Harbour in Transition

P5-presentation | Sicco Jansen | # 4427718

09th of November 2017

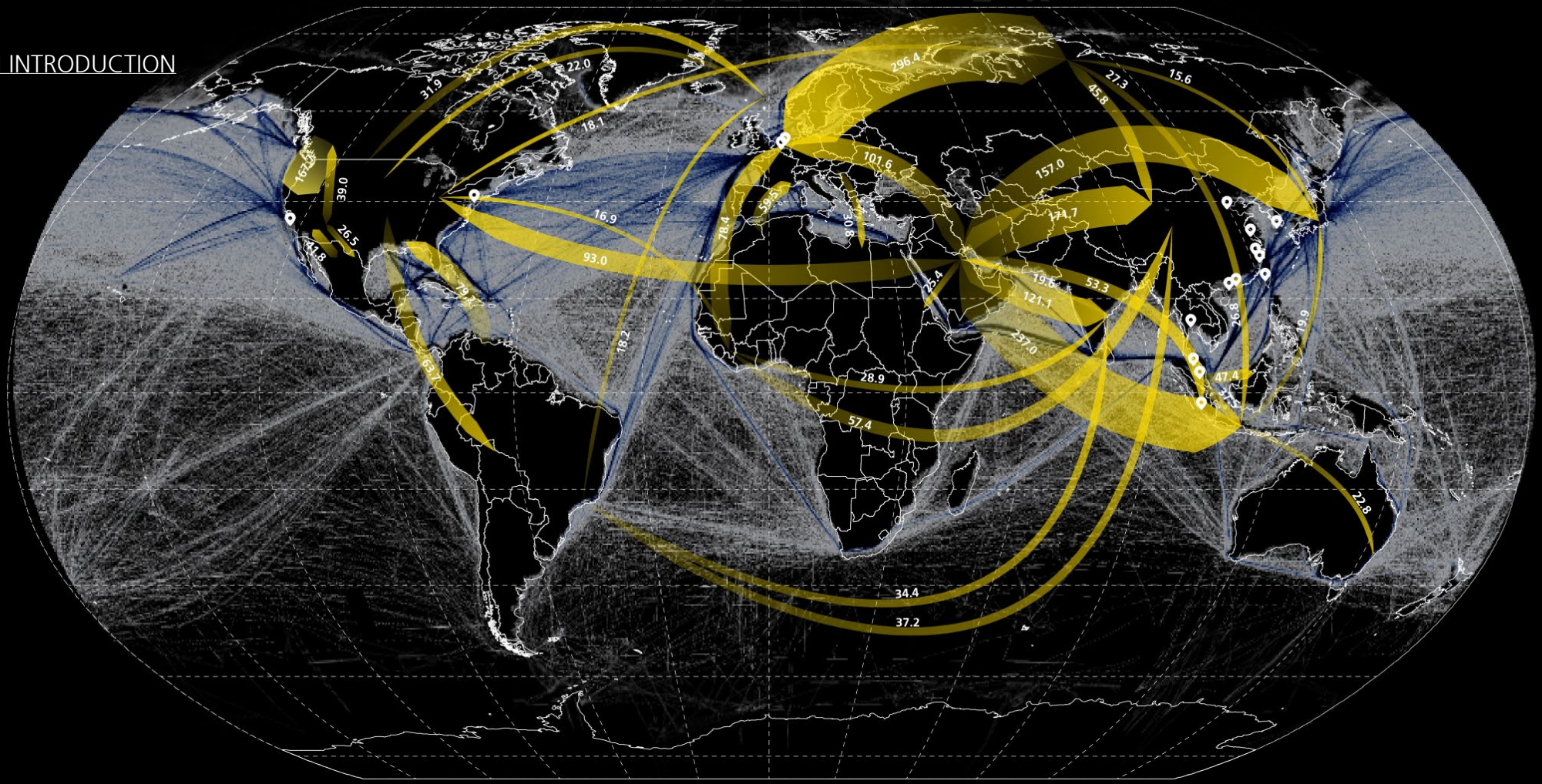
Content of the presentation

- Problem introduction
- Theoretical framework
- Problem analysis
- Design
  - Masterplan
  - Design
  - Detail
  - Elaboration
- Conclusion

#P1

Problem introduction: Oil harbour facing transition

PROBLEM INTRODUCTION



Legend

- Main [oil] harbours
- Ship intensity
- Oil flows [source-destination]
  In million tons

*Sources: *BP Oil*
University of California (2008)


1,4
Hamburg
19,7
Willemshaven
103,1
Rotterdam
4,8
Antwerp
Legend
Oil pipelines on land
Oil pipelines on sea
Shipping routes
Crude oil transshipment (2015)
In million ton
*Sources: The Port of Rotterdam Statistics (2015)

PROBLEM INTRODUCTION

Paris Climate Agreements

Goals

- 2020 20% cut in greenhouse gas emissions
- 2030 40% cut in greenhouse gas emissions
- 2050 80-95% cut in greenhouse gas emissions

PROBLEM INTRODUCTION

Main Question: How can the harbour of Rotterdam anticipate the coming energy transition in such a way that the regional scale system interests are incorporated and that the harbour will be ecologically and economically healthier, using a landscape-based approach?

#P2

Theoretical framework

What we can learn from previous energy transitions:

- The fourth energy transition
- The landscape changes completely
- From centralized to decentralized
- Closing of The Limburg coal mines 1965-1974; a success story
- Transition plan

The idea of landscape-based design:

- The theory of the studio
- Landscape as infrastructure; conditions as design tool

THEORETICAL FRAMEWORK

Landscape architecture as a tool to generate new perspectives: learning from the Ruhr region

- From the 1950's onwards industries leave the region
- What is left is a polluted and scattered landscape
- The IBA masterplan: make the landscape something positive
- Now: a unique selling point; the region is on the rise again

#P3

Problematique

… A precise spatial translation of a scenario study

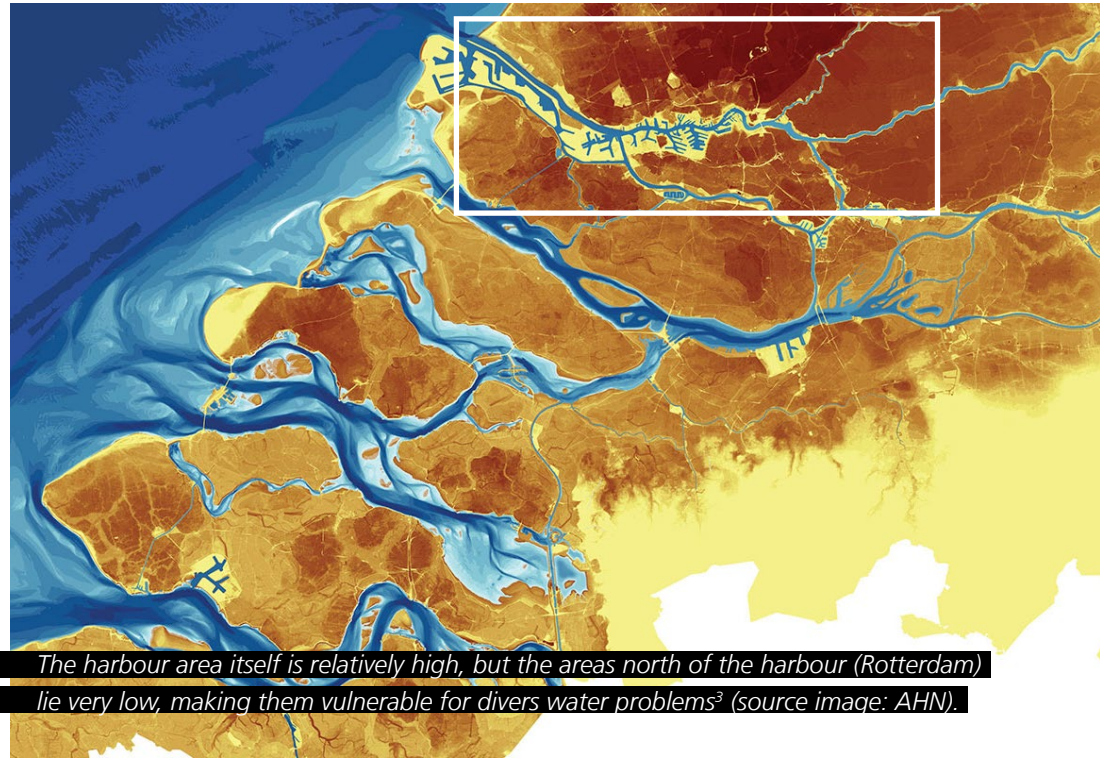
Global trends	Home made	Disaster	Asia Rules	Scarcity
Climate: increasing global temperature, sea level rise	+	++		
Energy: sustainable energy central, hydrogen and LNG	+	++		
Resources: rare earth metals key-material, circular economy		+	++	++
Technology: IoT, robotization, autonomous sailing, 3D printing	++		+	+
World economy: low growth global economy, growth Asia, local growth	++		++	++
Urbanisation: strong growth, especially in River delta's		++		
Demography: greying, 3 billion people extra, immigration		++	++	
Logistic/transport: fragmentation e-commerce, regional ground form	++			
Safety: growing unsafety, increasing security	+			++
Leisure: health, prosperous elderly, sustainable			++	++

Ten global trens that can influence developments (Kuiper et al., 2017).

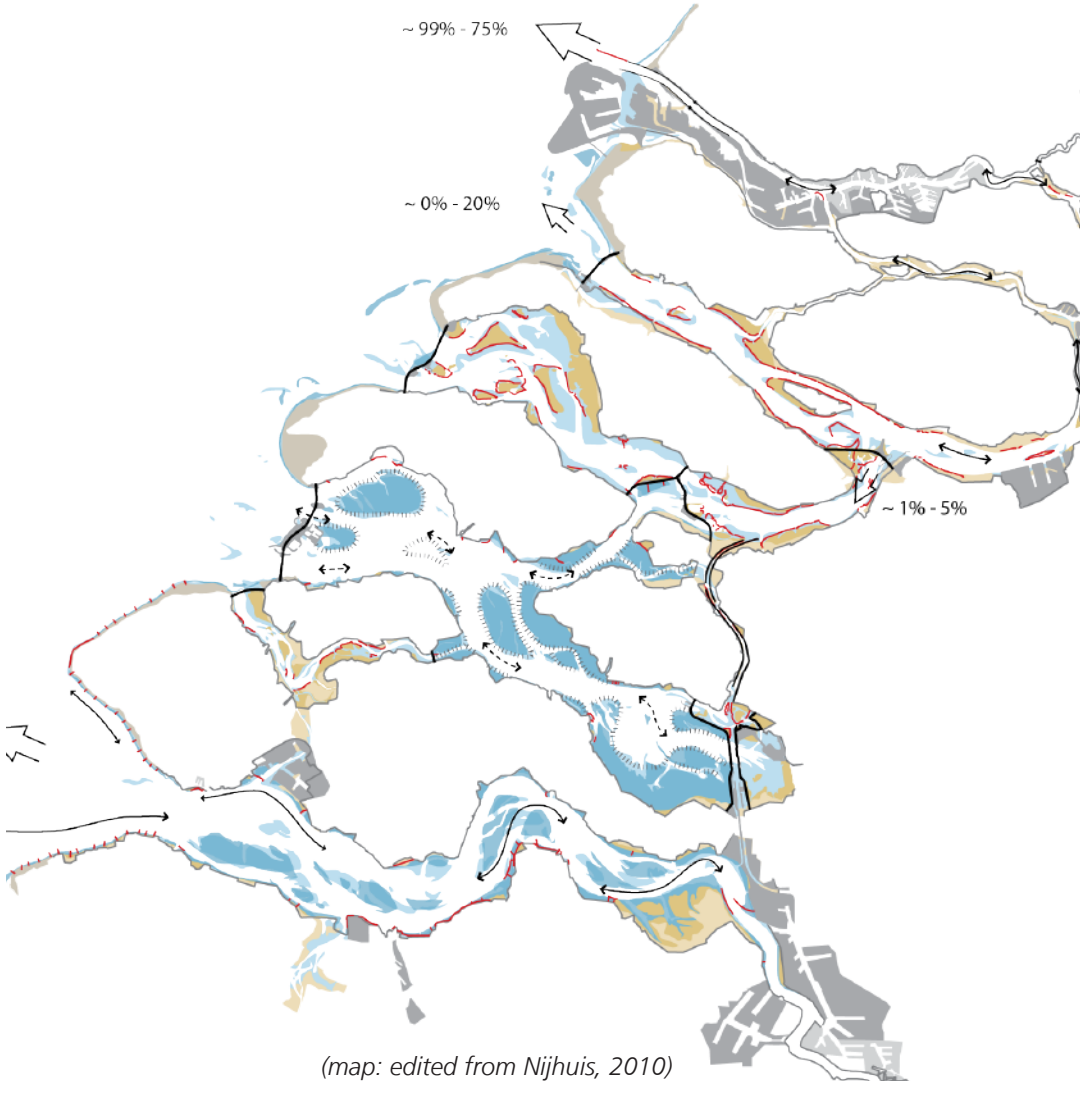
THE IMPACT OF THE ENERGY TRANSITION

Water management and harbour activities; a frictional relationship:

- In the long-term a dam is necessary.



The harbour area itself is relatively high, but the areas north of the harbour (Rotterdam) lie very low, making them vulnerable for divers water problems[3] (source image: AHN).

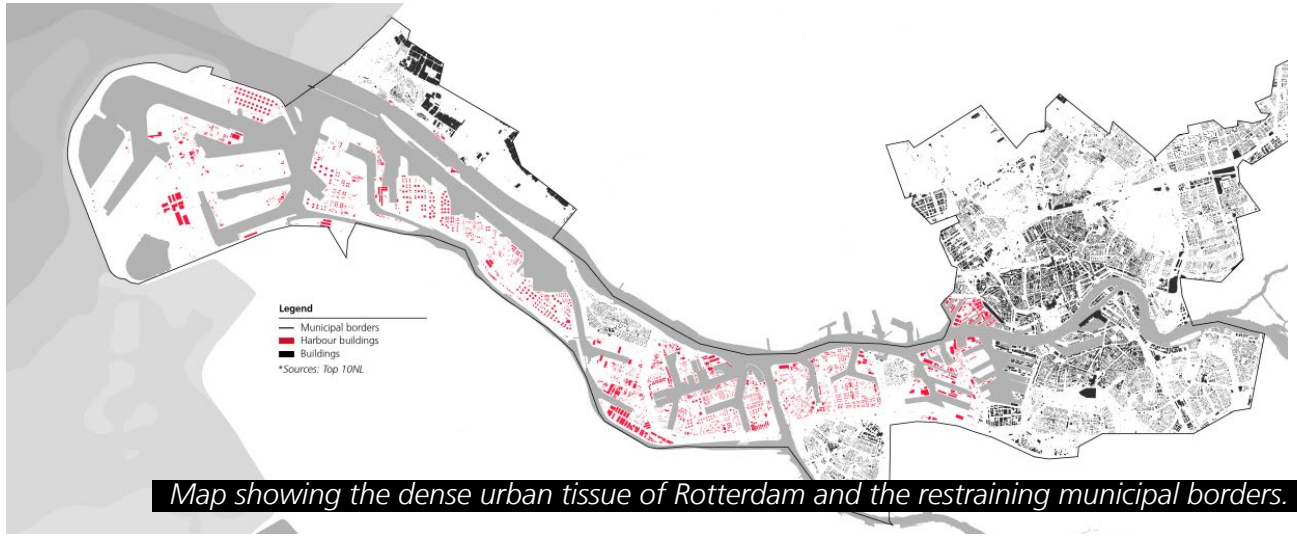


(map: edited from Nijhuis, 2010)

Map showing the water discharge of the Meuse-Rhine river system. Most of the water is flowing through the harbour of Rotterdam, a situation that is not sustainable in the light of climate change (source map: own).

Urban growth and limited space

- Strong urban growth until 2040
- Restraining municipal borders
- Space in the harbour

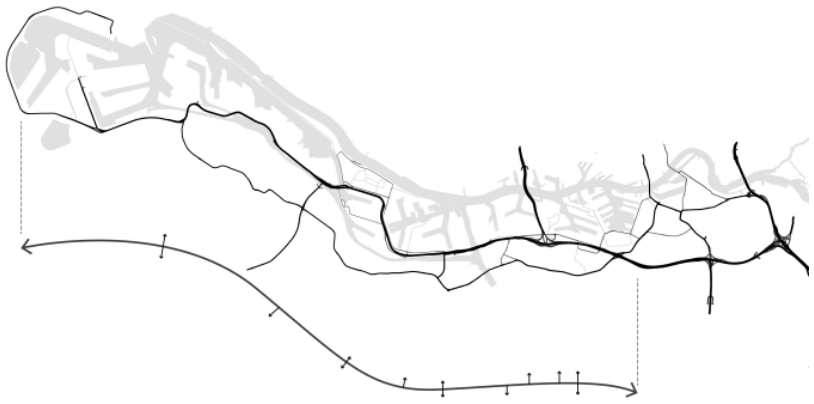


Map showing the dense urban tissue of Rotterdam and the restraining municipal borders.

The development of Rotterdam from 1850 to 2015.

Connectivity: Is the harbour well connected?

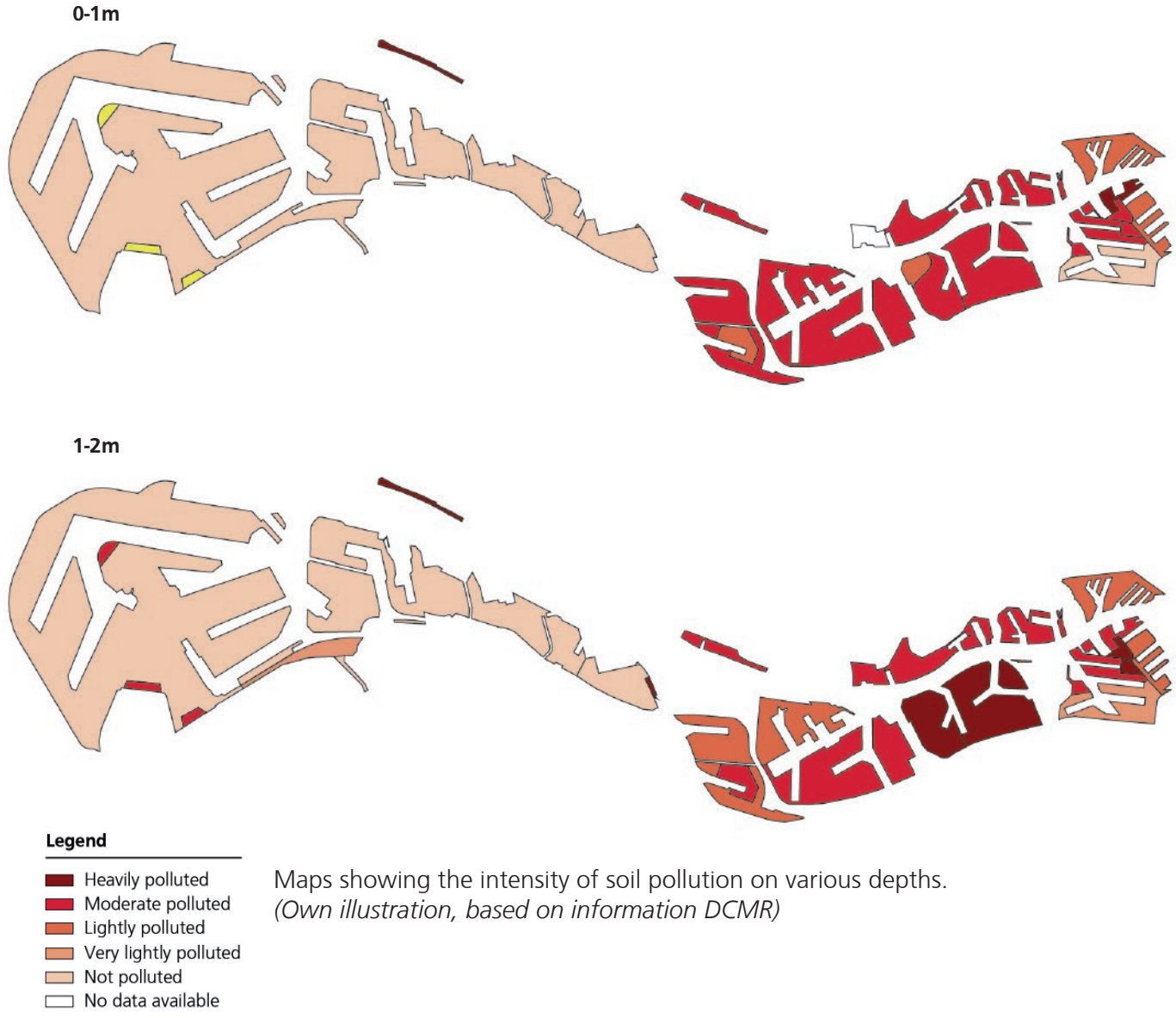
- The harbour is not accessible by public transport



Maps showing the structure of the infrastructure in the harbour.

Soil: About half of the harbour territory is heavily poluted

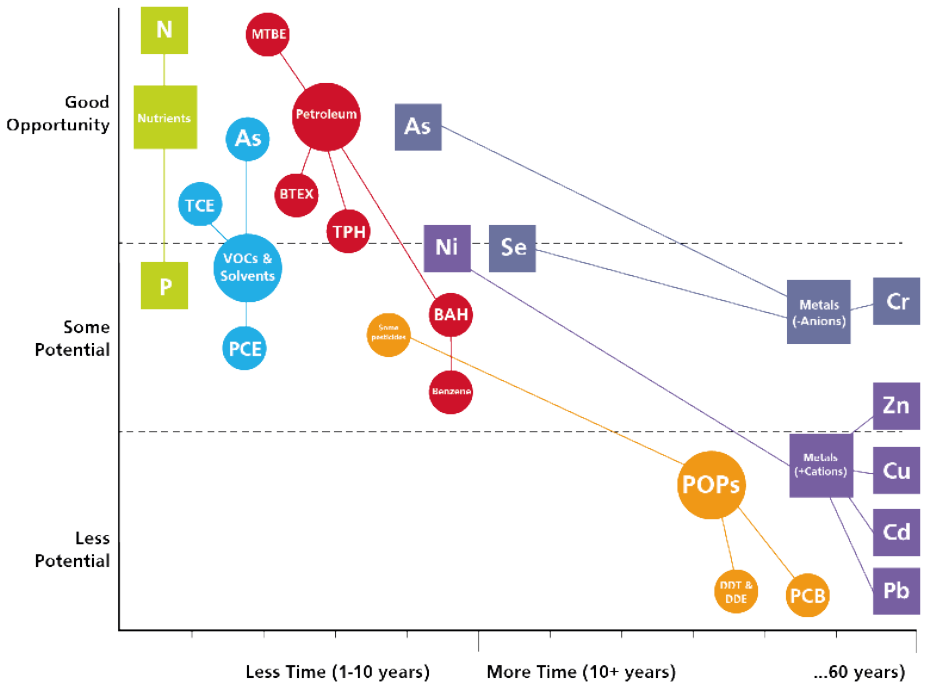
- Giving direction to the long-term planning of the harbour

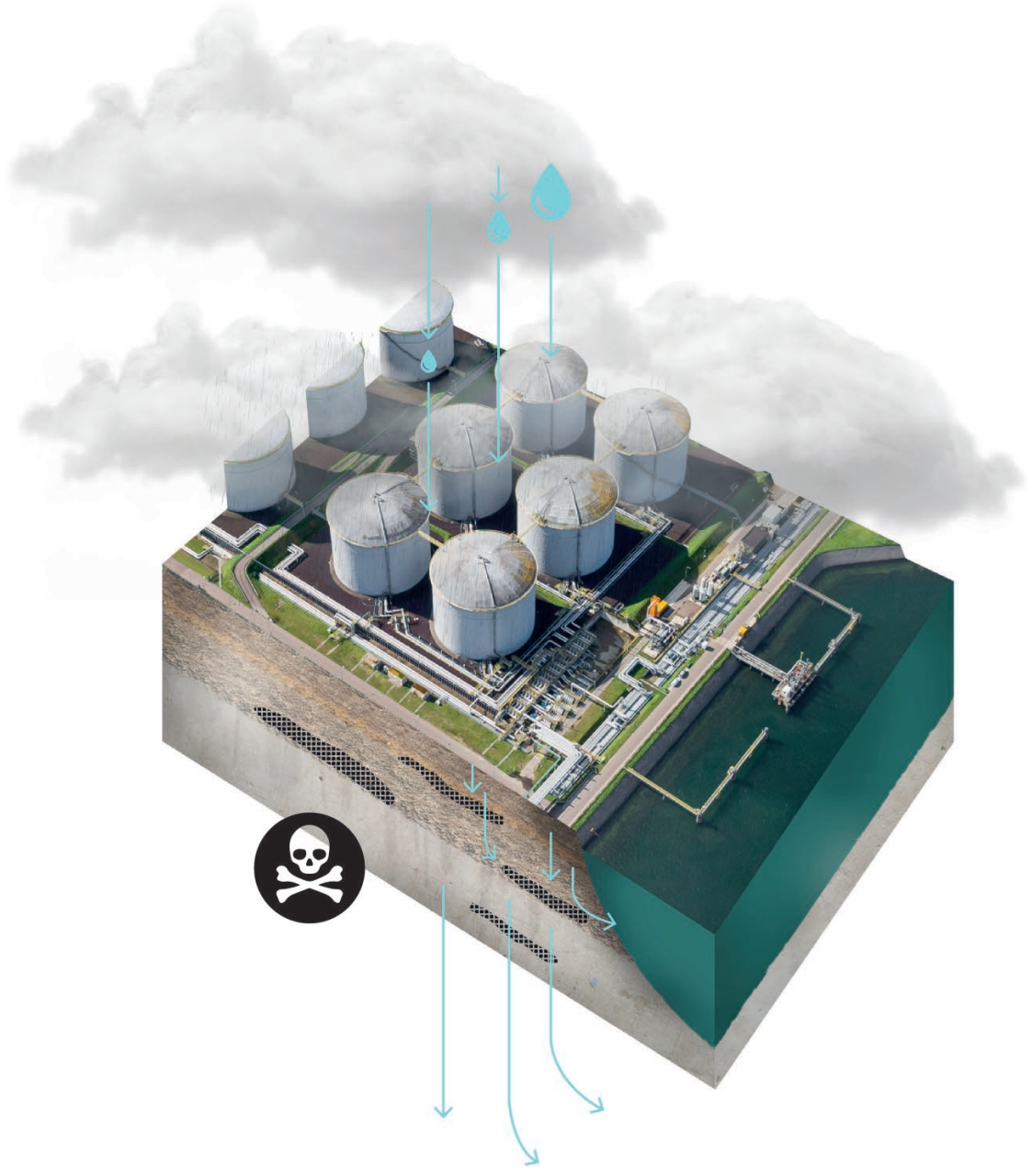


Maps showing the intensity of soil pollution on various depths.
(Own illustration, based on information DCMR)

Soil: About half of the harbour territory is heavily poluted

- The pollution moves down
- Phyto remediation as a design tool

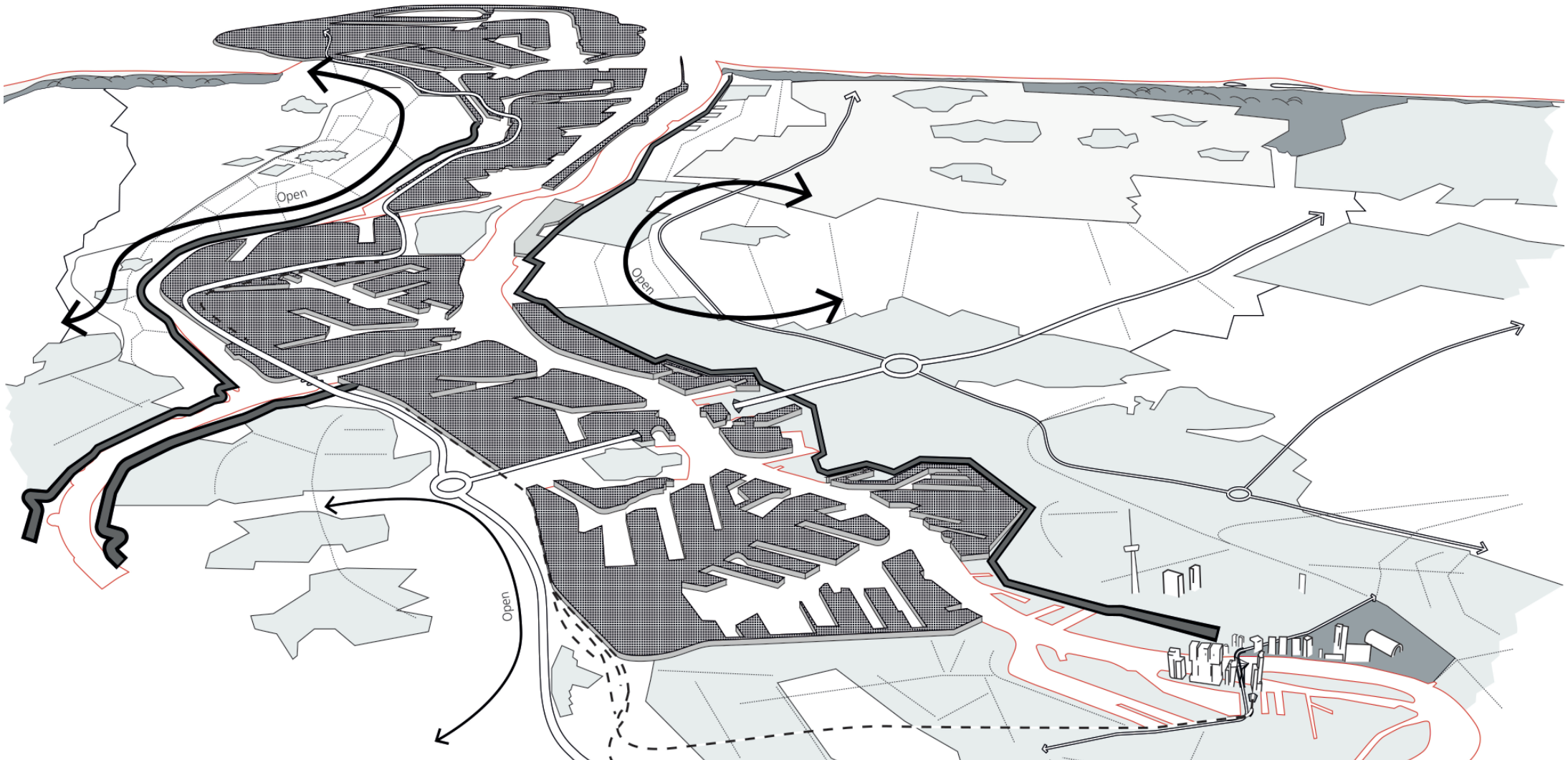




#P4

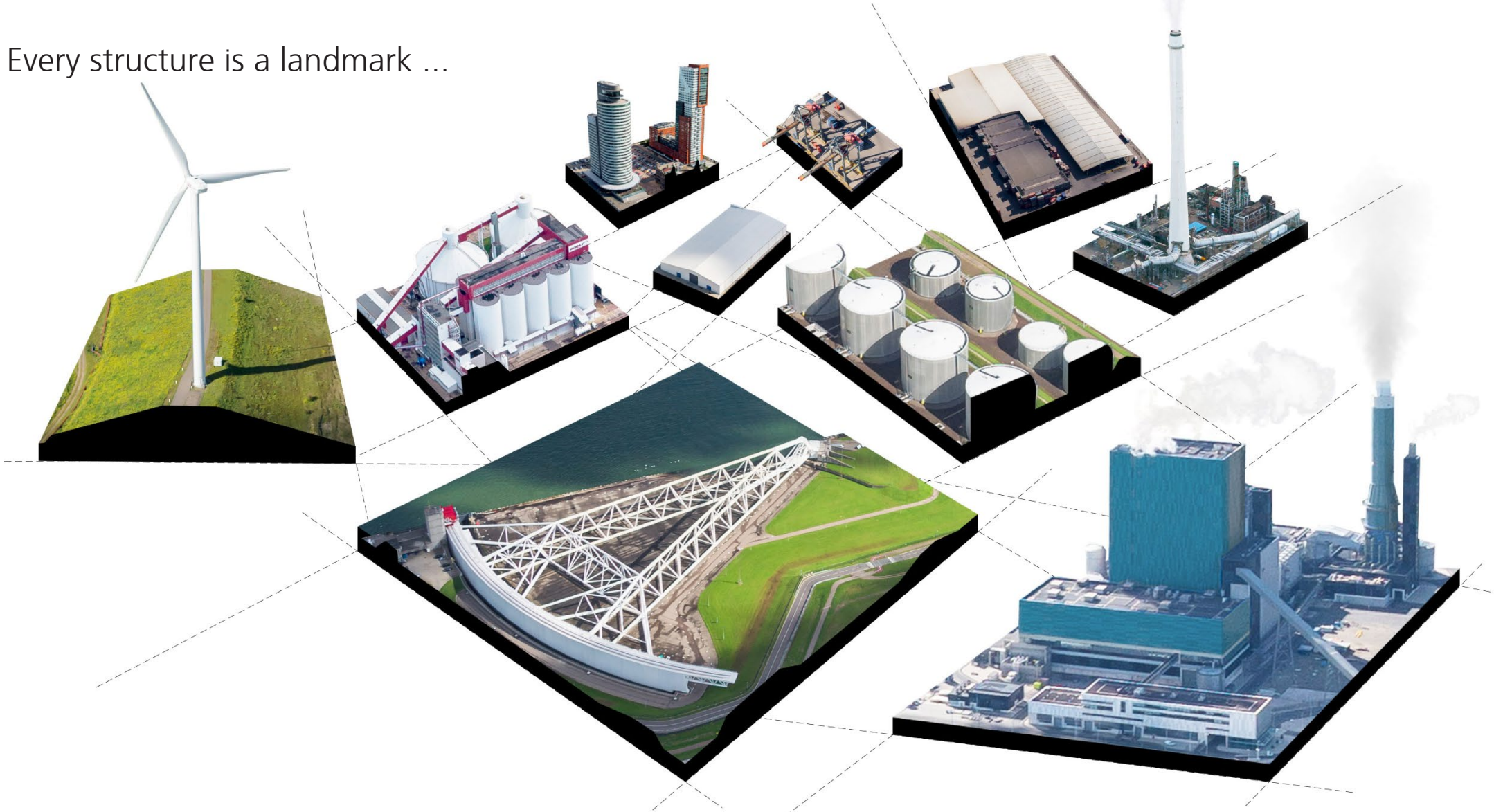
The Harbour Landscape

Spatial structure of the landscape



Contrasting soil conditions result in a contrasting landscape

Every structure is a landmark ...



The harbour is a landscape of drama

In the harbour every structure is a landmark (source photo: P. Nijhuis).

#P5.1

The strategy

Program:

The type of strategy:

- A fixed spatial framework, the conditions of the zones are fixed, the program of the zones is determined later
- The strategy should both inform on the short term (the process of companies leaving) and on the long term (attracting new activities)

1

Program:

The type of strategy: **1**

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Program of the strategy: **2**

- The soil pollution is the biggest problem in the harbour. It needs to be cleaned in an extensive way. The type of pollution is informing for the zoning in the strategy
- In the zoning the strategy should anticipate the damming of the river
- The improvement of the landscape quality and the improvement of public transport connection are the most important factors that will allow new (high quality) program to develop

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Program design: **3**

- The unique contrast in height, spatial density and soil conditions with the context are the basis for the spatial characteristics of the design
- The connecting nature of the harbour city-sea should be utilised

THE STRATEGY

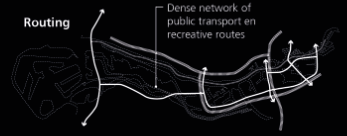
A phased strategy as a solution

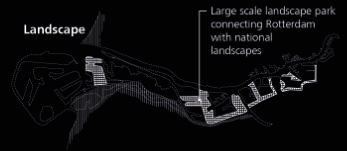
- Two moments and an intervention
- Solving current problems and building a lasting framework

phase 1
2020>

Inter-vention
2040

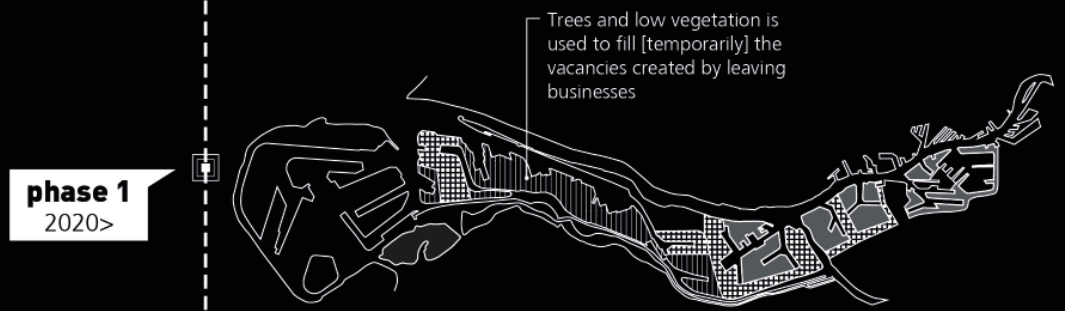
phase 2
2040>





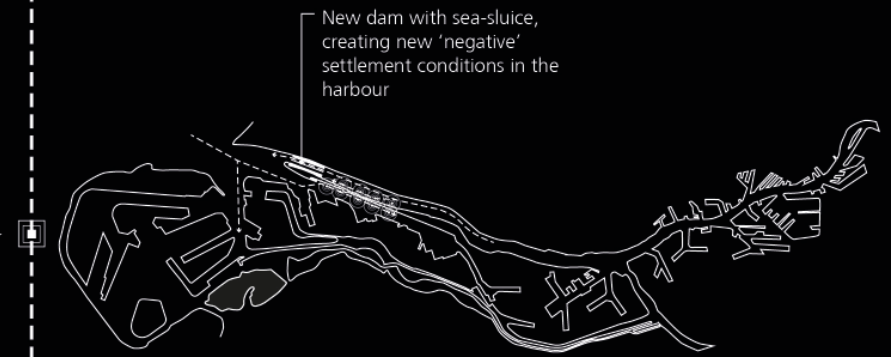
Phase 1:

- dealing with spatial scat-tering;
- Laying the foundations for phase 2



Intervention:

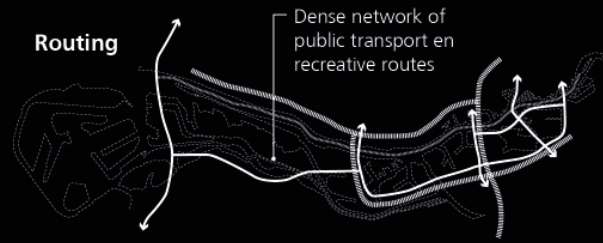
- New conditions in the harbour

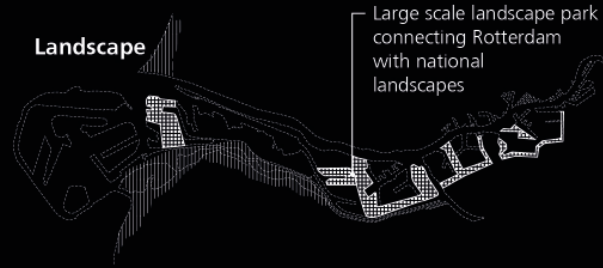


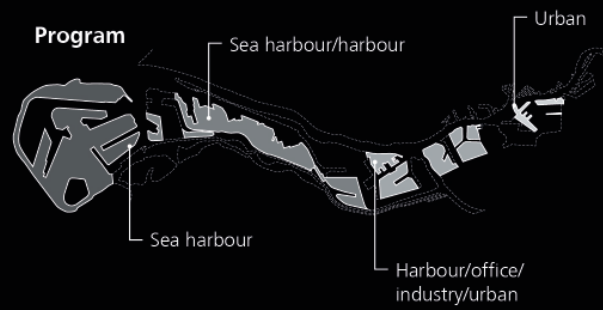
Inter-vention 2040

Phase 2:

- New conditions for a development of a healthy harbour landscape







Phase 1:

- (Temporary) introduction of green
- Active relocation of businesses

Phase 2:

- Clear zoning
- A strategy that allows uncertainty
- A high quality green landscape well connected to the city

#P5.2

The Harbour Forest

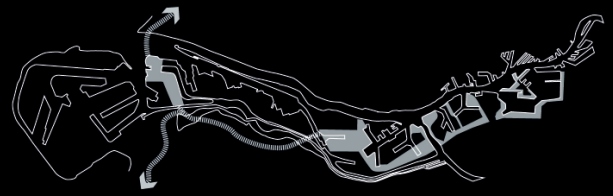
THE HARBOUR FOREST: VISION

DESIGN: THE HARBOUR FOREST

THE CONCEPT

[1] Connection with the bigger landscape

A green connection from the heart of Rotterdam to the dunes ...



[2] The harbour area

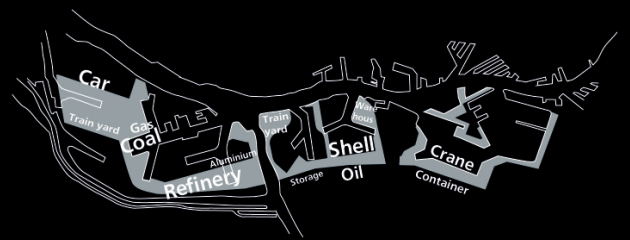
The forest structures the harbour in different zones, creating possibilities for divers development ..

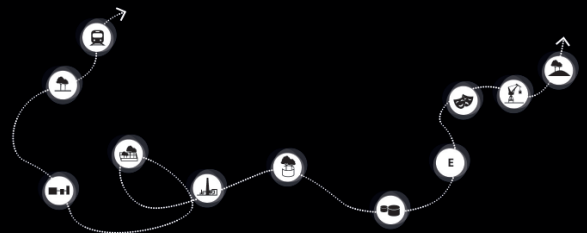
DESIGN: THE HARBOUR FOREST

THE CONCEPT

[3] The story of the park ...
Organised around a day-trip

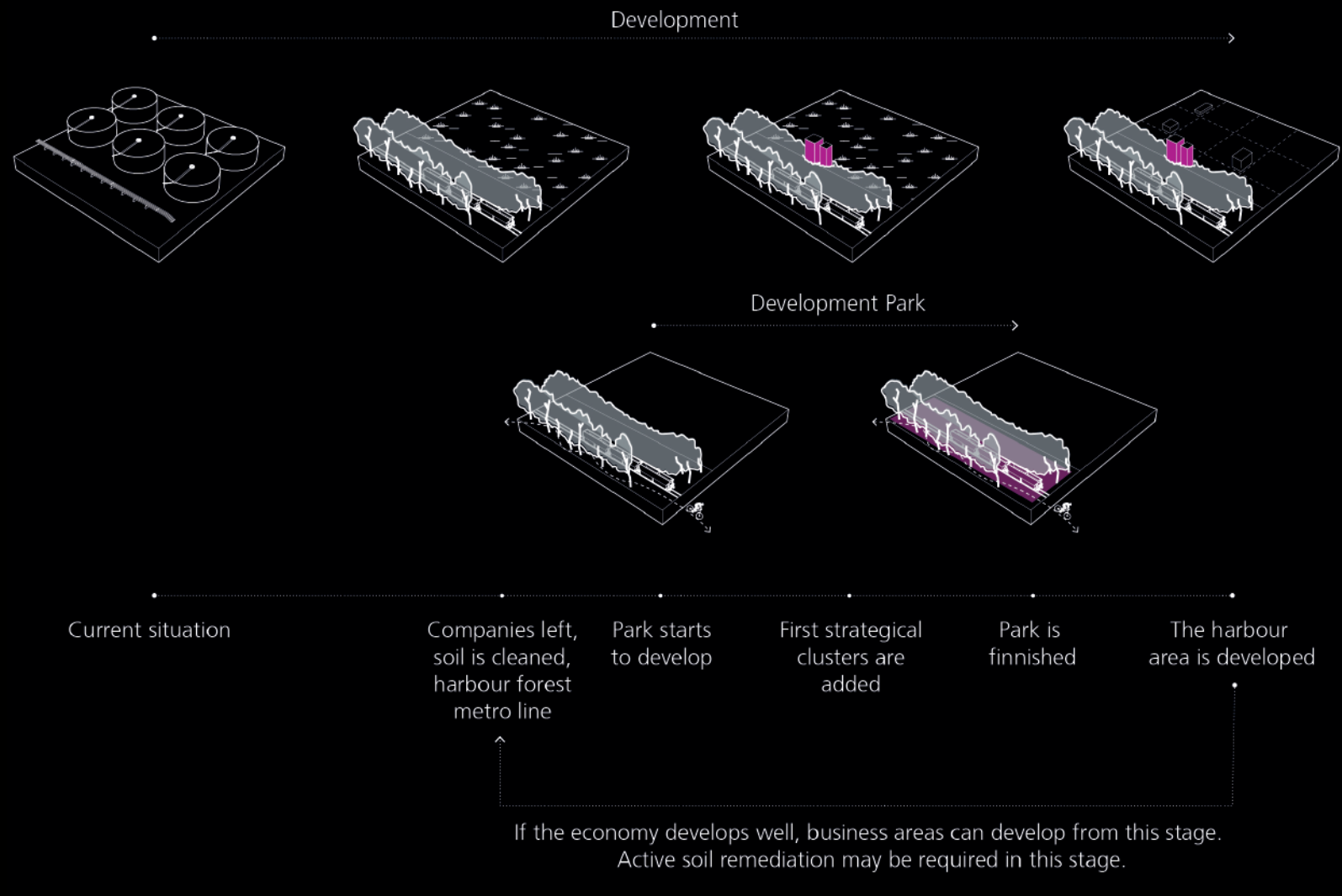
... the story of the park
A chronological story of industrial landscape pearls ...





Overall concept

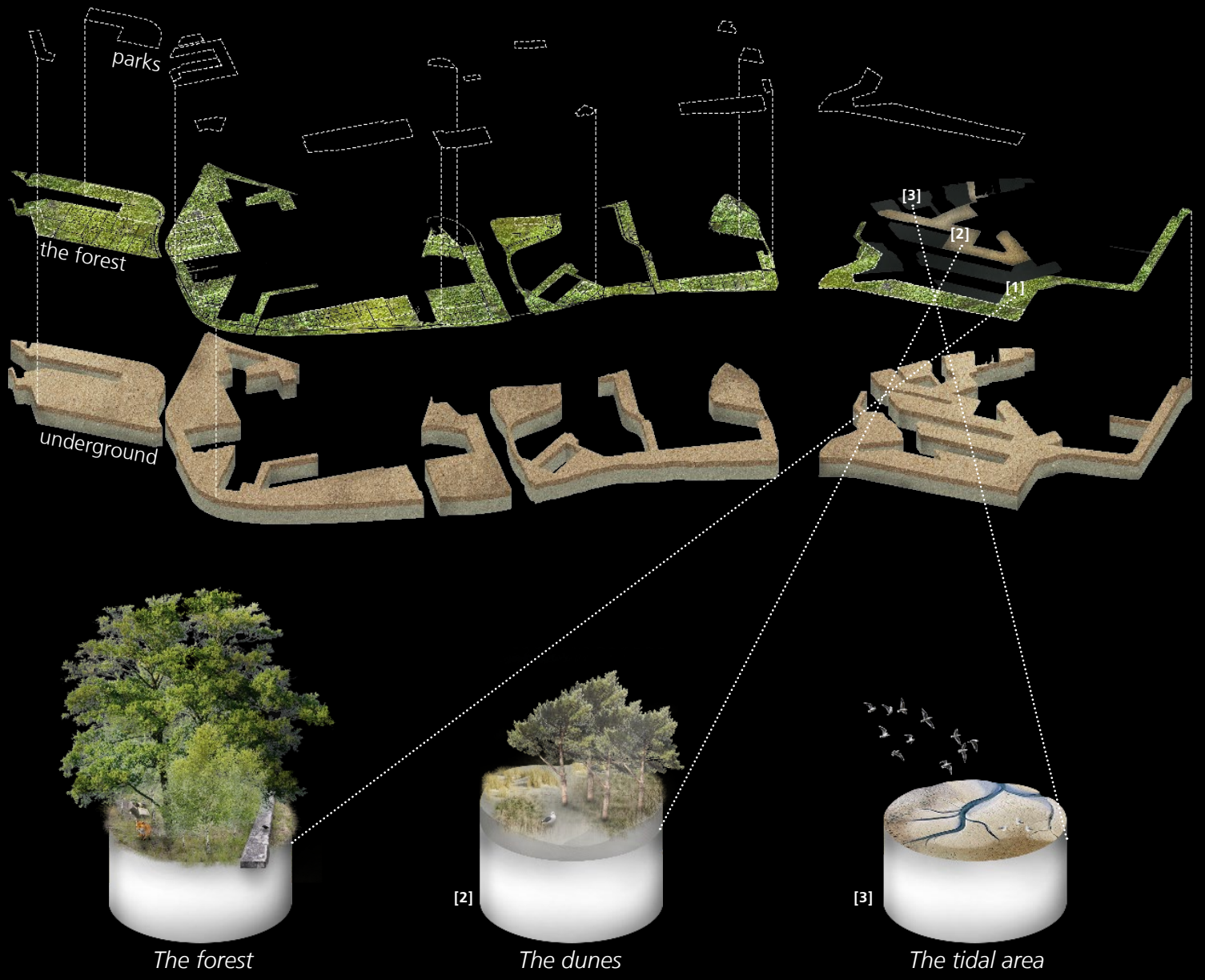
Basic timeline of the development



THE HARBOUR FOREST

The design in layers: landscape types

- Forest
- Dunes
- Tidal area



[1]

The forest

- Dry vegetation
- Decreases soil pollution

Future situation

Current situation

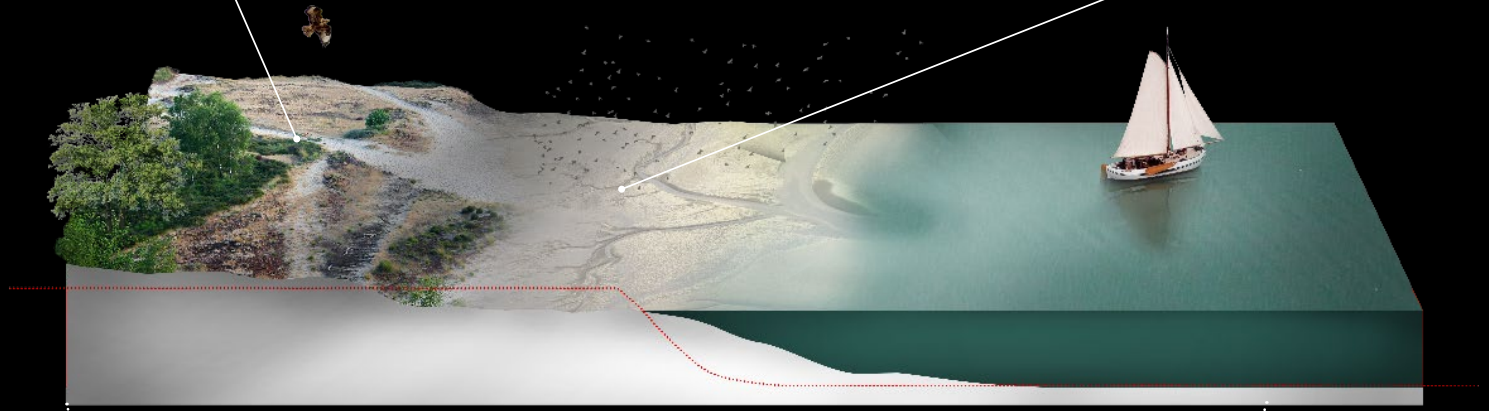
THE HARBOUR FOREST

The tidal area and dunes: a second Kralingseplas

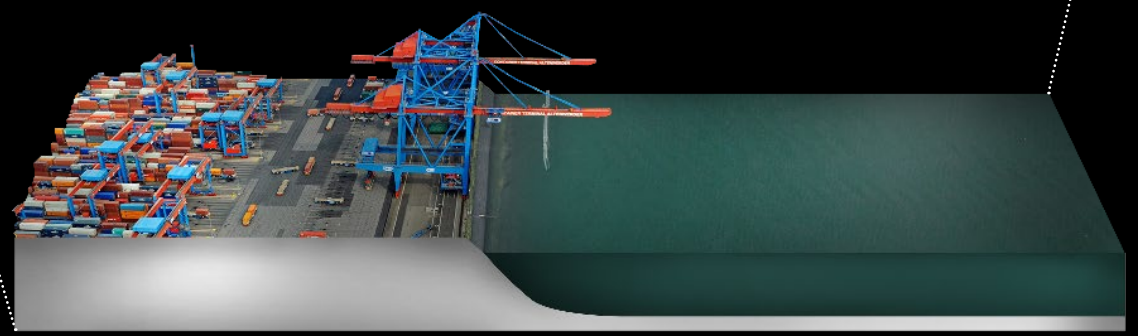
- Reprofiled
- More gradients
- Nature, recreation and living

[2]

[3]



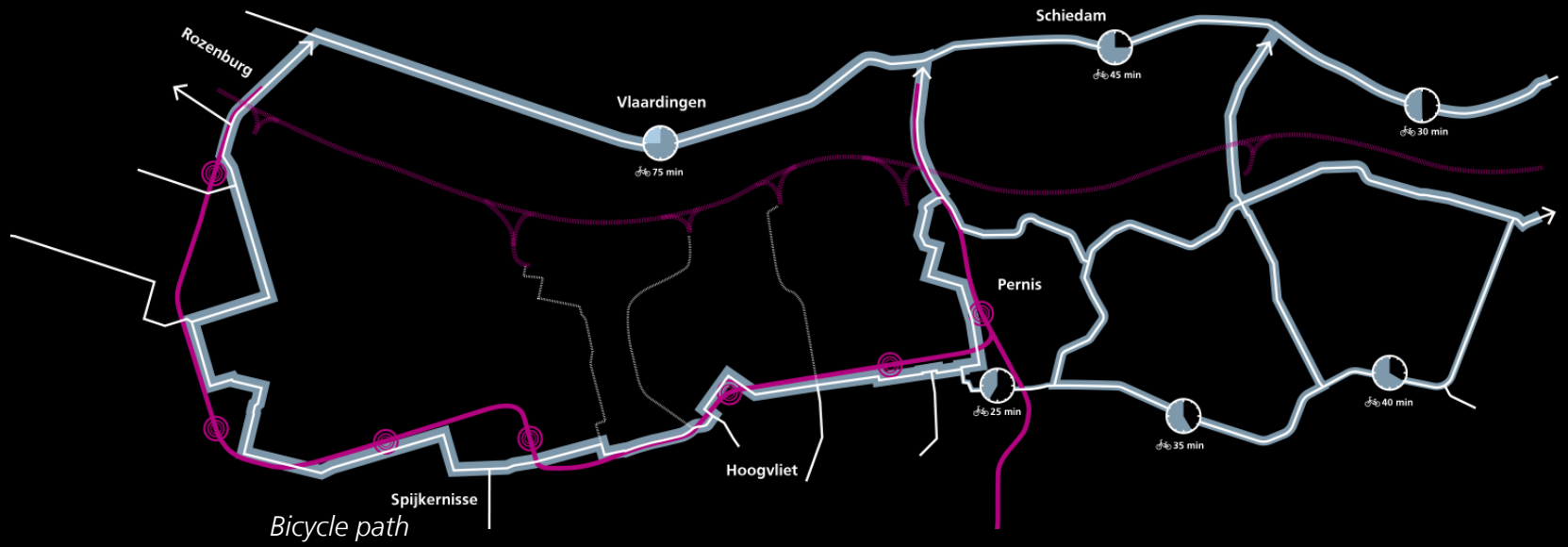
Future situation



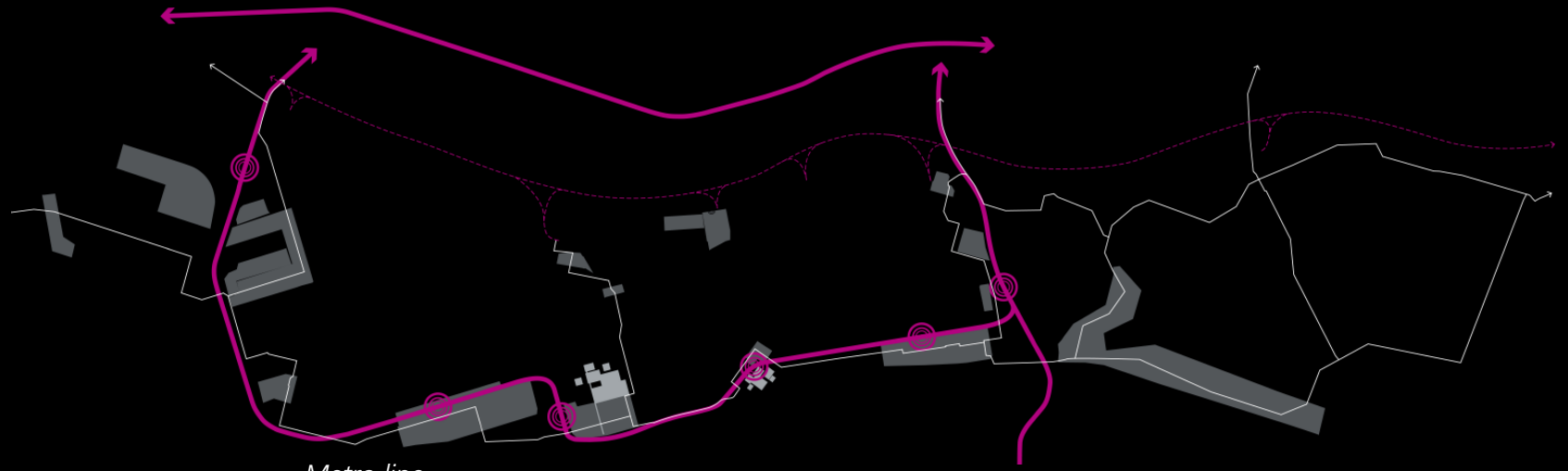
Current situation

THE HARBOUR FOREST

Connectivity



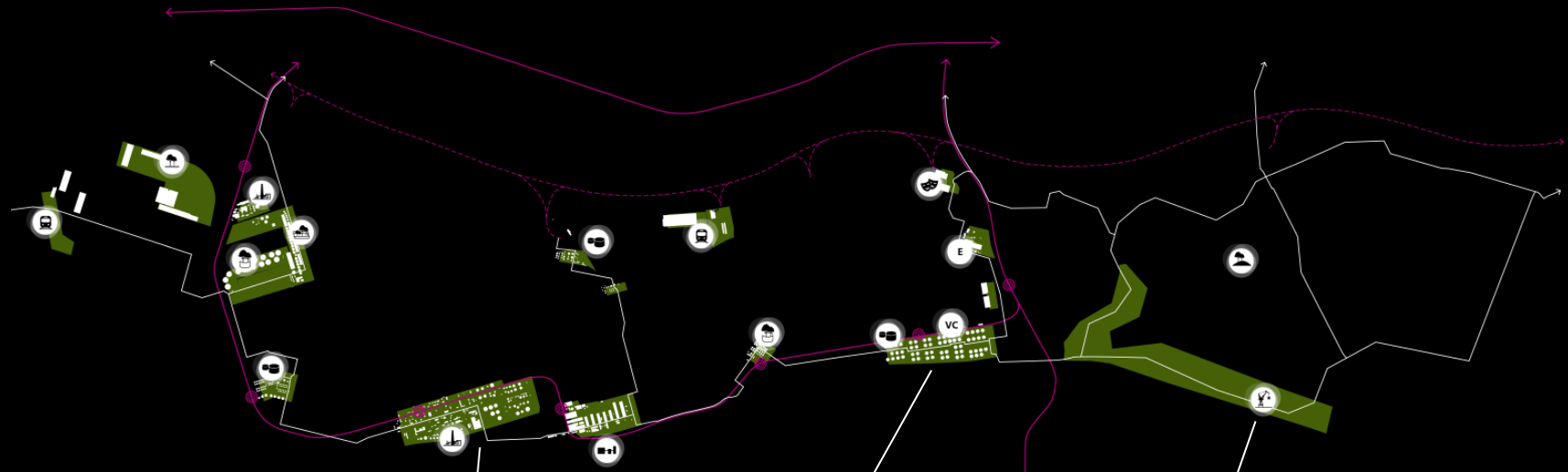
Bicycle path



Metro line

Thematic parks

16 parks, representing industry-types

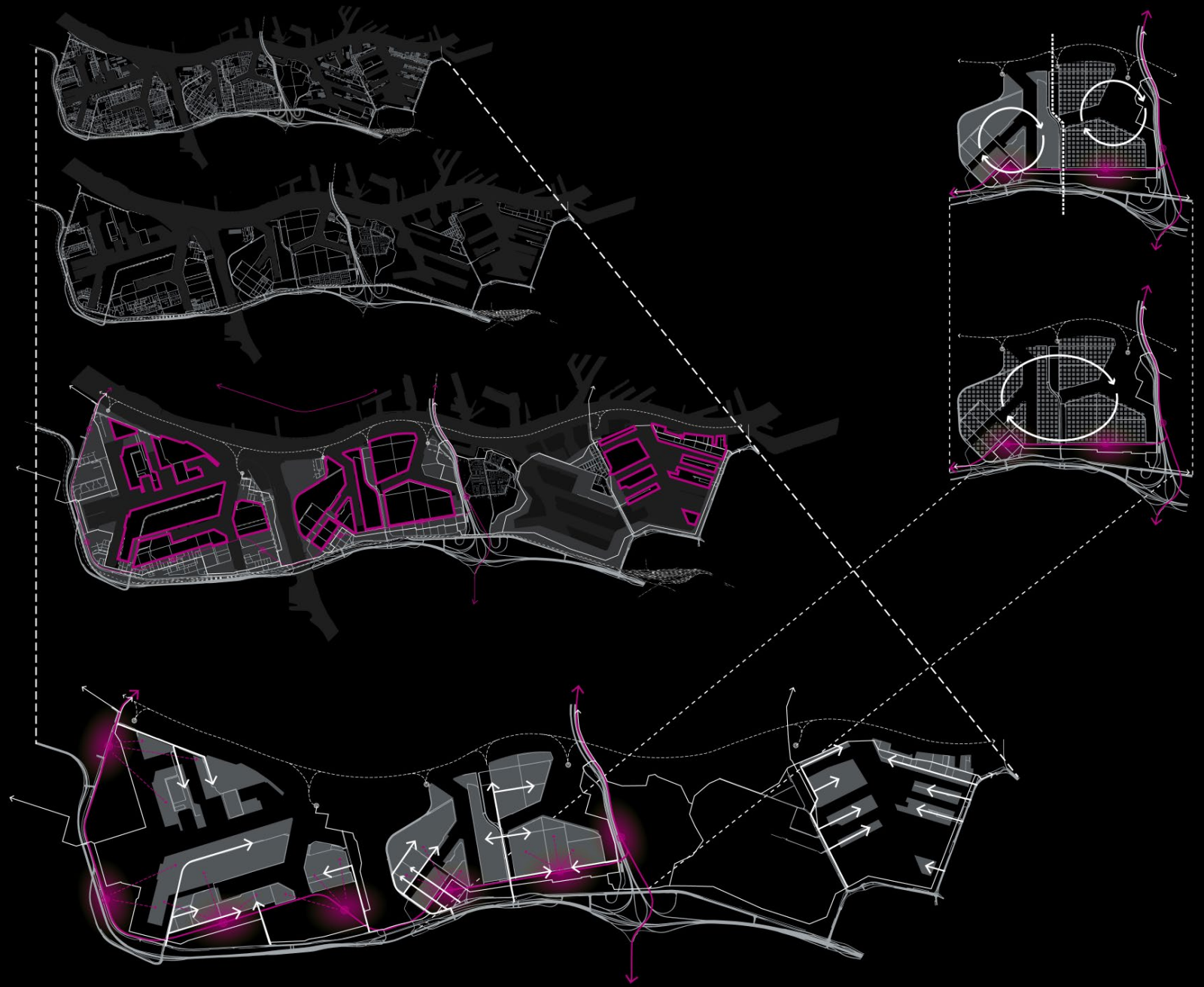


Thematic parks

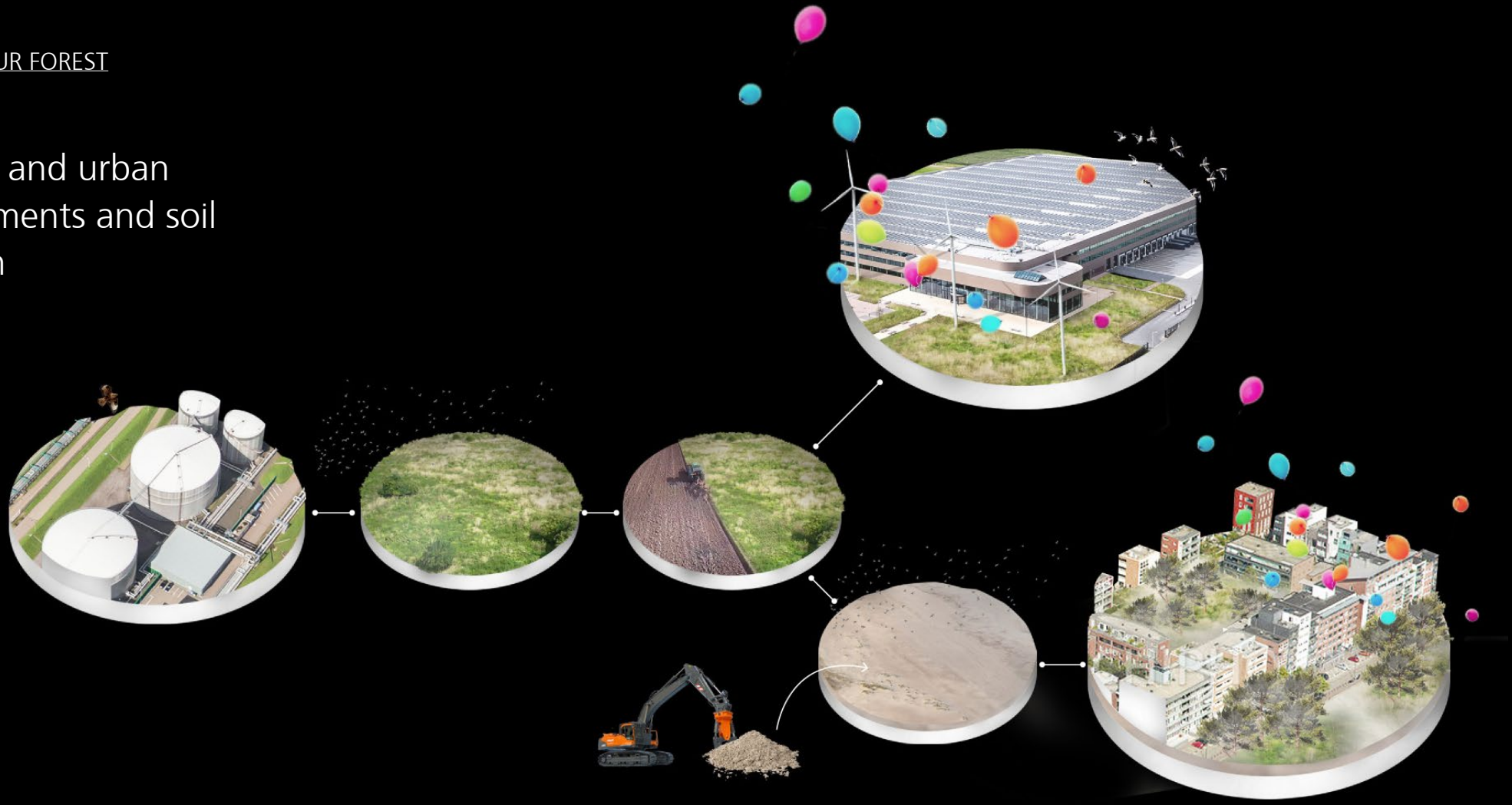
- The island
- Quay and cranes
- Warehousing
- Esso
- Shell storage
- Visitor centre
- Tanks and trees
- Trainyard
- Storage tanl
- Aluminium factory
- Shell refinery
- Storage tanks
- Coal storage
- Gas factory
- Concrete forest
- Trainyard

Impression of the used sites

Business and urban developments



Business and urban developments and soil pollution



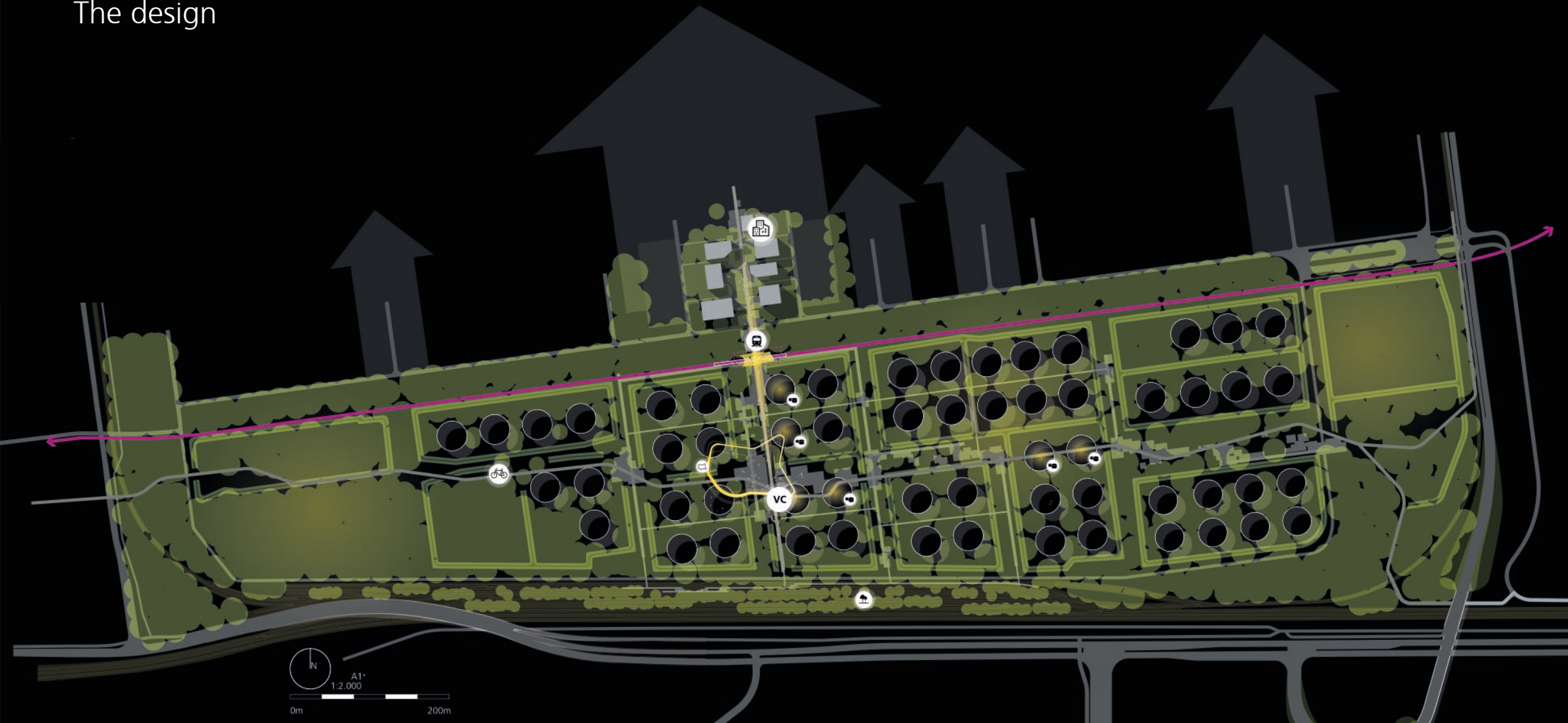
Current situation → Vegetation cleans shallow pollution → Soil preparations for development → Finished situation

The remediation strategy is based on the program type that is chosen. If the program is industry, no additional steps are necessary. If the program is urban, a two metre 'life layer' of sand needs to be added.

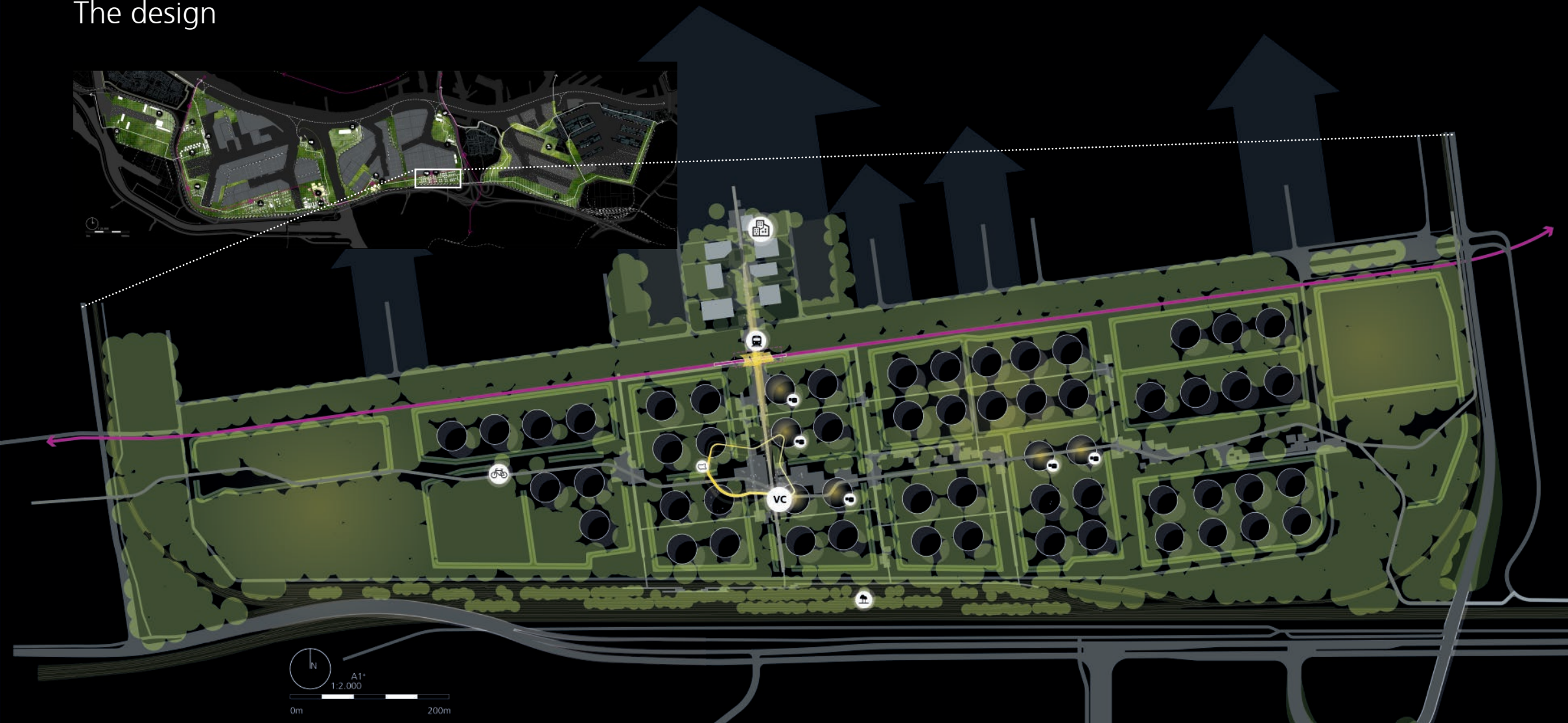
#P5.3

Detail: Shel Storage Park

The design

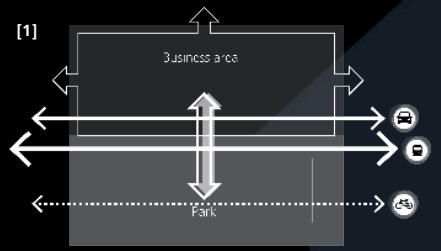


The design



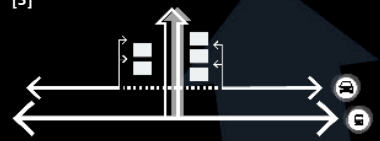
The design

THE CONCEPT



The basic infrastructural relations

Programmatic scheme of the park

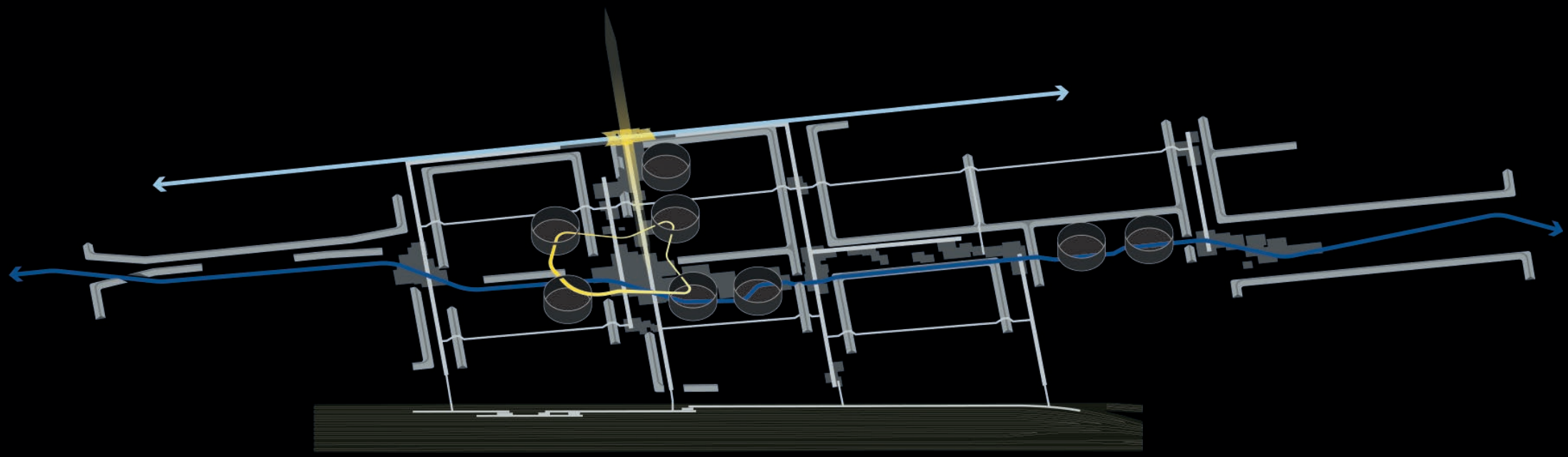


Infrastructural scheme of the office area

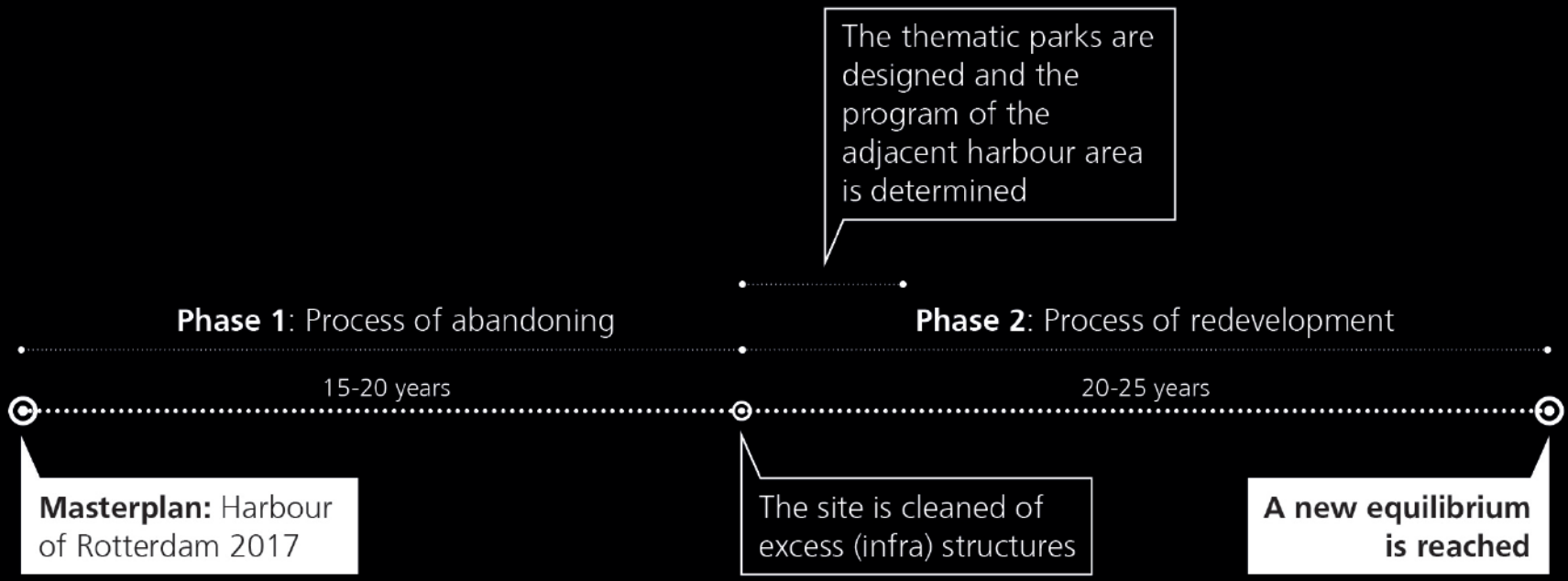
DETAIL: SHELL STORAGE PARK

Composition scheme

- Height as a unique property



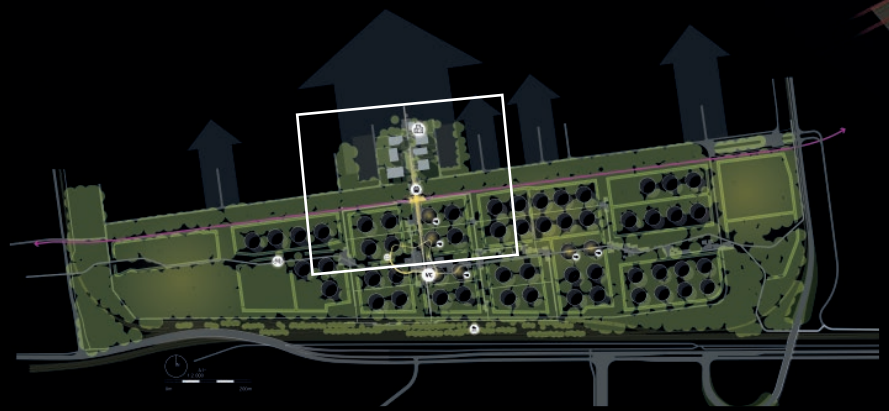
Basic timeline of the strategy

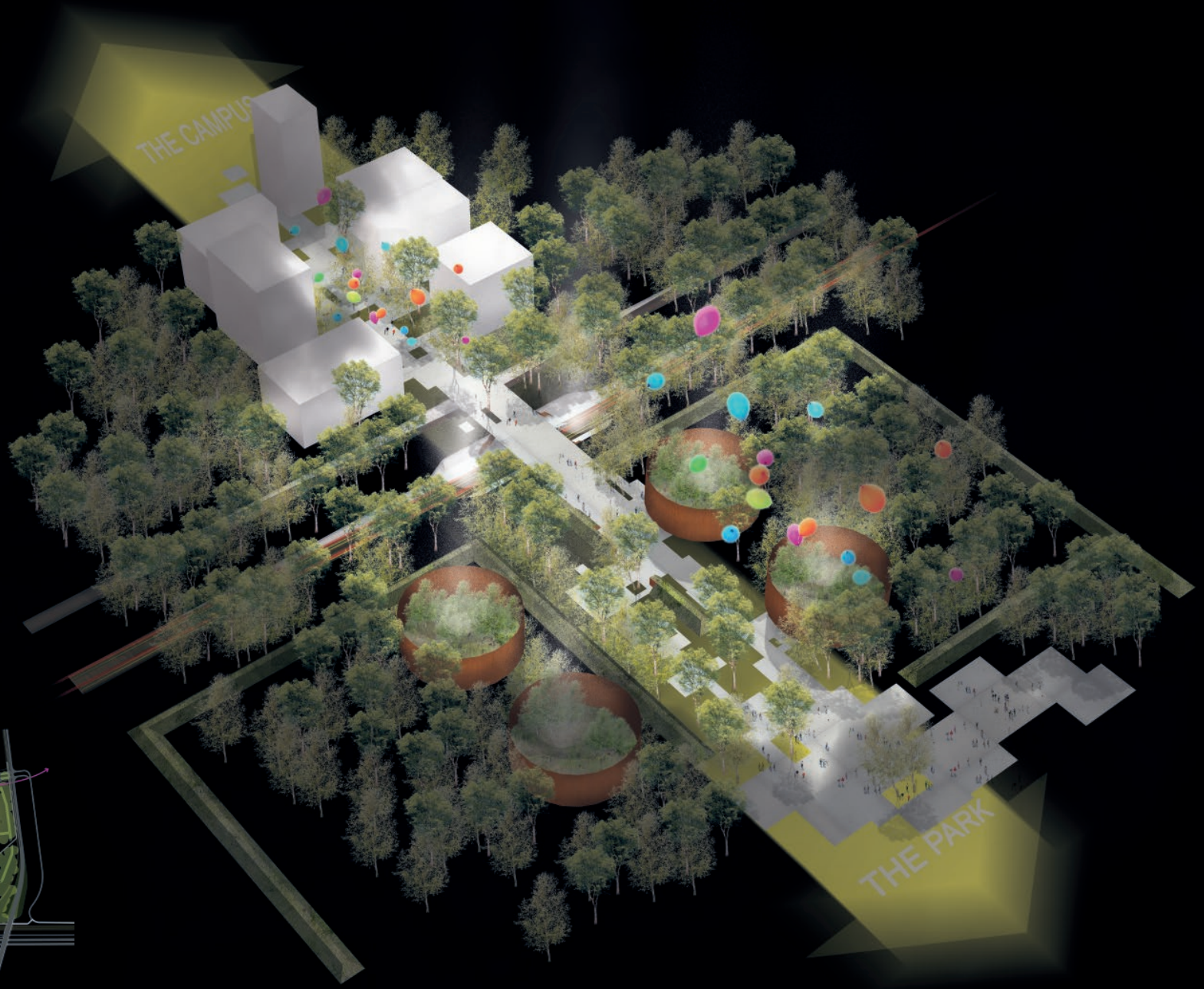


DETAIL: SHELL STORAGE PARK

Business and recreation

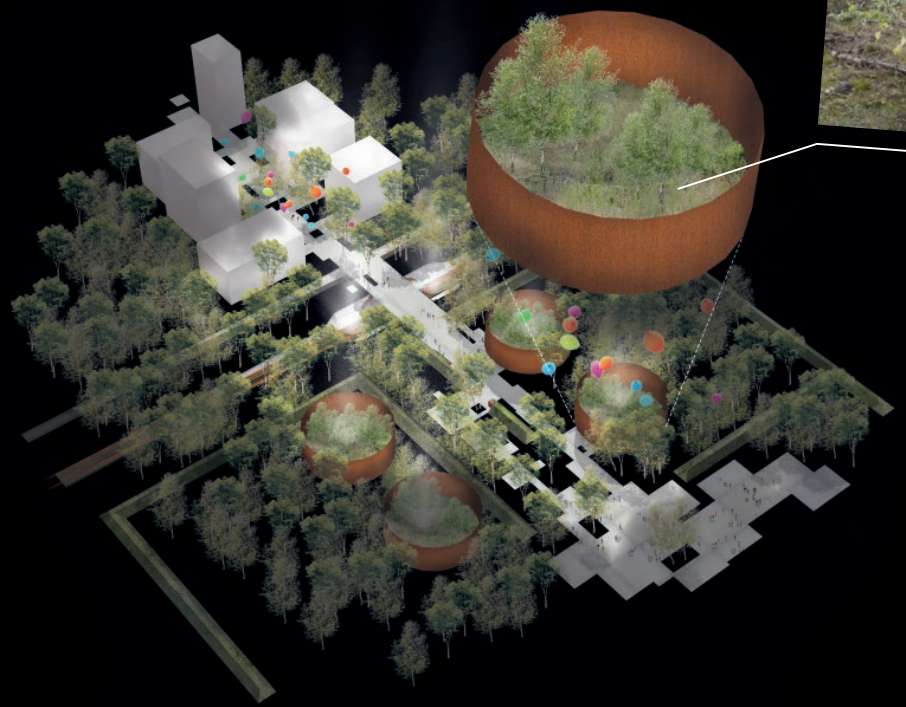
- Functions deeply integrated
- Development axes
- Re-use of materials





DETAIL: SHELL STORAGE PARK

Storage tanks as a container for park program; a visual experiment …



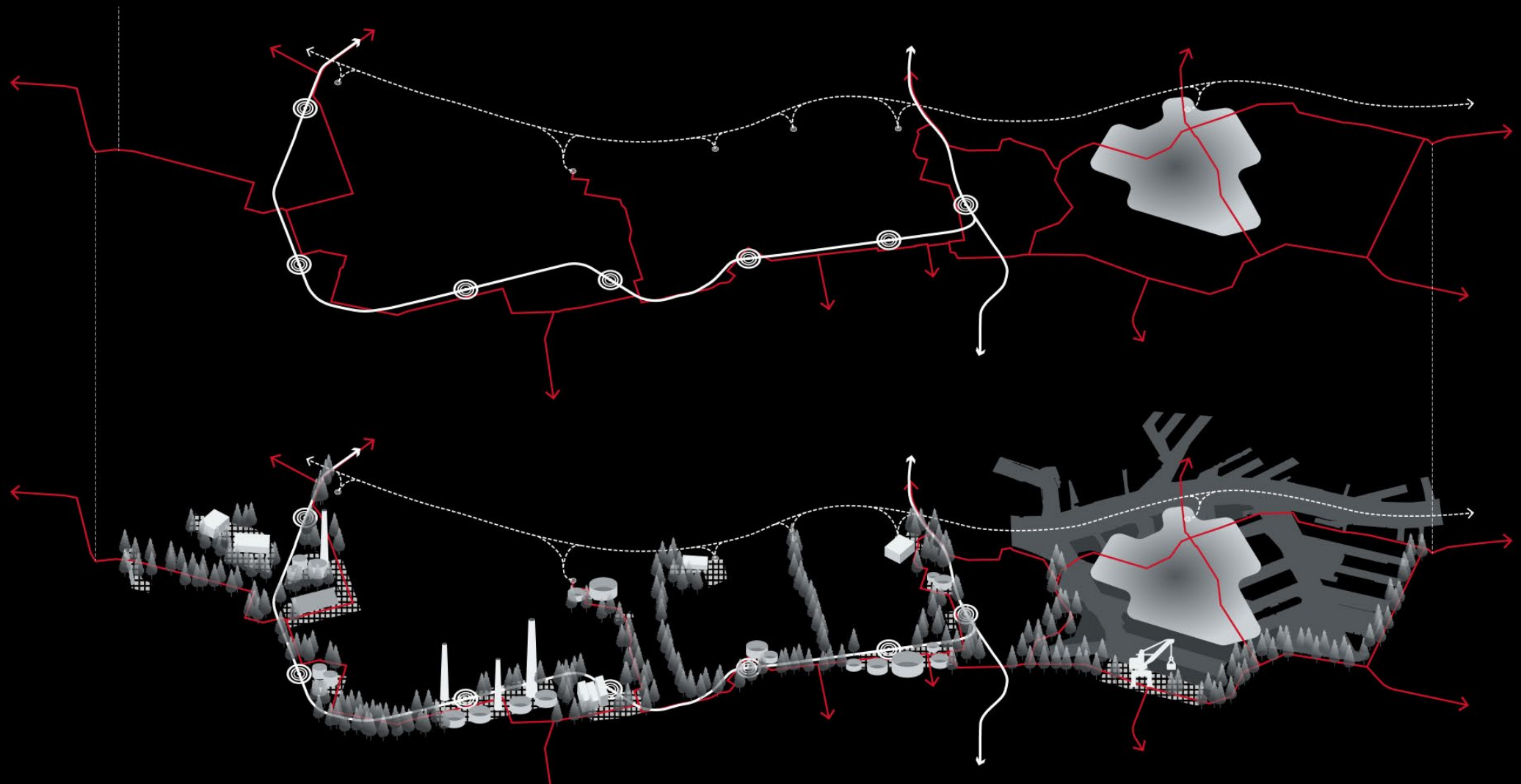
Storage tank without program after a few years of succession.

#P5.4

Elaboration: A landscape in motion

ELABORATION

A landscape experienced in motion ...



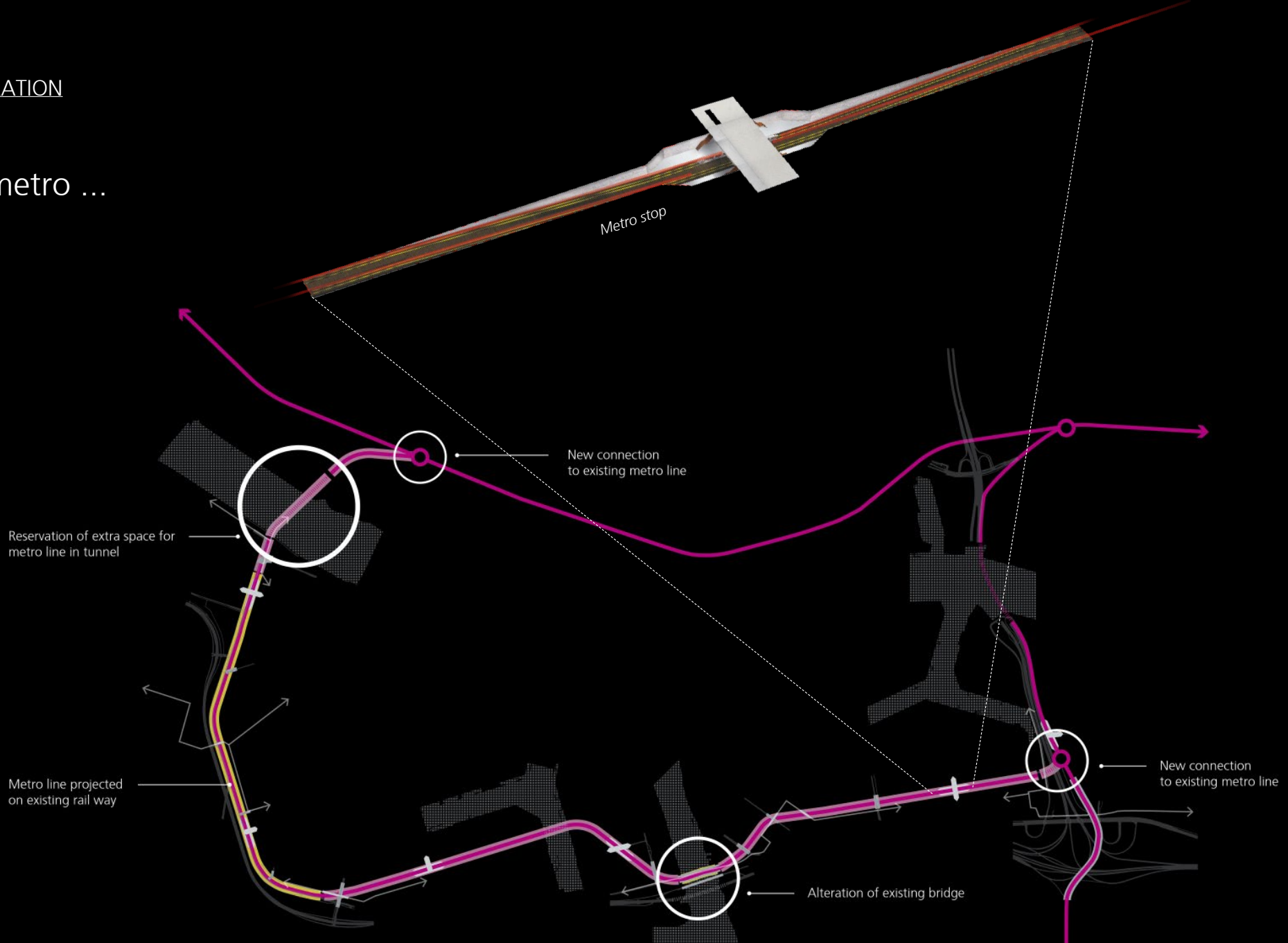
ELABORATION

ELABORATION

ELABORATION

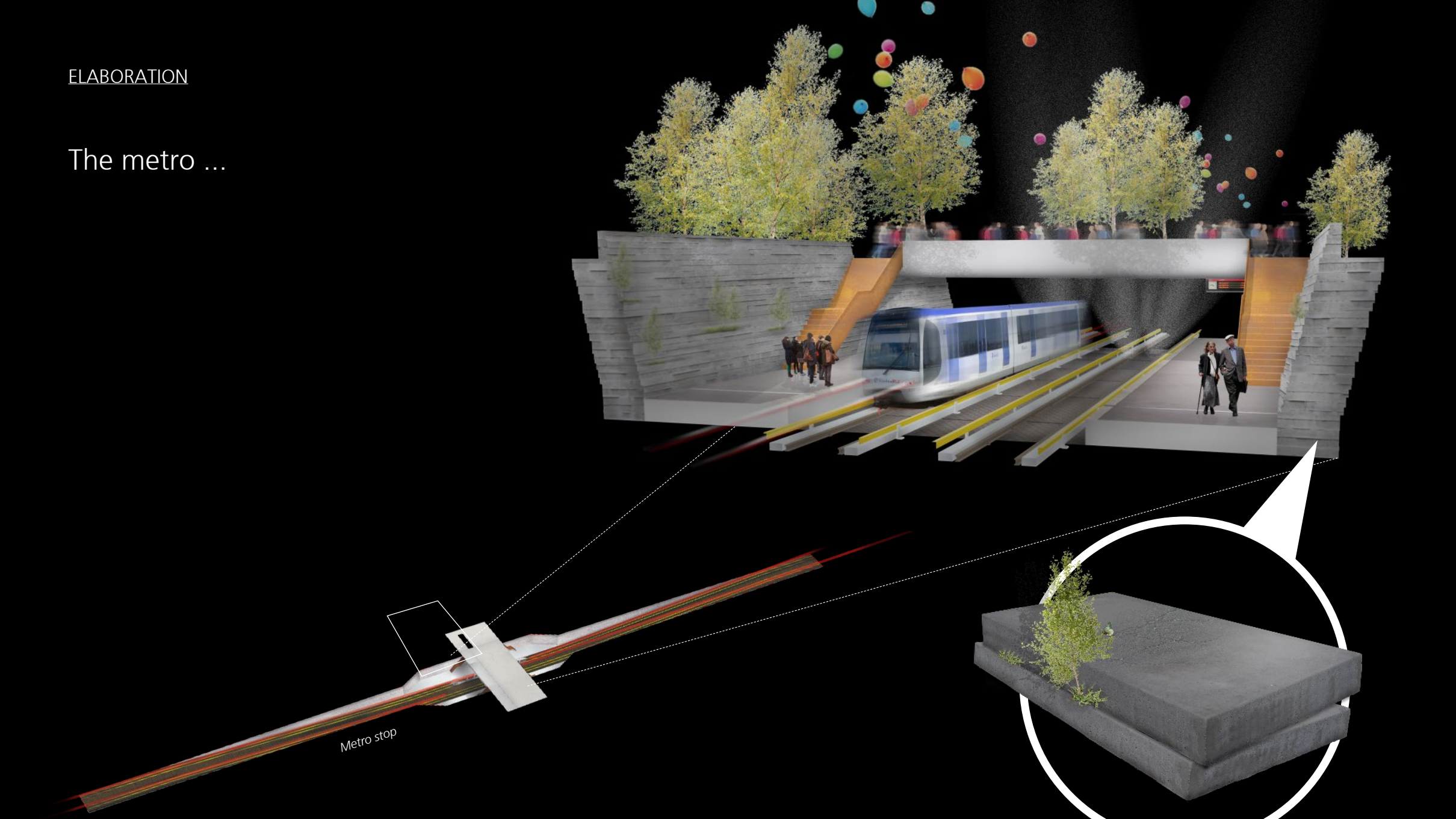
ELABORATION

The metro ...



ELABORATION

The metro ...

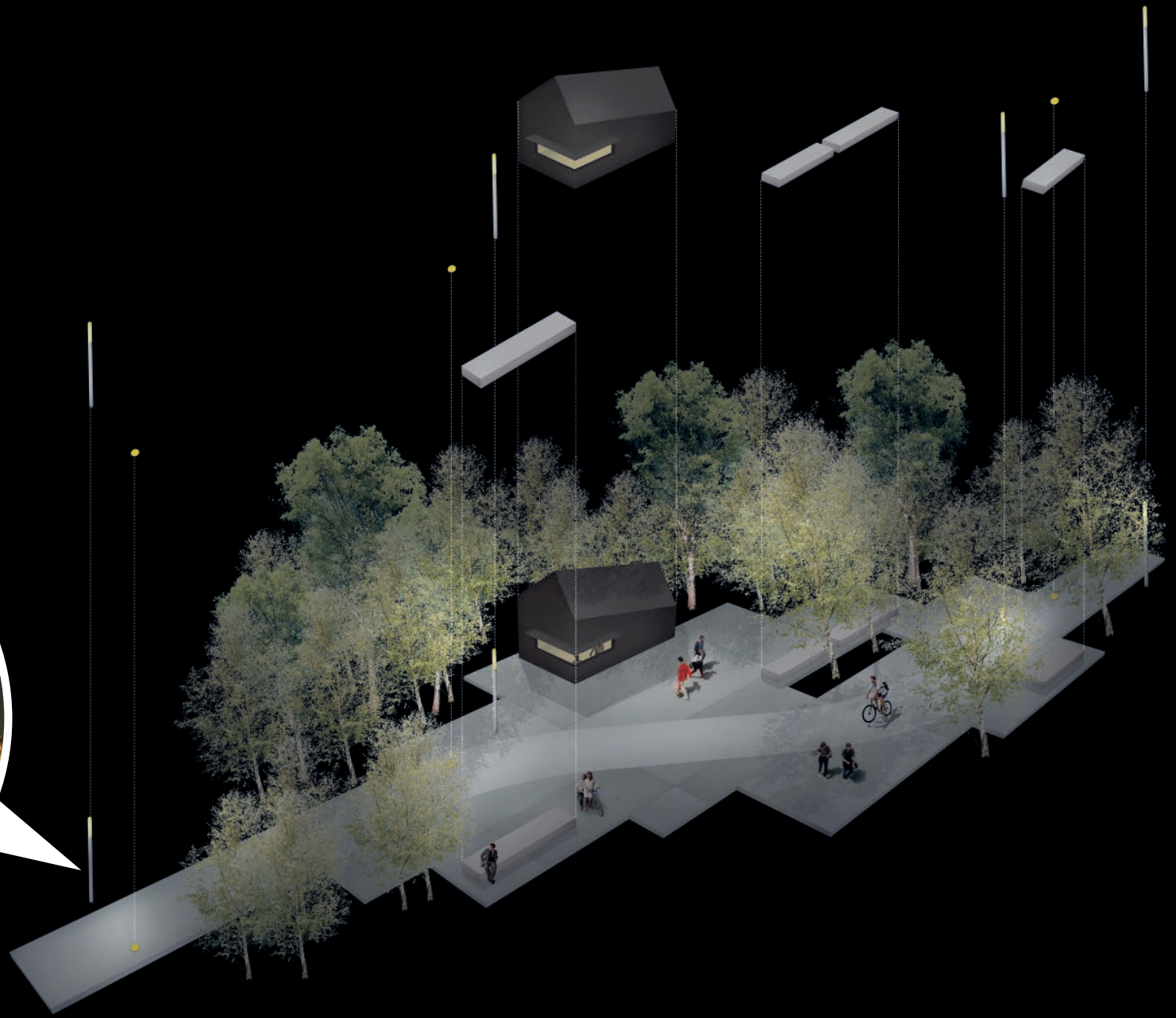


ELABORATION

The bicycle route ..

ELABORATION

The bicycle route ..



#P6

Conclusion & Reflection

How can the harbour of Rotterdam anticipate the coming energy transition in such a way that the regional scale system interests are incorporated and that the harbour will be ecologically and economically healthier, using a landscape-based approach?


1000M
SHELL
PARK