing indus-

try. With the RDM Campus (see fiche RDM) an important step has been taken towards strengthening this new economy. With the Testsite M4H (see fiche Testsite M4H+) a research and development strategy has been tested to operationalize circular area development.

Who is behind it?

The municipality and the Port Authority are working together on this. A programme organisation has been set up that focuses on marketing, branding, strengthening the makers community, guiding companies or organisations to the right desk at RDM or M4H and initiating projects.

Sources

www.rotterdammakersdistrict.com

What is the timeframe?

Vision and structural plan vor Stadshavens by Port of Rotterdam

Vision and strategic plan Makersdistrict

RDM Campus cooperation agreement

Testsite M4H+

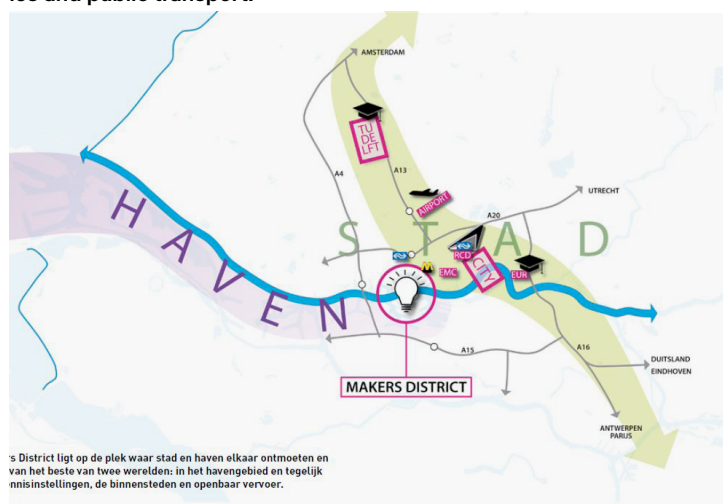
2011

2017

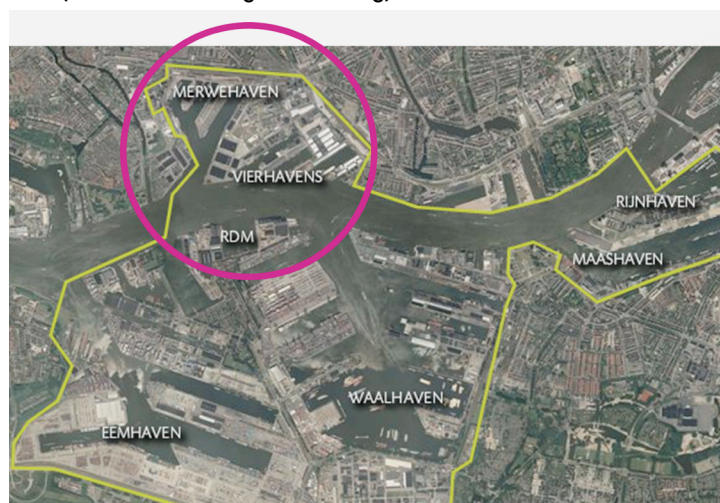
2018

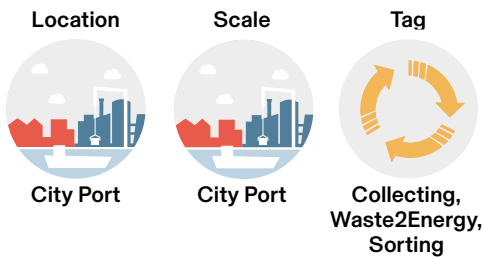
2018

The Rotterdam Makers District as a strategic location: inside the port area and at the same time close to knowledge institutions, the inner cities and public transport.

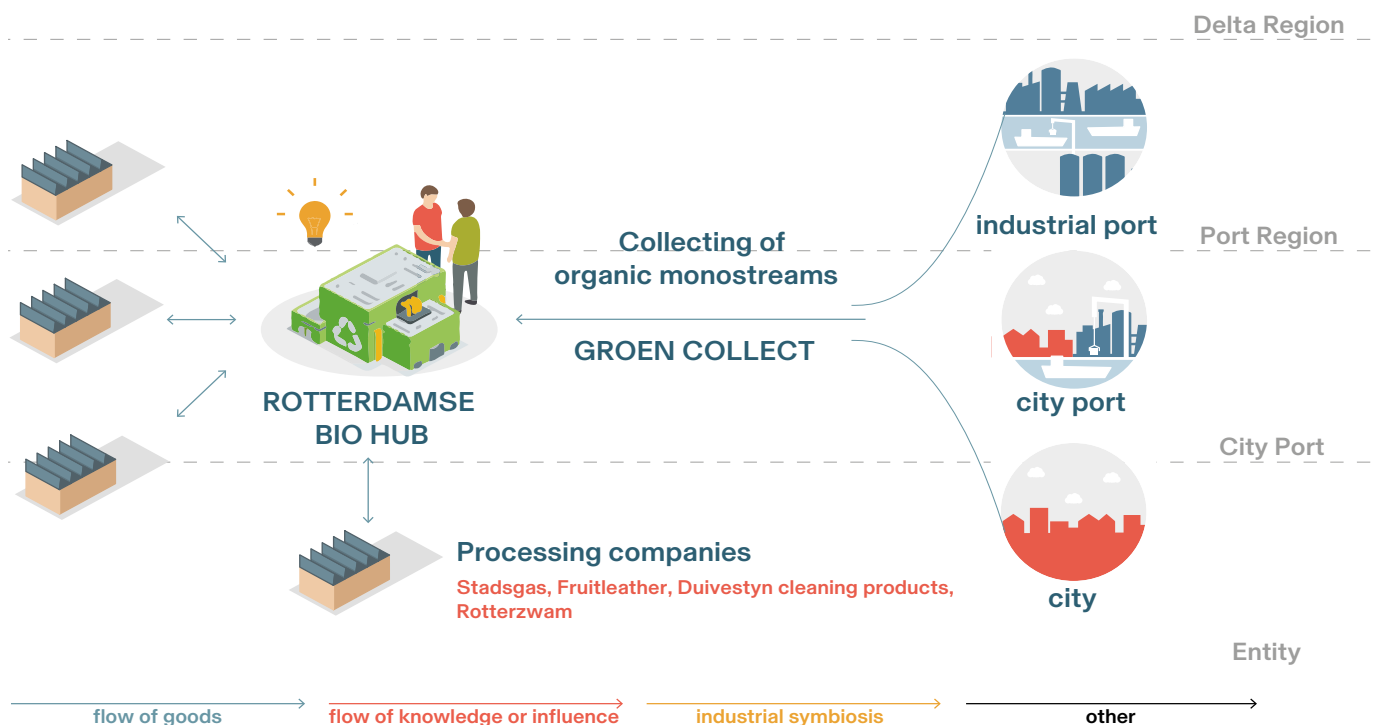


The Rotterdam Makers District as a specific area within the Stadshavens (with a mix of living and working)





“In providing resources for the biobased economy we deploy local collecting projects with a focus on job integration programs”



What's happening? How does it happen?

Groencollect is a service oriented company that collects, sorts and stores organic waste. These different streams are delivered to other companies for processing. The reason for their success lies in bridging the gap between mono-streams (which are pure and more usable for high-end purposes like cosmetics or bio-materials) and a continuous, supply of these streams. These activities demand much space and can be messy. Storage is necessary because not enough organic material can be collected by the vans at once. As certain mono-streams are more valuable they provide the service of sorting and up-

scaling these flows until enough volume is gathered. With the development of M4H, they fear that clean, odorless makers will be put to the front.

Why is this an interesting circular initiative for circular ports?

Both its business-model (new skilled-labourforce) and its operation are innovative and representative for new circular ways of doing things. Collecting mono-stream waste flows from the city (and port), nourished by an innovative makers network, their activity is growing quickly.

What is the relation with the port and water?
Located in the former biggest fruit and juice cluster of the world, an interest and business was developed for organic waste and its possibilities. It started in this in-between period between the former port area and the future as a cityport. Leftovers from the (former) fruit-port were collected and used as resources for testing and processing. Several years later, their business has grown by x30 and they provide monostream organic waste flows from the city, to be processed by other companies, located around them. As certain mono-streams are more valuable they provide the service of sorting and up-scaling these flows until enough volume is gathered.

What is the relation with the city?
As they work with organic waste streams from the city, their location close to the city is crucial. For them, the proximity to these flows (both city and port), the space for testing (environmental legislations/smell/noise/space) and interaction with other 'makers', were key to their success. As such, they fill in a gap between large scale industrial processing facilities and small scaled labo's that develop new technologies.
On top, they work together with a neighbourhood initiatives around job integration programs wherein

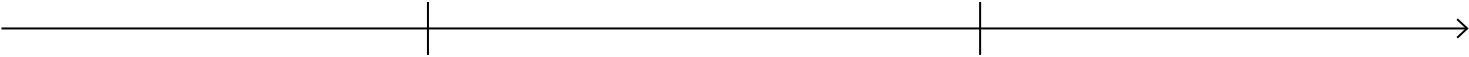
they educate long-termed unemployed people with skills in the circular economy.

What are the ambitions?
Working in this specific service for 3 years now, they developed a network of providers (restaurants, distribution centres, ...) and a network of producers around them. With their development of the Rotterdam BioHub their position is more consolidated and their business is growing rapidly. As such, they positioned themselves as a crucial spill and game changer for a more high-level valorisation of organic waste,

Who is behind it?
The Rotterdam Biohub is a concept created by GroenCollect [Green Collect] and Stadsgas [Citygas]. These companies focus on collecting organic waste from dense urban environments. The hub focuses on the production of materials from these waste streams. For example producing detergent from orange peelings or anti corrosion fluids from bananas.

Sources
www.groencollect.nl

What is the timeframe?



Pure, monostream residual organic waste is collected in the city of Rotterdam with small e-trucks as input for other, small and specific production processes.



With a small e-truc, the waste materials are collected throughout the city.



