

From Atomgrad to Atompark

Upcycling a nuclear energy landscape

Gintare Norkunaite



















STRUCTURE





- Context
- Problem
- Approach and Vision
- Strategy and Framework
- Projects

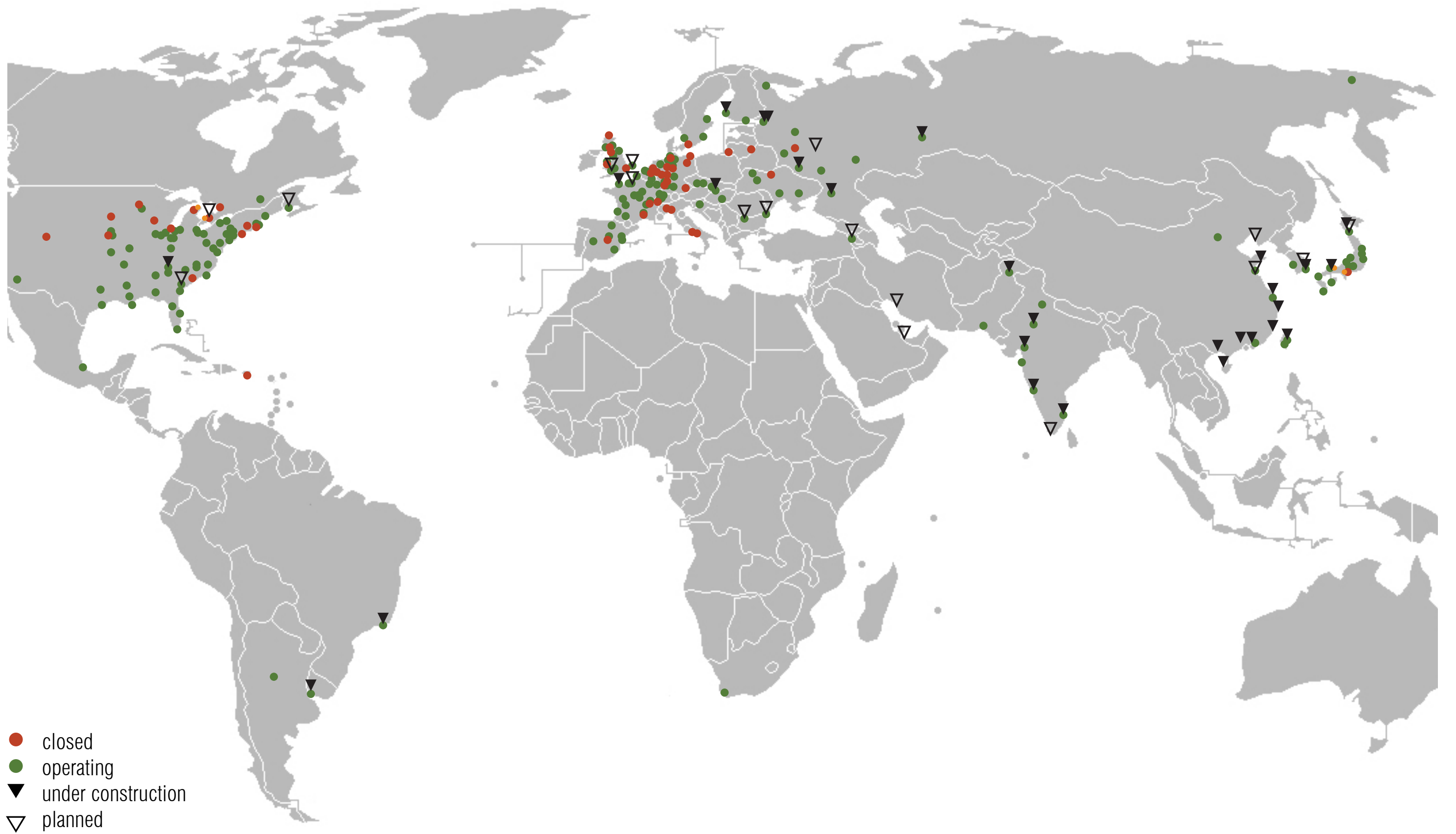
From an Atomgrad to an Atompark

ATOMGRAD - a small industrial city (from 30,000 to 80,000 inhabitants) designed to serve the needs of a large nuclear power plant

(Historian V. wendland)

City	establishment	Nuclear facilities	Country
Agidel	1980	Nuclear power plant Bashkiria	 Russian Federation
Aktau	1961	Aktau nuclear power plant	 Kazakhstan
Balakovo	1762	Balakovo Nuclear Power Plant	 Russian Federation
Bilibino	1955	Bilibino nuclear power plant	 Russian Federation
Desnogorsk	1974	Smolensk nuclear power plant	 Russian Federation
Enerhodar	1970	Zaporizhia Nuclear Power Plant	 Ukraine
Yuzhnoukrainsk	1976	South Ukraine Nuclear Power Plant	 Ukraine
Kamskije Polyany	1981	Nuclear power plant Tatarstan (Kama)	 Russian Federation
Kurchatov	1968	Kursk Nuclear Power Plant	 Russian Federation
Kuznetsovsk	1973	Rivne Nuclear Power Plant	 Russian Federation
Mezamor	1969	Metsamor Nuclear Power Plant	 Armenia
Netishyn	1984	Khmelnitsky nuclear power plant	 Ukraine
Novovoronezh	1975	Nuclear power plant Novovoronezh Novovoronezh Nuclear Power Plant II	 Russian Federation
Obninsk	1956	Obninsk Nuclear Power Plant, IPPE	 Russian Federation
Ozersk	1945	Mayak, nuclear power plant South Urals	 Russian Federation
Polyarnye Zori	1968	Kola nuclear power plant	 Russian Federation
Pripyat, Slavutich	In 1970, 1986	Chernobyl Nuclear Power Plant	 Ukraine
Saretschny	1957	Beloyarsk nuclear power station	 Russian Federation

Scholkin	1978	Crimean Atomic Energy Station	 Ukraine
Seversk	1949	Sibirskaya nuclear power plant	 Russian Federation
Sosnovy Bor	1958	Leningrad Nuclear Power Plant Leningrad Nuclear Power Plant II	 Russian Federation
Teplodar	1981	Nuclear thermal power station Odessa	 Ukraine
Chistye Bory	1979	Nuclear power plant Kostroma	 Russian Federation
Udomlya	1961	Kalinin Nuclear Power Plant	 Russian Federation
Visaginas	1975	Ignalina nuclear power plant, Visaginas Nuclear Power Plant	 Lithuania
Volgodonsk	1950	Rostov Nuclear Power Plant, nuclear equipment	 Russian Federation
Sillamäe	1502	chemical factory that produced fuel rods and nuclear materials	Estonia
Paldiski	1783	a Soviet Navy nuclear submarine training centre	Estonia
Kurchatov		Nuclear testing site	Kazakhstan
Oak Ridge, Tennessee	1942	Manhattan Project.	USA
Los Alamos, New Mexico		Manhattan Project.	USA
Gold Coast Historic District (Richland, Washington)	1943	Manhattan Project.	USA
Mercury, Nevada	1950	Nevada Test Site	USA



Nuclear power plants in the World ■

THE PROJECT LOCATION



LITHUANIA

LATVIA

RUSSIA

LITHUANIA

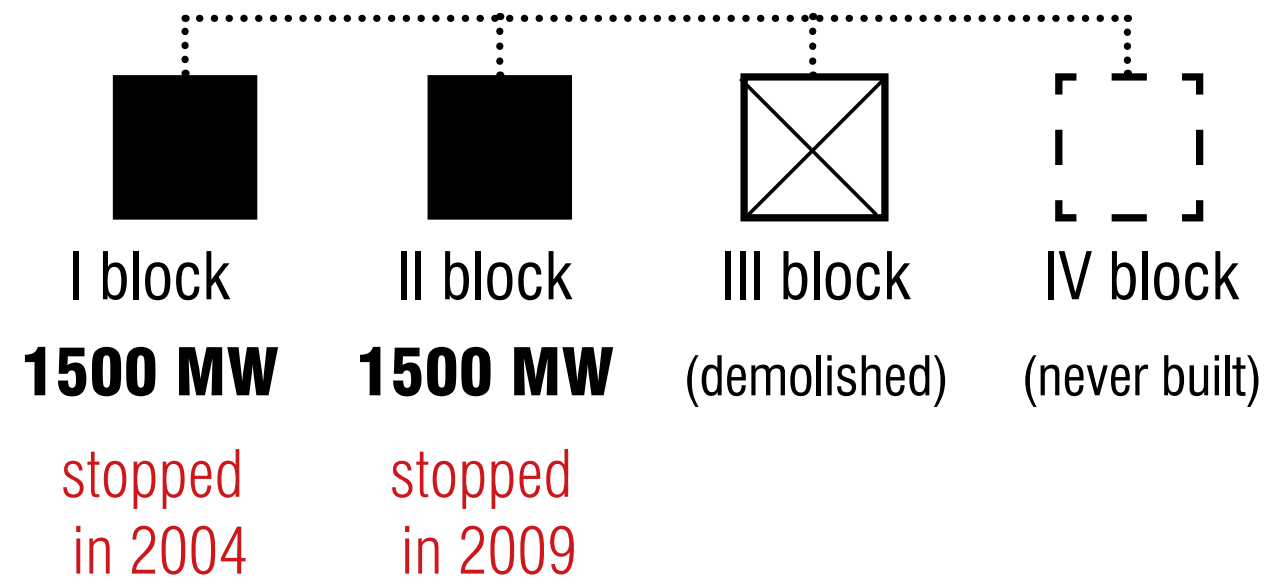
RUSSIA

Vilnius

Visaginas

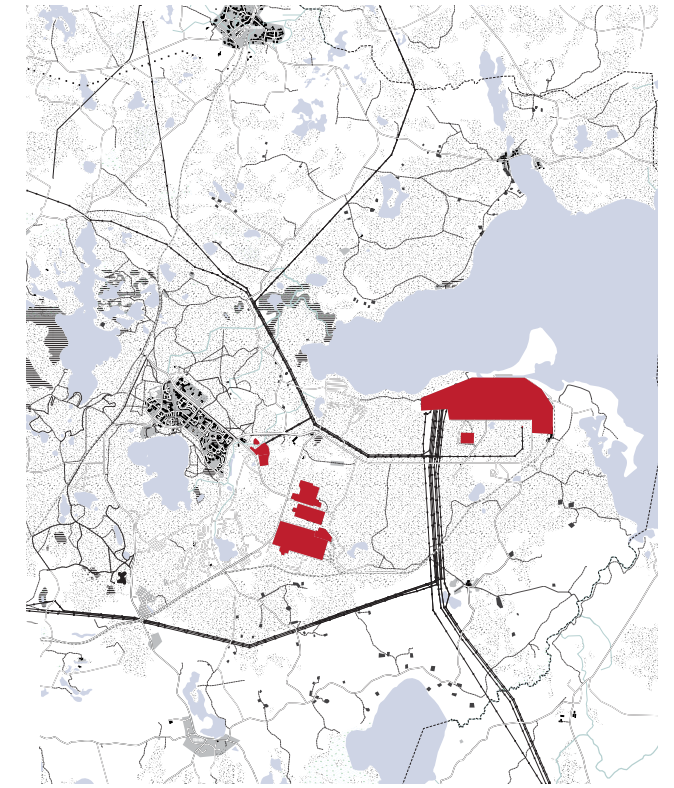
BELARUS

Project location ■



=3000 MW
(6000 MW projected)

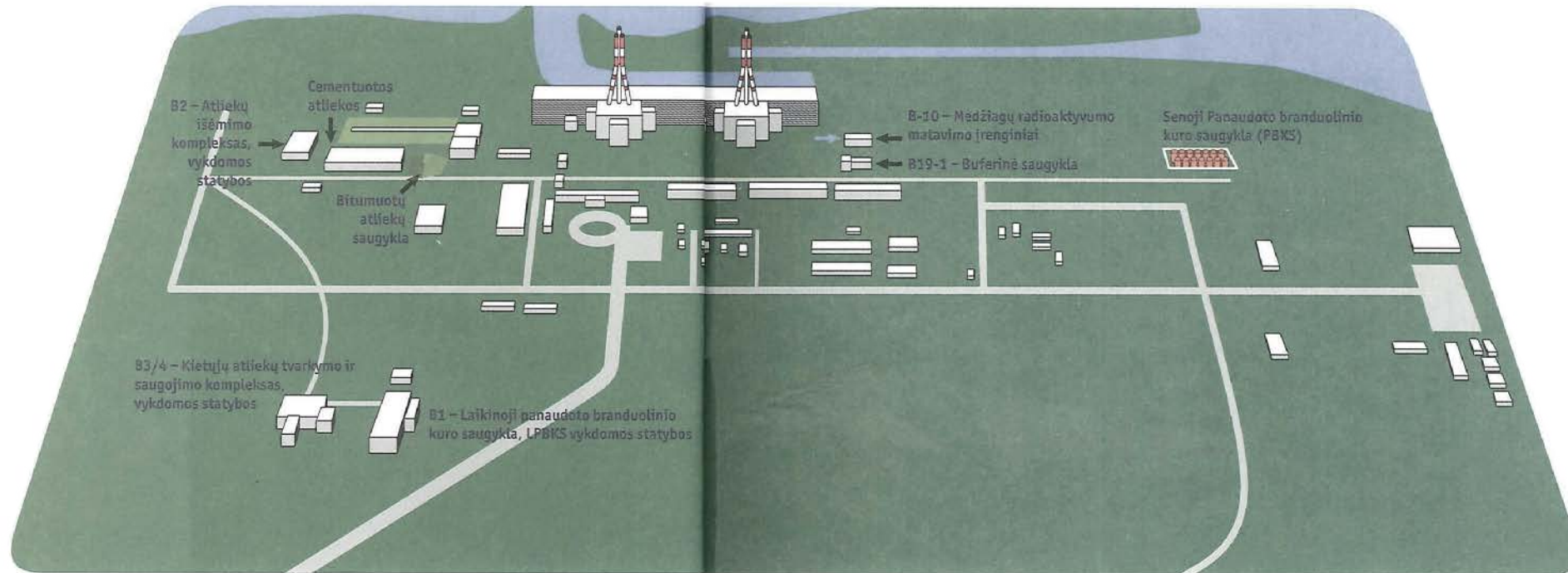
80 % of Lithuania
electricity needs



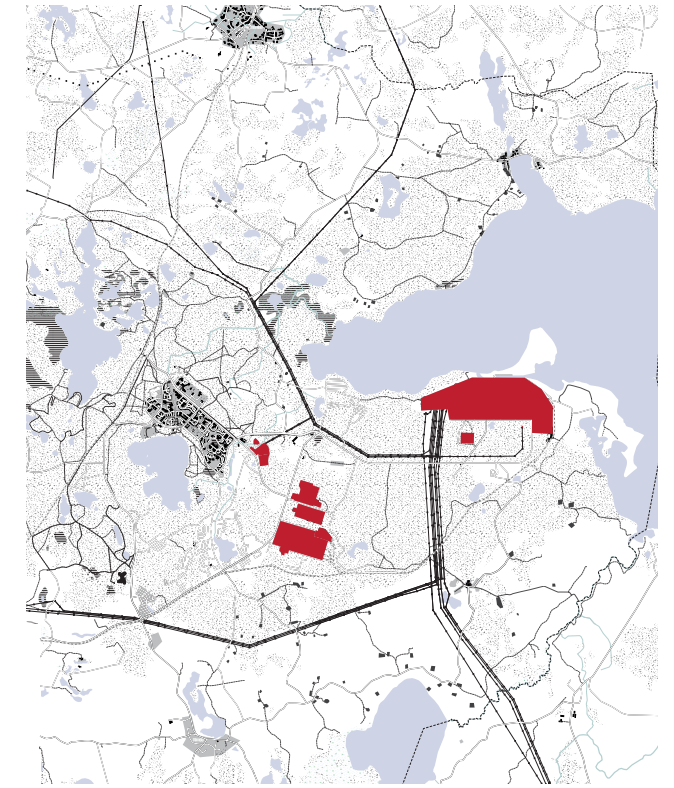
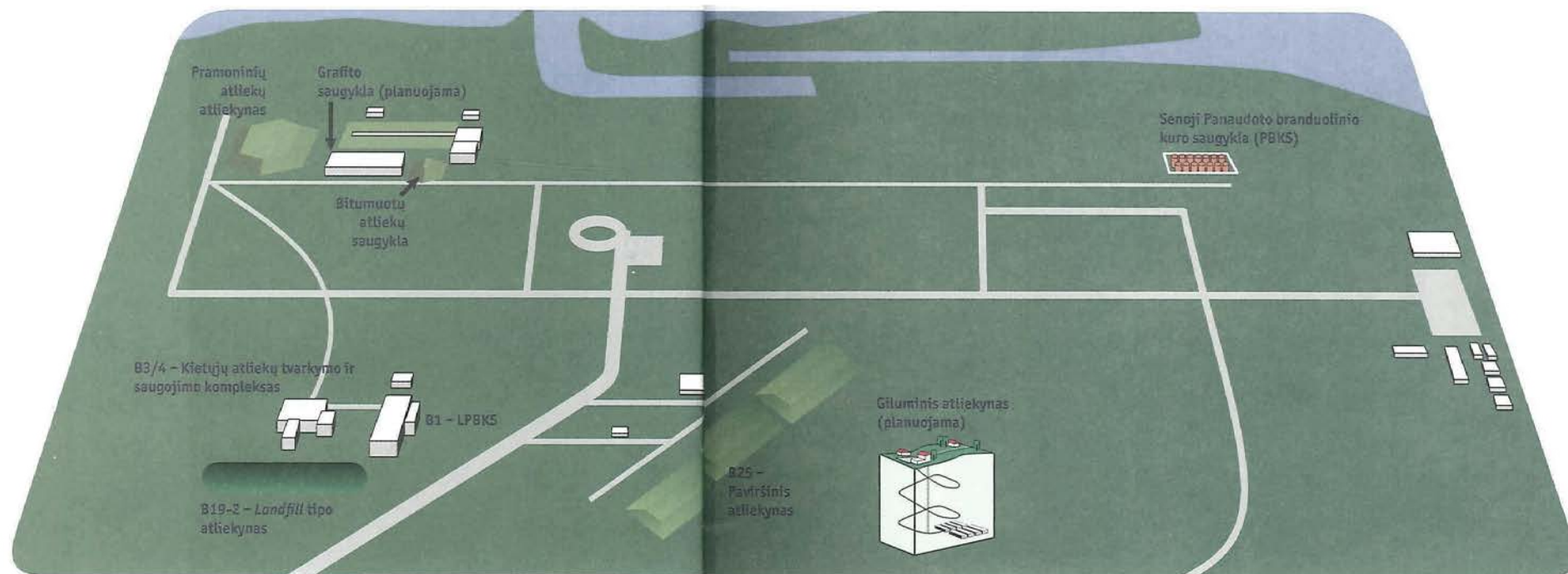
Ignalina nuclear power plant

DECOMMISSIONING

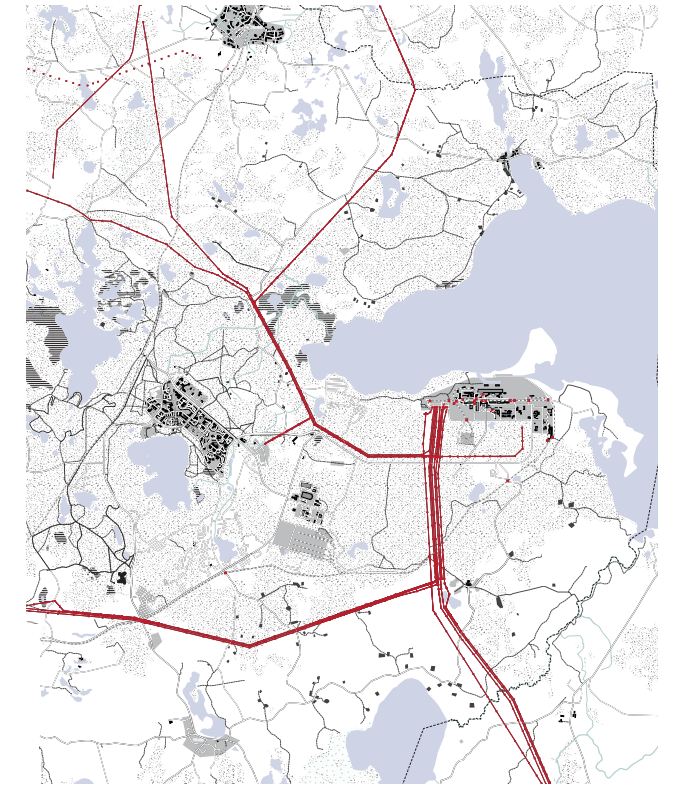
2015



2038



The initial decommissioning plan of Ignalina nuclear power plant



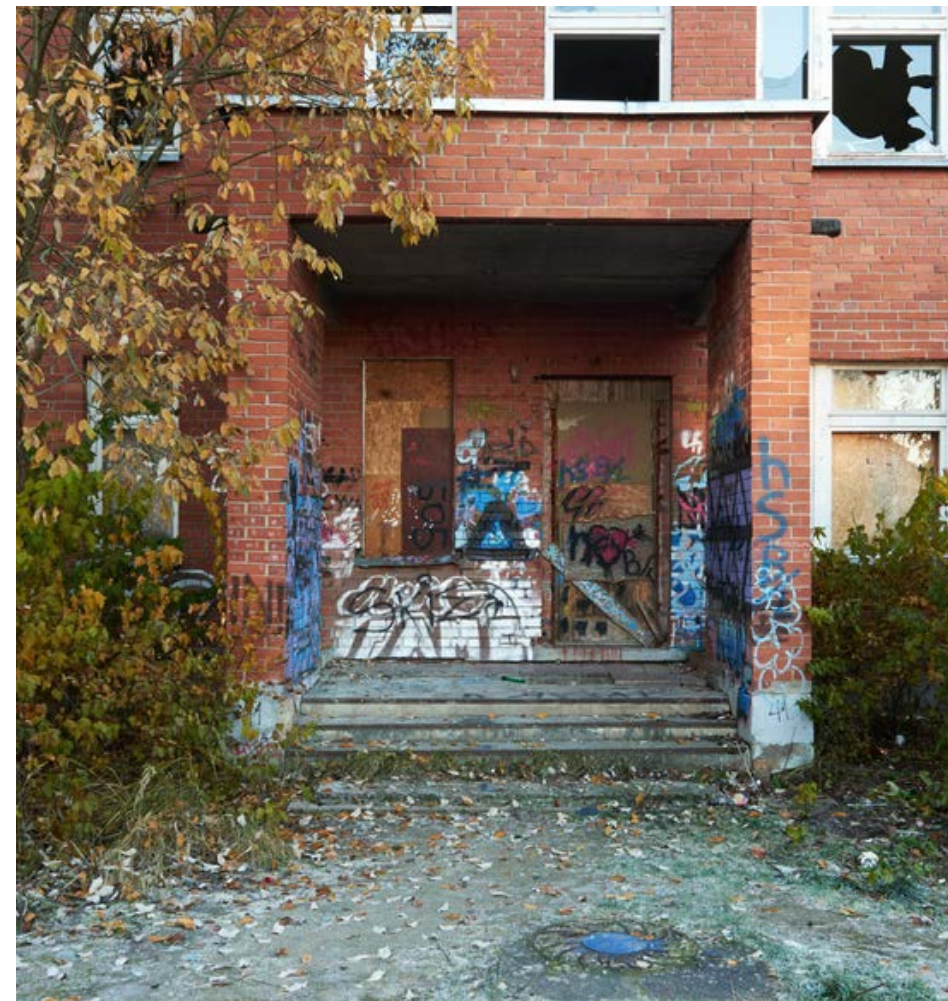
Gigantic infrastructure

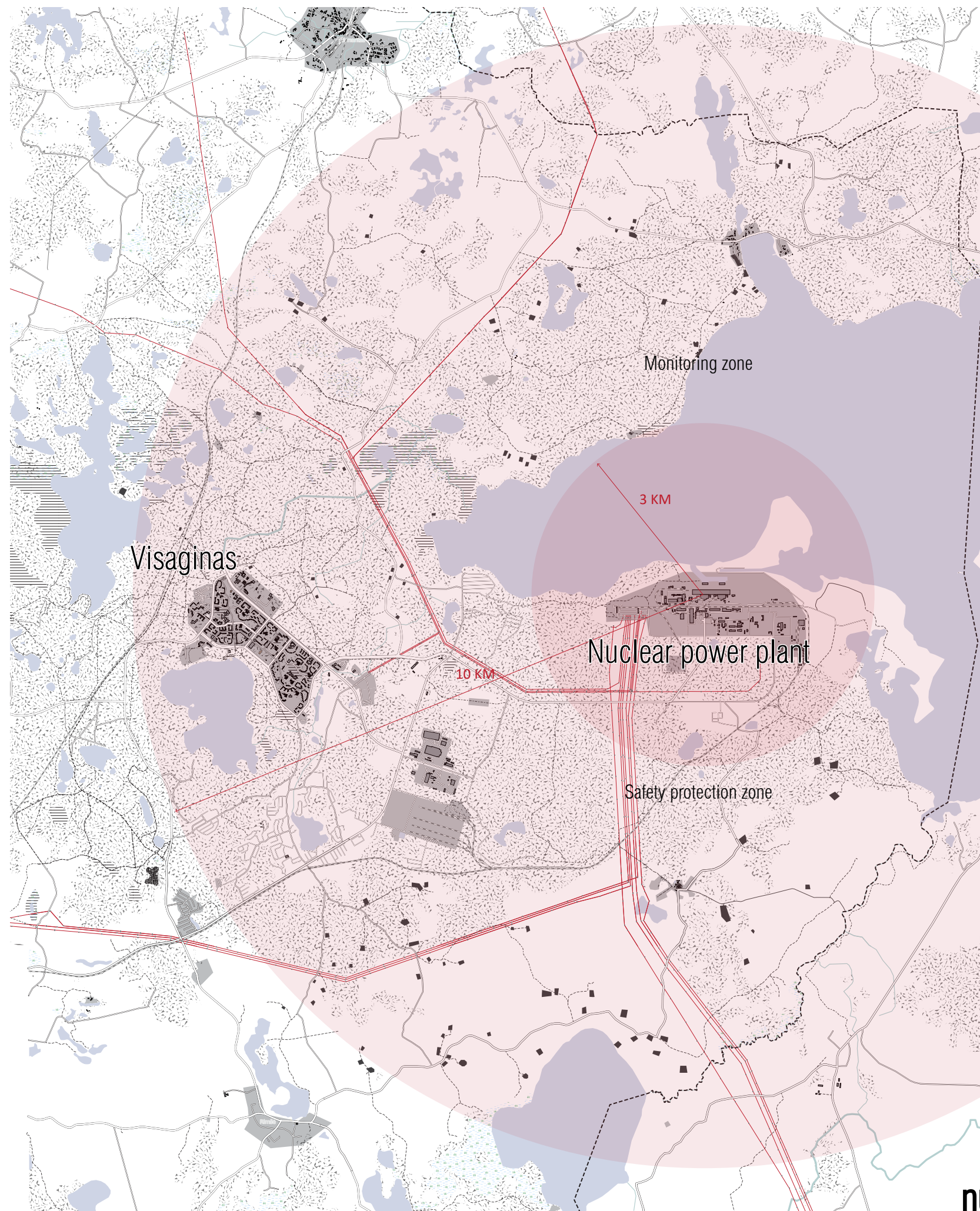


Mural painting in Visaginas ■

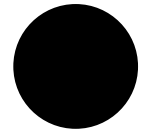
41% of jobs are provided
by Ignalina nuclear power
plant

40% of the population
have already left the city

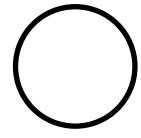




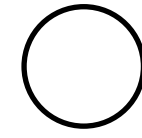
APPROACH



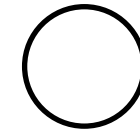
Nature



Energy
structures and
knowledge

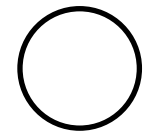


creative
population

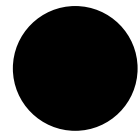


Industrial
heritage

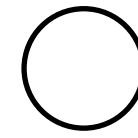




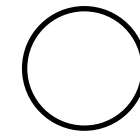
Nature



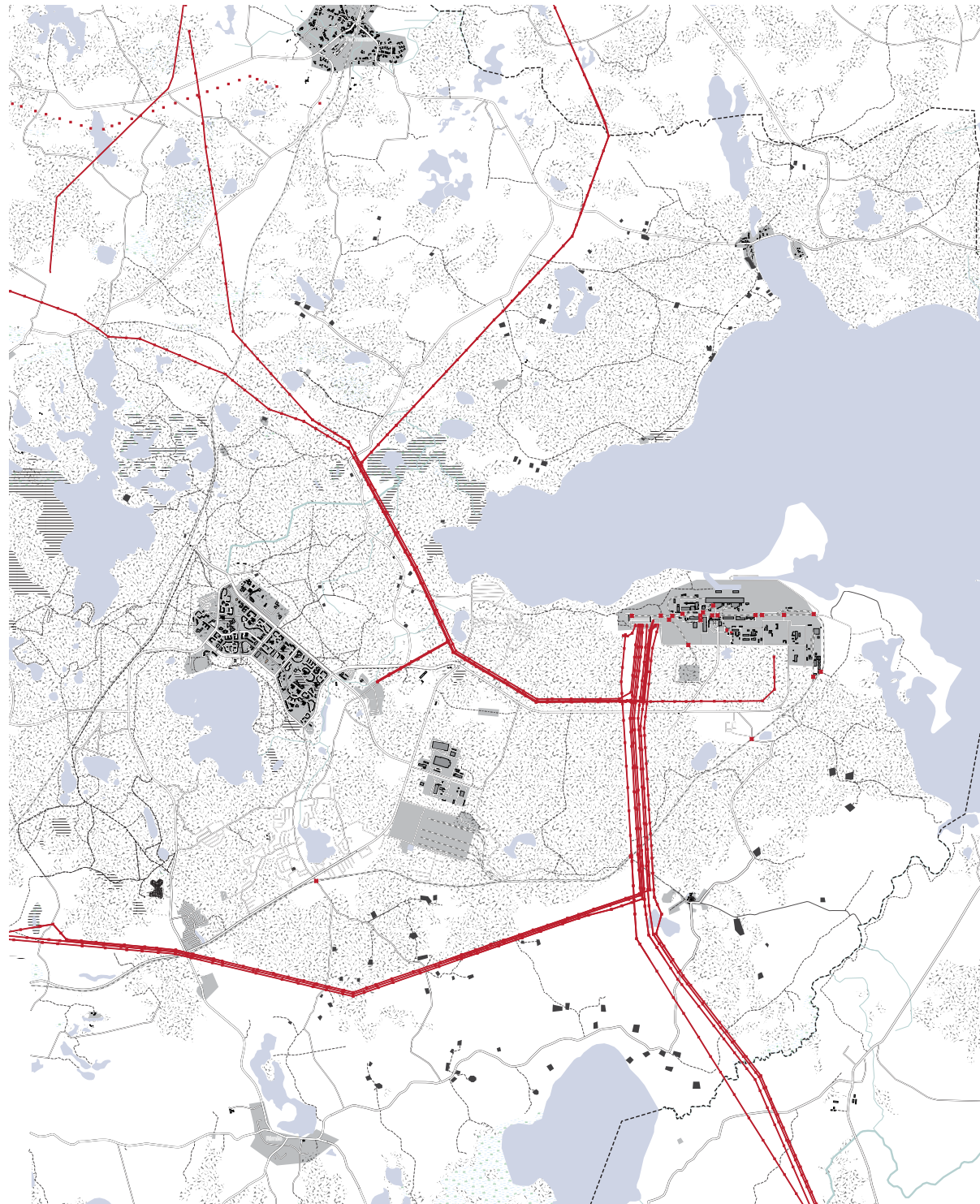
Energy
structures and
knowledge



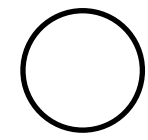
creative
population



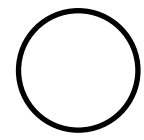
Industrial
heritage



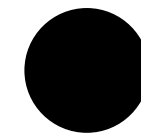
80 % of the population has higher education
43 nationalities



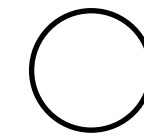
Nature



Energy
structures and
knowledge

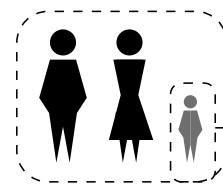


creative
population

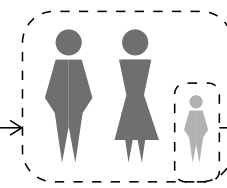


Industrial
heritage

I generation



II generation



III generation

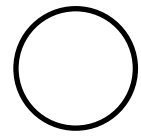


1975

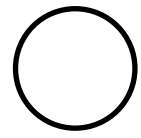
~1990s

2016

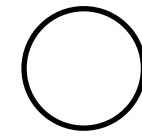




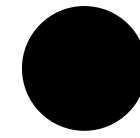
Nature



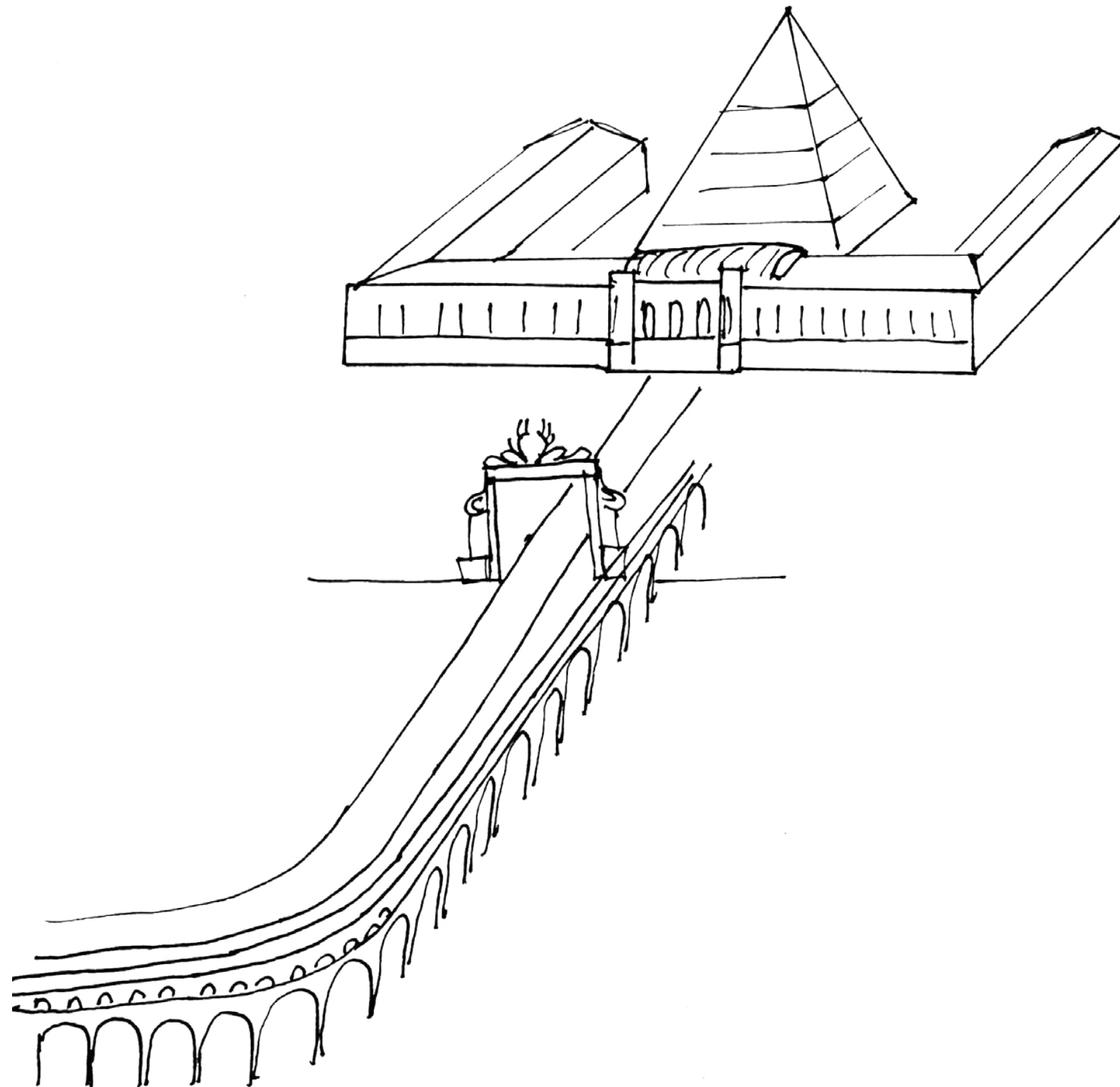
Energy
structures and
knowledge

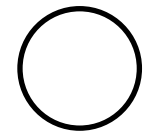


creative
population

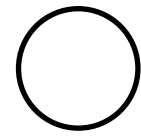


Industrial
heritage

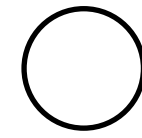




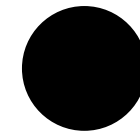
Nature



Energy
structures and
knowledge

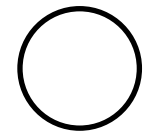


creative
population

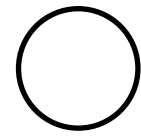


Industrial
heritage

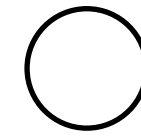




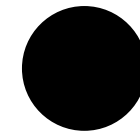
Nature



Energy
structures and
knowledge



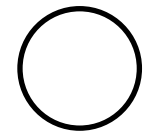
creative
population



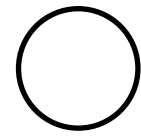
Industrial
heritage



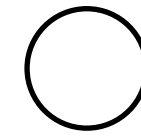
Sequence of spaces leading to INPP ■



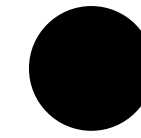
Nature



Energy
structures and
knowledge



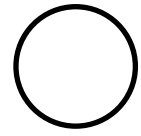
creative
population



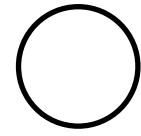
Industrial
heritage



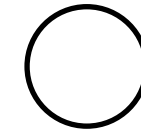
Sequence of spaces leading to INPP ■



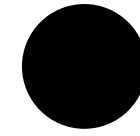
Nature



Energy
structures and
knowledge



creative
population



Industrial
heritage



ATOMPARK

ATOMPARK



Nature



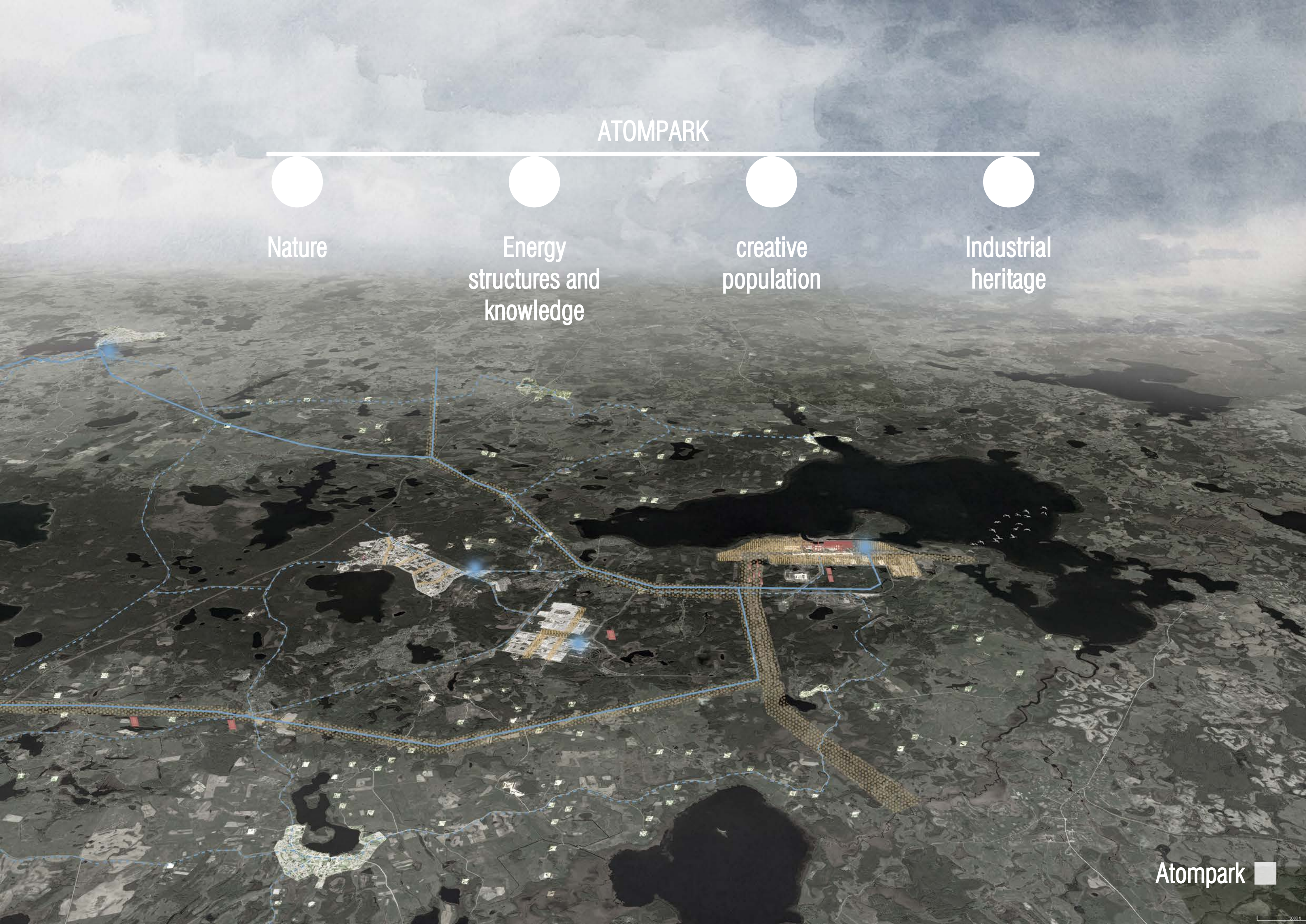
Energy
structures and
knowledge



creative
population



Industrial
heritage



AtomGRAD - AtomPARK

1. Regional city



urbanized parts ■

1. A regional city

2. Nature is part of the city,
The city is part of nature



1. A regional city

2. Nature is part of the city,
The city is part of nature

3. A biophilic region

An aerial photograph of a city and its surrounding landscape, including a large lake. Overlaid on the image are various colored lines and markers representing urban planning or environmental zones. A solid blue line forms a large, irregular boundary around the city and surrounding areas. A dashed blue line follows a similar path but is slightly offset. A solid orange line with a dotted pattern runs through the city and extends towards the lake. A solid red line runs horizontally across the lower part of the city. Small red rectangles are placed at various points along the lines. The sky is filled with soft, white clouds.

1. A regional city

2. Nature is part of the city,
The city is part of nature

3. A biophilic region

4. A cradle for endangered
species

1. A regional city

2. Nature is part of the city,
The city is part of nature

3. A biophilic region

4. A cradle for endangered
species

5. Energy transition



An aerial photograph of a landscape featuring a city, several large water bodies, and a network of roads. Overlaid on the image are various colored lines and markers representing planning or infrastructure projects. A solid blue line forms a large loop around the city and water bodies. A dashed blue line follows a similar path but is more irregular. A solid orange line runs horizontally across the middle of the image. A solid brown line runs vertically on the right side. Small red rectangles are placed at various points along the lines. The sky is filled with soft, grey clouds.

1. A regional city

2. Nature is part of the city,
The city is part of nature

3. A biophilic region

4. A cradle for endangered
species

5. Energy transition

6. The ecosystem of high-
tech industries

1. A regional city

2. Nature is part of the city,
The city is part of nature

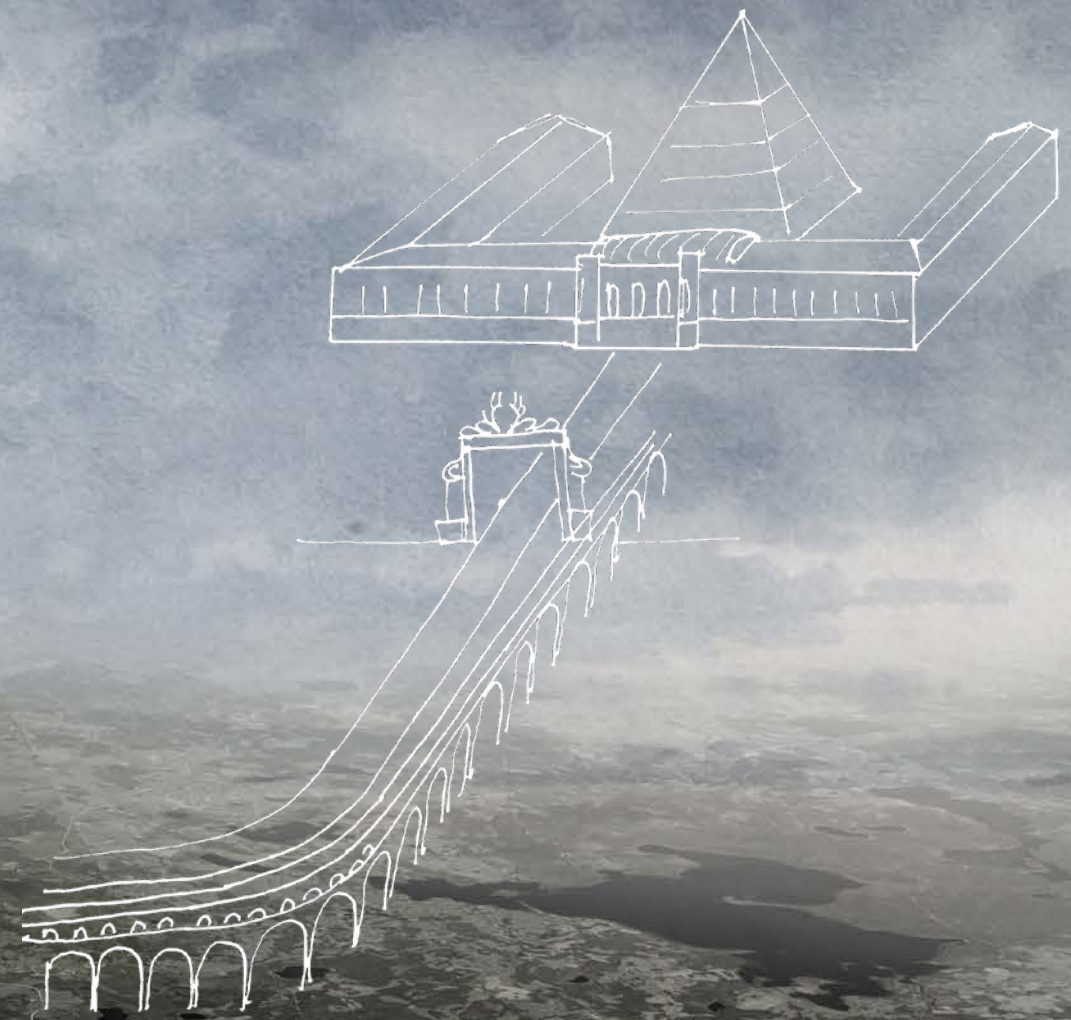
3. A biophilic region

4. A cradle for endangered
species

5. Energy transition

6. The ecosystem of high-
tech industries

7. The preservation of indus-
trial heritage



AtomGRAD - AtomPARK

nuclear

1. A regional city
2. Nature is part of the city,
The city is part of nature
3. A biophilic region
4. A cradle for endangered
species
5. Energy transition
6. The ecosystem of high-
tech industries
7. The preservation of indus-
trial heritage
8. Handled radiation

STRATEGY

ATOMPARK



Nature

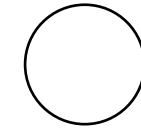
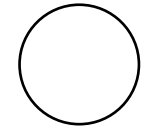
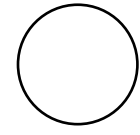
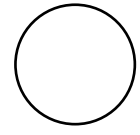
Energy
structures and
knowledge

creative
population

Industrial
heritage

POTENTIALS

ATOMPARK

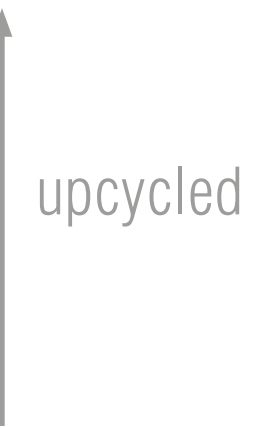


Energy
structures and
knowledge

creative
population

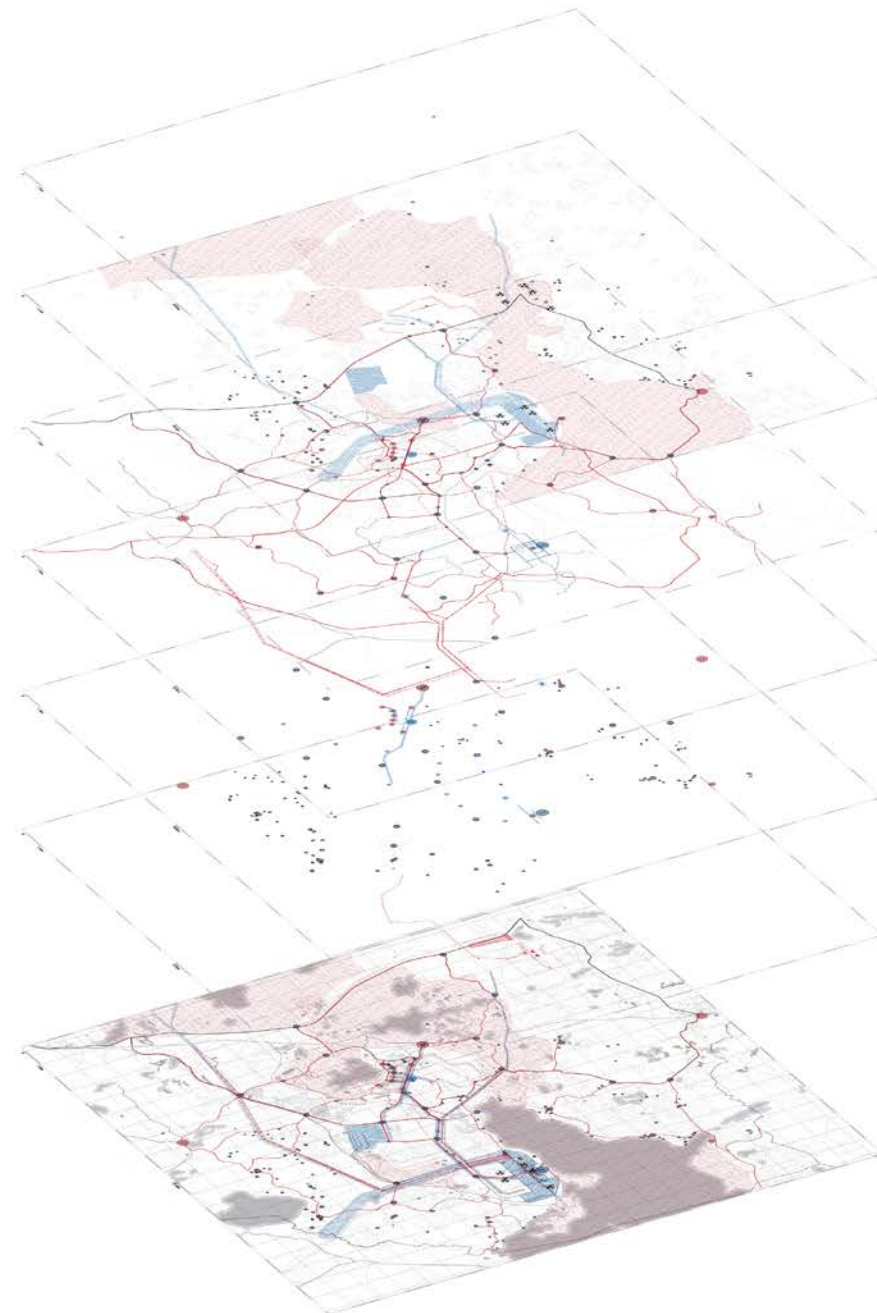
Industrial
heritage

POTENTIALS



STRATEGY
LAYERS

spatial structures



Sensing radiation

'New nature'

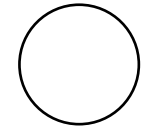
Mobility

Energy transition

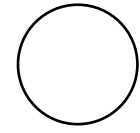
High tech industry

Heritage

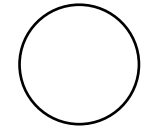
ATOMPARK



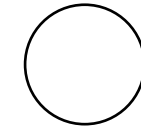
Nature



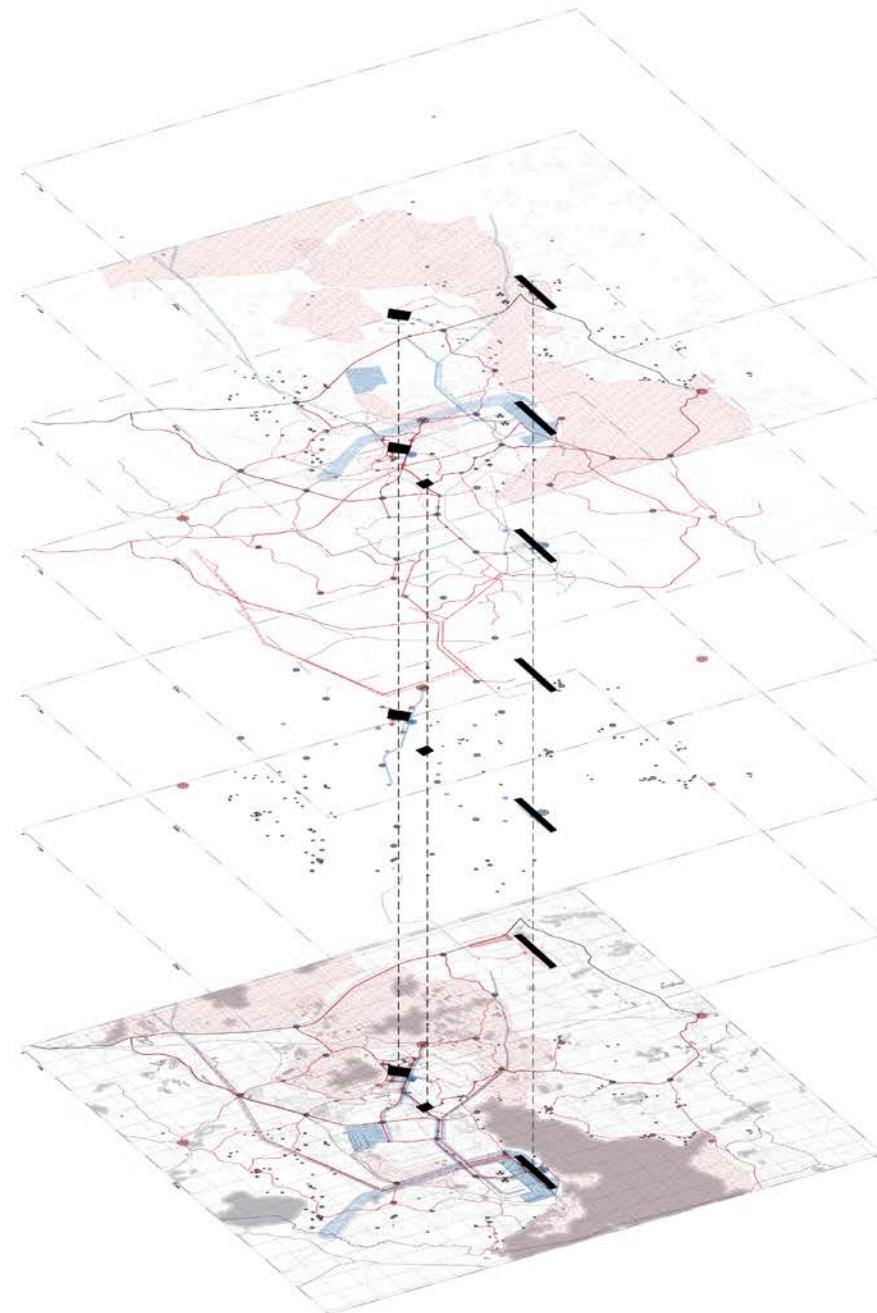
Energy
structures and
knowledge



creative
population



Industrial
heritage



Sensing radiation

'New nature'

Mobility

Energy transition

High tech industry

Heritage

POTENTIALS



upcycled

STRATEGY
LAYERS

spatial structures



integrated by

PROJECTS

Structure of the project ■

SENSING RADIATION

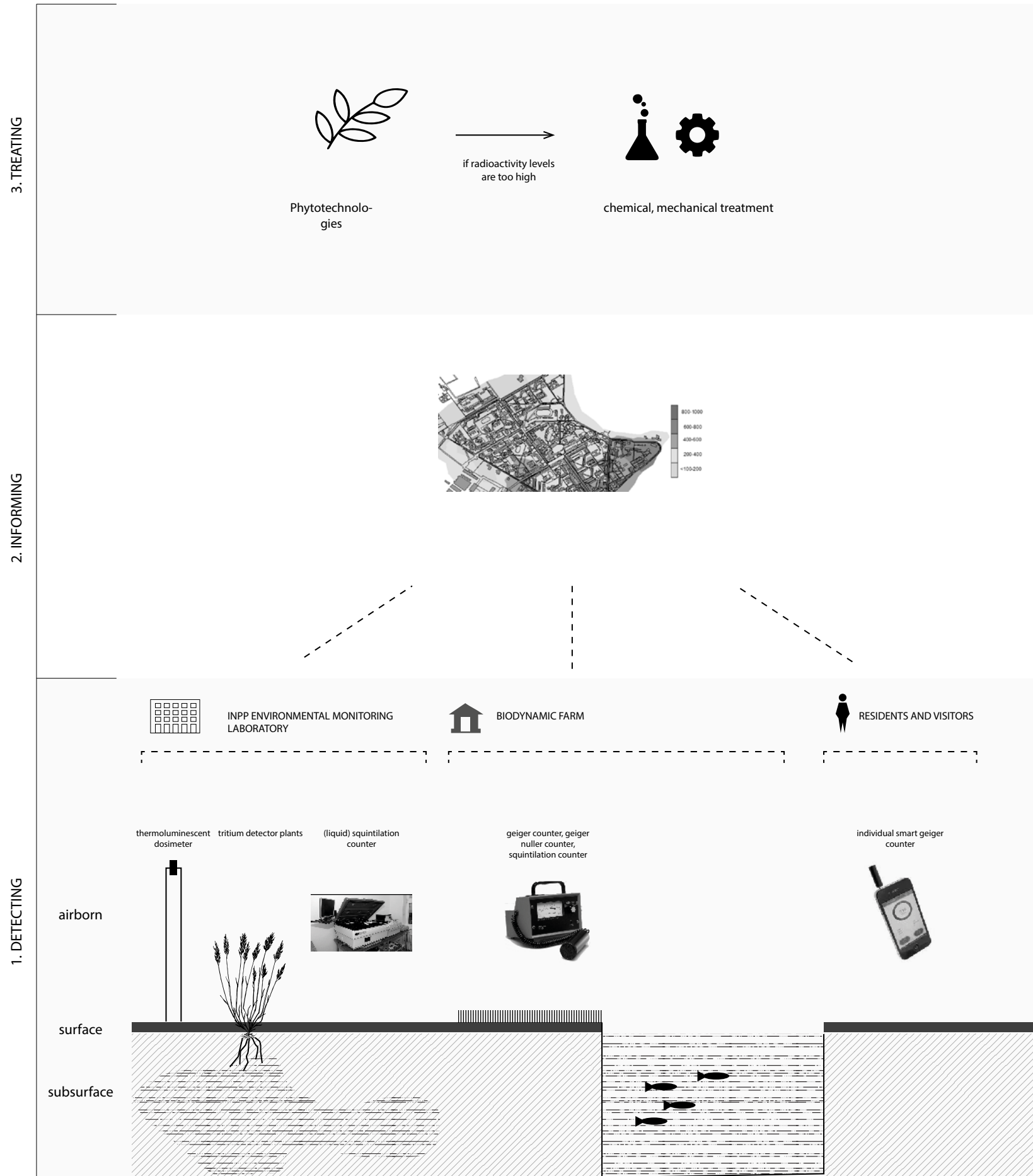


reactors



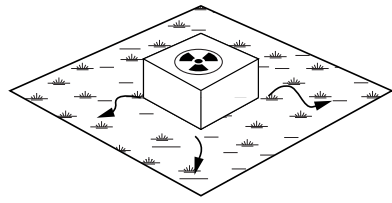
radioactive waste storage

radioactive objects ■

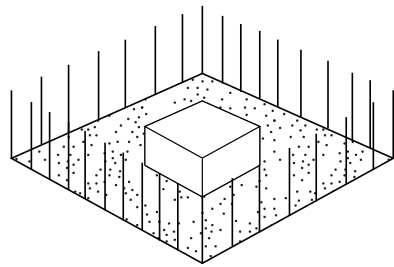


'NEW NATURE'

- healing



Phytotechnologies
cleaning/stabilizing radionuclides






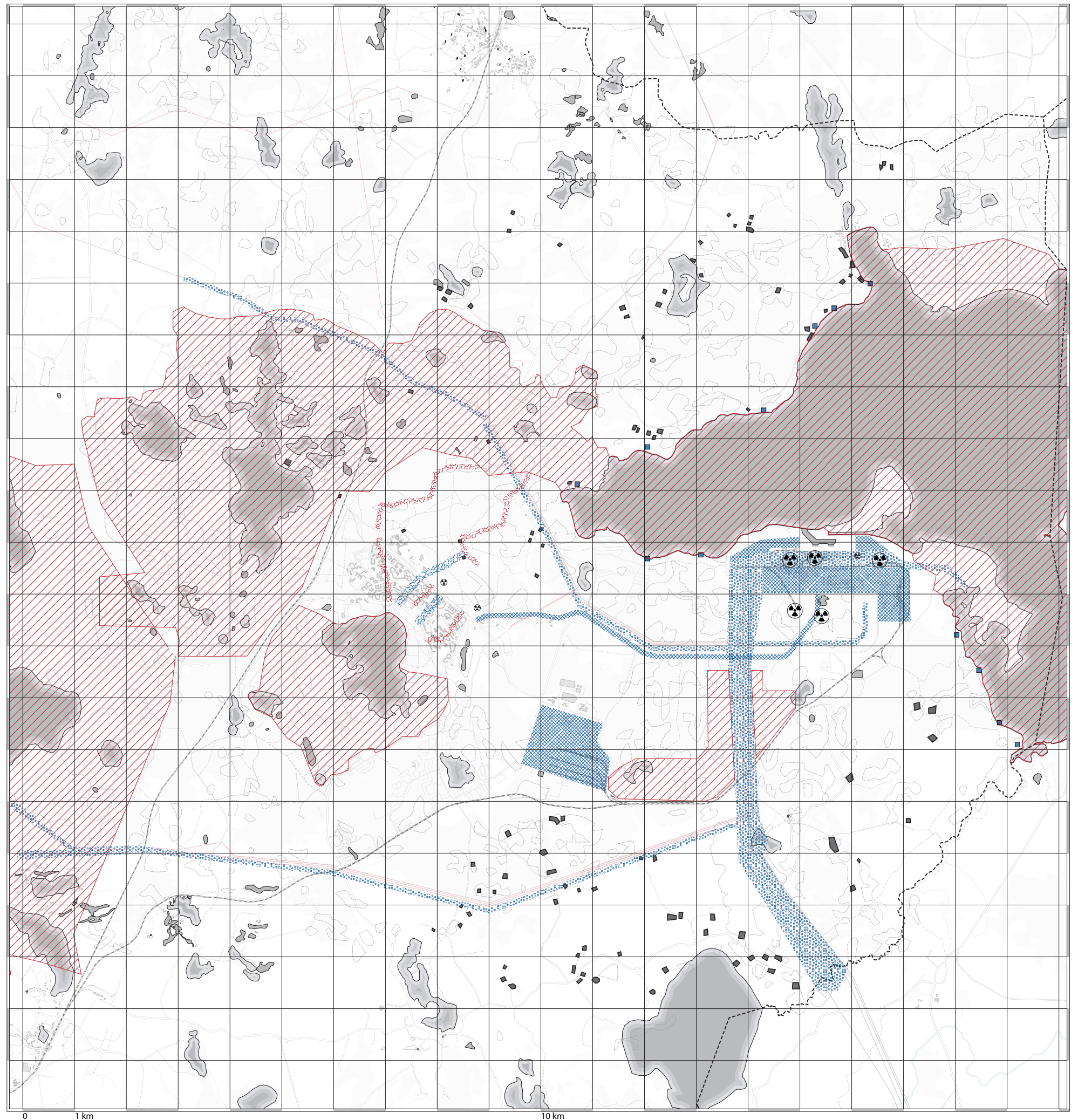
Phytotechnologies
cleaning/stabilizing industrial pollution

NATURE structures

-  water
-  reserves
-  habitats
-  corridors
-  connections
-  phytotechnologies/new plants

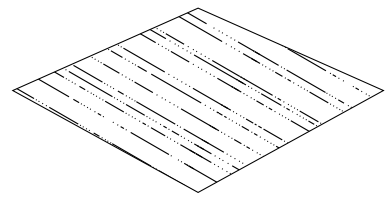
ACTIONS

-  reused
-  transformed/strengthened
-  new

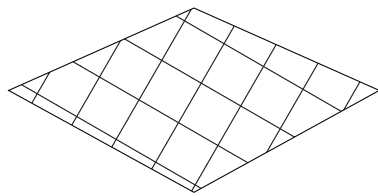


'NEW NATURE'

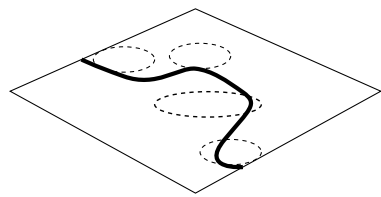
- healing
- upcycling



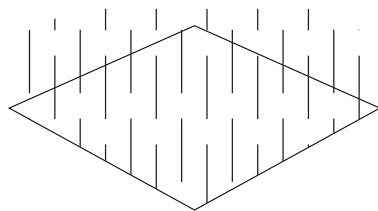
Allotments



Biodynamic farming



Ecological corridors



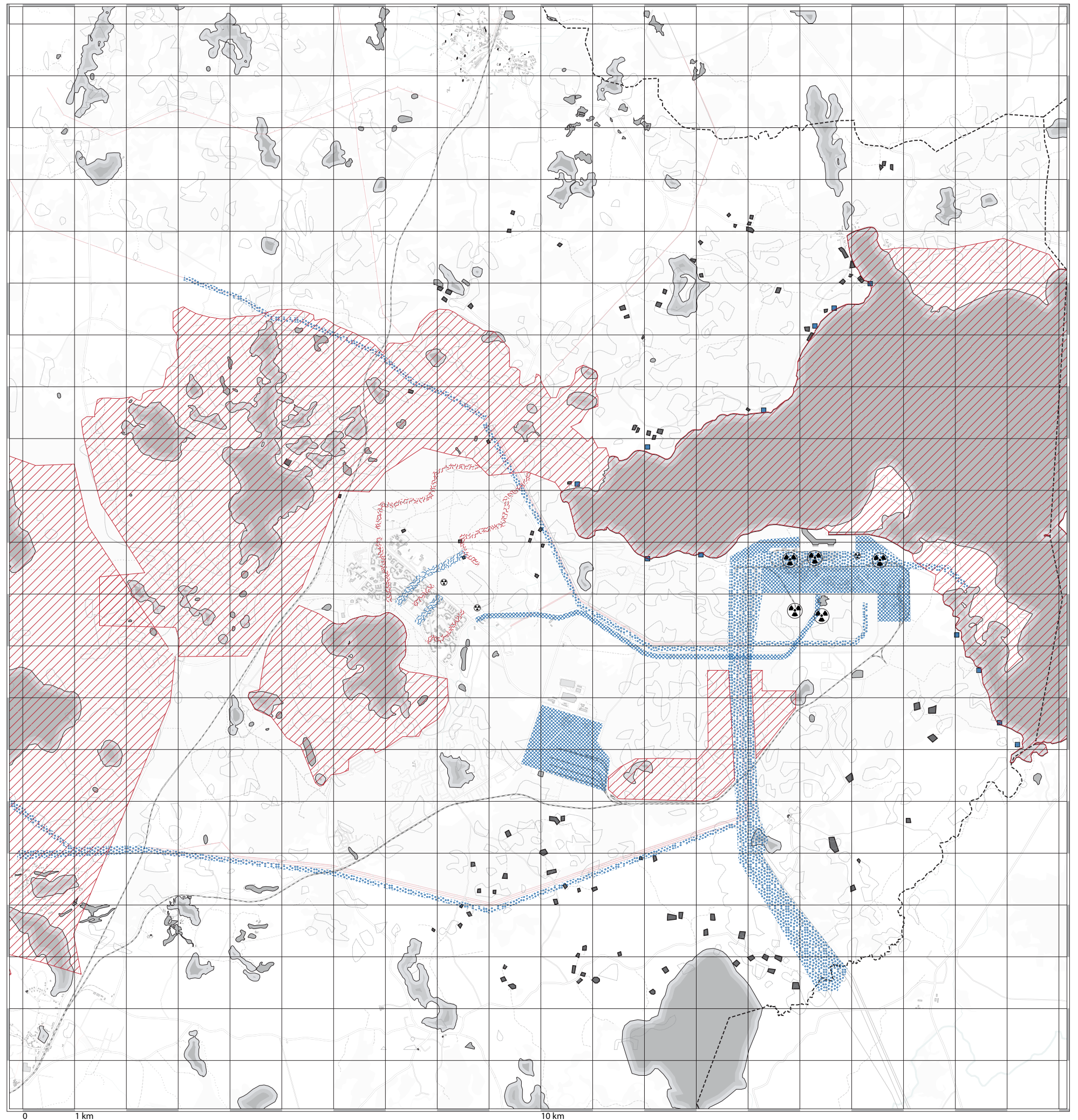
"New nature"

NATURE structures

- water
- reserves
- habitats
- corridors
- connections
- phytotechnologies/new plants

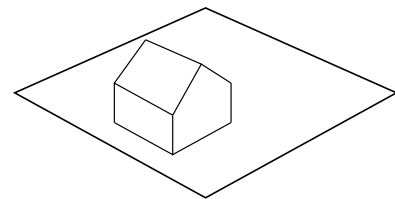
ACTIONS

- reused
- transformed/strengthened
- new

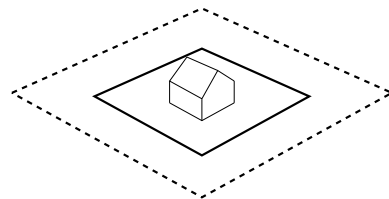


'NEW NATURE'

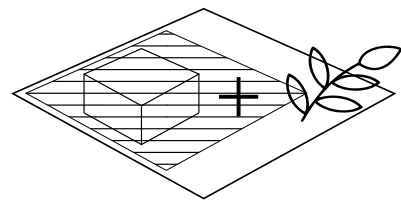
- healing
- upcycling
- maintaining



biodynamic farms



Homesteads



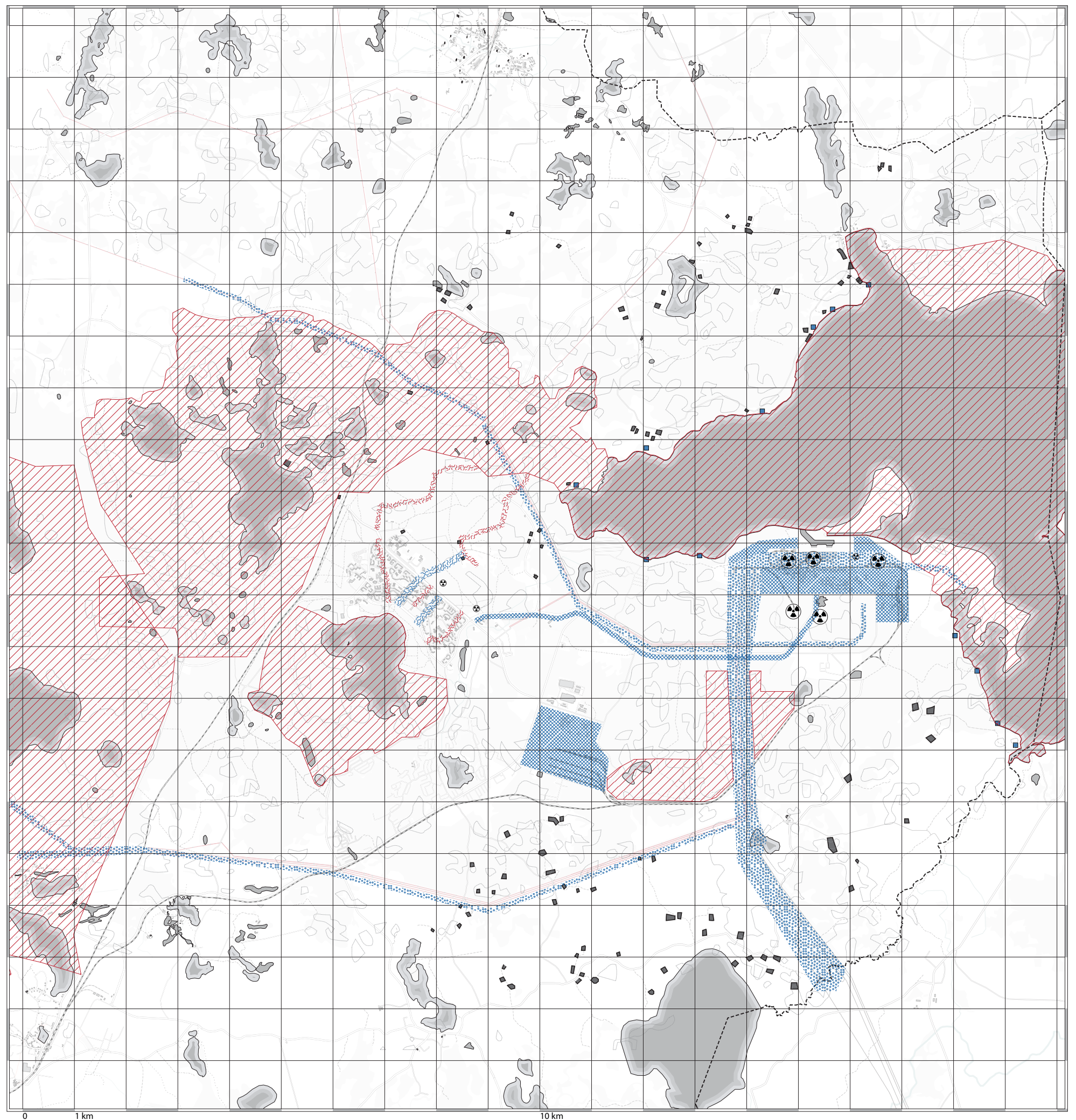
Phytotechnologies

NATURE structures

- water
- reserves
- habitats
- corridors
- connections
- phytotechnologies/new plants

ACTIONS

- reused
- transformed/strengthened
- new

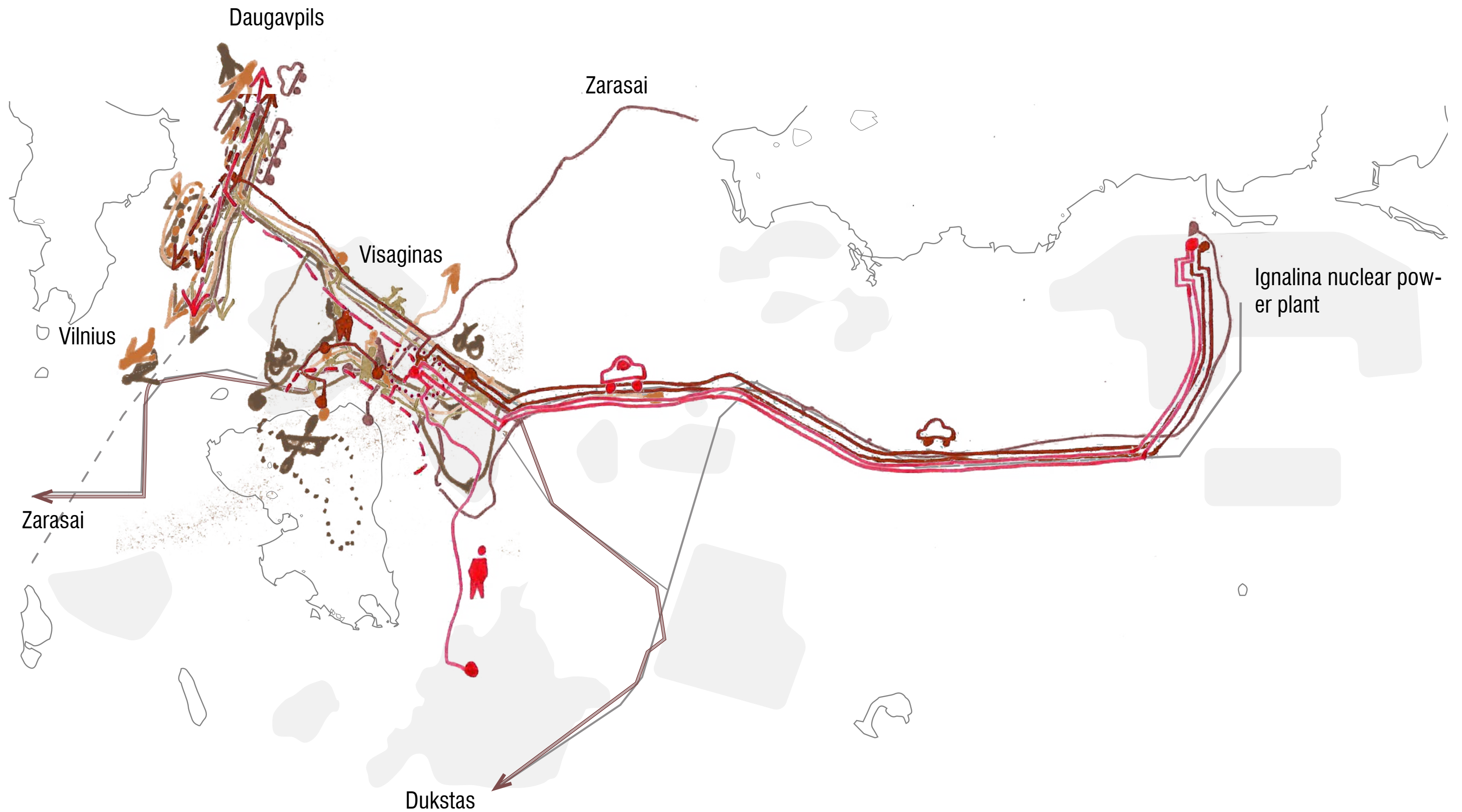






Transformation of electricity transmission corridors ■

MOBILITY



daily routes of people ■



A link between INPP and Visaginas ■



A link between INPP and Visaginas

MOBILITY

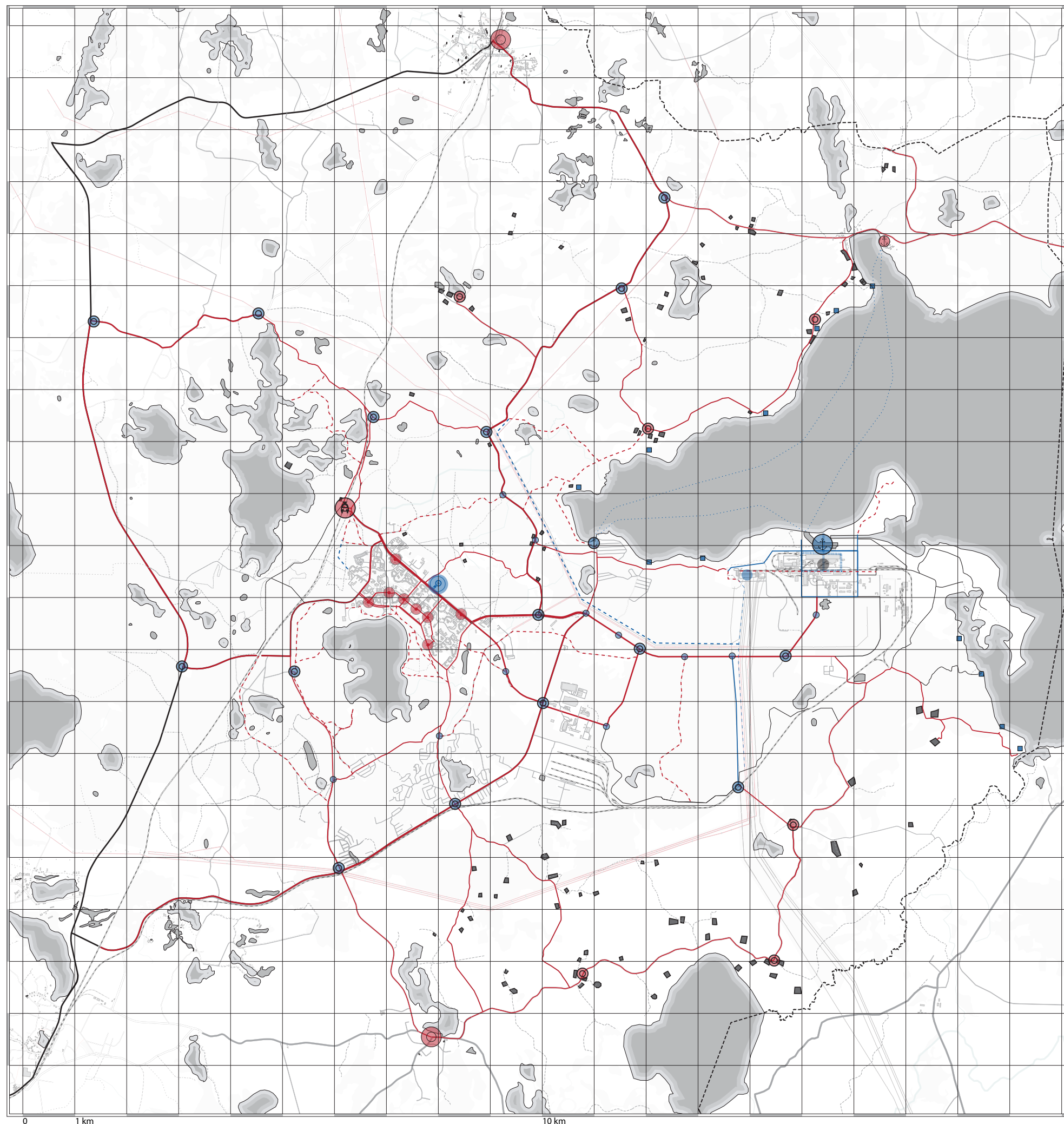
- slow network
- hiking network

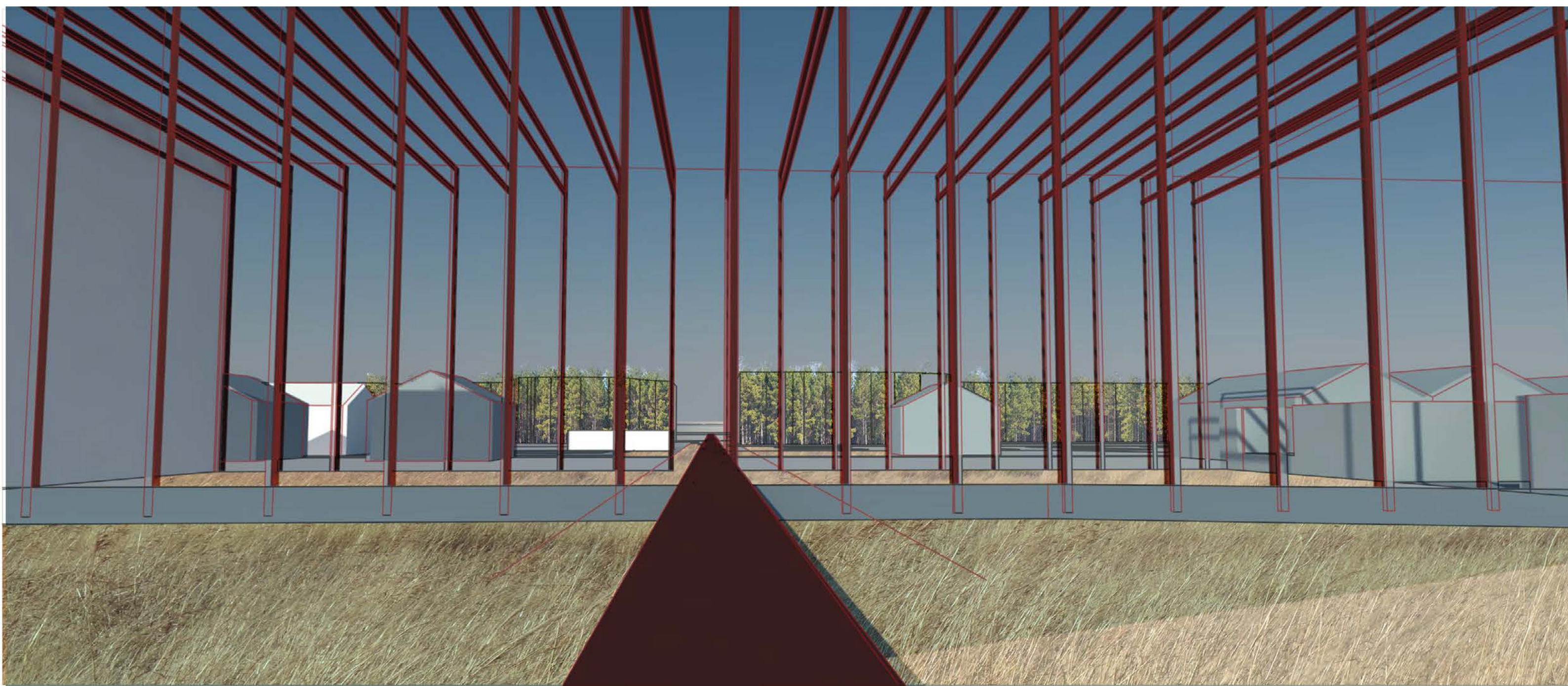
PATHS

- main city connections
- - region connections
- - strolling/bicycle path
- · · water route
- ||||| elevated path

ACTIONS

- reused
- transformed/strengthened
- new





Transformed turbine hall T2 ■



MOBILITY

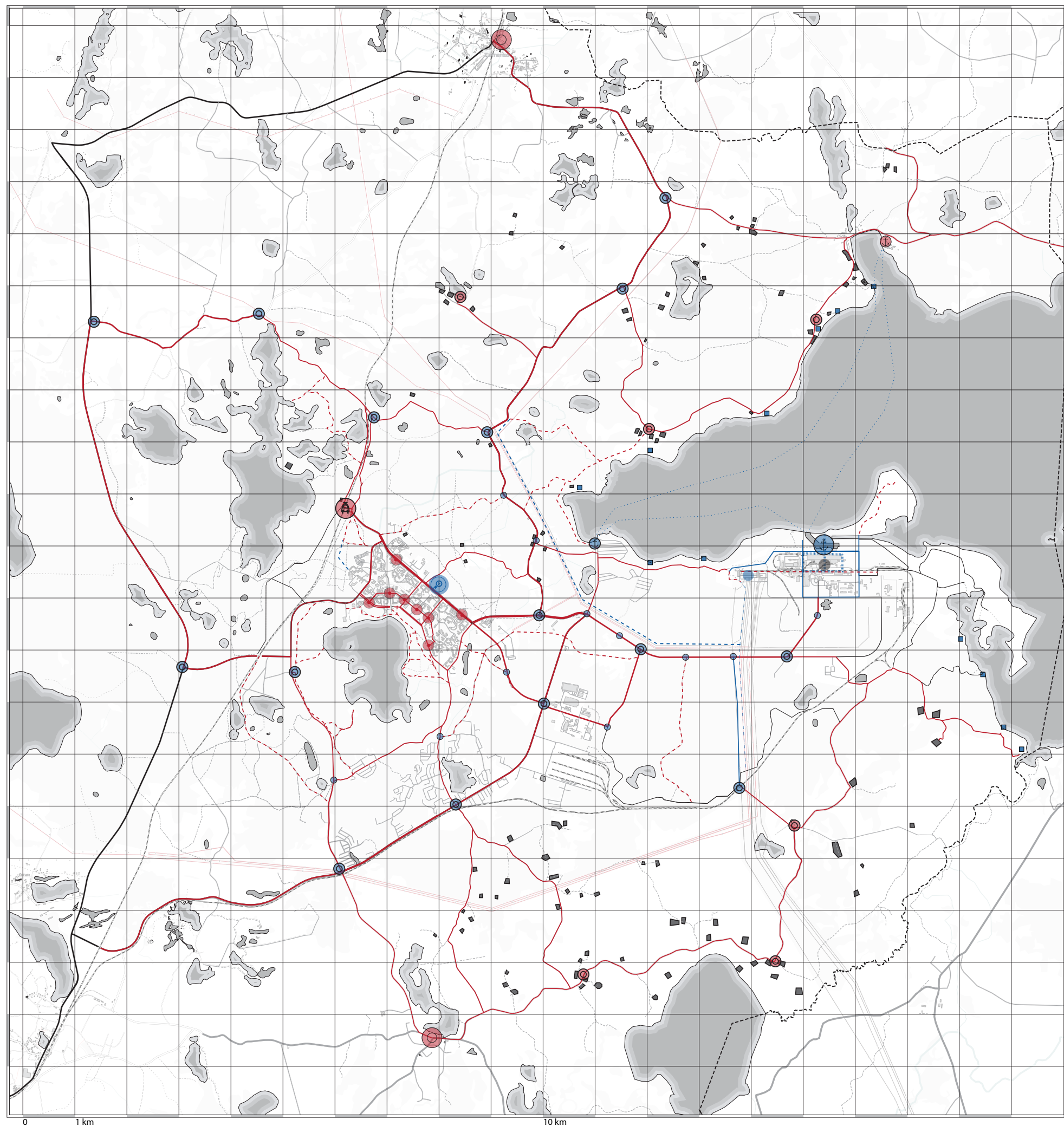
- regional network

PATHS

- main city connections
- - region connections
- - strolling/bicycle path
- . . . water route
- ||||| elevated path



ACTIONS

- reused
- transformed/strengthened
- new






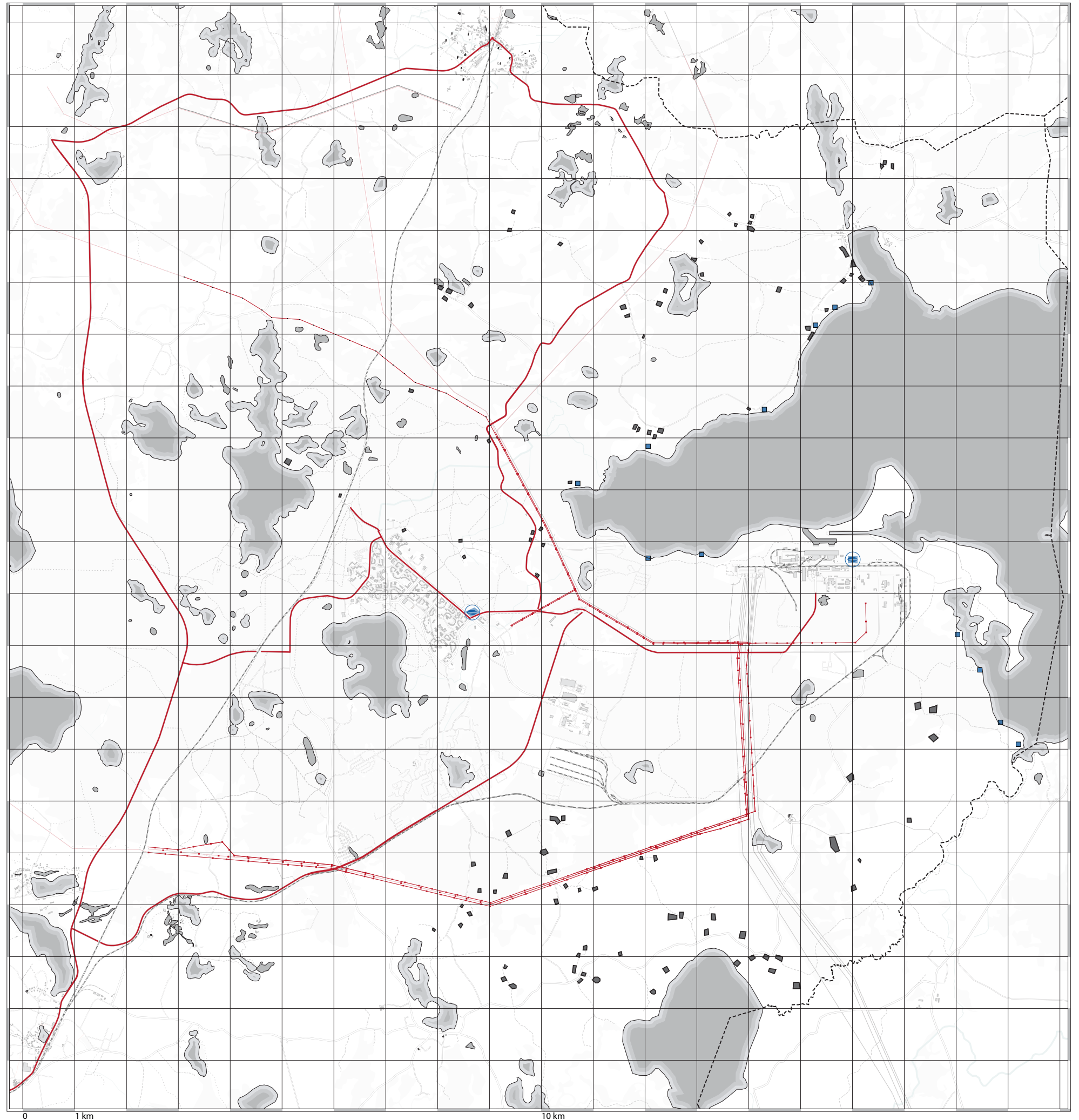
ENERGY TRANSITION

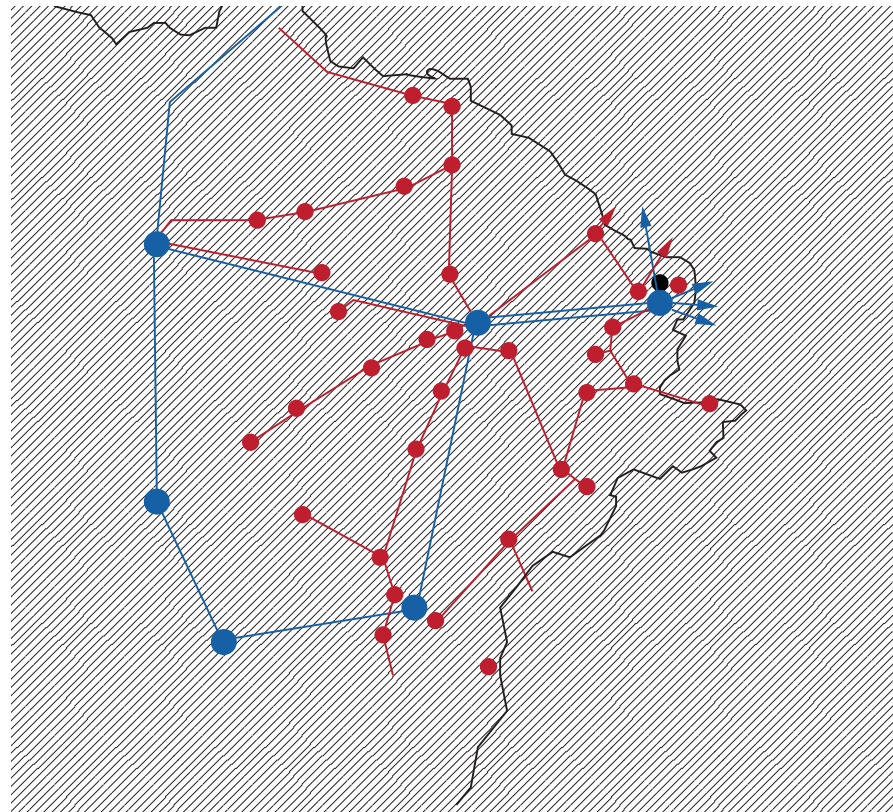
- regional energy subgrid
- distributed energy generation
- sinks and sources

- ENERGY generation
-  new reactors/biorefineries/hydrogen combined cycle power plant
 -  reused energy lines

ACTIONS

-  reused
-  transformed/strengthened
-  new





international grid

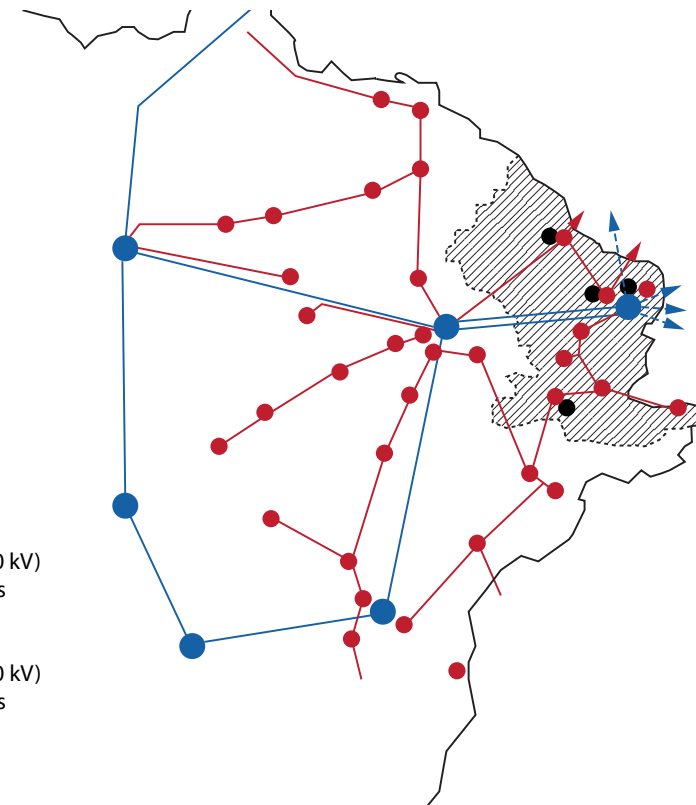
3 000 MW power
for 2 400 000 people

Fission

Centralised energy source



Ignalina Nuclear Power plant



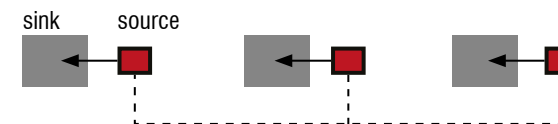
- national grid (330 kV)
transmission lines
- substations
- regional grid (110 kV)
transmission lines
- substations
- power plants

regional grid

75 MW
for 60 000 people

Fusion

Distributed energy source



- nuclear fusion,
- biorefinery,
- hydrogen combined cycle power plant



Ignalina nuclear power plant ■







A new nuclear fusion reactor ■




HIGH-TECH INDUSTRIES

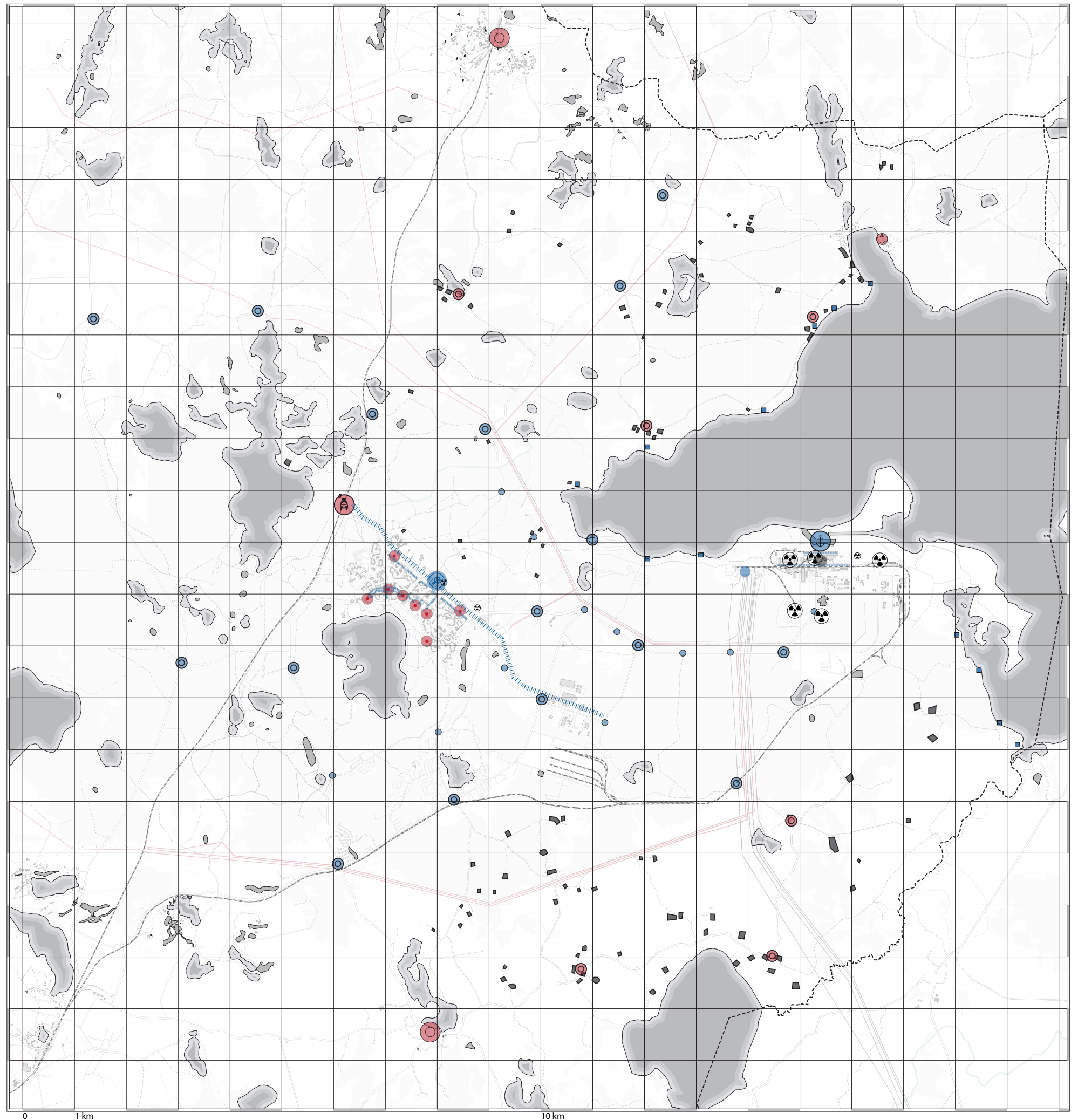
Activators:

- research institute
- pavilions

- ENERGY research
-  new research center
 -  transformations buildings
 -  new temporary structures (activators)
 -  new permanent structures (development areas)

ACTIONS

-  reused
-  transformed/strengthened
-  new



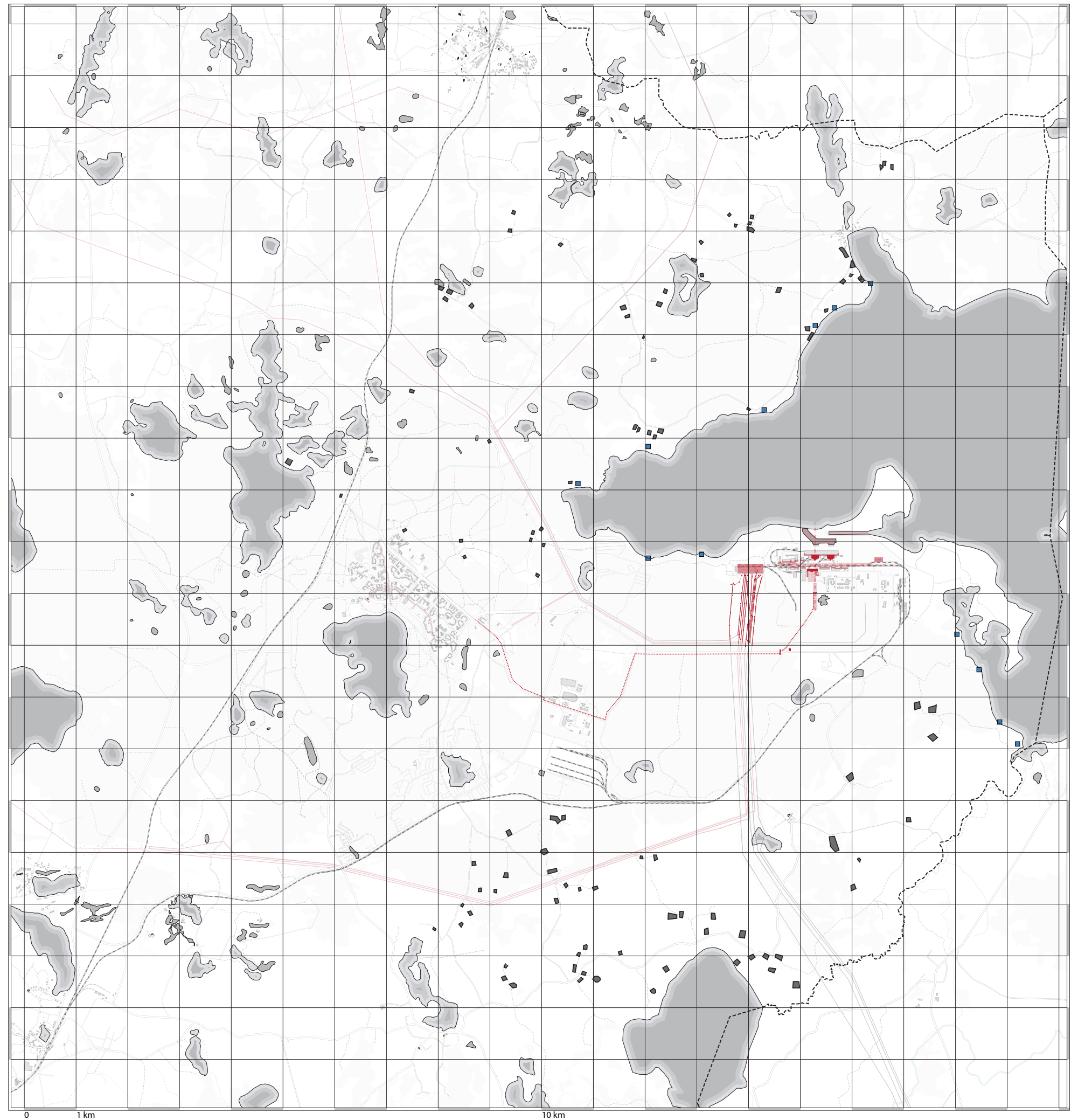


A pedestrian alley in the town ■







Path in the town (T3)




INDUSTRIAL HERITAGE



INDUSTRIAL HERITAGE

-  buildings
-  infrastructure
-  composition (axes, sequence of spaces, formants)
-  symbols

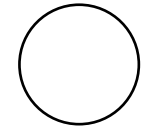
ACTIONS

-  reused
-  transformed/strengthened
-  new

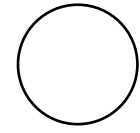


THE FRAMEWORK

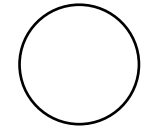
ATOMPARK



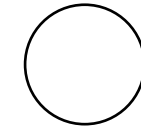
Nature



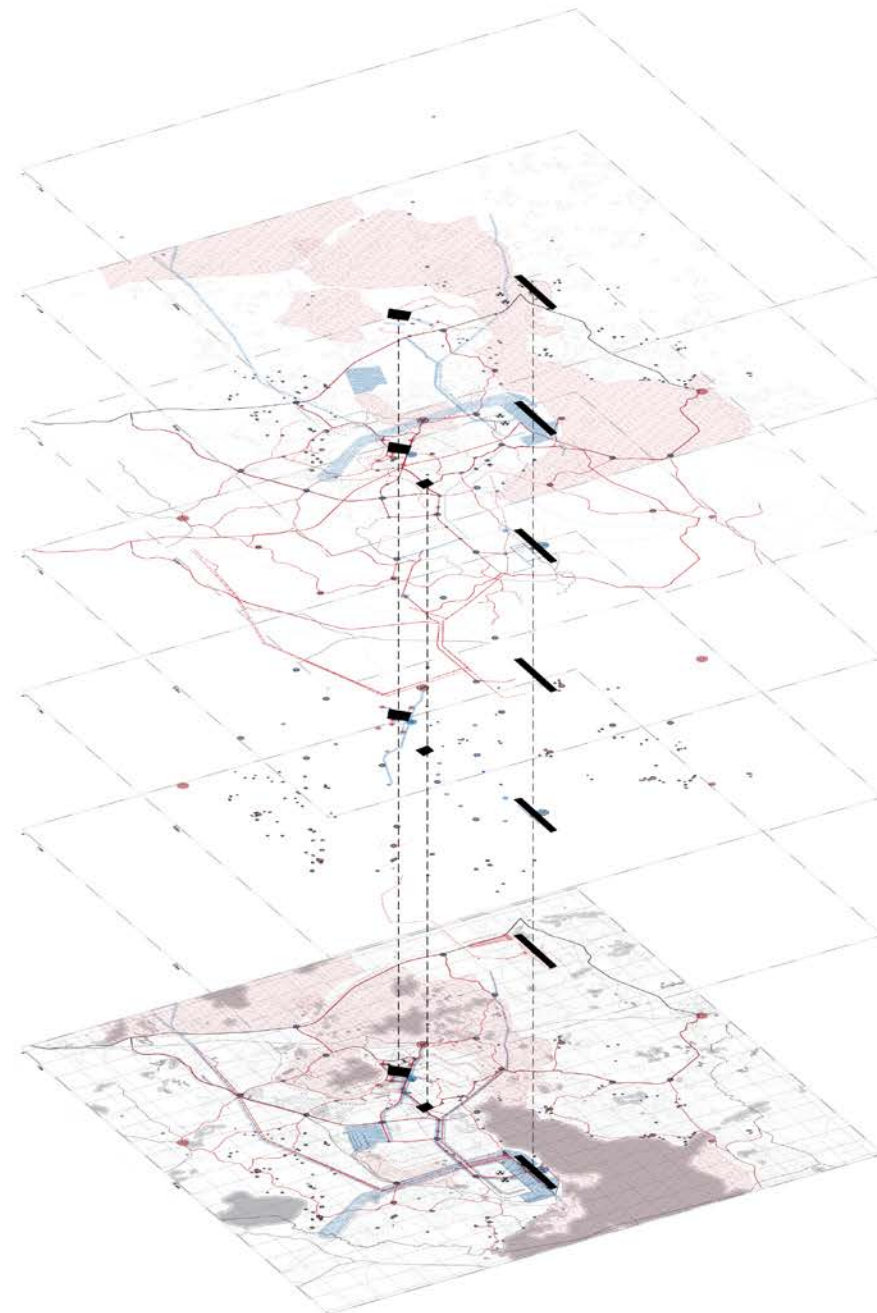
Energy
structures and
knowledge



creative
population



Industrial
heritage



Sensing radiation

'New nature'

Mobility

Energy transition

High tech industry

Heritage

FRAMEWORK

POTENTIALS

upcycled

STRATEGY
LAYERS
spatial structures

integrated
by

PROJECTS

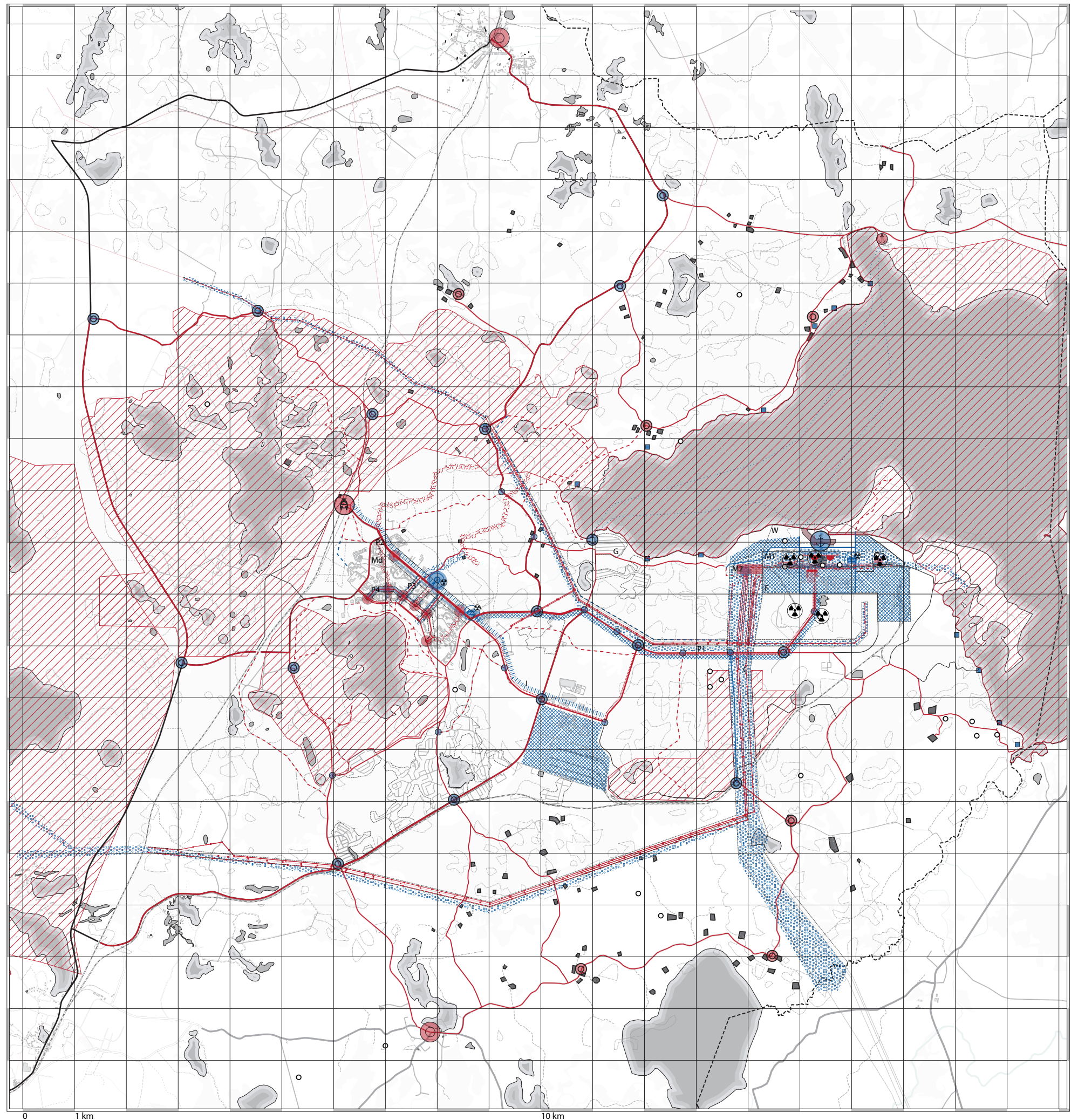
FRAMEWORK

Structure of the project ■

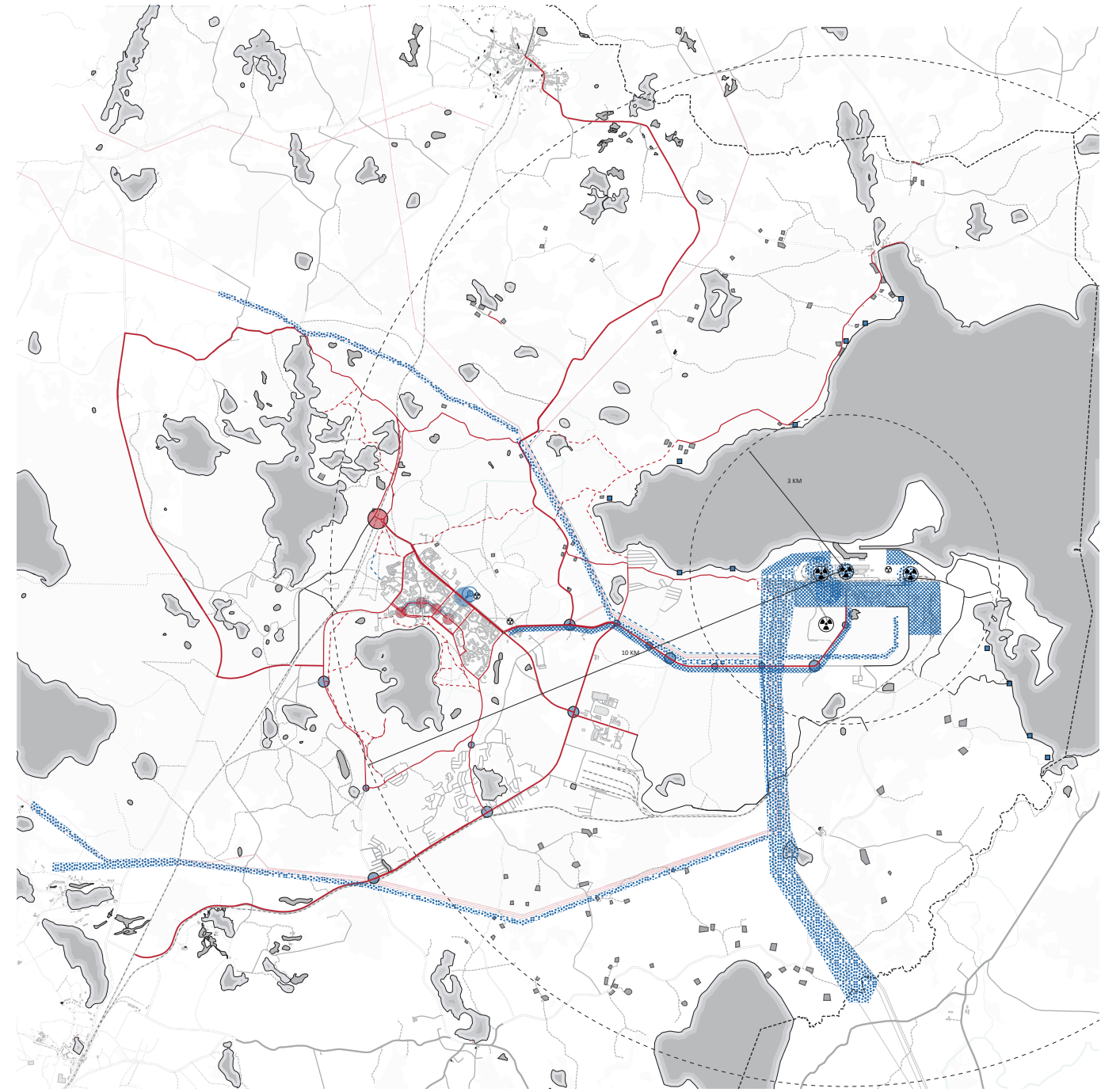
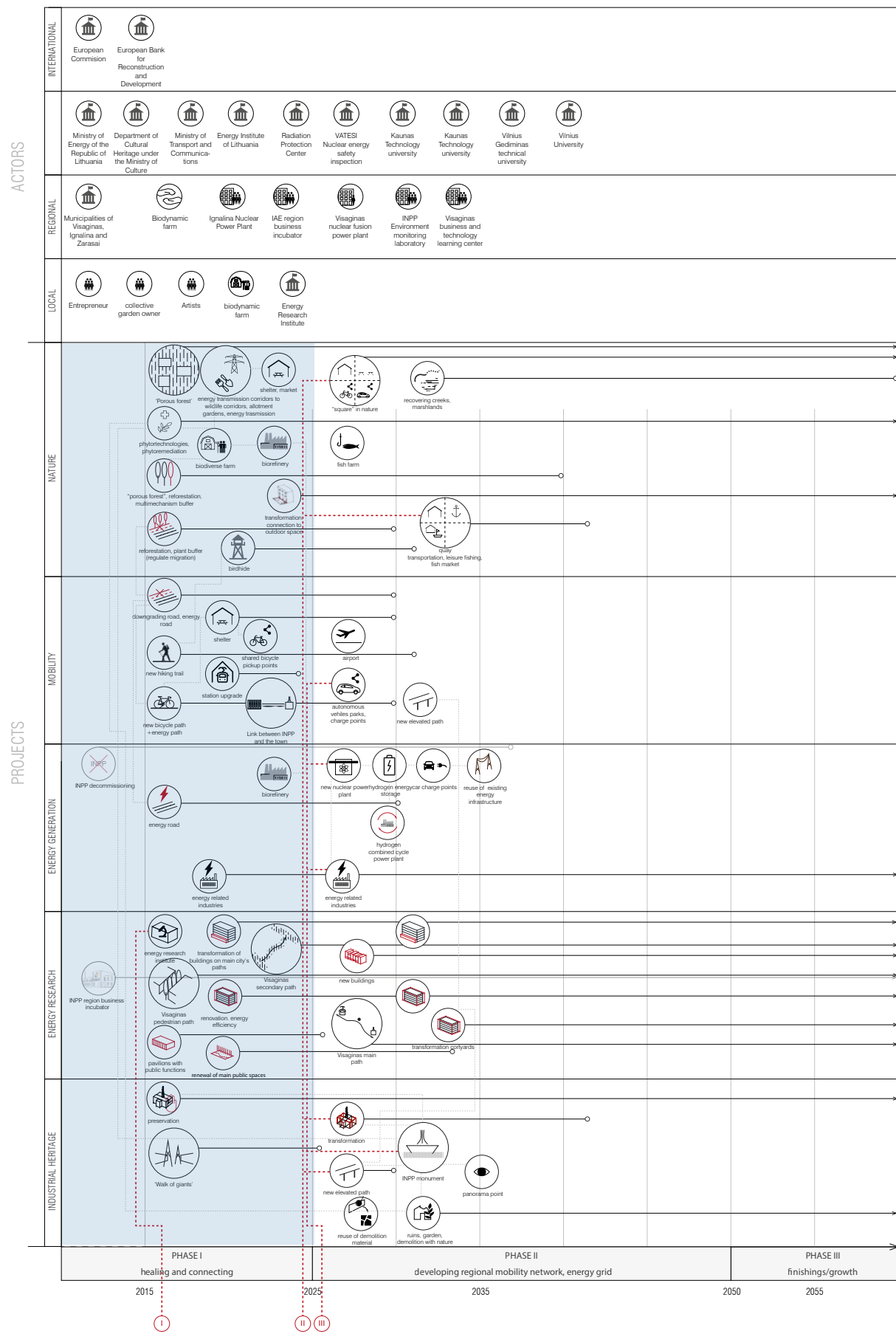
FRAMEWORK

ACTIONS

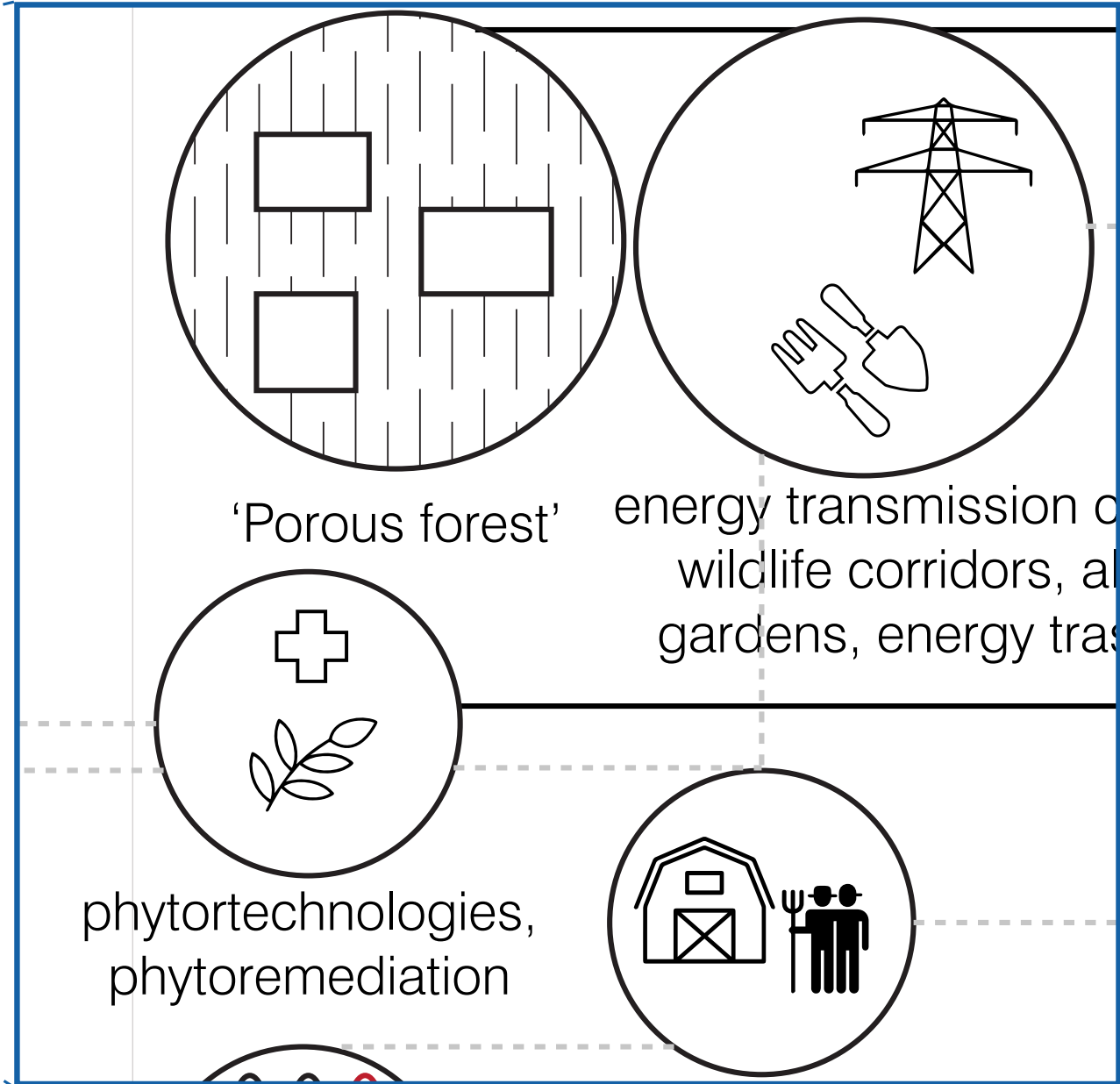
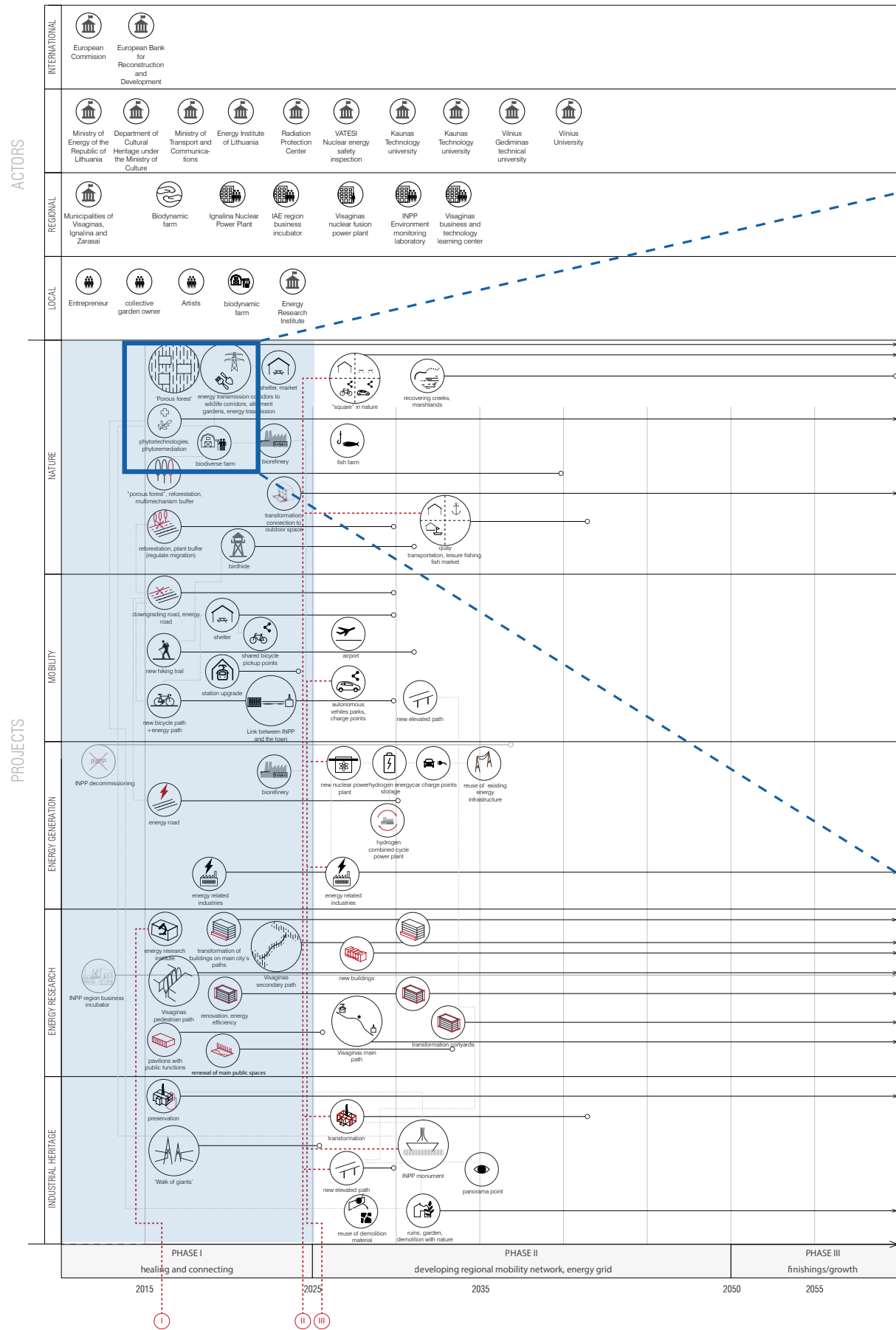
- reused
- transformed/strengthened
- new



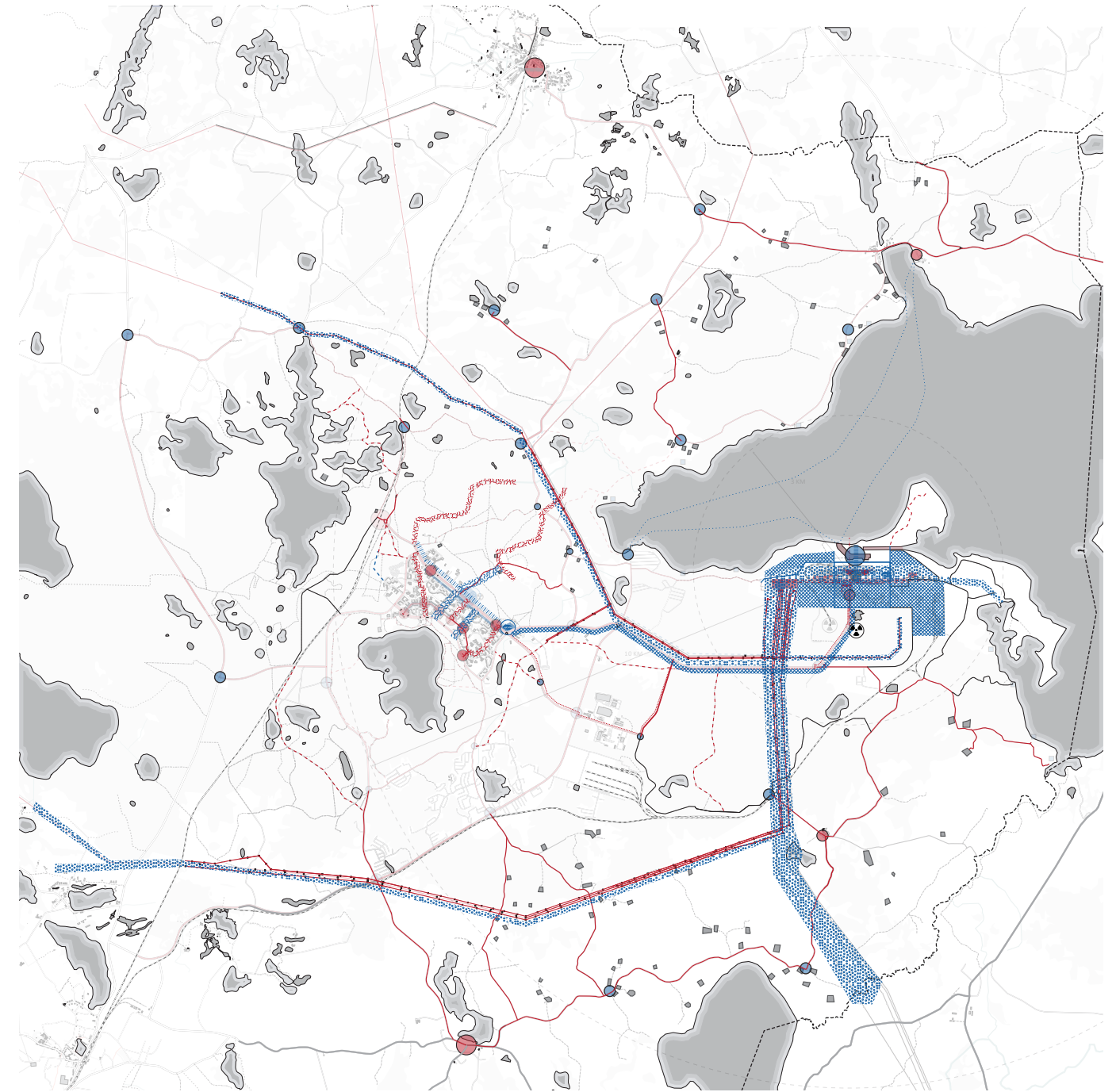
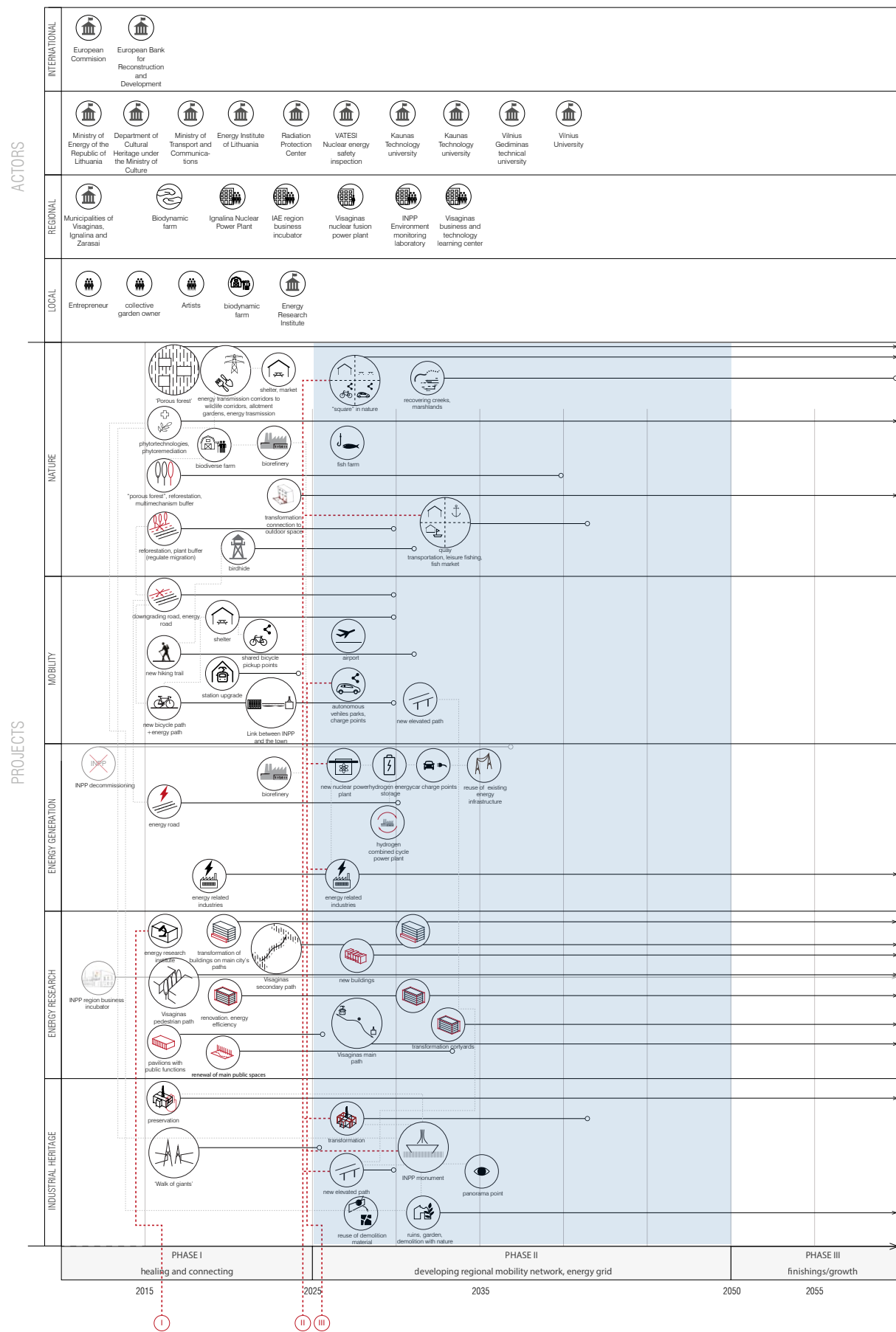
PHASE I



PHASE I



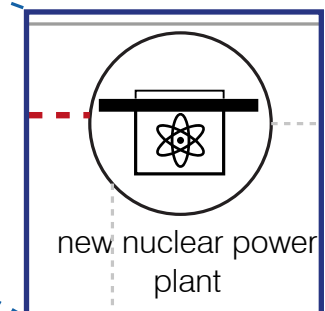
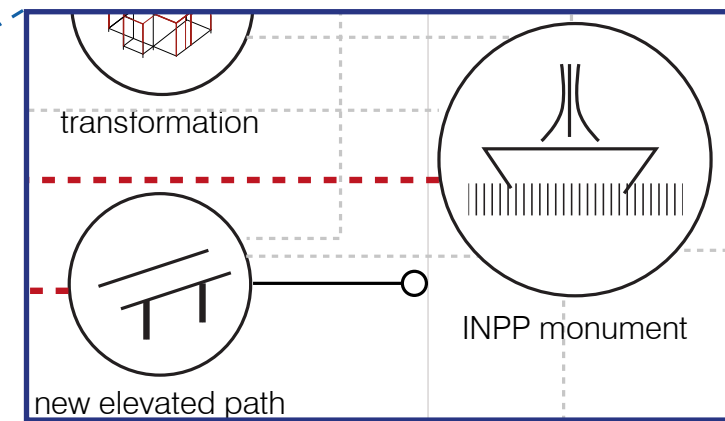
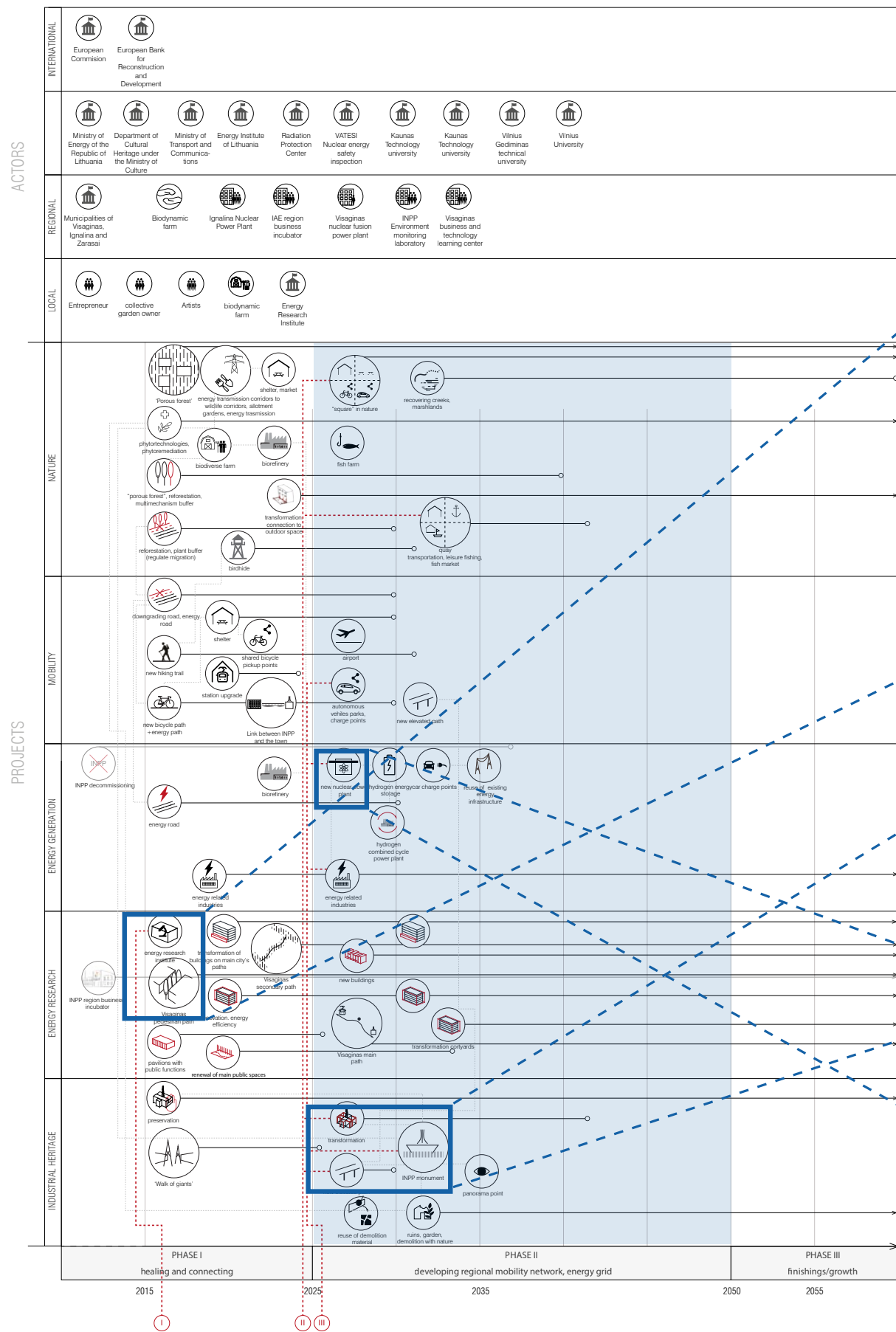
PHASE II



























MILESTONES

- I Research institute
- II INPP gains non-nuclear object status (radioactive fuel is taken from reactors and stored, radioactive machinery is removed)
- III Commercialisation of fusion reactors

PHASE II



ACTORS

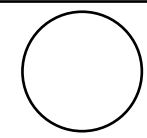
ACTORS	INTERNATIONAL	 European Commission	 European Bank for Reconstruction and Development								
		 Ministry of Energy of the Republic of Lithuania	 Department of Cultural Heritage under the Ministry of Culture	 Ministry of Transport and Communications	 Energy Institute of Lithuania	 Radiation Protection Center	 VATESI Nuclear energy safety inspection	 Kaunas Technology university	 Kaunas Technology university	 Vilnius Gediminas technical university	 Vilnius University
	REGIONAL	 Municipalities of Visaginas, Ignalina and Zarasai	 Biodynamic farm	 Ignalina Nuclear Power Plant	 IAE region business incubator	 Visaginas nuclear fusion power plant	 INPP Environment monitoring laboratory	 Visaginas business and technology learning center			
	LOCAL	 Entrepreneur	 collective garden owner	 Artists	 biodynamic farm	 Energy Research Institute					

ACTORS

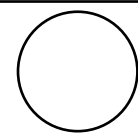
-  Government/ministry/institution
-  public institution
-  private institution
-  NGO
-  residents

THE PROJECTS

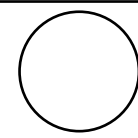
ATOMPARK



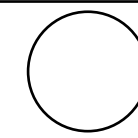
Nature



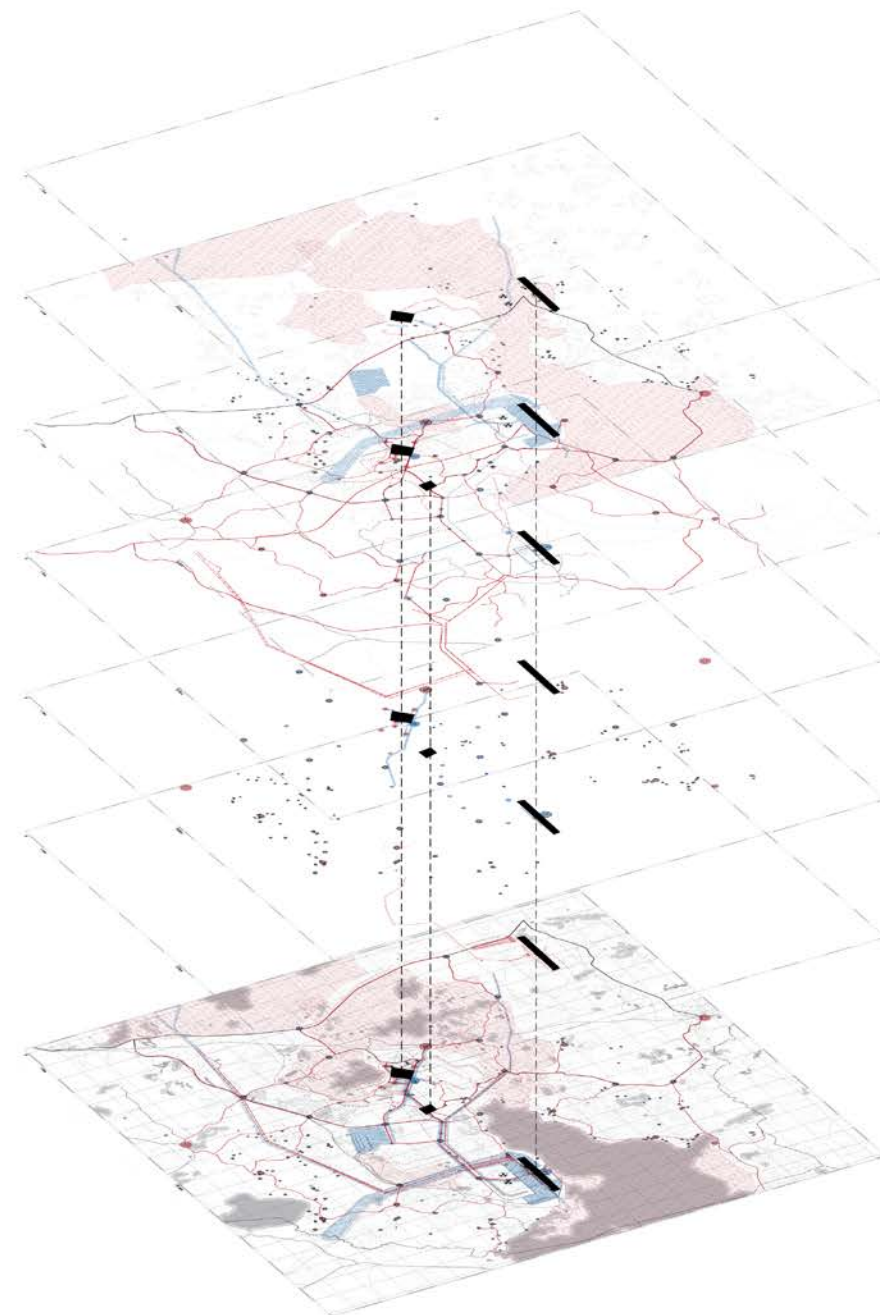
Energy structures and knowledge



creative population



Industrial heritage



Sensing radiation

'New nature'

Mobility

Energy transition

High tech industry

Heritage

FRAMEWORK

POTENTIALS

upcycled

STRATEGY LAYERS
spatial structures

integrated by

PROJECTS

FRAMEWORK

Structure of the project ■

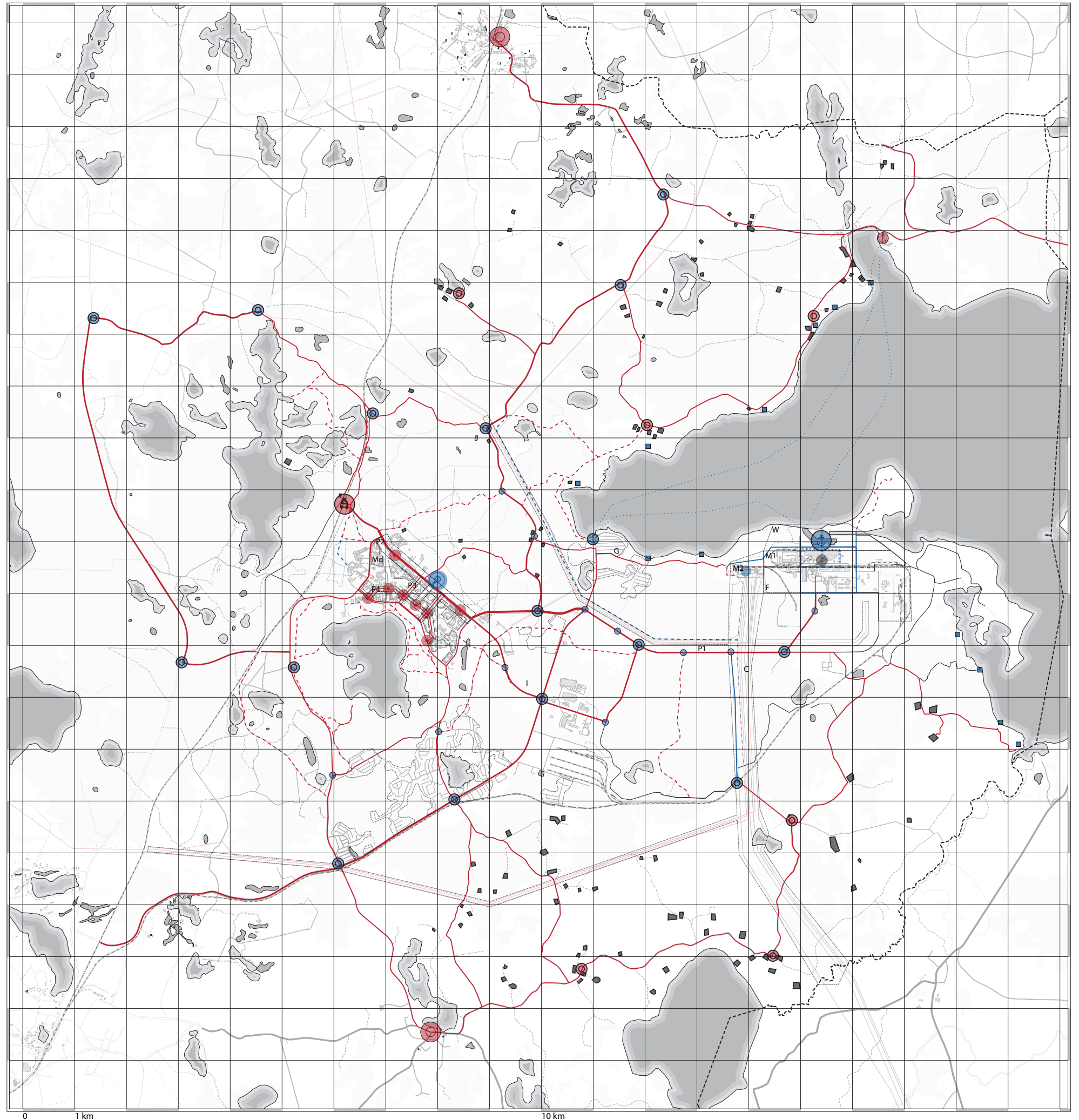
PROJECTS

SITES AND LINKS (focus areas)

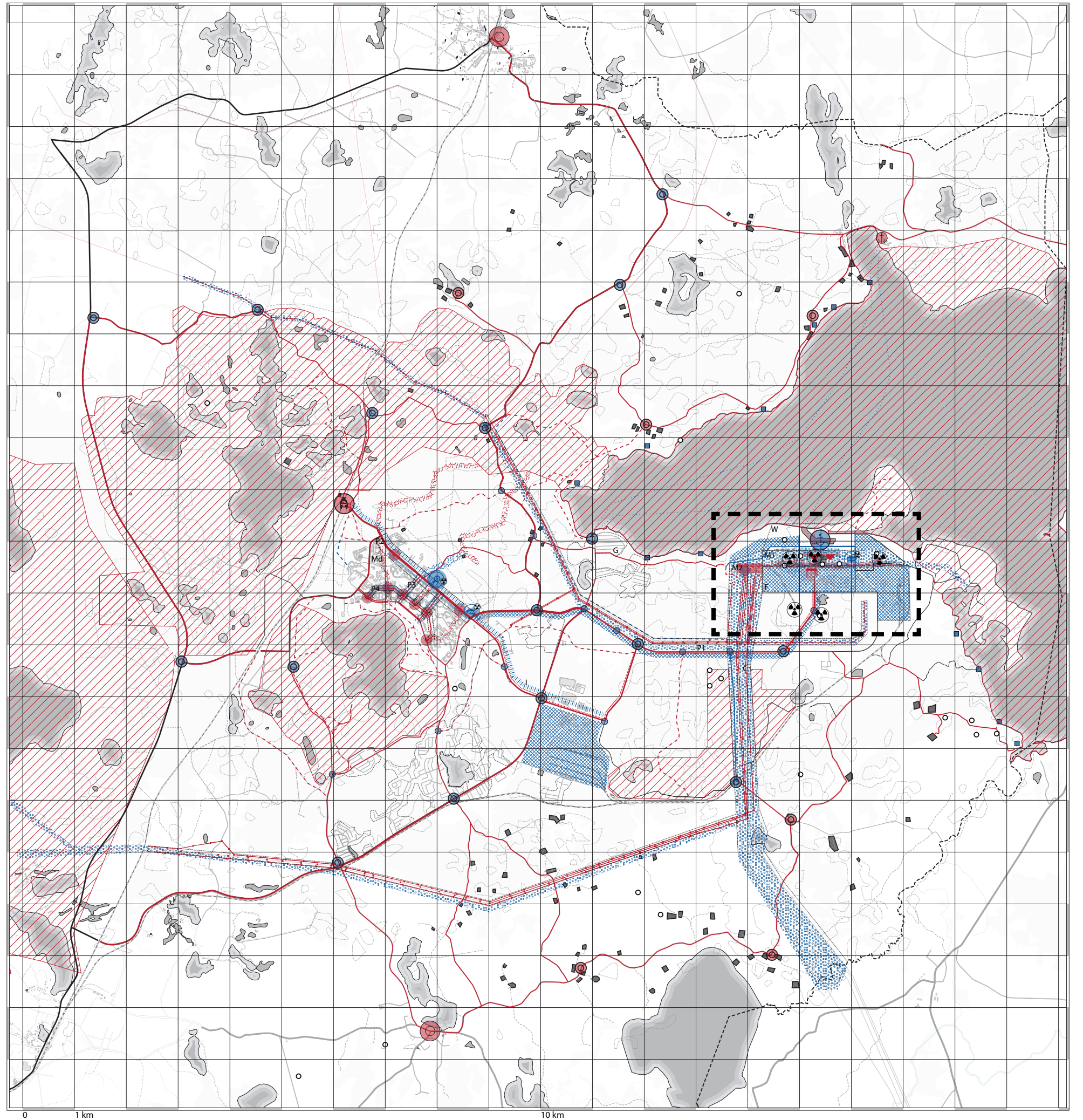
- W Waterfront
- M1 INPP monument of the First Nuclear Age (power plant site)
- M2 INPP monument "The Walk of Giants")
- F "Porous forest "
- C Complex transmission corridors
- P1 Path from INPP to the city
- P2 Visaginas main path
- P3 Visaginas secondary path
- P4 Visaginas pedestrian path
- Md Micro-district
- G Collective gardens
- I New development paths

NODES

- A station
- ⚓ quay
- 🔍 research institute
- ◉ "square"
- shelter
- homestead
- "Stay in nature"
- Region/local node

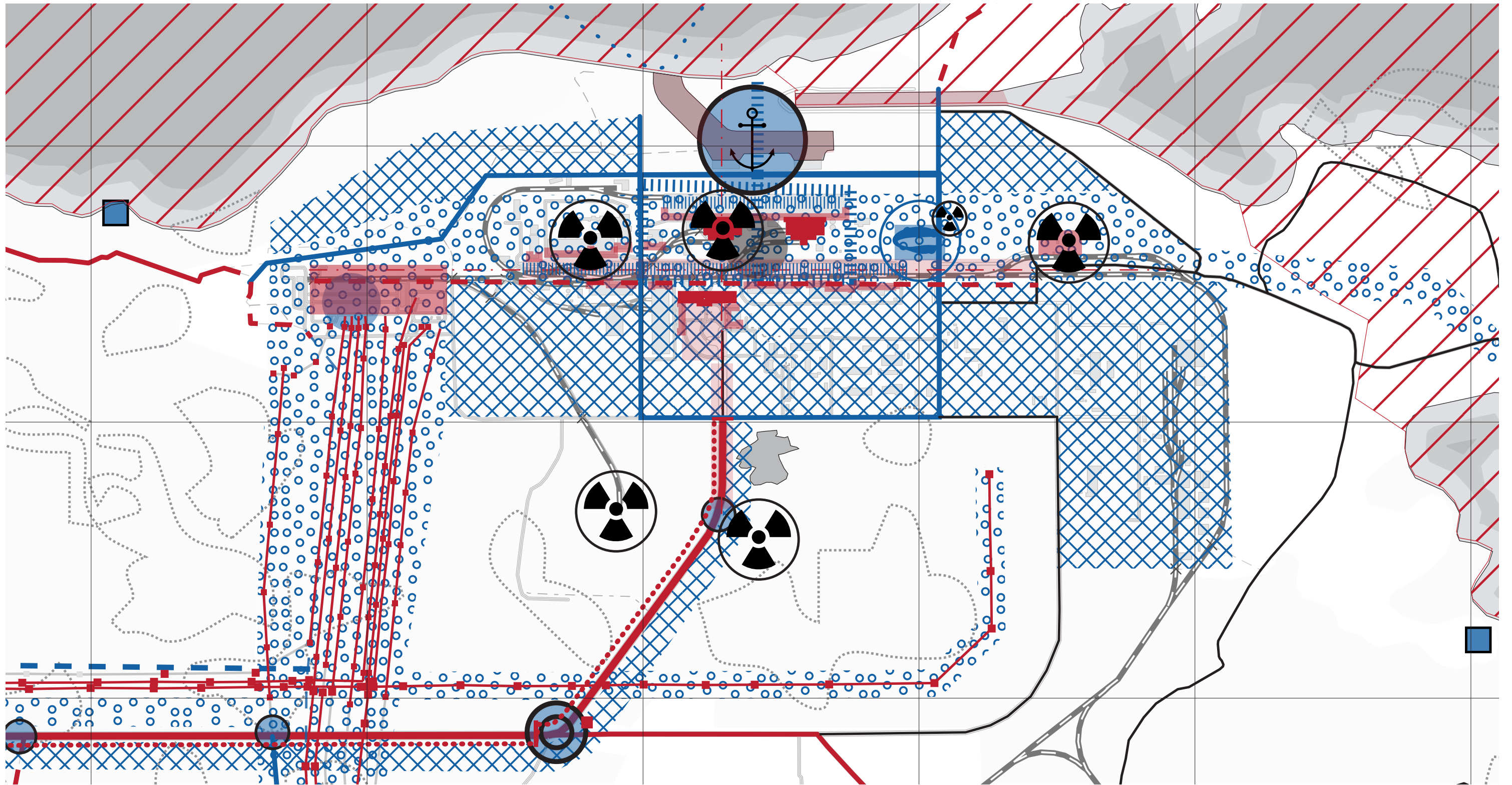


INPP AREA

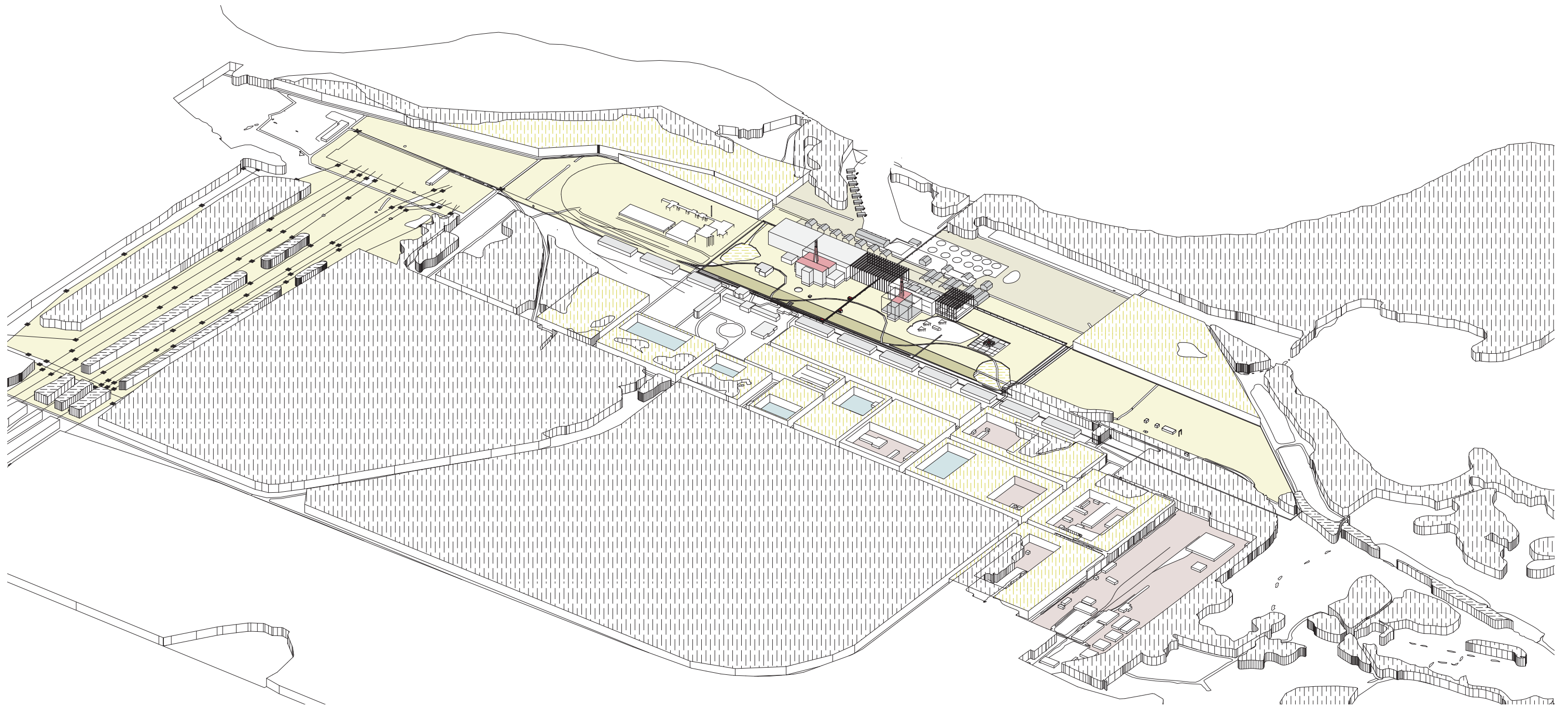




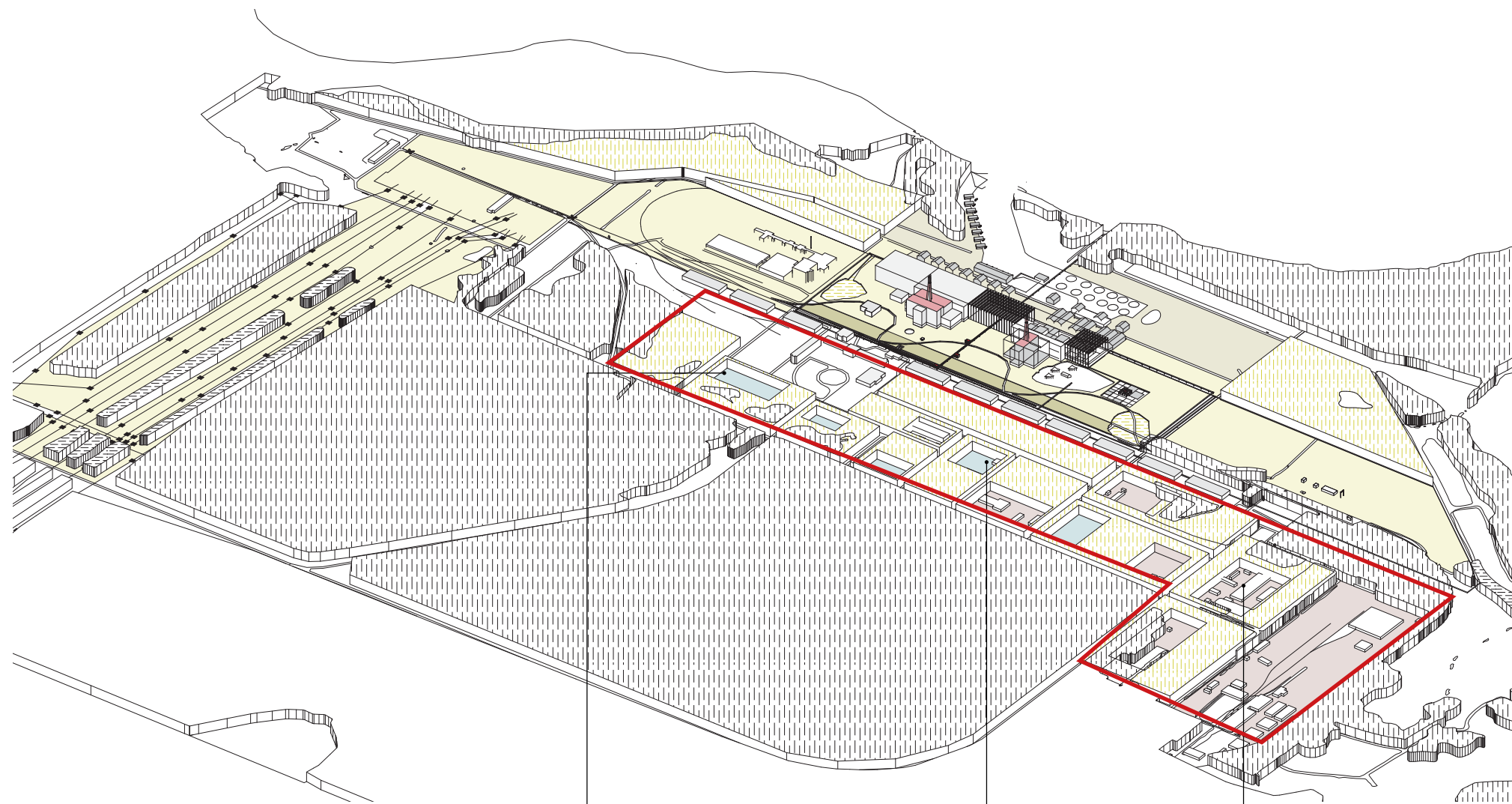
INPP existing situation ■



INPP framework ■



INPP spatial composition ■



biodynamic
farming

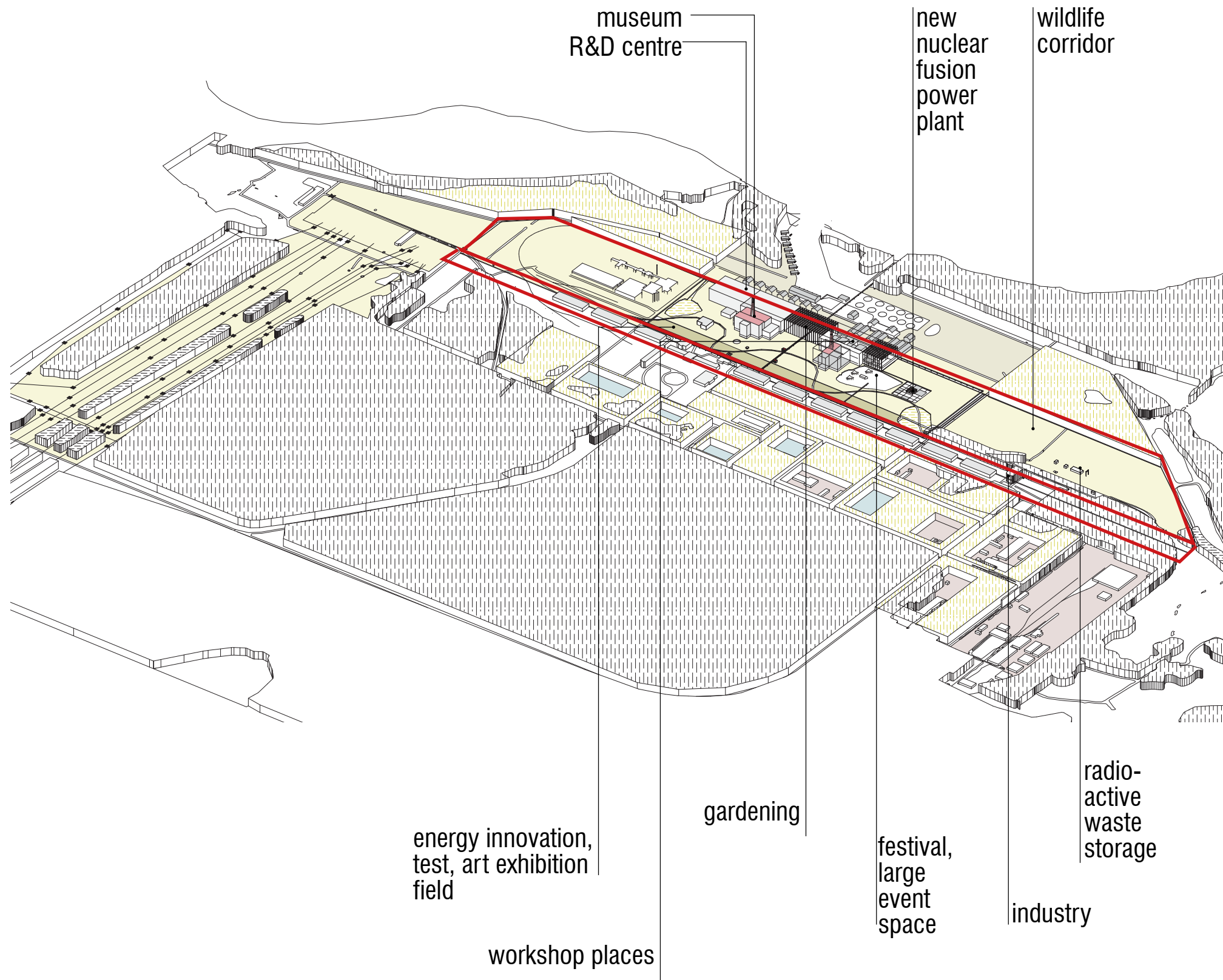
culture, artist
studios,
galleries

industry

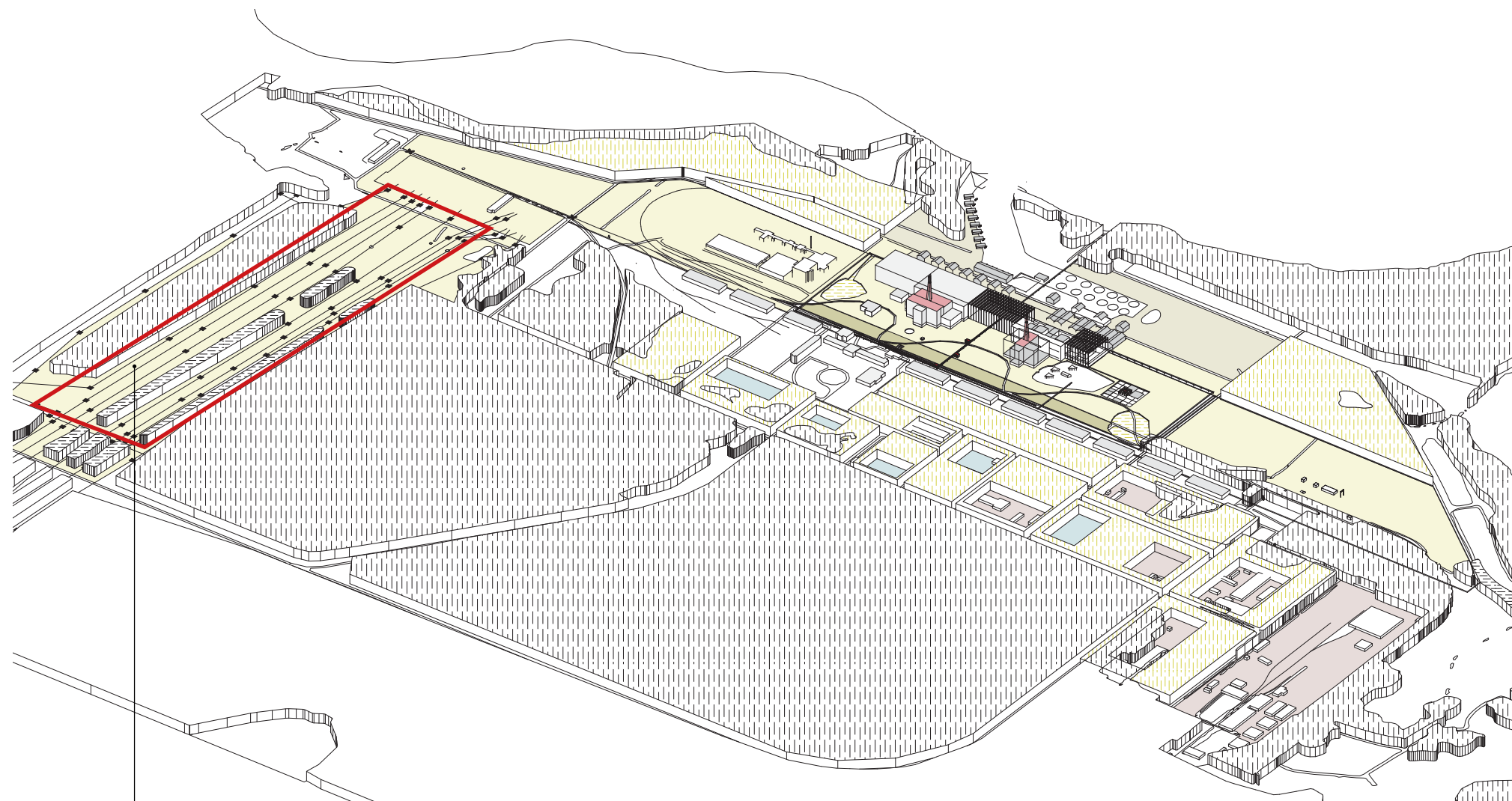


the "porous forest"

INPP spatial composition



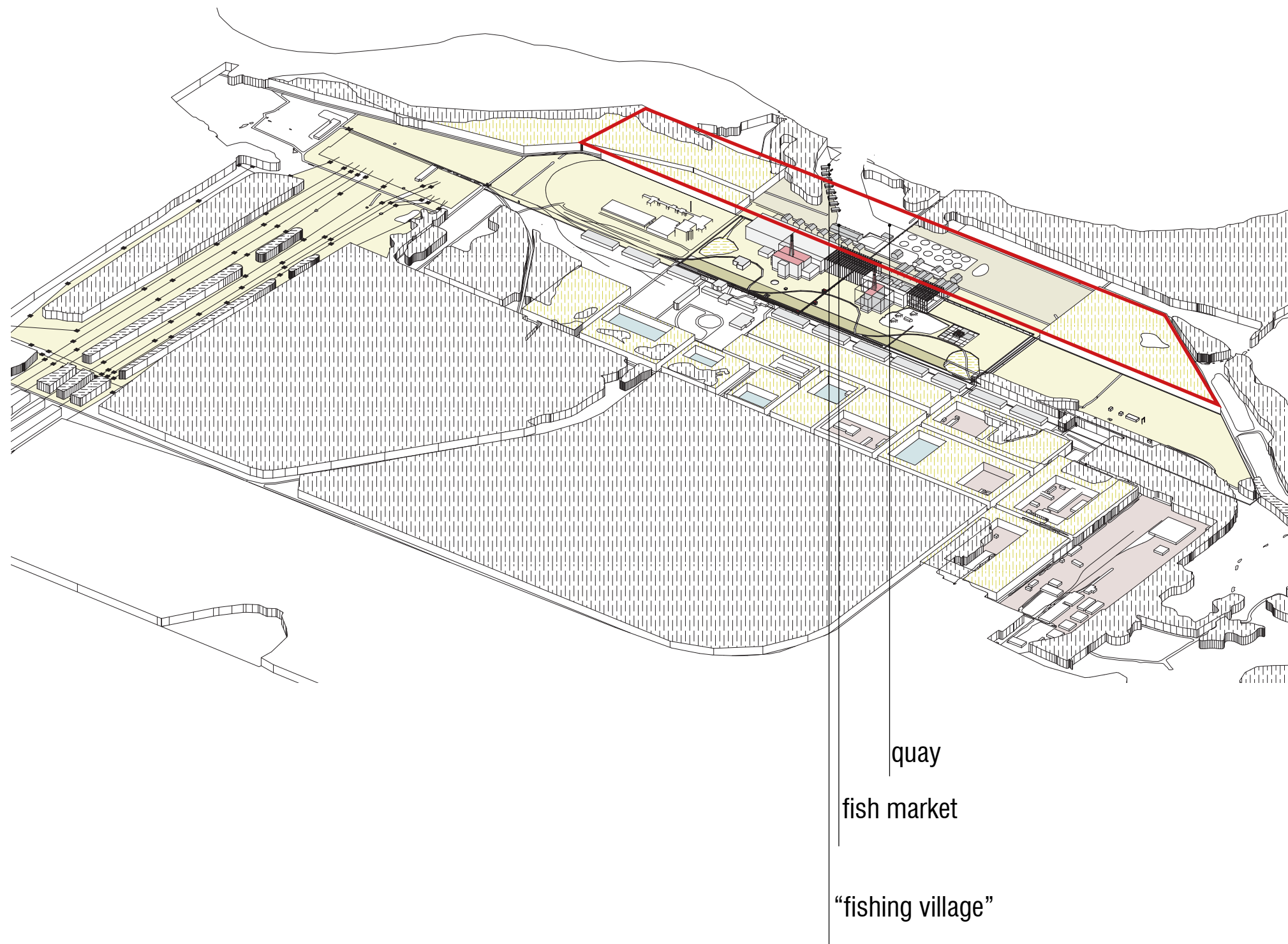
the "pier", the "quay"



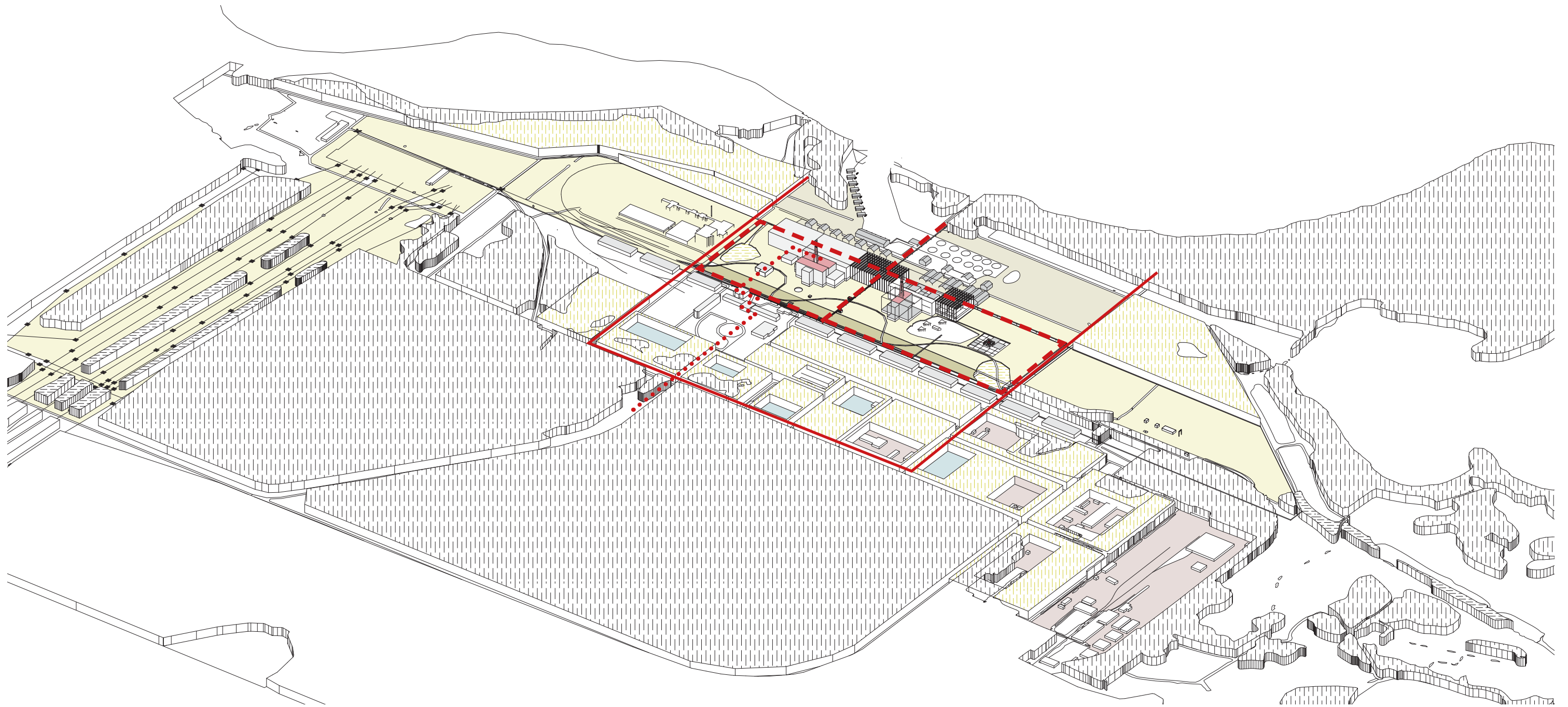
leisure and biodiversity
park



the “Walk of Giants”



the waterfront



INPP spatial composition ■



INPP monument T3 ■

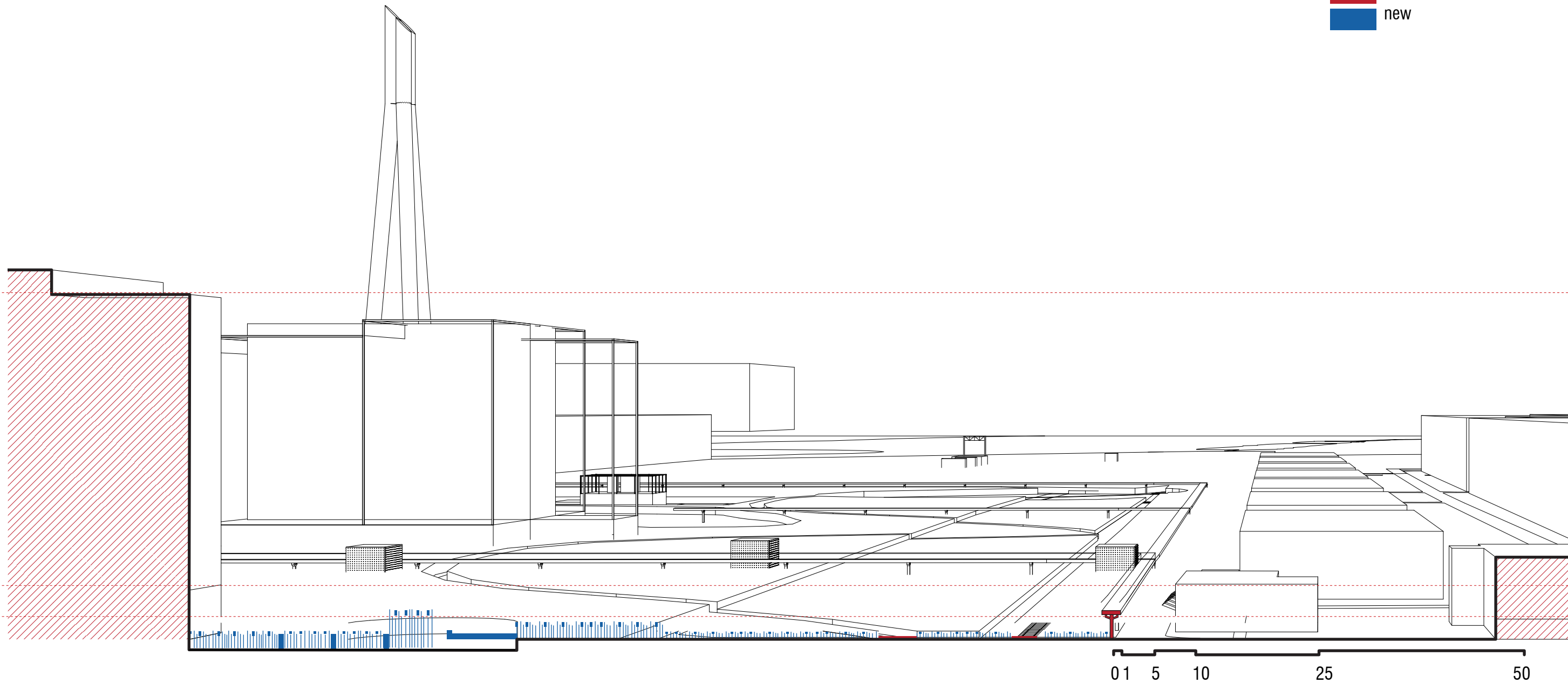
upcycled
new

PANORAMA
level 3

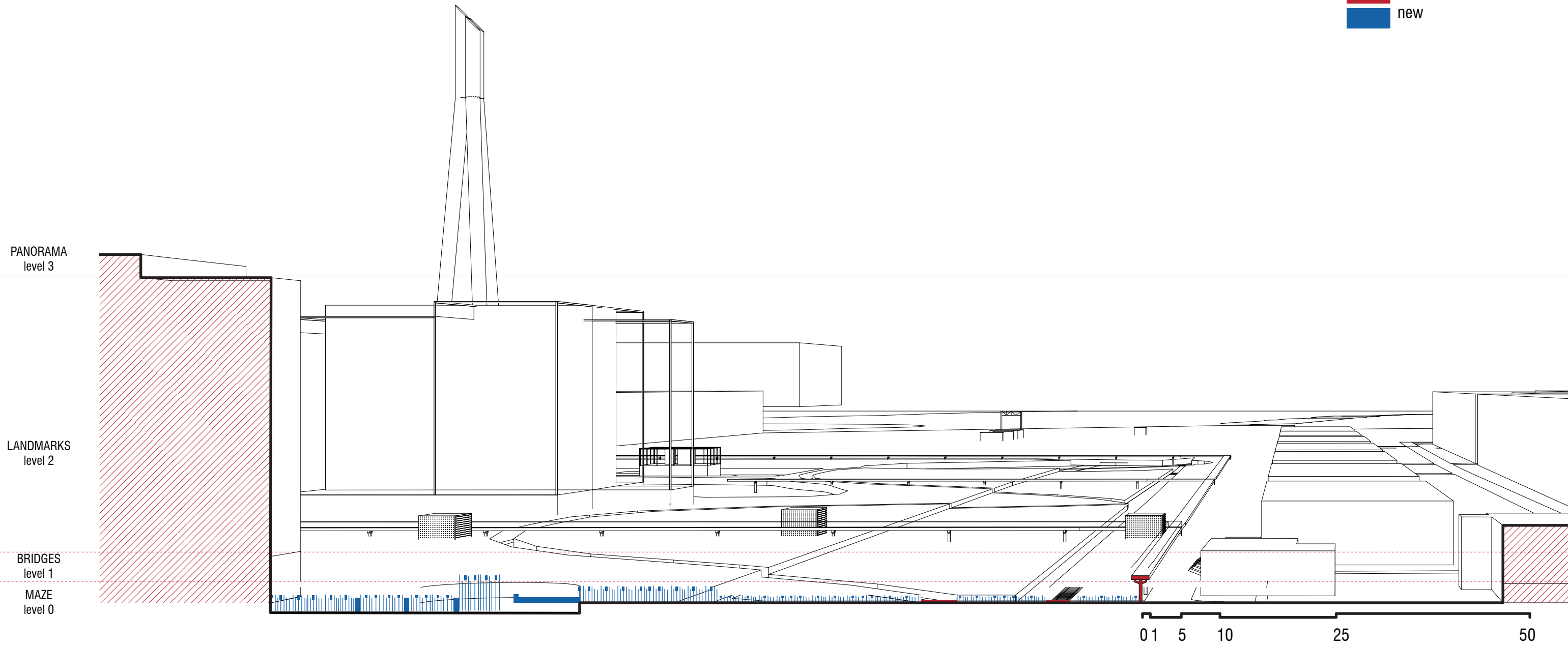
LANDMARKS
level 2

BRIDGES
level 1

MAZE
level 0



■ upcycled
■ new



a meadow with high grass (T1)



a recreated marshland (T2)



a reused railway for paths (T2)



the "squares" public spaces in the landscape (T2)



a constructed surface flow wetland (T1)



temporary accommodation (T3)

PHASE I. Healing

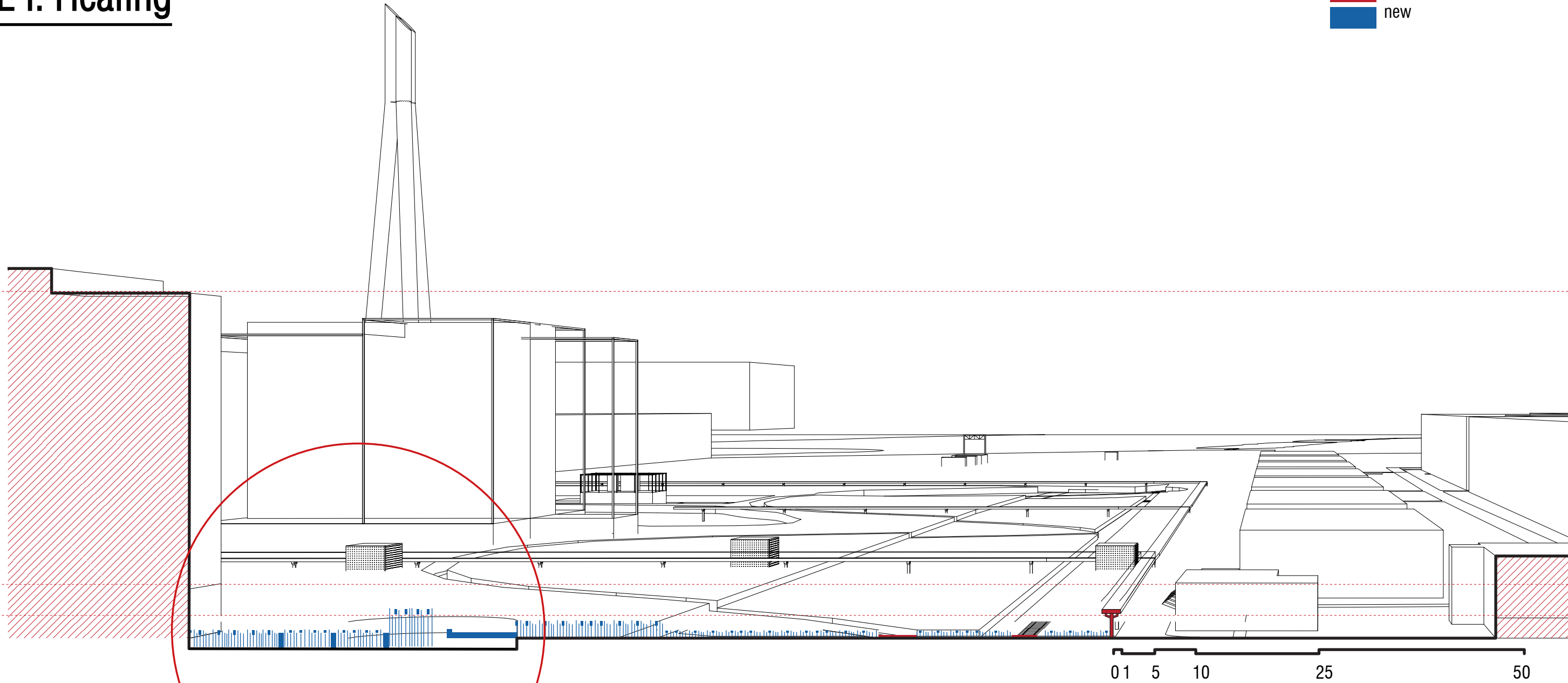
upcycled
new

PANORAMA
level 3

LANDMARKS
level 2

BRIDGES
level 1

MAZE
level 0



a constructed surface flow wetland (t1)



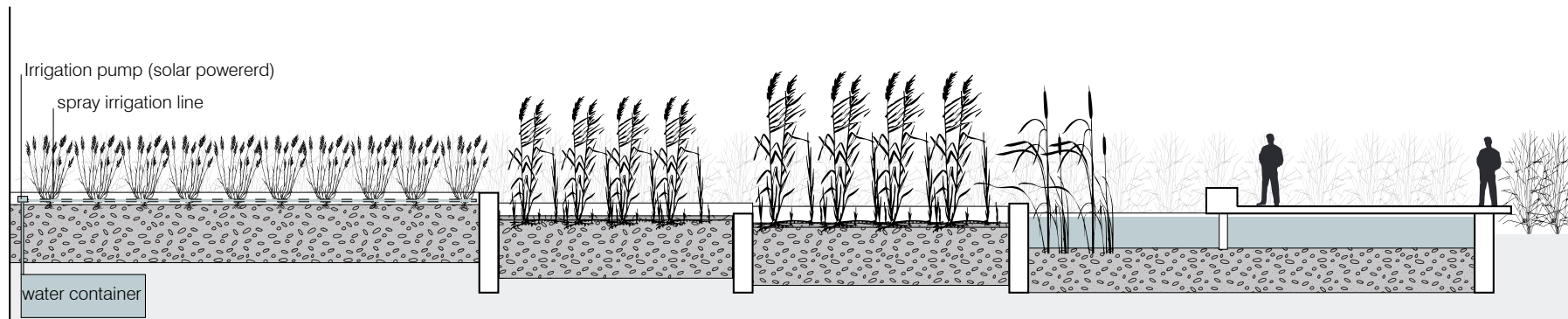
Alopecurus pratensis
Meadow Foxtail Grass



Phragmites australis
Phragmites



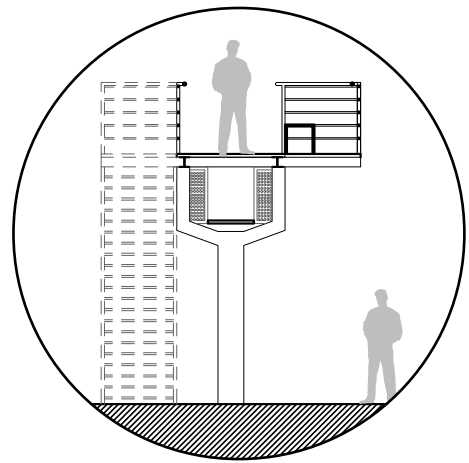
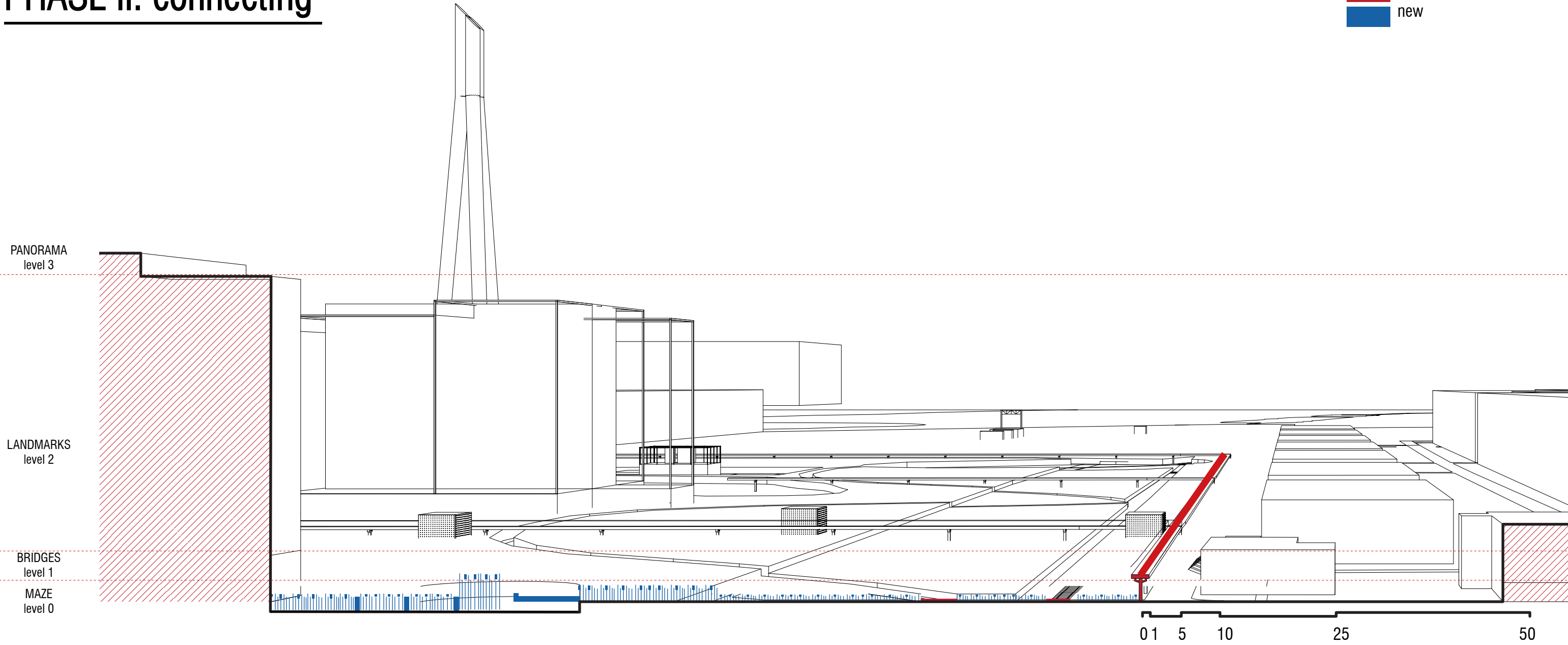
Typha latifolia
Cattail



Constructed surface flow wetland (T1) ■

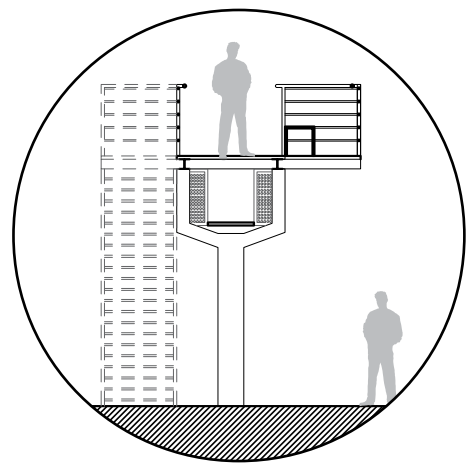
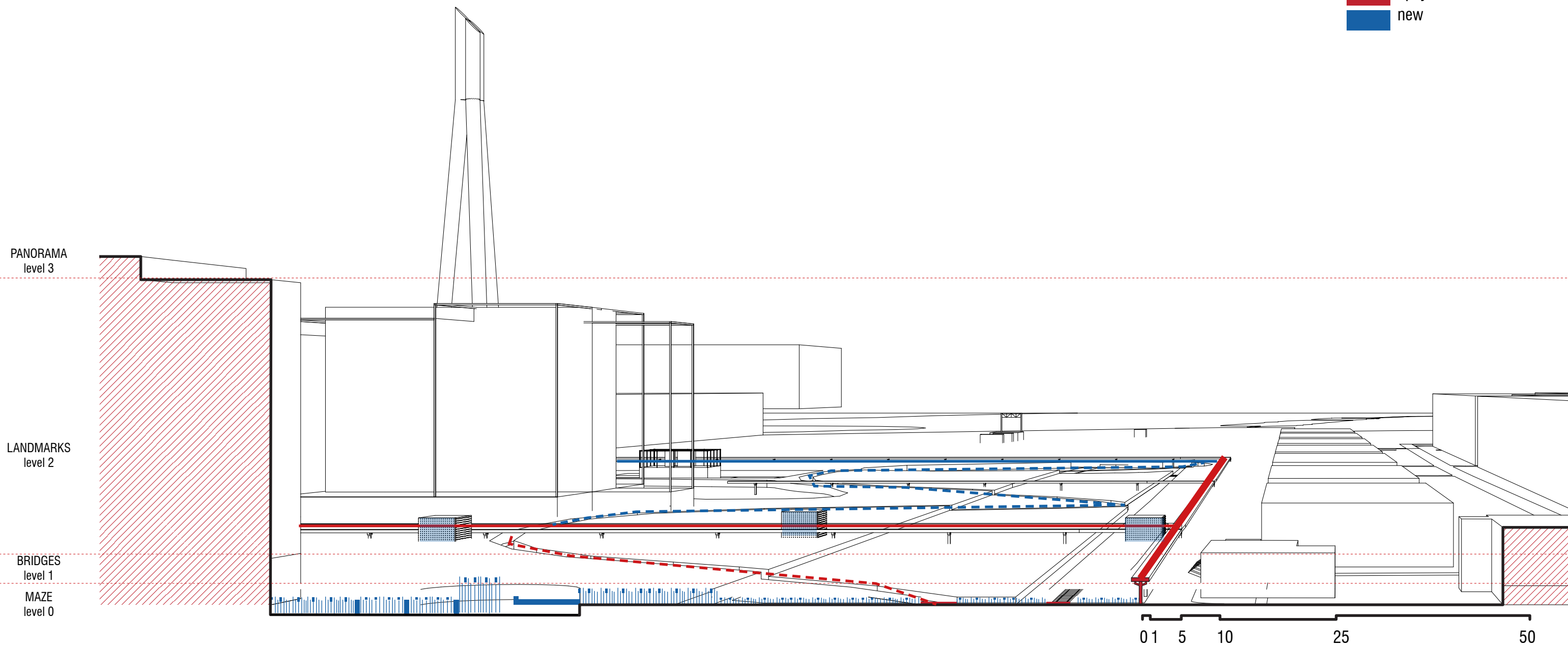
PHASE II. connecting

upcycled
new



a reused cable via-
duct for path (T2)

upcycled
new



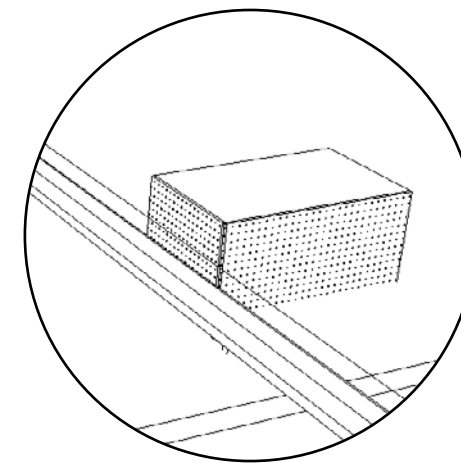
a reused cable via-
duct for path (T2)



demolition of the
fence and reuse it
for paving (T2)



a reused railway for
paths (T2)



pavilions for facilities
(scale measures) (T2)

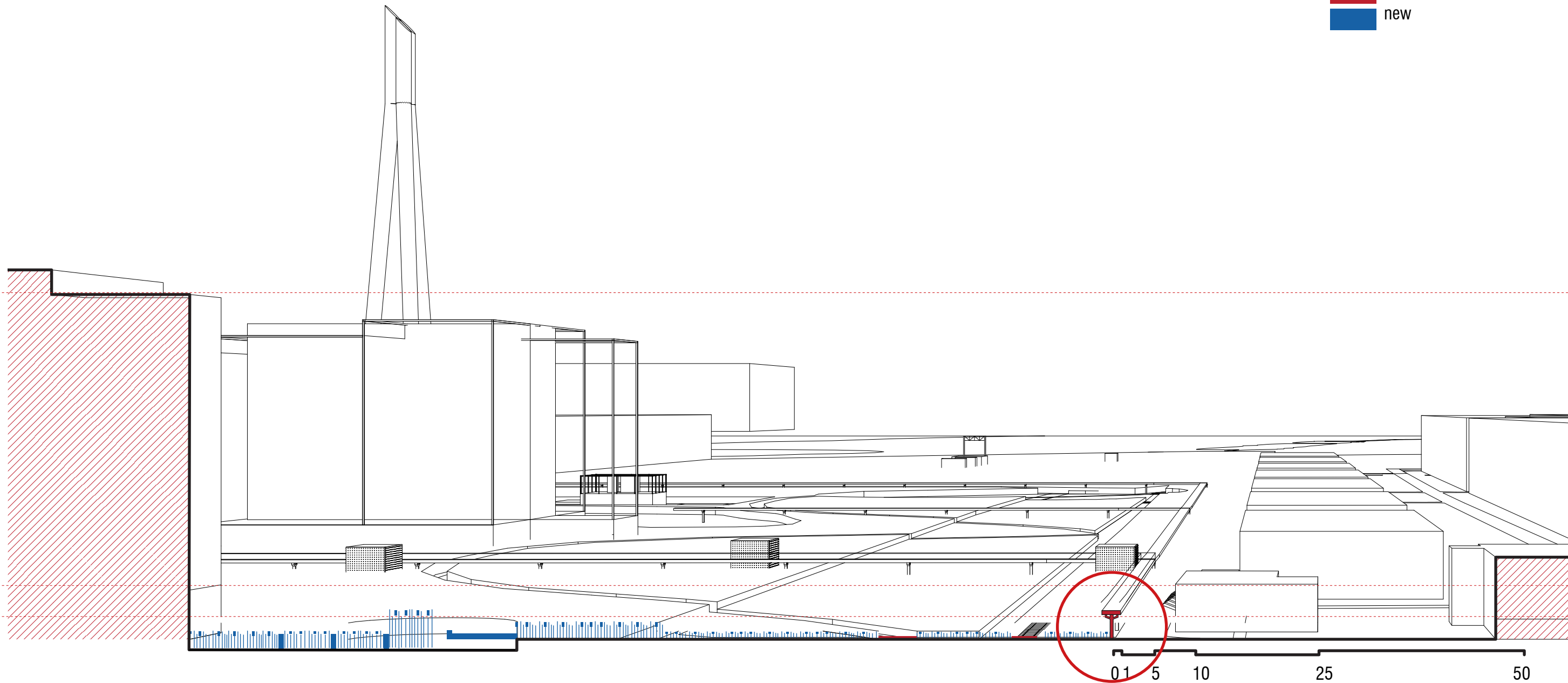
upcycled
new

PANORAMA
level 3

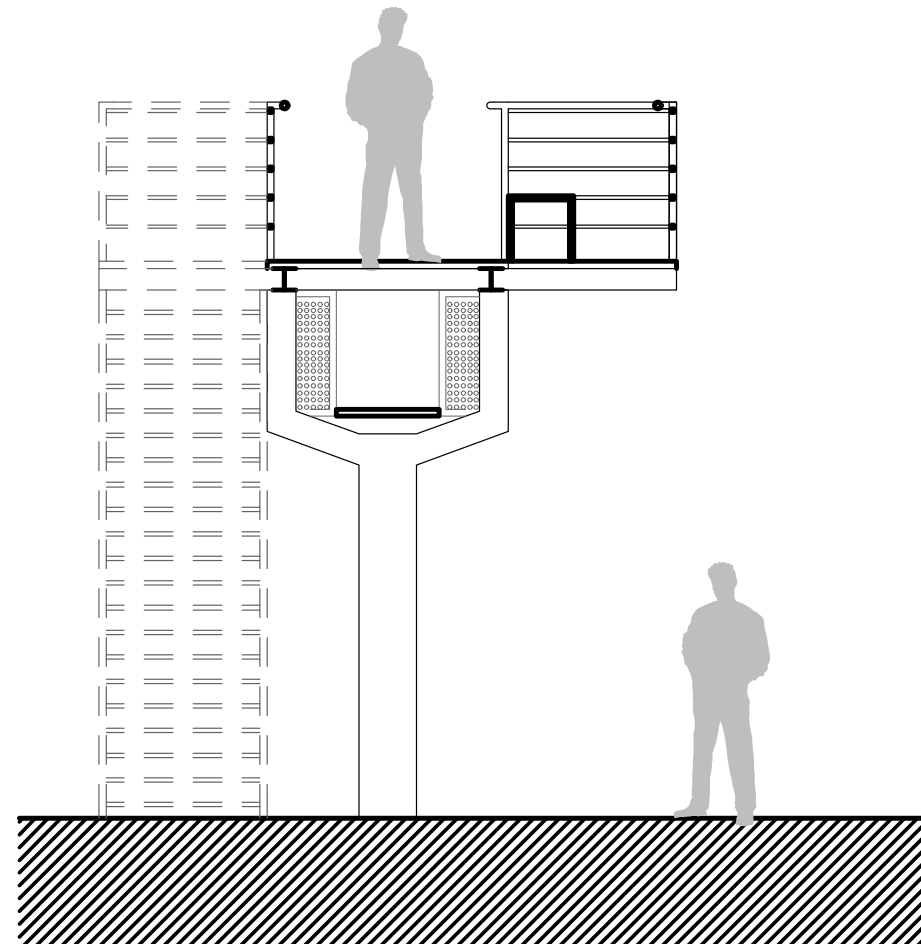
LANDMARKS
level 2

BRIDGES
level 1

MAZE
level 0



an elevated path



reused steel from demolished INPP buildings



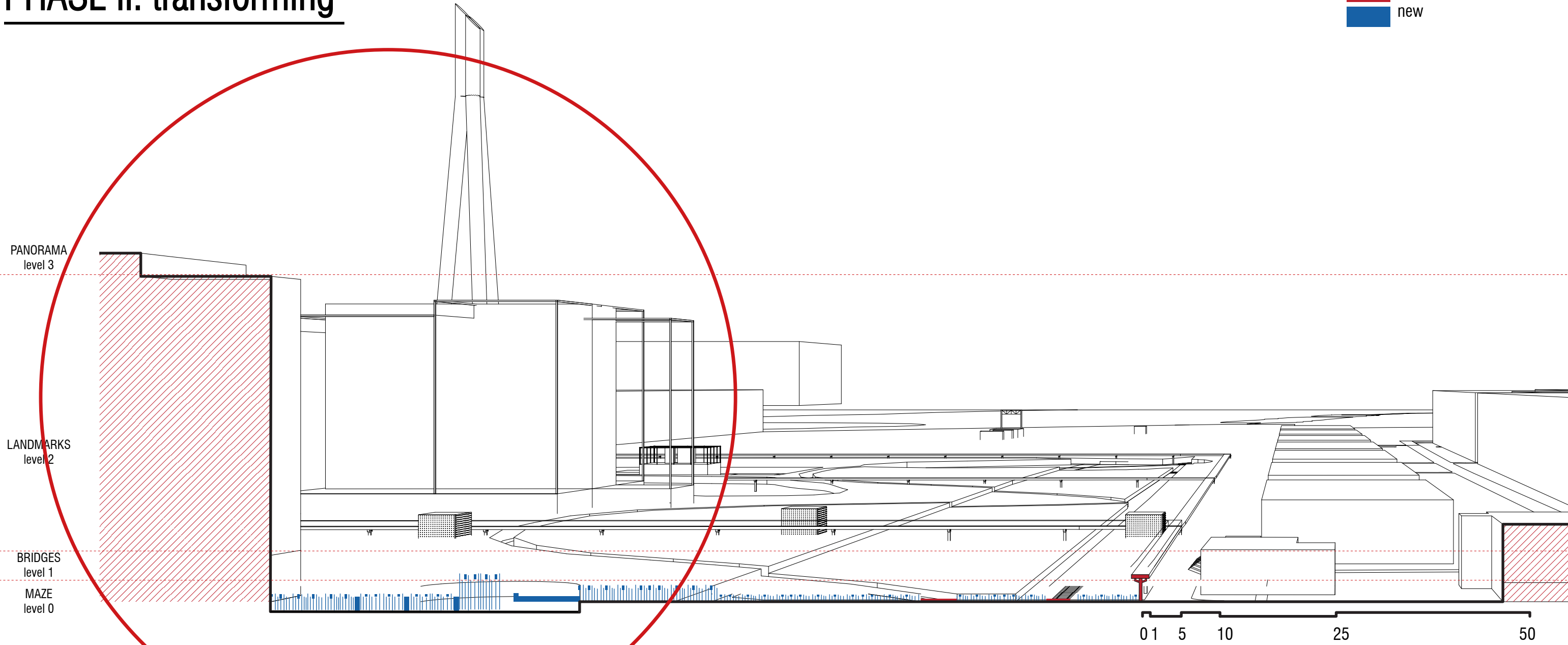
reused steel from demolished INPP buildings



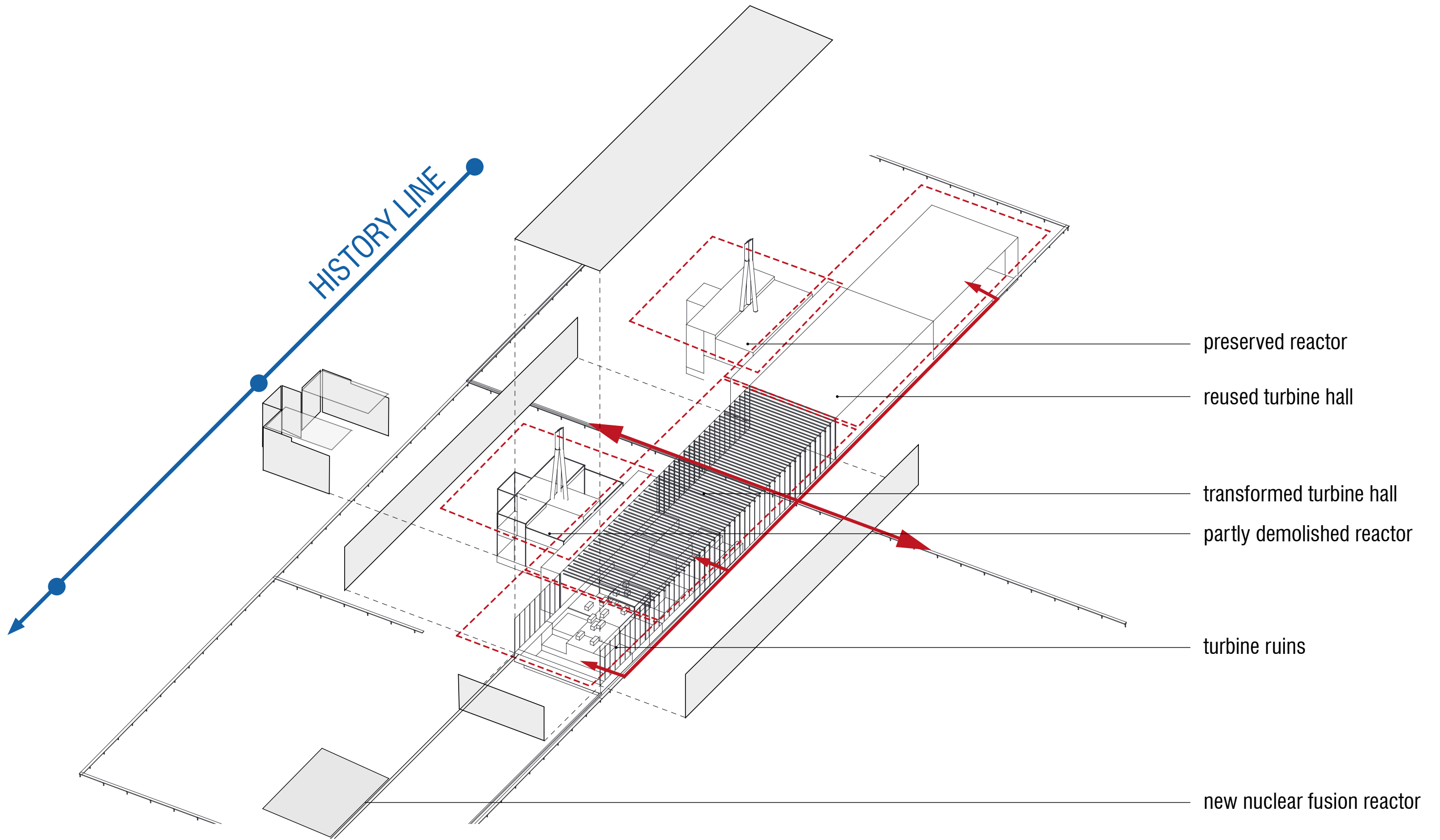
reused steel from demolished INPP buildings

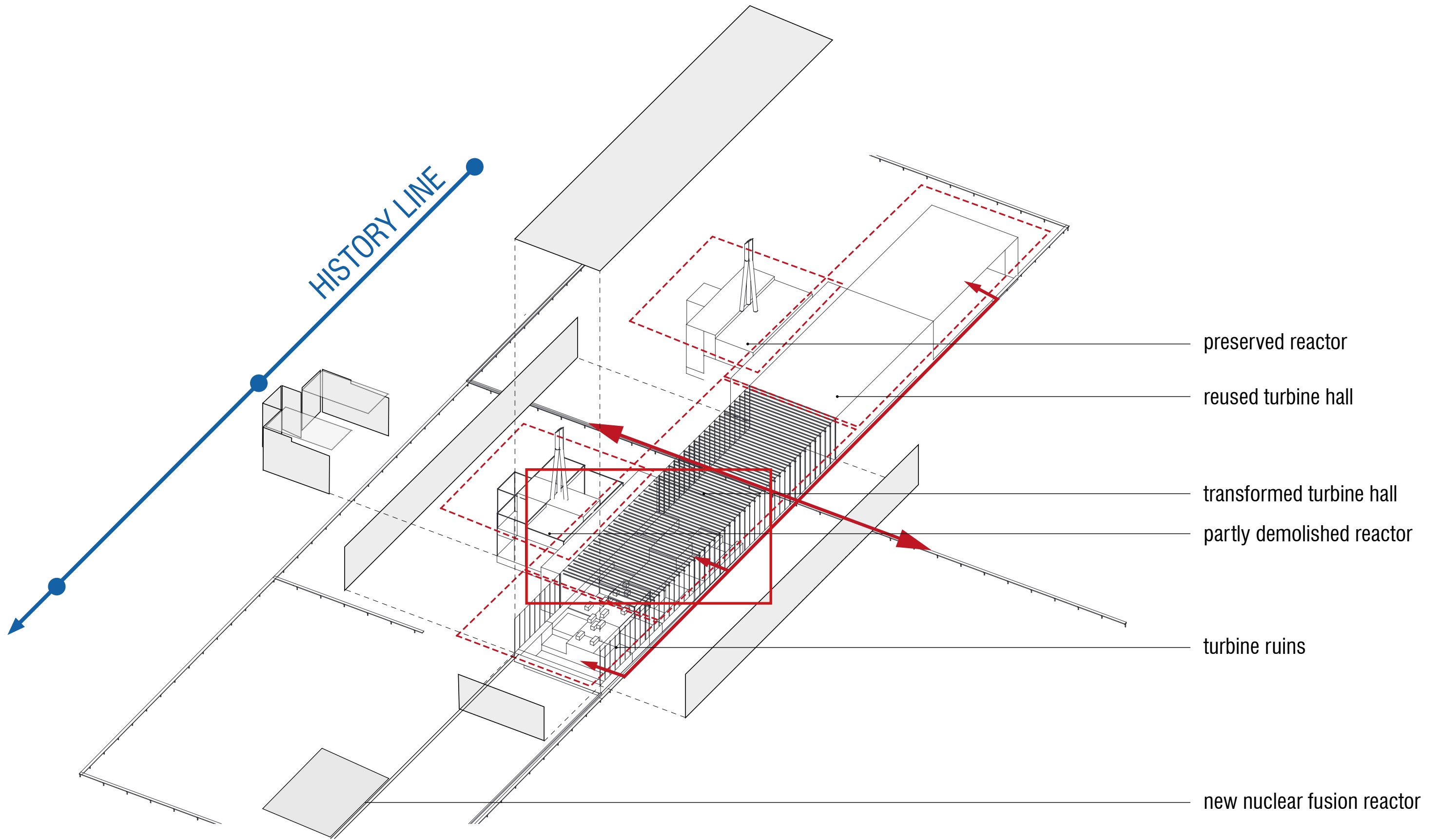
PHASE II. transforming

upcycled
new



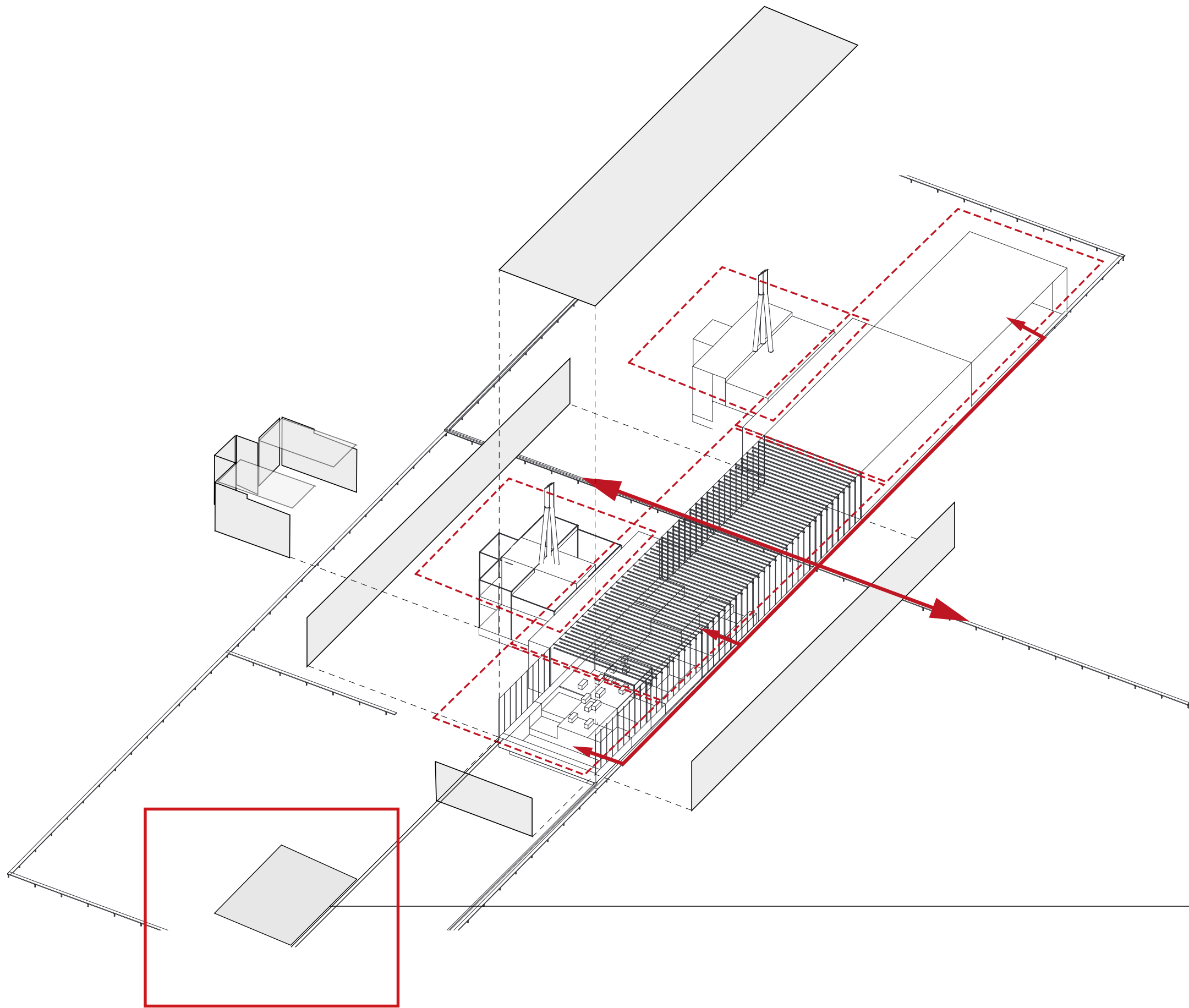
transformations of reactors and turbine halls



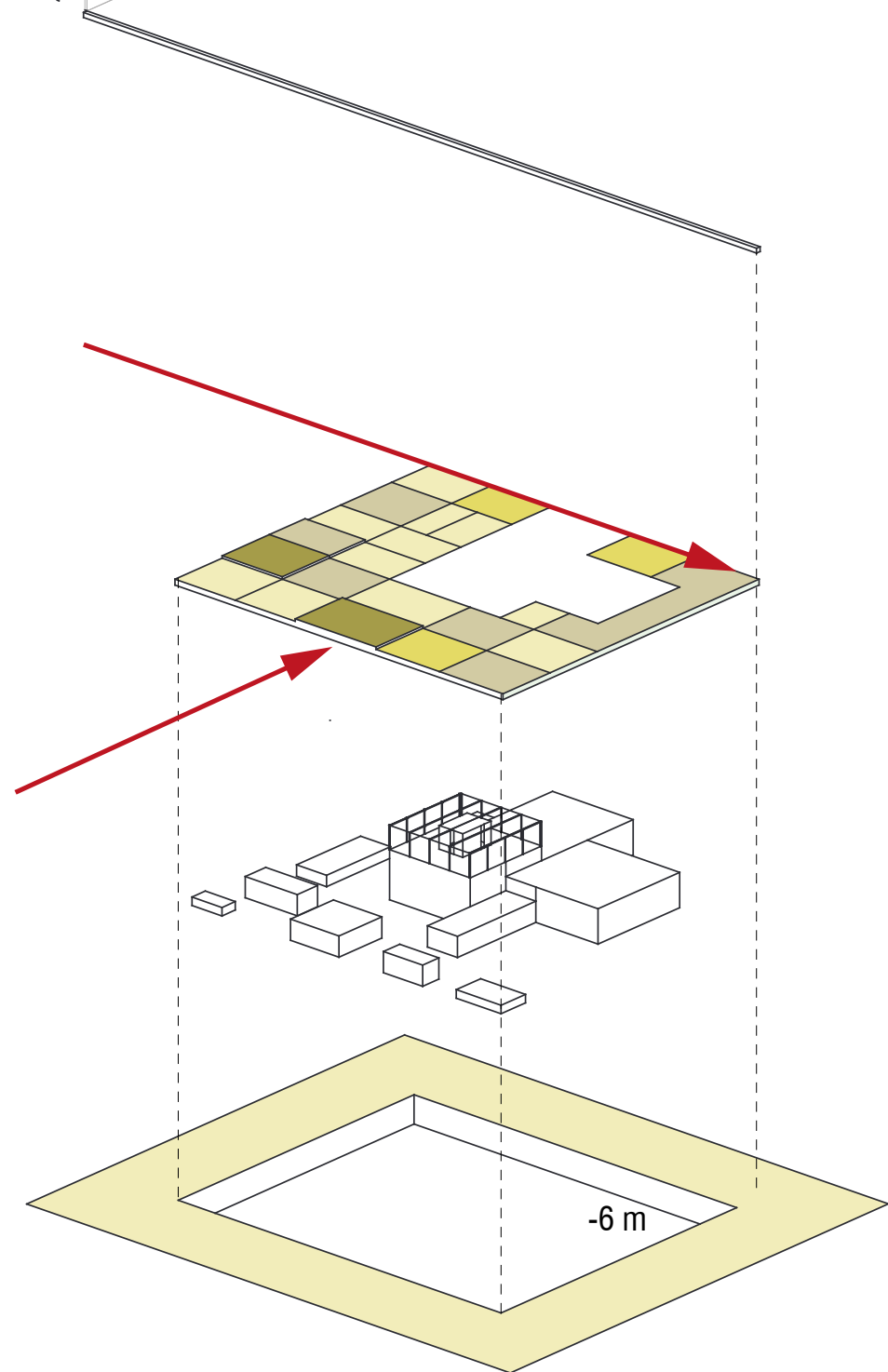
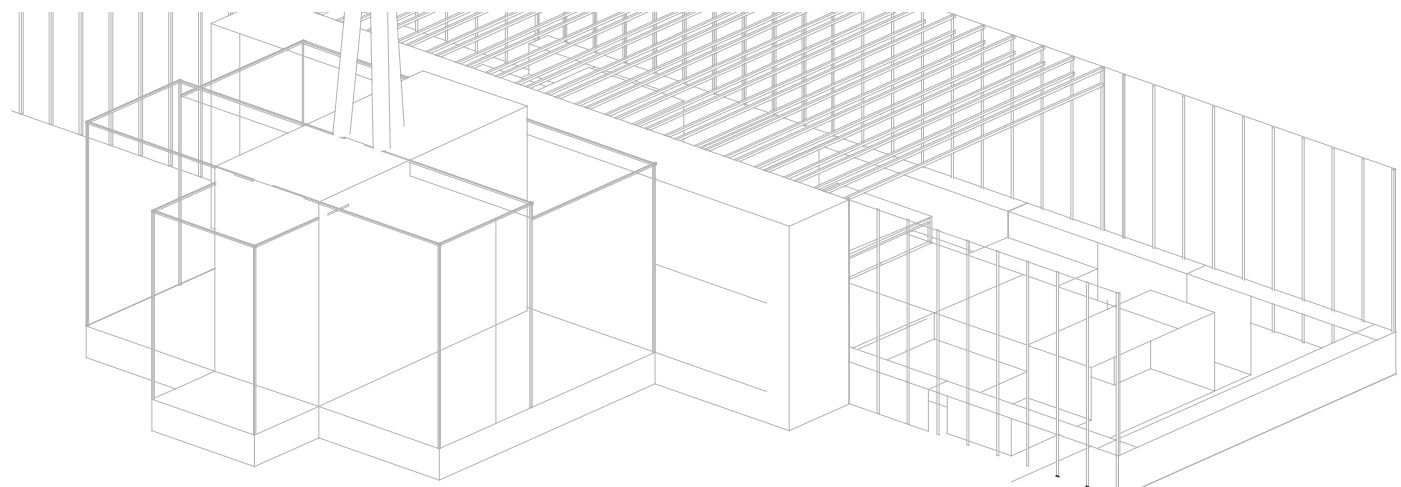




Transformed reactors and turbine hall (T3) ■



new nuclear fusion reactor



history layer

extension of parkland
accessibility

building layer

park layer
underground layer

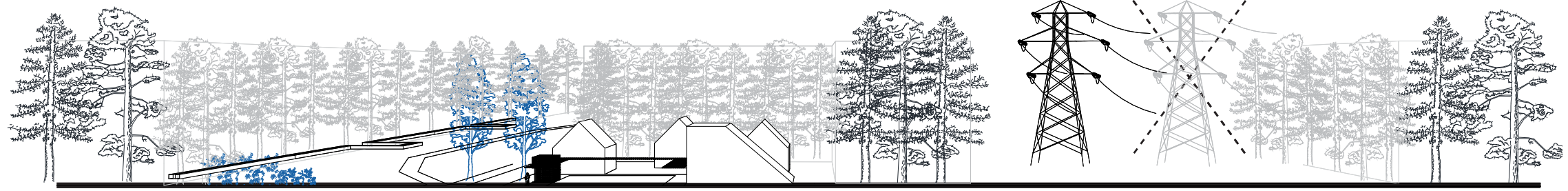
New nuclear fusion reactor (T3) ■

THE LINK AND NODE BETWEEN INPP AND THE TOWN

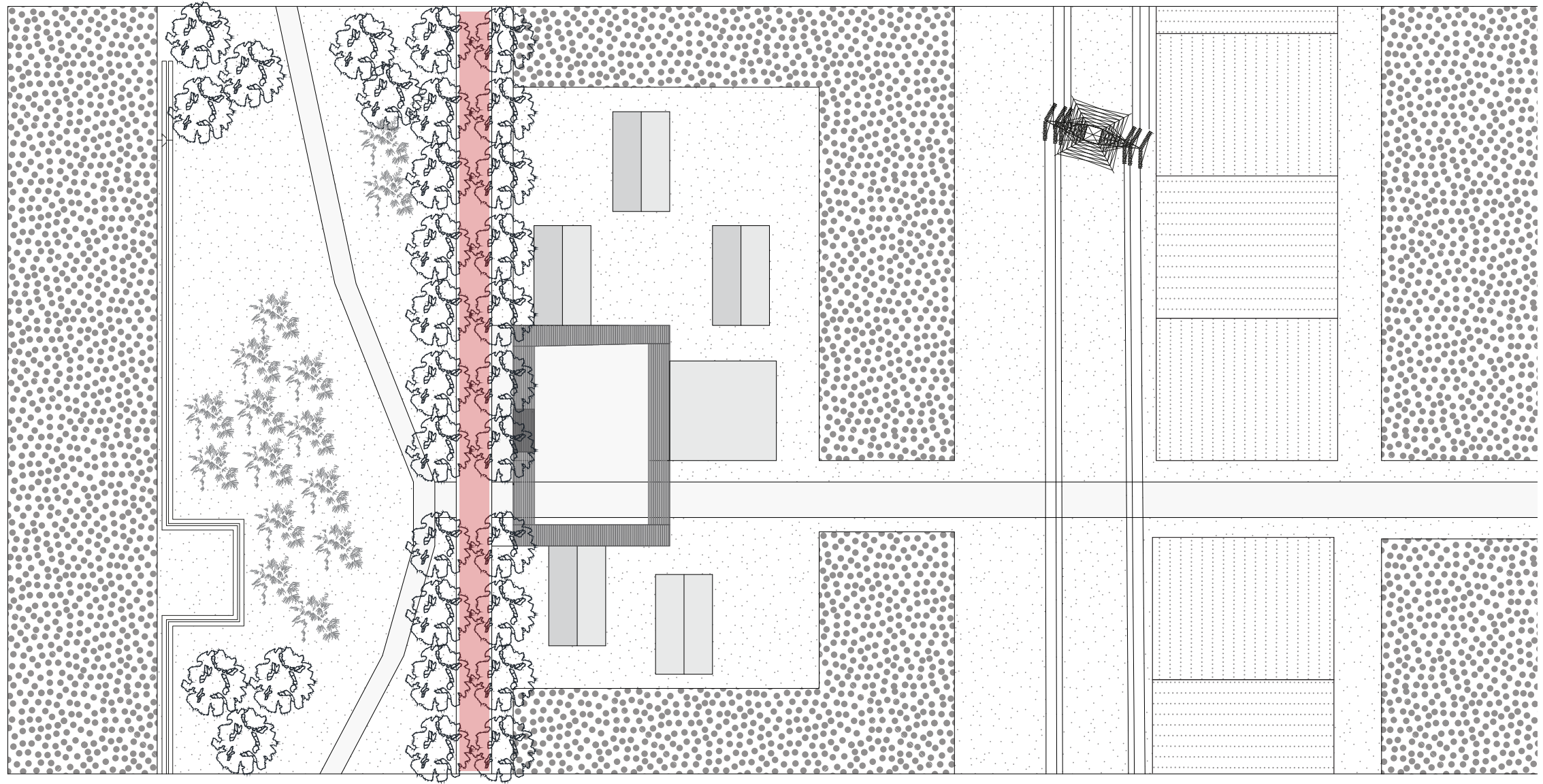




Framework of a link between INPP and the town ■

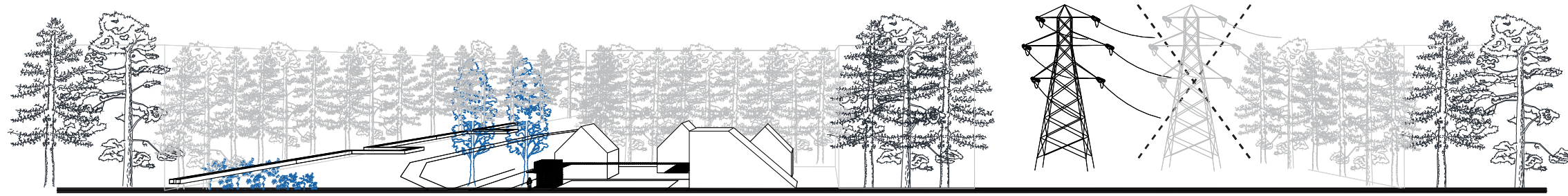


phase I

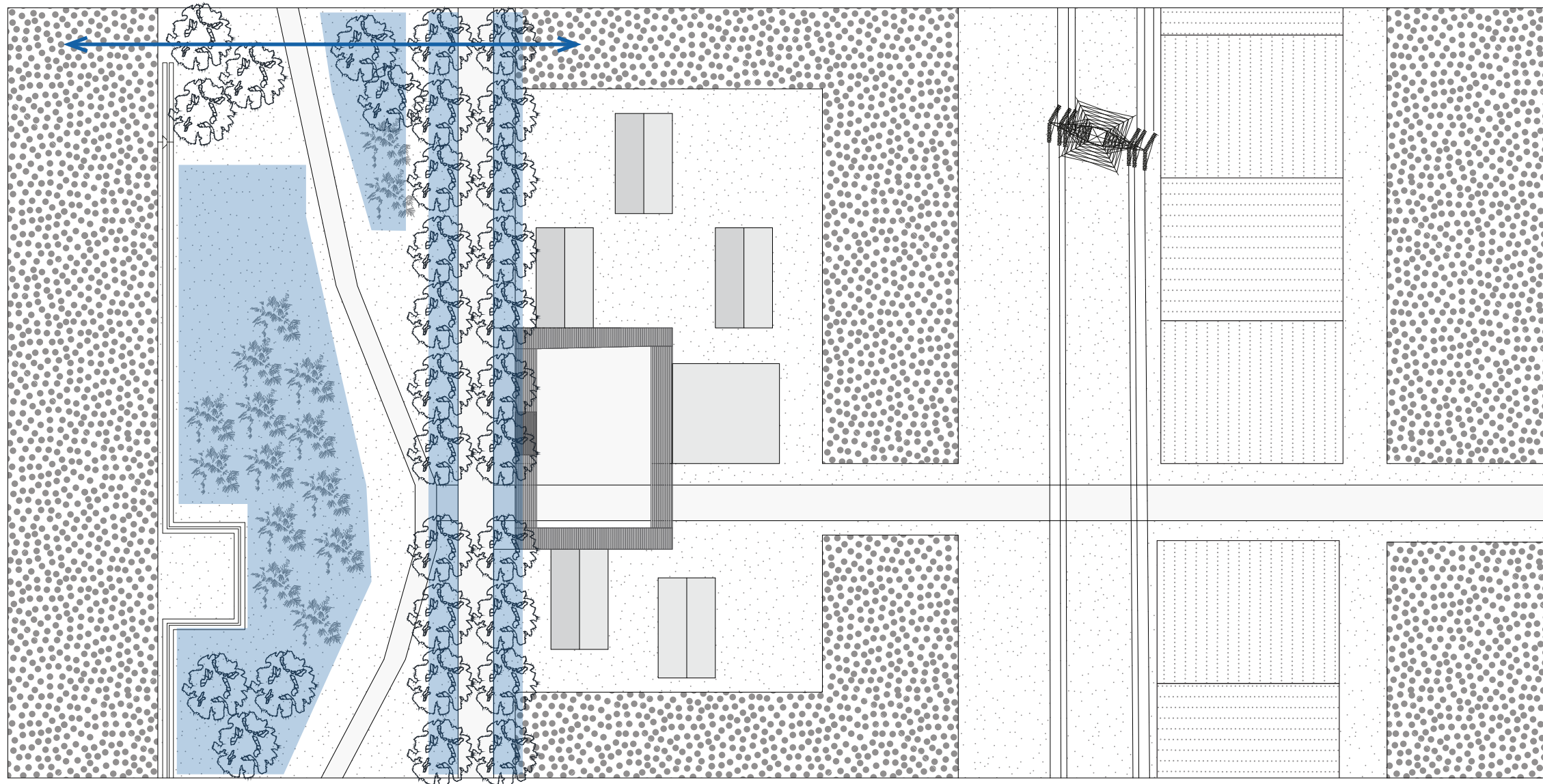
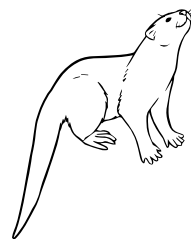


0 10 25 50

A link between INPP and the town ■



phase I



pipeline as barrier and as a guide

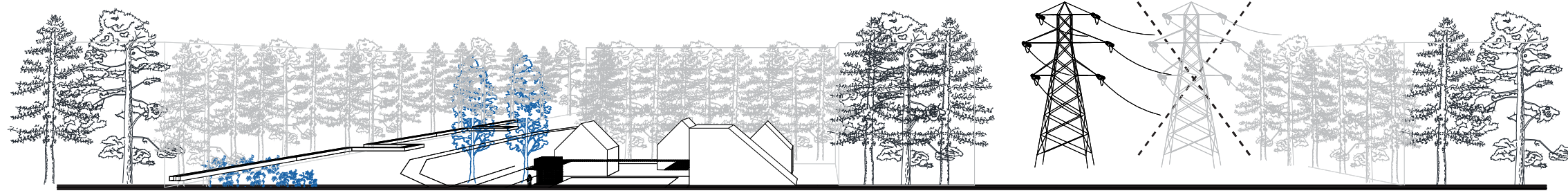
parkway

trees shapes the corridors, diminish the impact of infrastructure

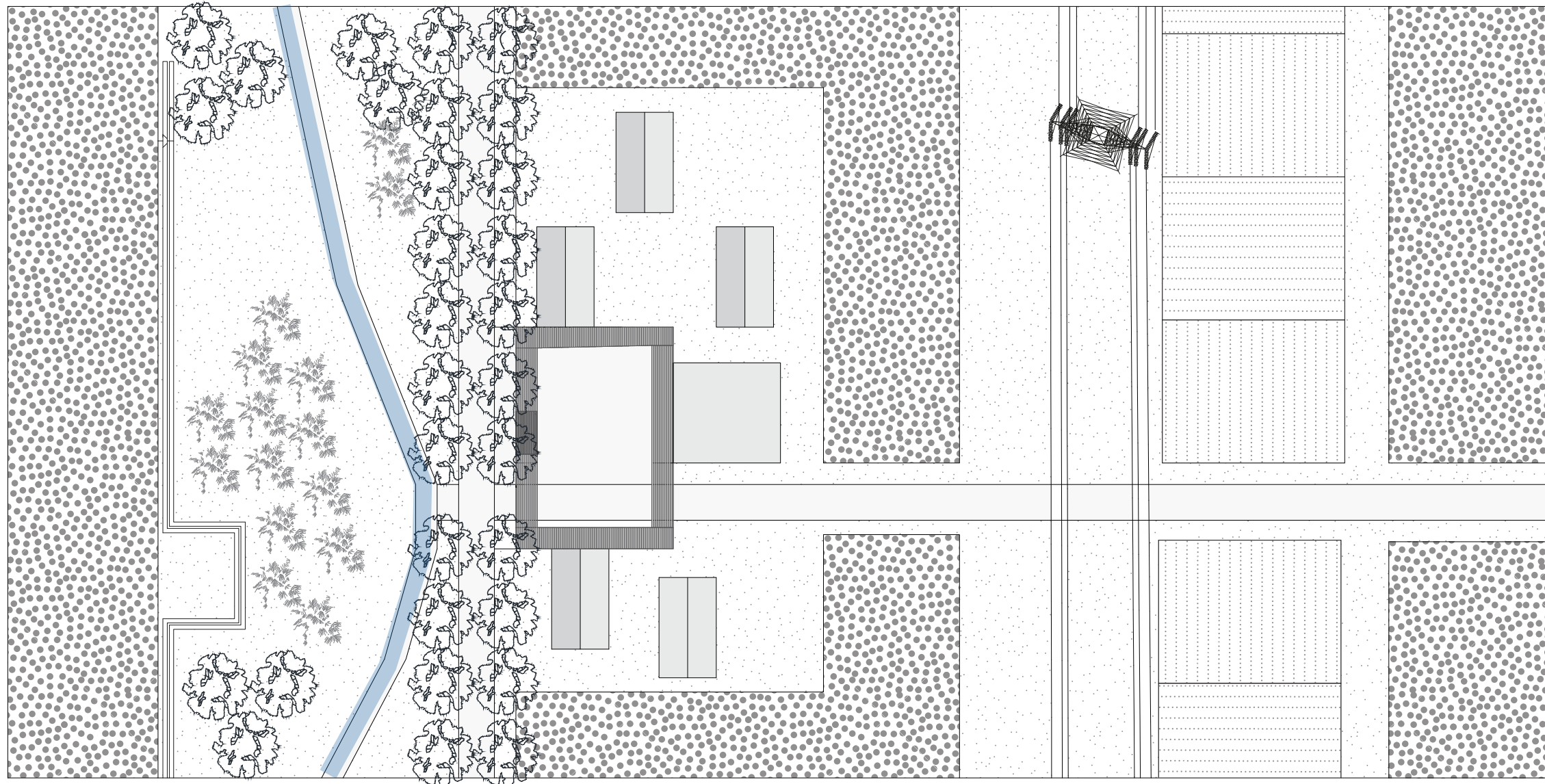
hedges regulate wildlife passages

underpass

A link between INPP and the town ■

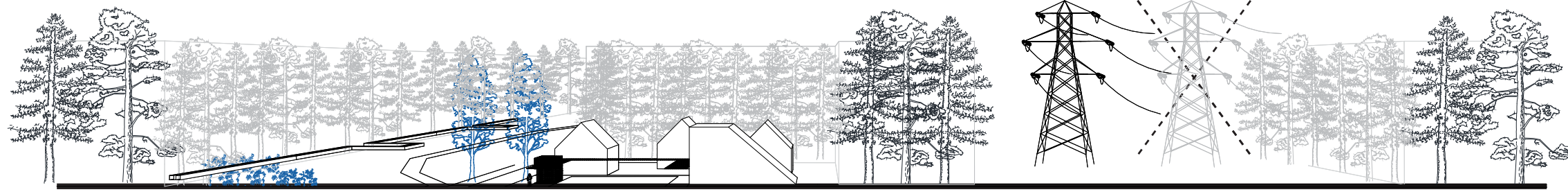


phase I

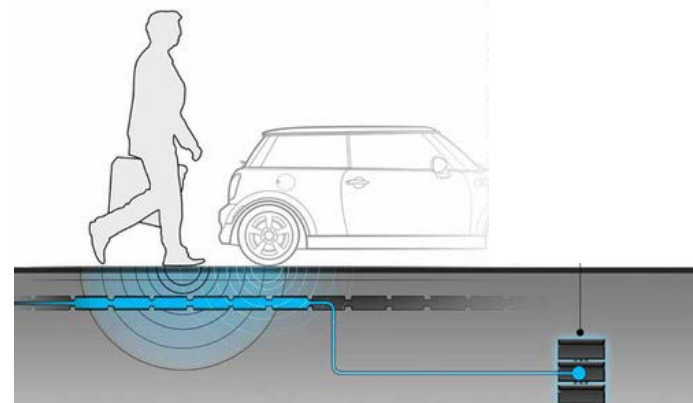
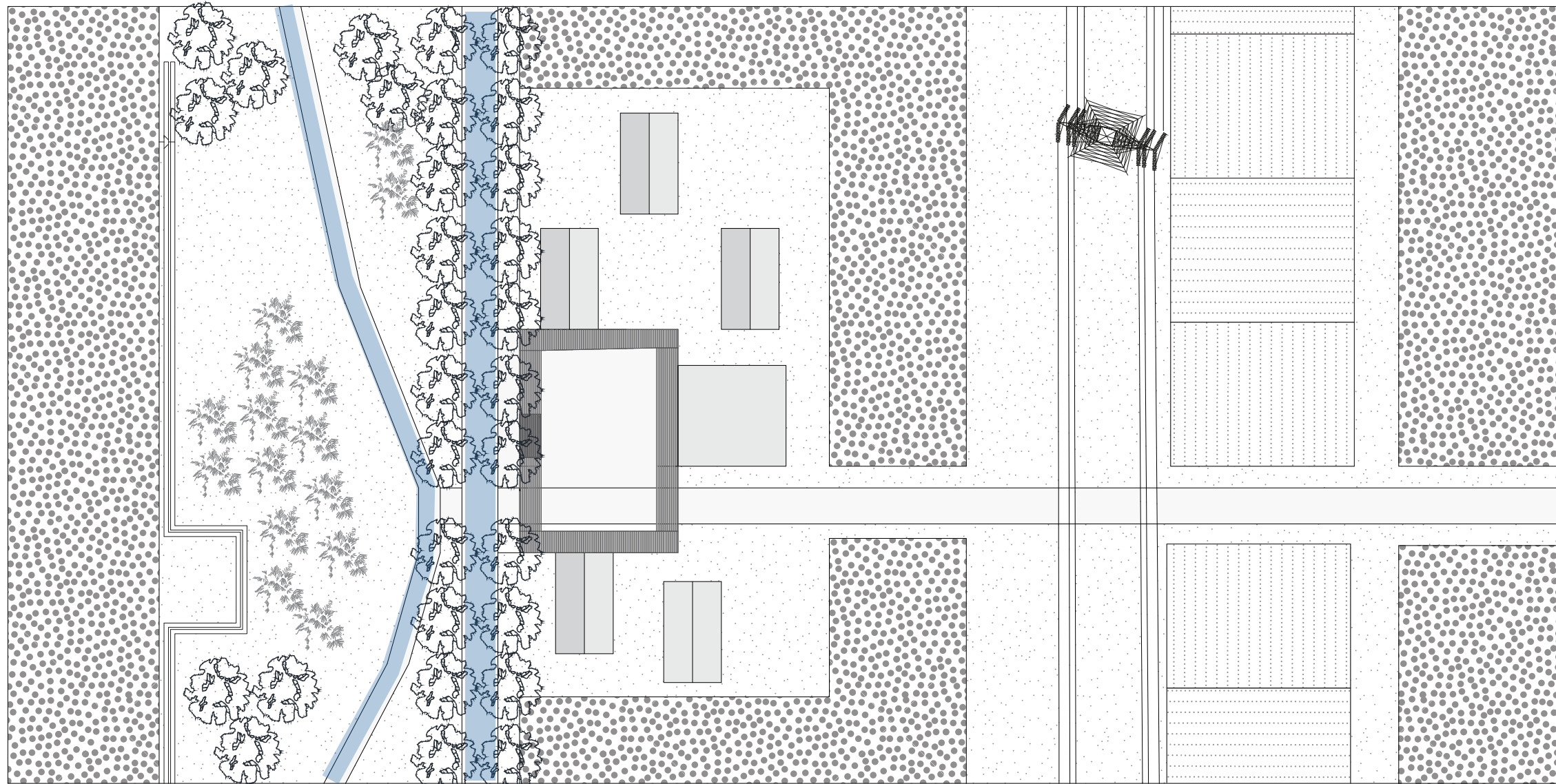


new bicycle/
pedestrian
path

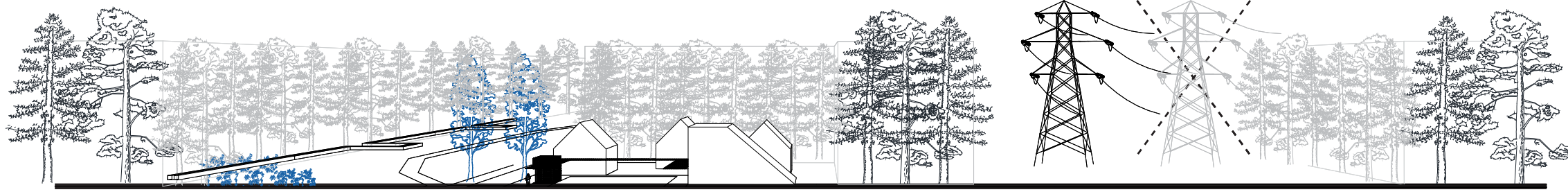
A link between INPP and the town ■



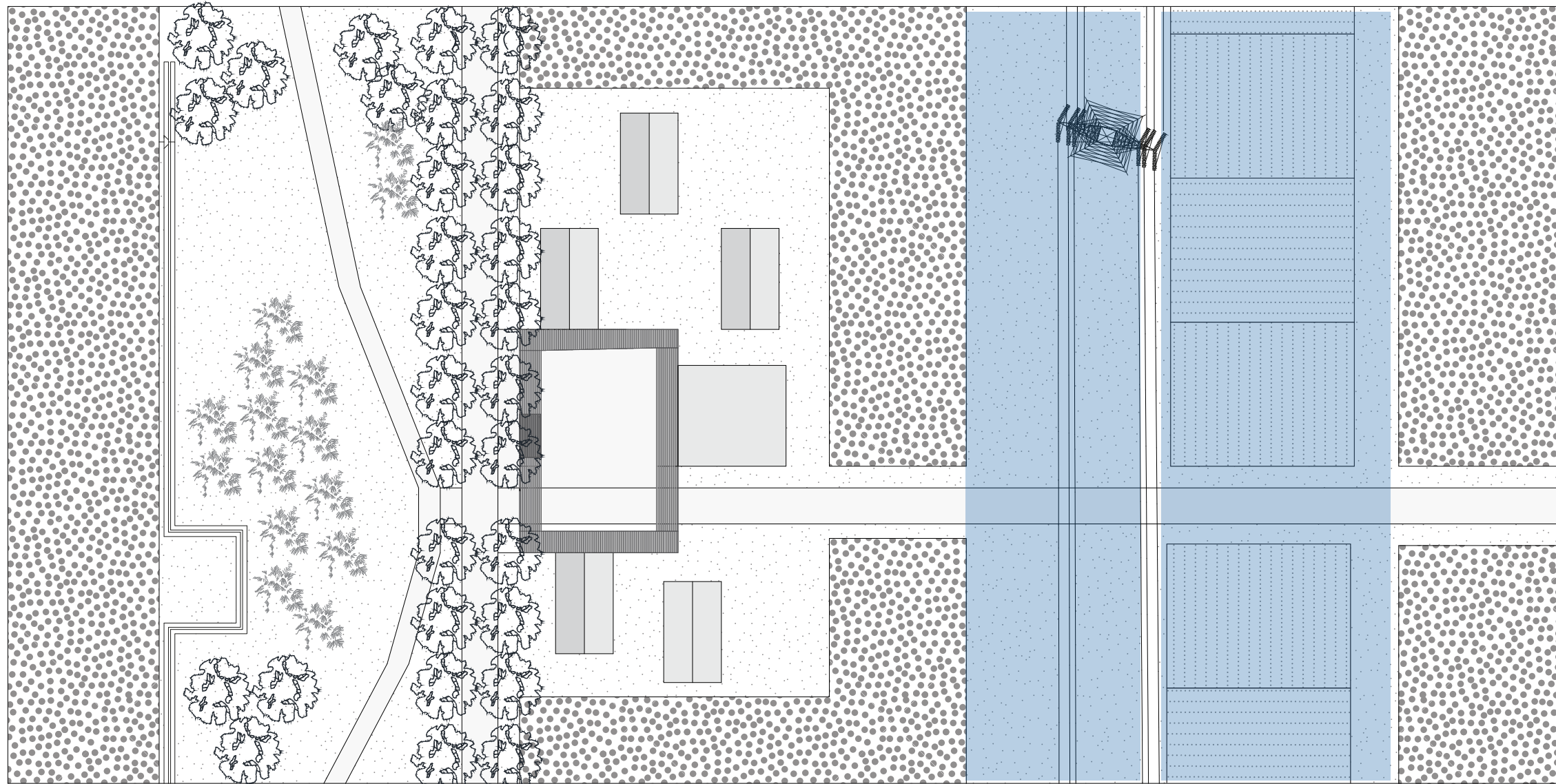
phase I



A link between INPP and the town ■



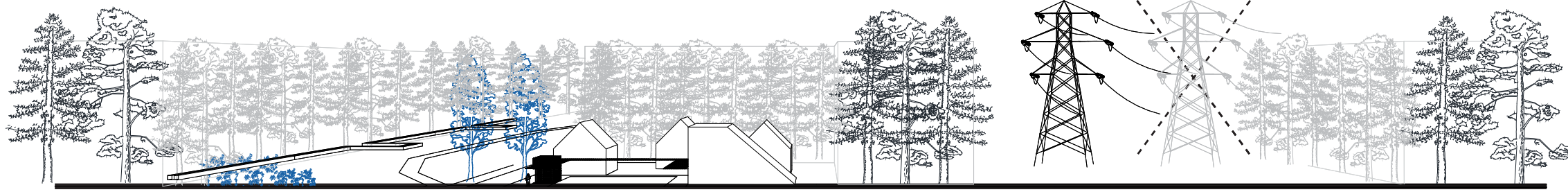
phase I



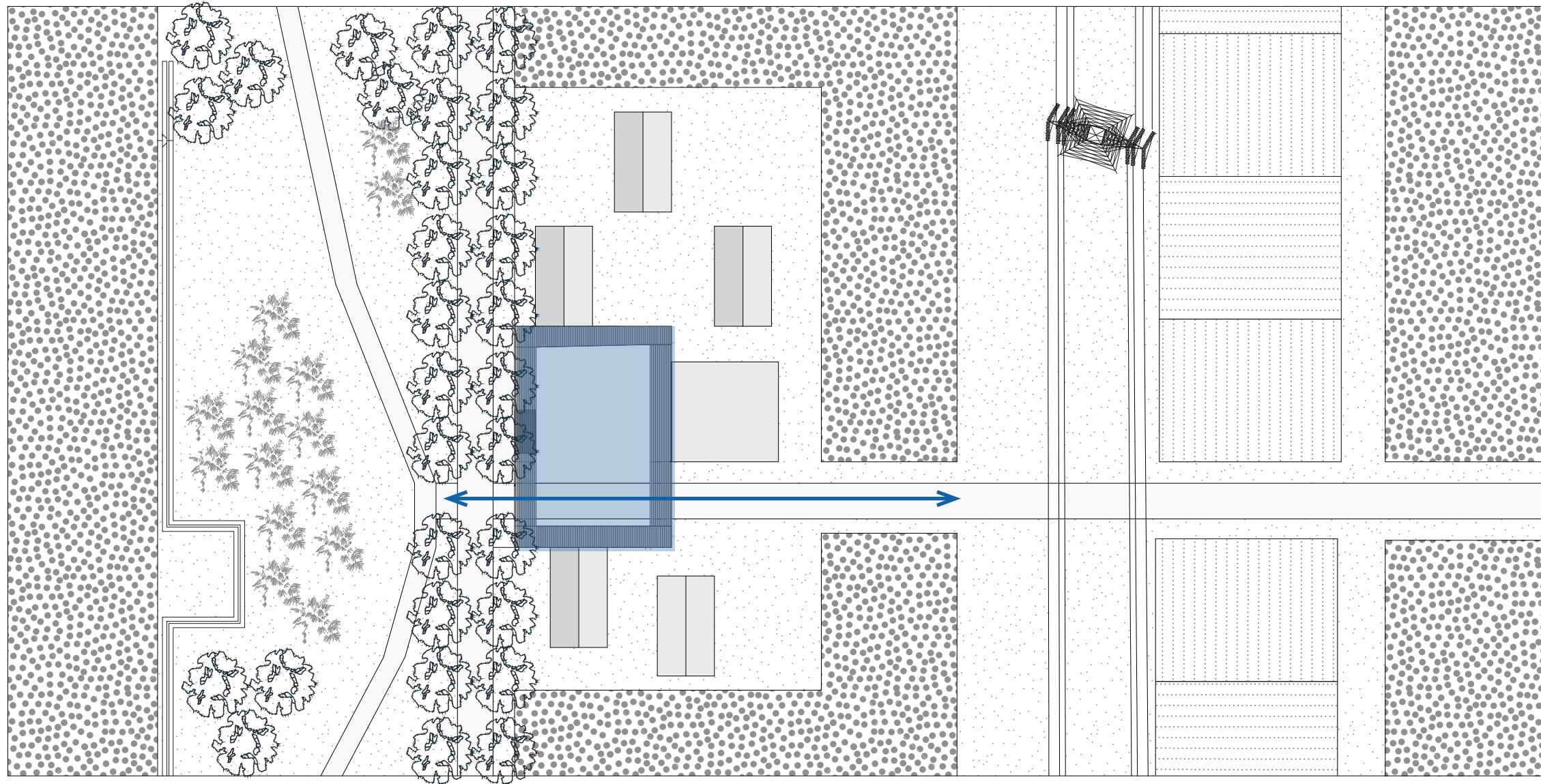
wildlife
corridor

allotmets/
parkland

A link between INPP and the town ■

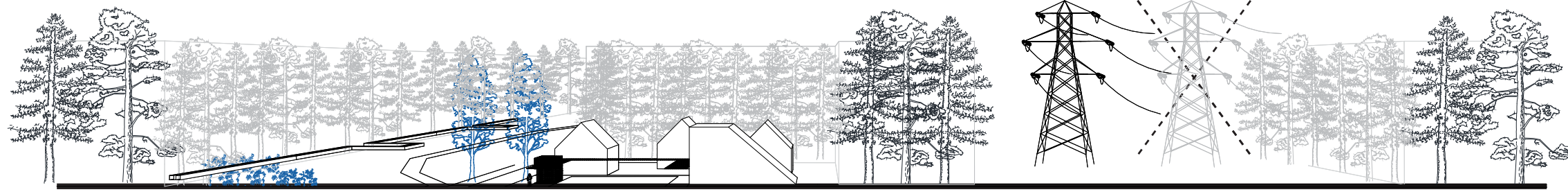


phase I

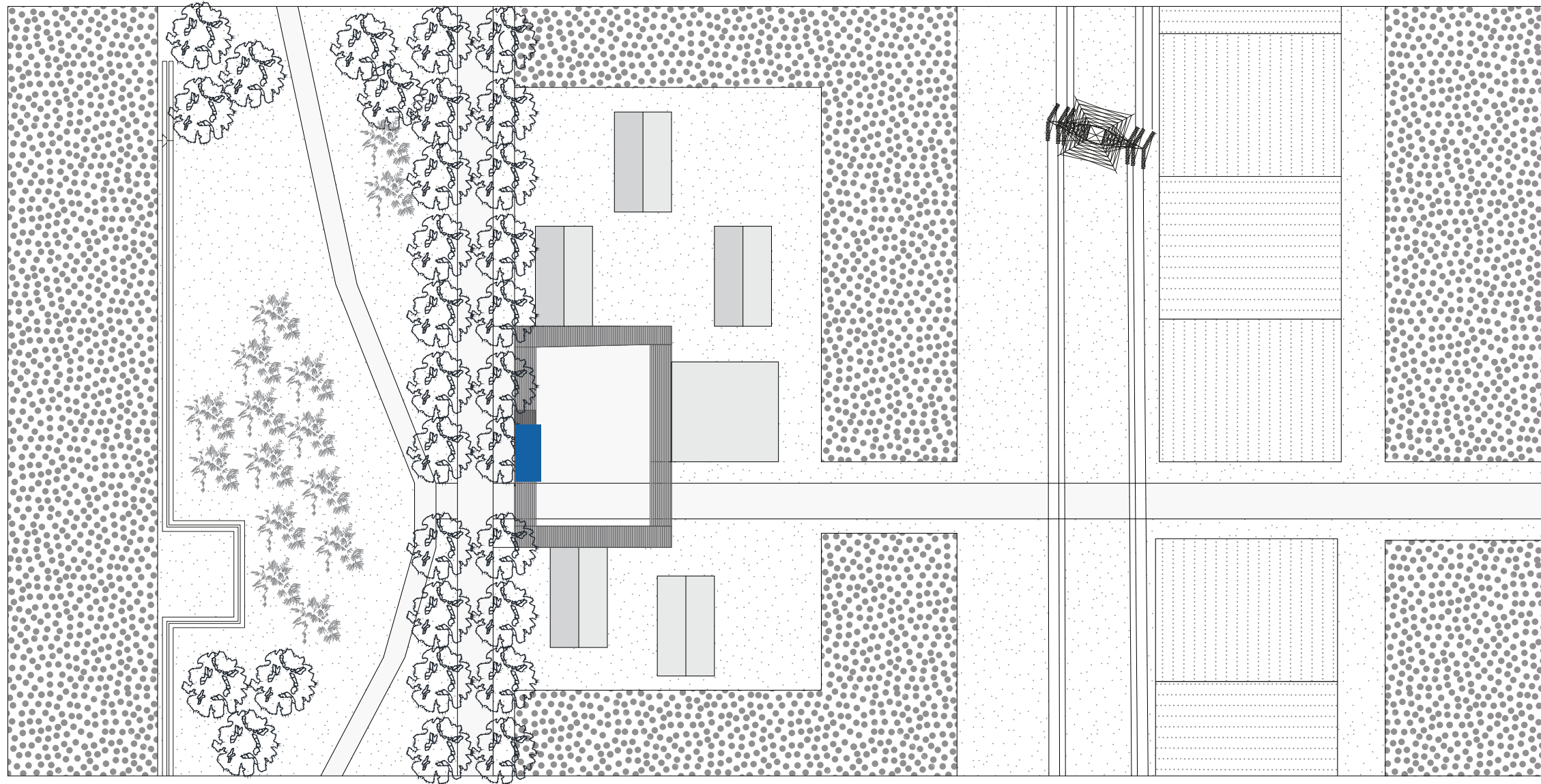


square

A link between INPP and the town ■

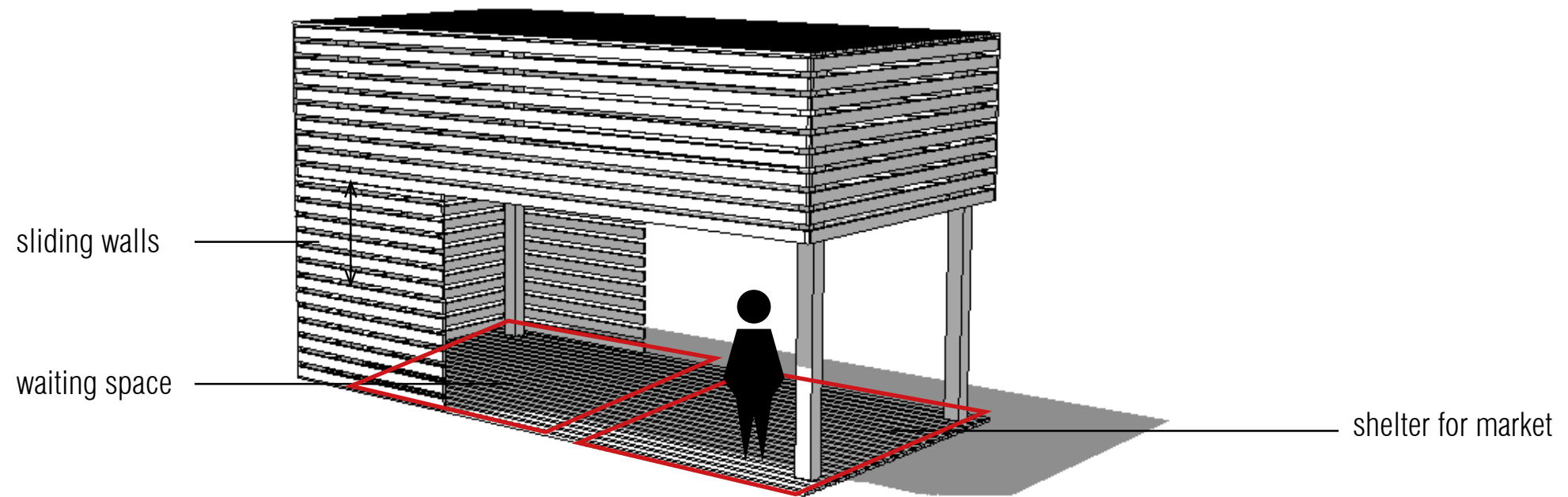


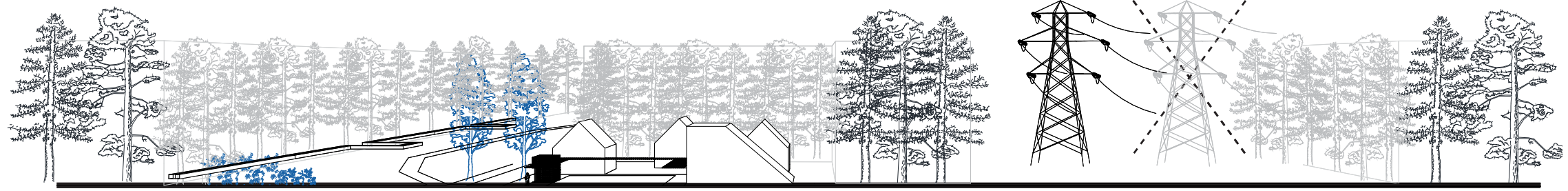
phase I



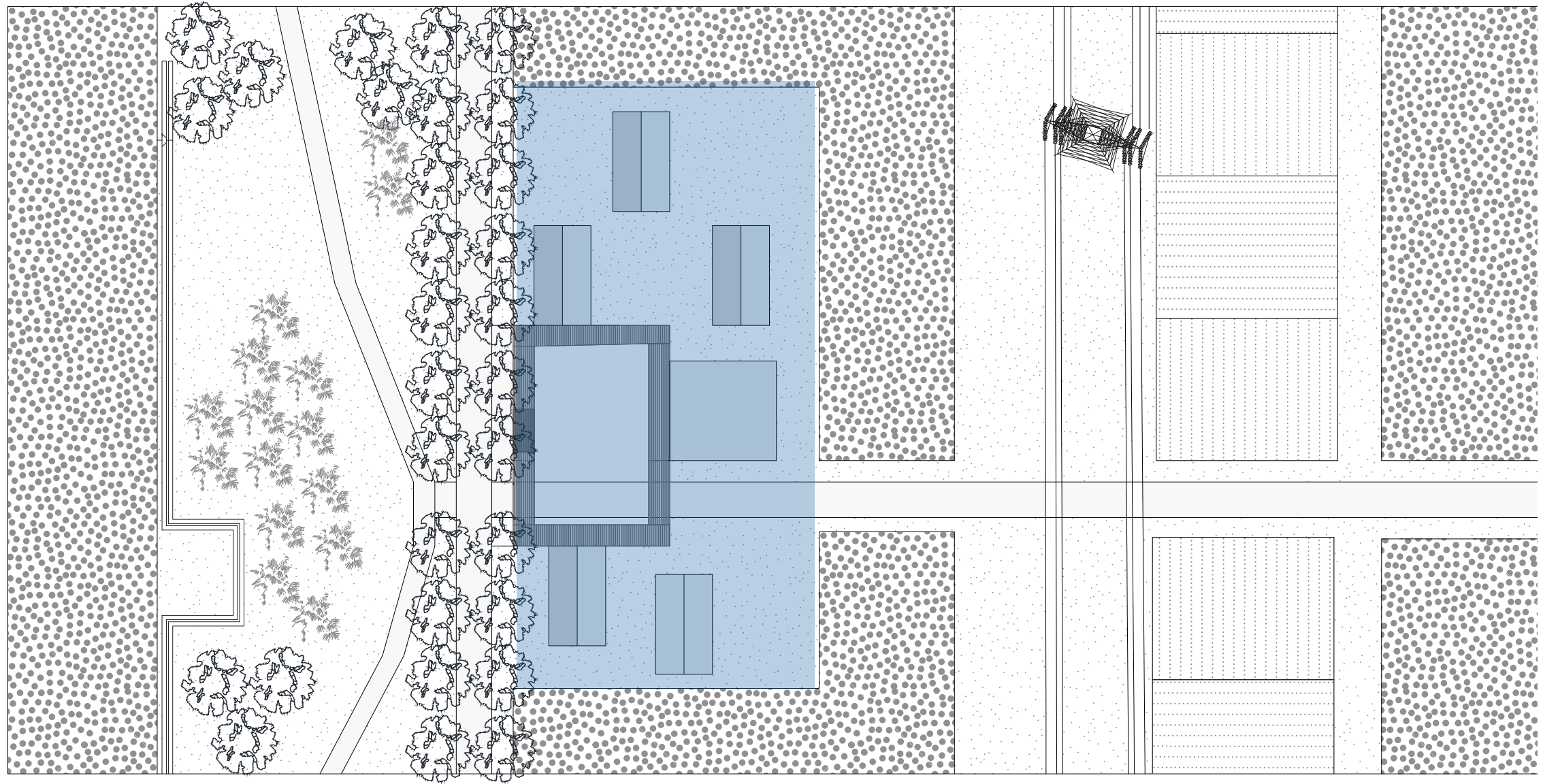
square

A link between INPP and the town ■





phase II



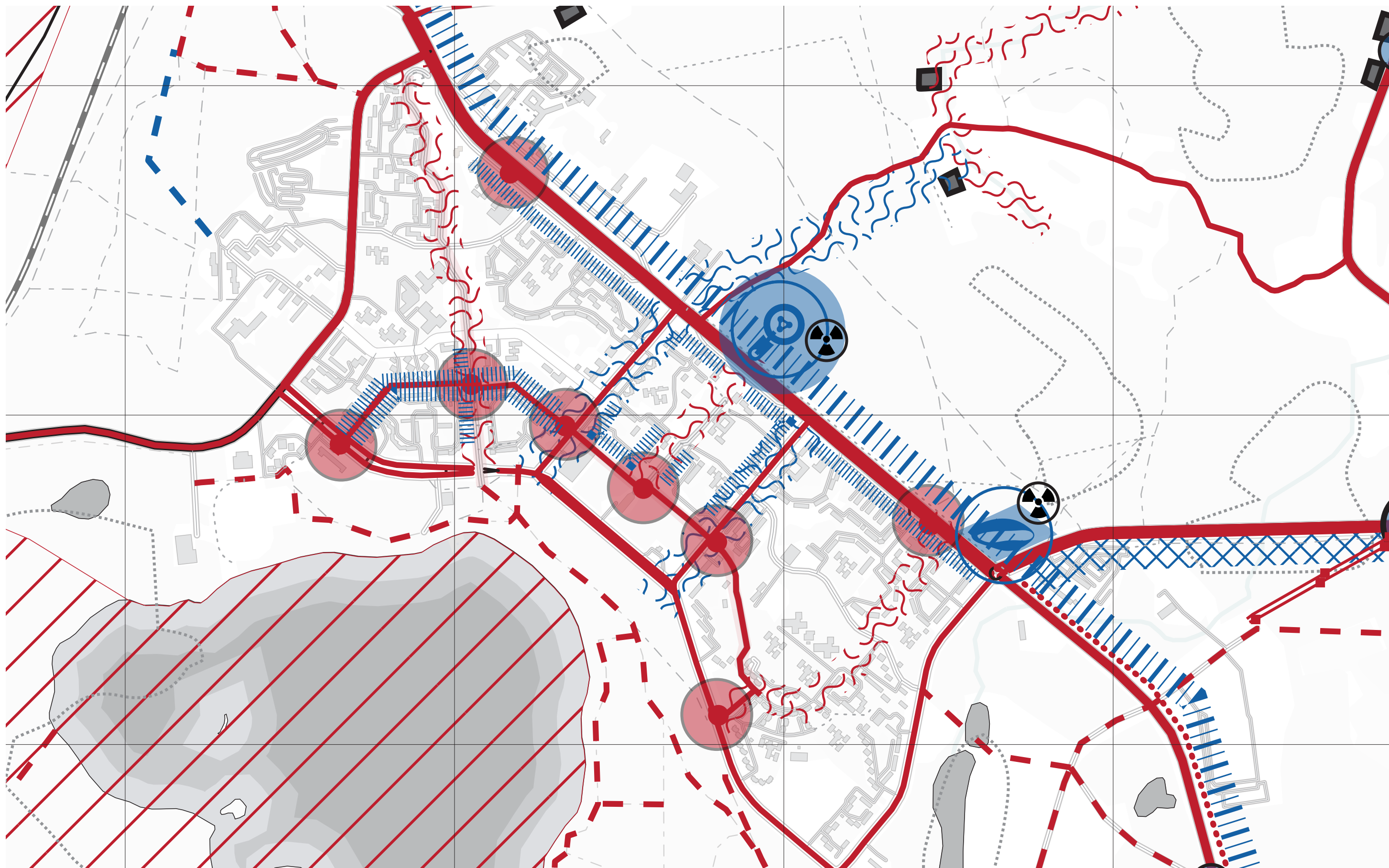
A link between INPP and the town ■

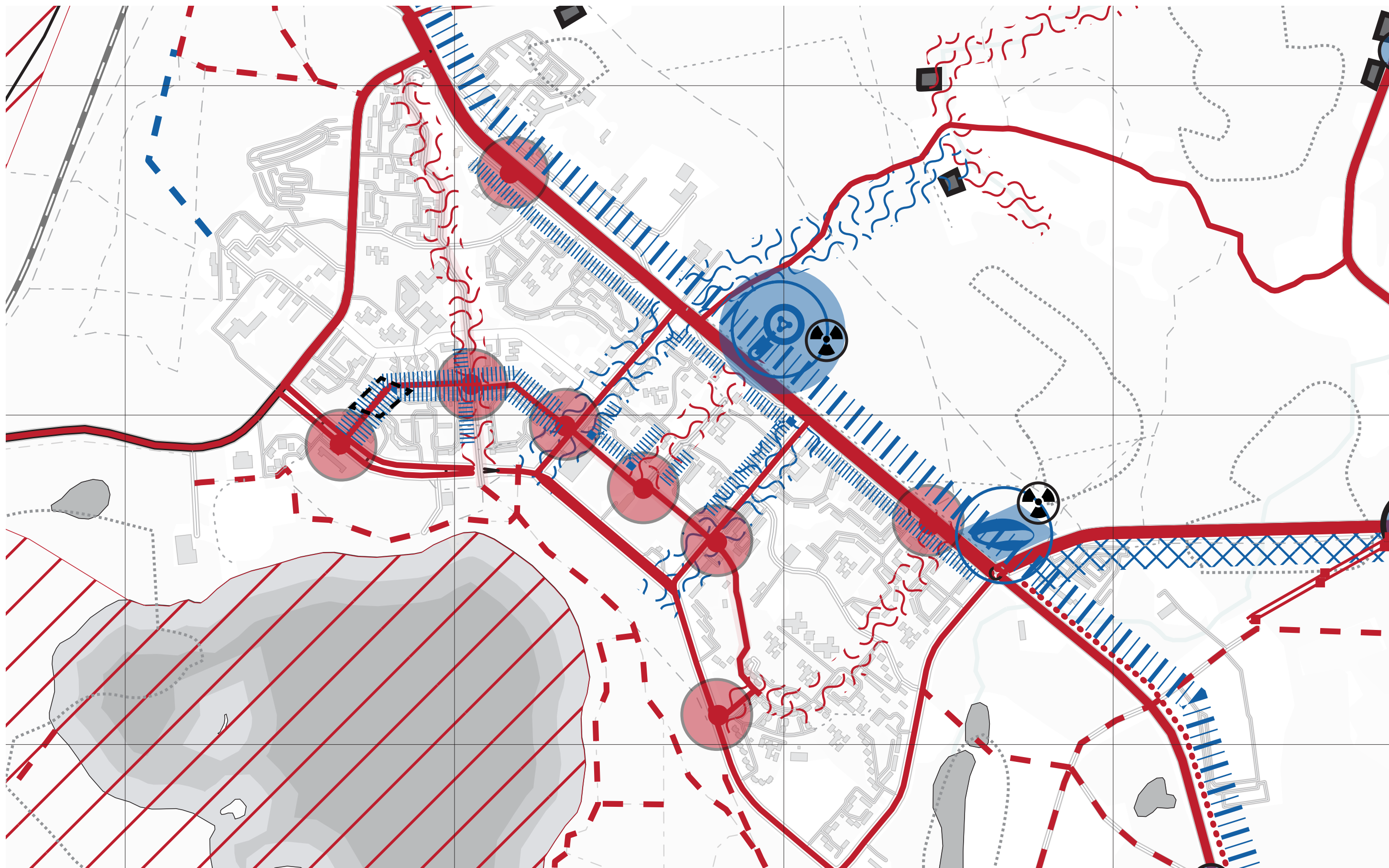


link between INPP and Visaginas ■

THE PATH IN THE TOWN

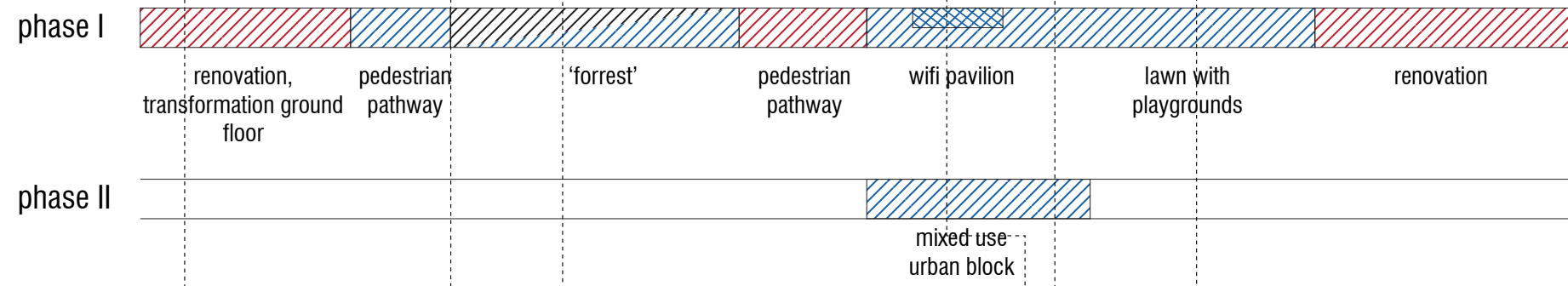
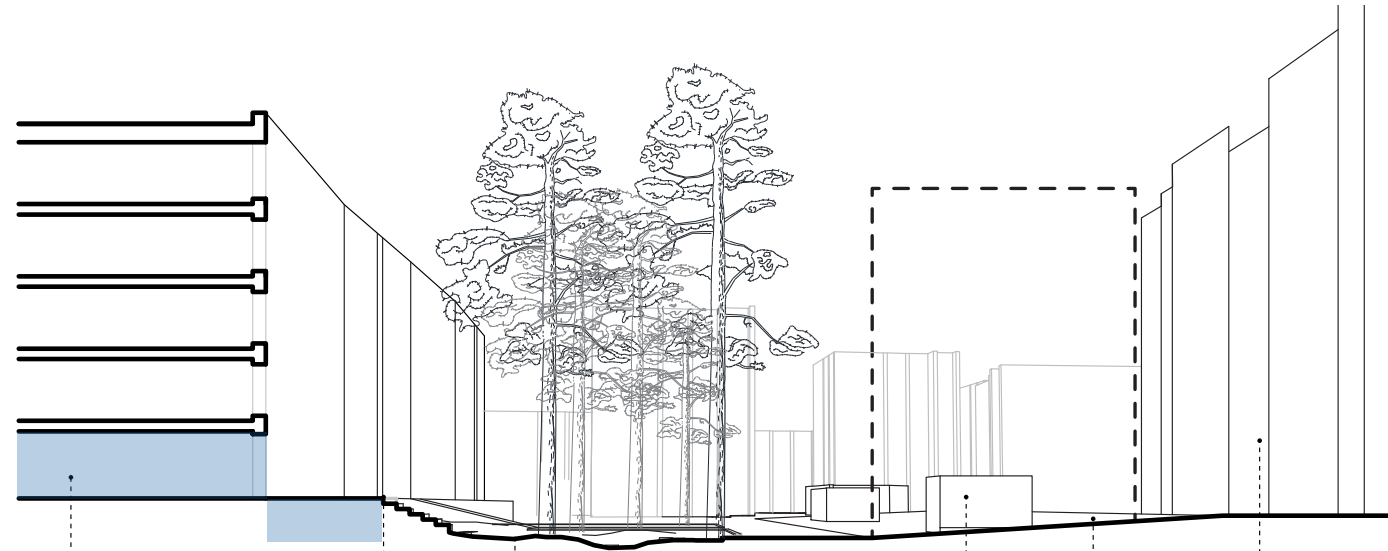


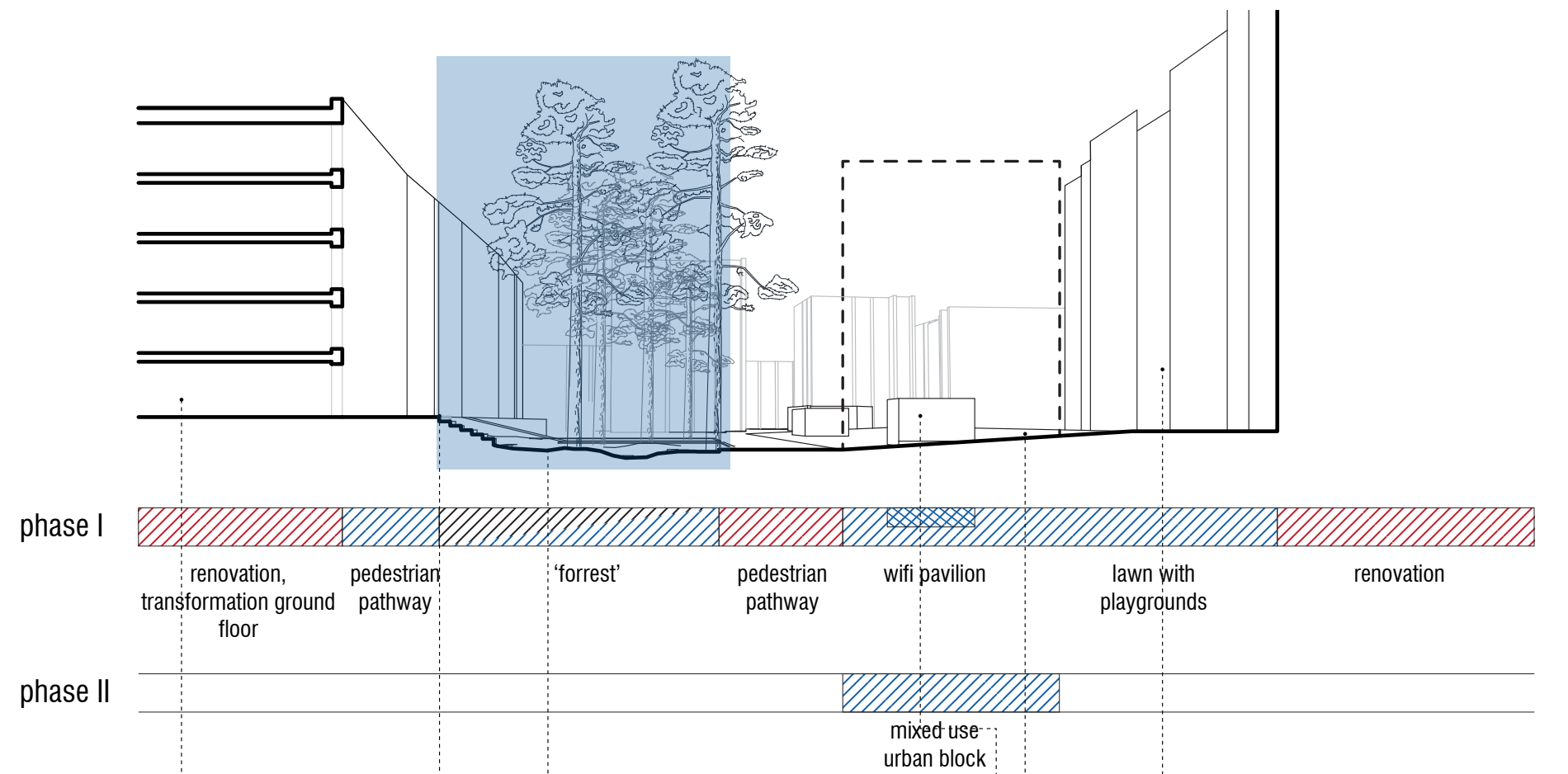


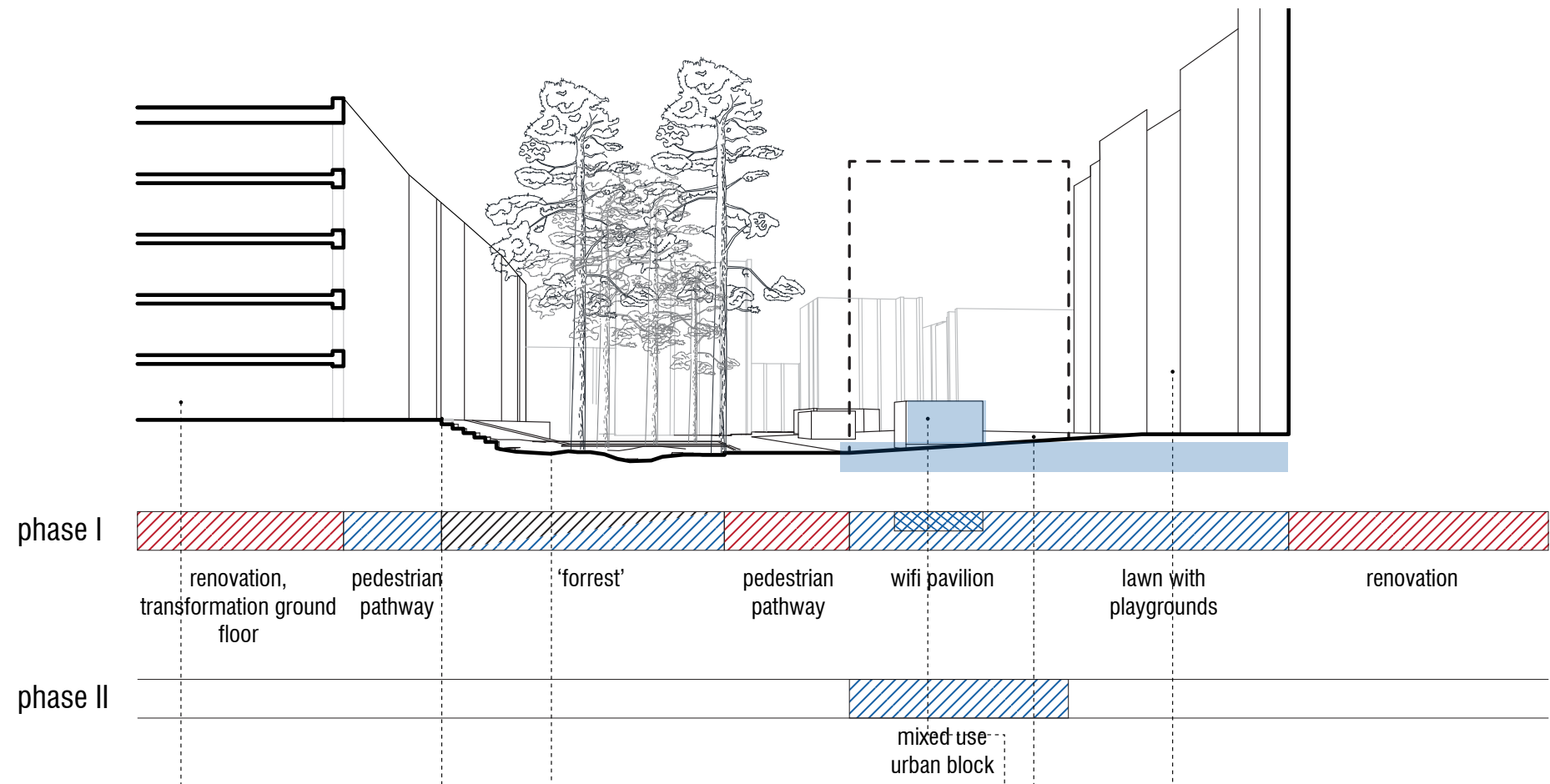


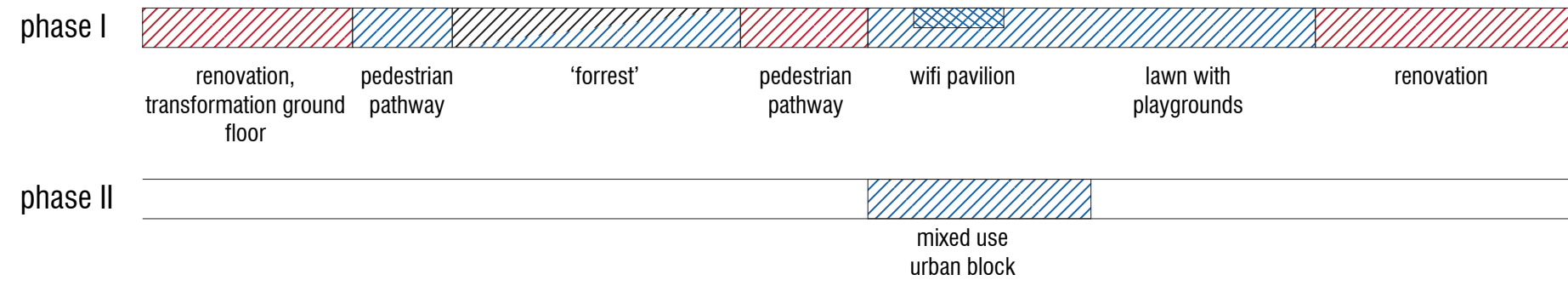
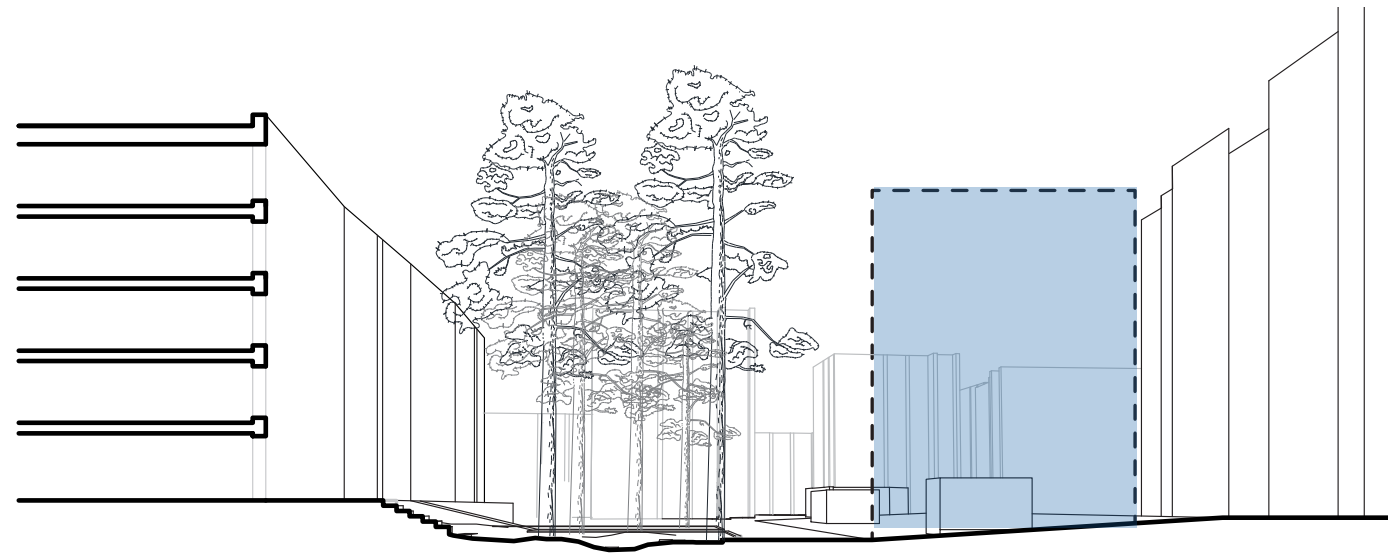


Sedulyno alley. Existing situation ■





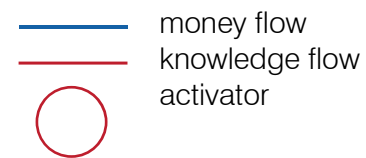






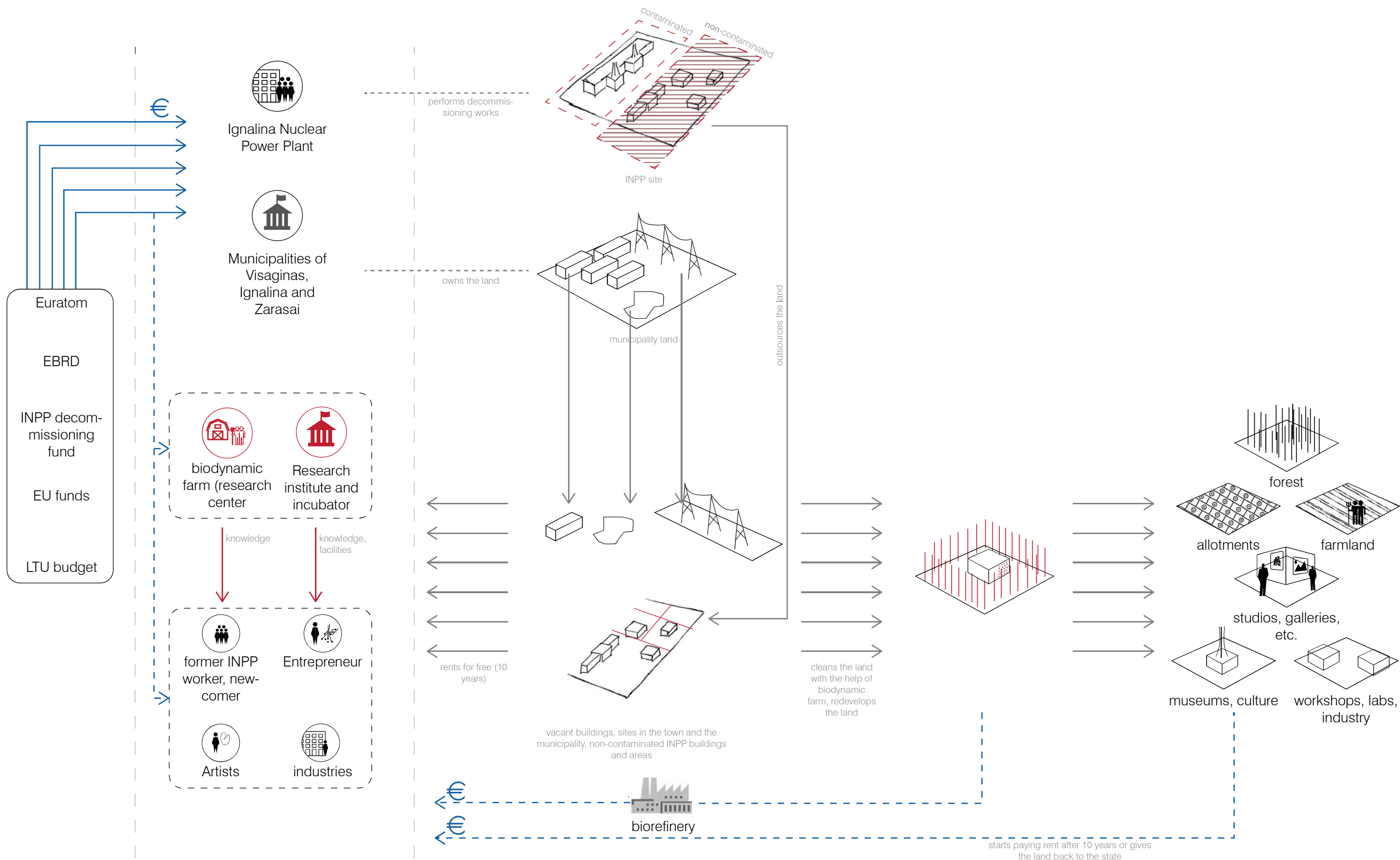
Path in the town (T3)

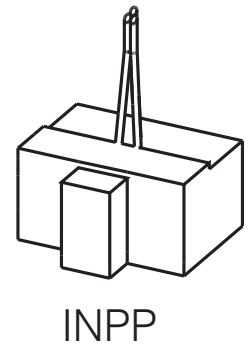
THE PROCESS



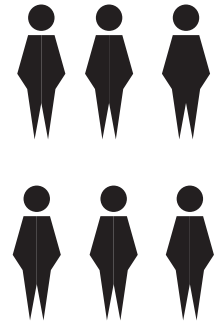
FUNDING

ACTORS





fire →



pension



retire

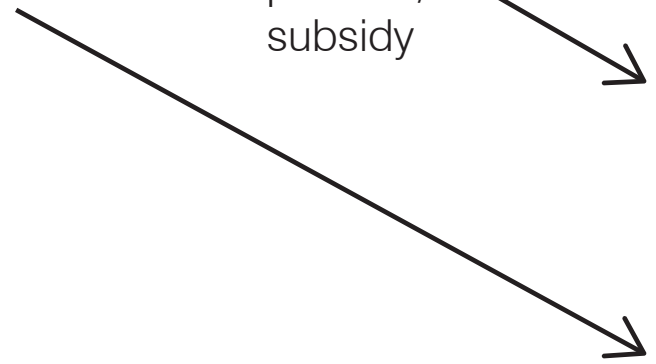


early
pension/
subsidy

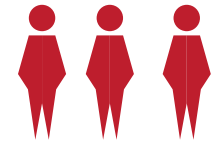


high-tech energy
industry park

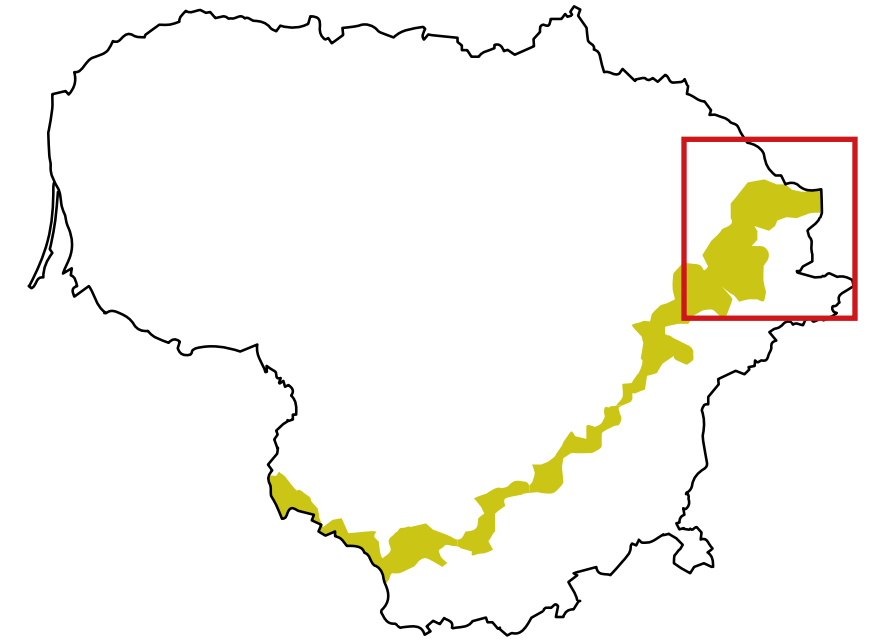
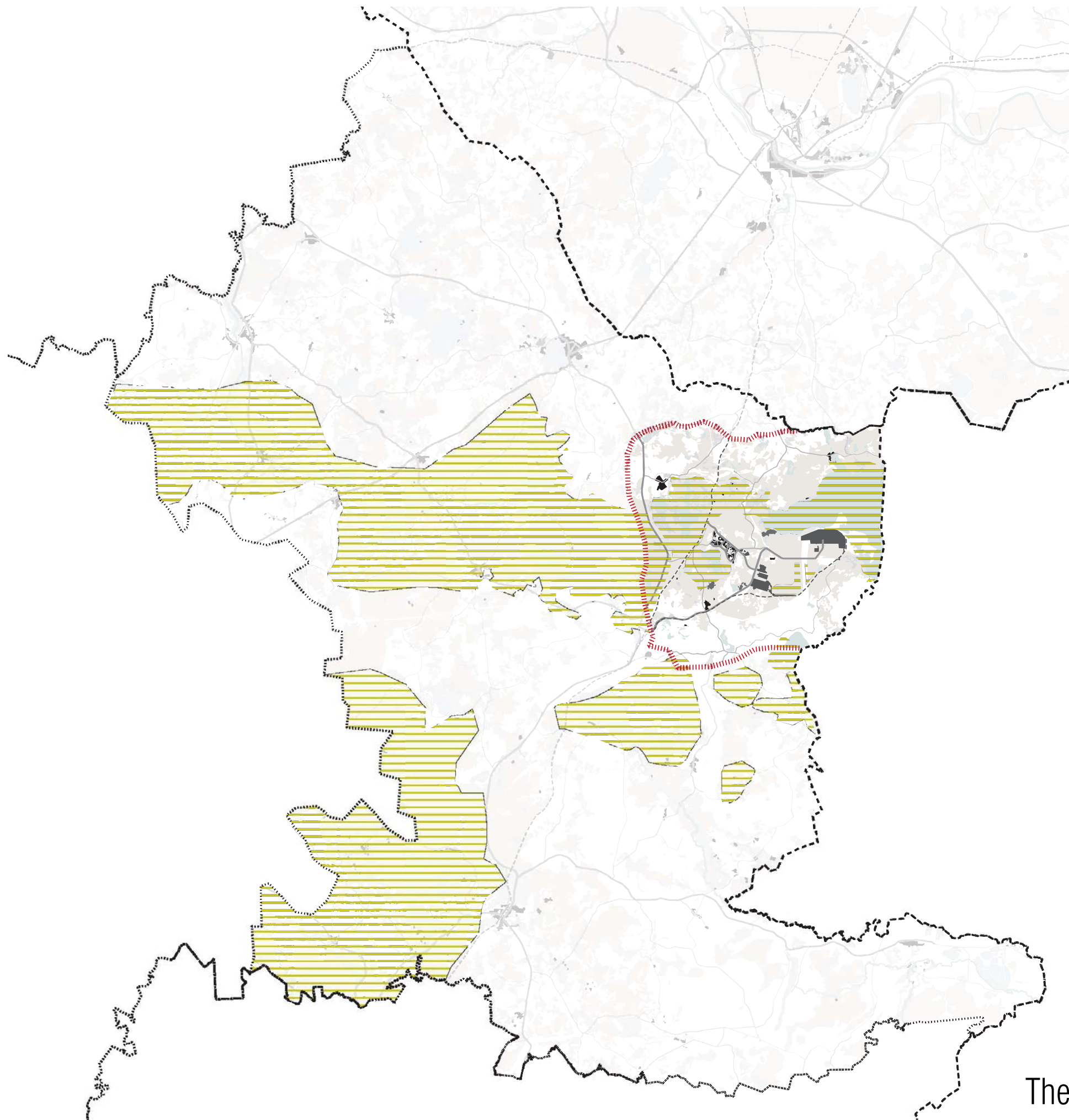
biodynamic farming



other jobs



new knowledge
workers



The international nature framework Natura2000 ■



Thank you for your attention

