



Integrated
Photovoltaic
Conference

25 – 26 November 2025
Chamber of Commerce
Florence, Italy

Phd. Filippo LaFleur

LAND

Agrivoltaic as Catalyst of Energy - Ecological Transitions, Territorial Potential and Case Study



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Agrivoltaic as Catalyst of Energy - Ecological Transitions, Territorial Potential and Case Study

- 1) The **SUPERVALLEY**: An Interdisciplinary, Landscape Led Project of Transition (PhD.) showing the territorial potential
- 2) Nature Positive Energy Landscapes **LAND**, Castelguglielmo Case Study

TRANSITIONS

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The decade of **energy** and of **nature** 2 structural opportunities toward 2030

Energy Transition

2030 Objectives:

- **65%** of electricity production from renewable sources in Italy
[2022: 31.1% of electricity production from renewable sources in Italy]
- **70 GW** of installed capacity from new renewable plants [10
GW average annual installations in Italy]

Source: MASE, Terna
<https://www.terna.it/it/sistema-elettrico/statistiche/pubblicazioni-statistiche>

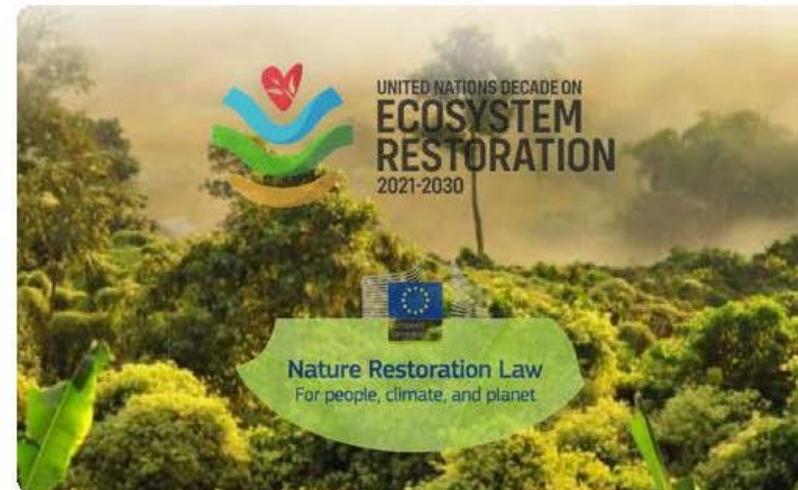


Ecological Transition

2030 Objectives:

- Restoration of 20% of compromised terrestrial and marine habitats
- Guarantee 25,000 km of natural connectivity of waterways
- Reverse the decline of pollinator populations
- Differentiated management of agricultural ecosystems
- Restoration of peatlands and wetlands
- Improvement of forest biodiversity
- Stop the net loss of green urban spaces and ensure at least 10% tree coverage in urban areas

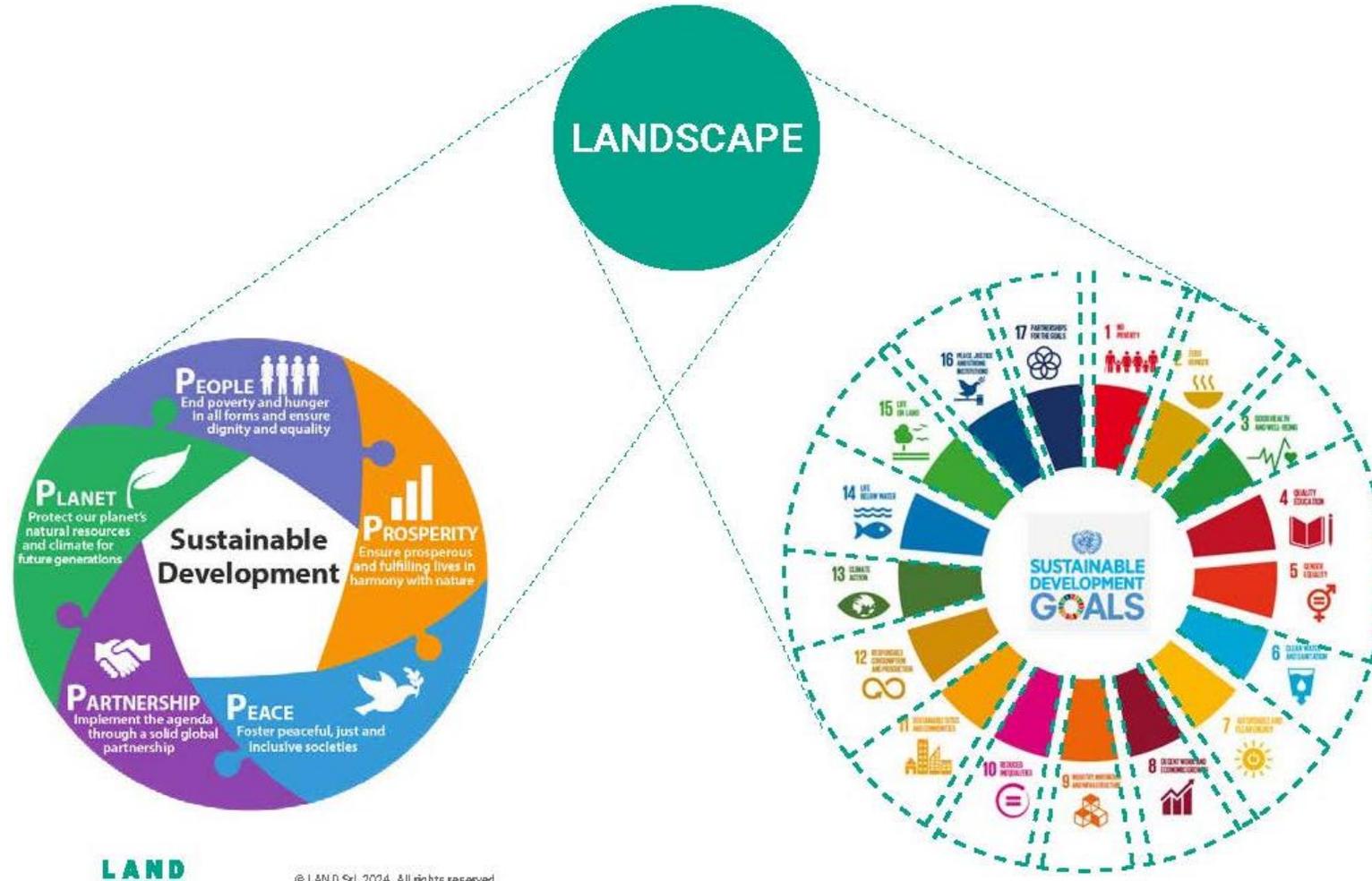
Source: UNEP, European Commission
http://environment.ec.europa.eu/topics/nature-and-biodiversity/nature-restoration-law_en



LANDSCAPES in TRANSITIONS

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Landscape as a platform for sustainable development



LAND

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WHY LANDSCAPE?

Firenze, 25 anni dopo: al paesaggio serve un progetto



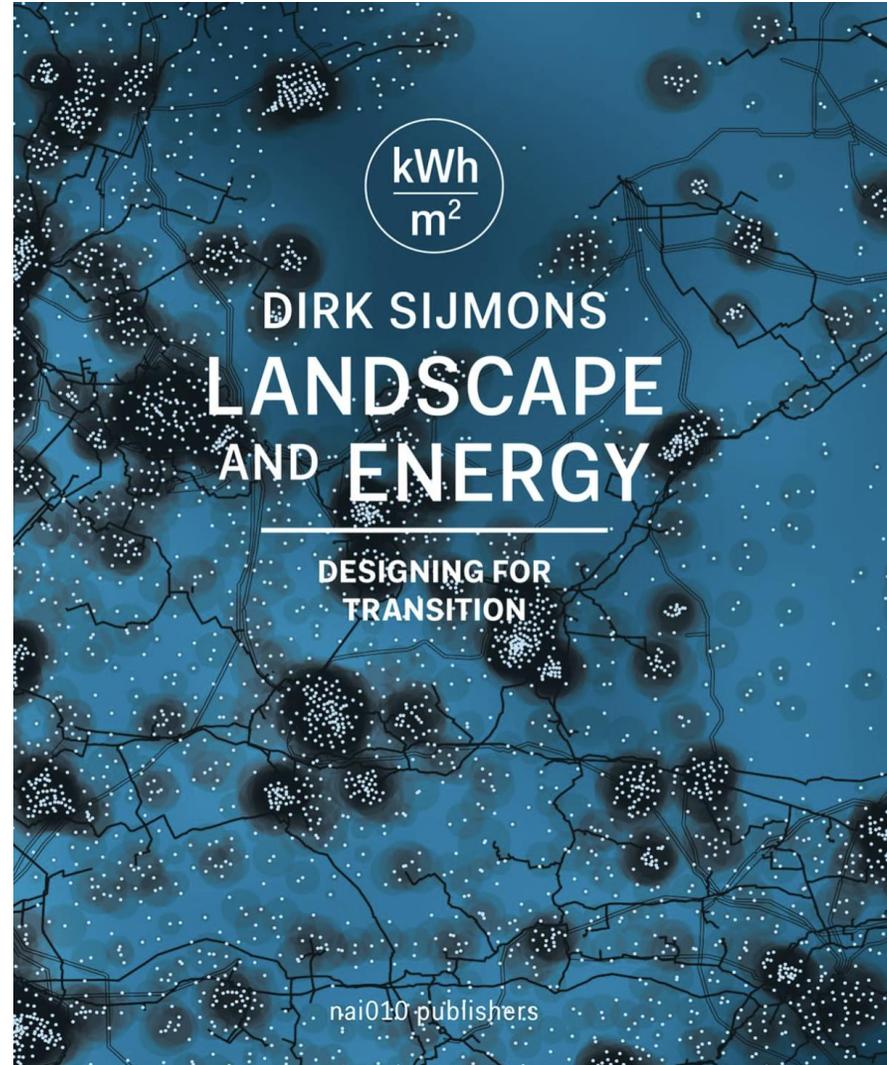
La Convenzione Europea del Paesaggio, [adottata dal Consiglio d'Europa il 20 ottobre 2000 a Firenze](#), rappresenta un primo strumento internazionale giuridicamente vincolante dedicato interamente al paesaggio. Una parola e un concetto che qui si fanno strada nella lunga marcia della loro percezione unitaria oltre i confini dei singoli paesi.





ENERGY LANDSCAPES

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etaflorence  **renewable**energies



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The SUPERVALLEY: A Project of Transition

The project aims to show the potential regeneration of soil in a vast geographical setting, planning and designing new hybrid Landscapes, combining **Nature-Agriculture-Water-Energy Strategies**

TU Delft-POLIMI-SIMBIOSI

The logo for the CITY'SCAPE AWARD, featuring a stylized 'to' in green and pink, followed by 'CITY'SCAPE' in large, bold, pink letters and 'AWARD' in smaller, teal letters below it.

PAYSAGE
TOPSCAPE

CNA
PPC CONSIGLIO NAZIONALE
DELLI ARCHITETTI
PARCHITETTI
PESAGGISTI
E CONSERVATORI

1 ° PREMIO

**Q - RICERCHE SULLA
PROGETTAZIONE DEL PAESAGGIO**

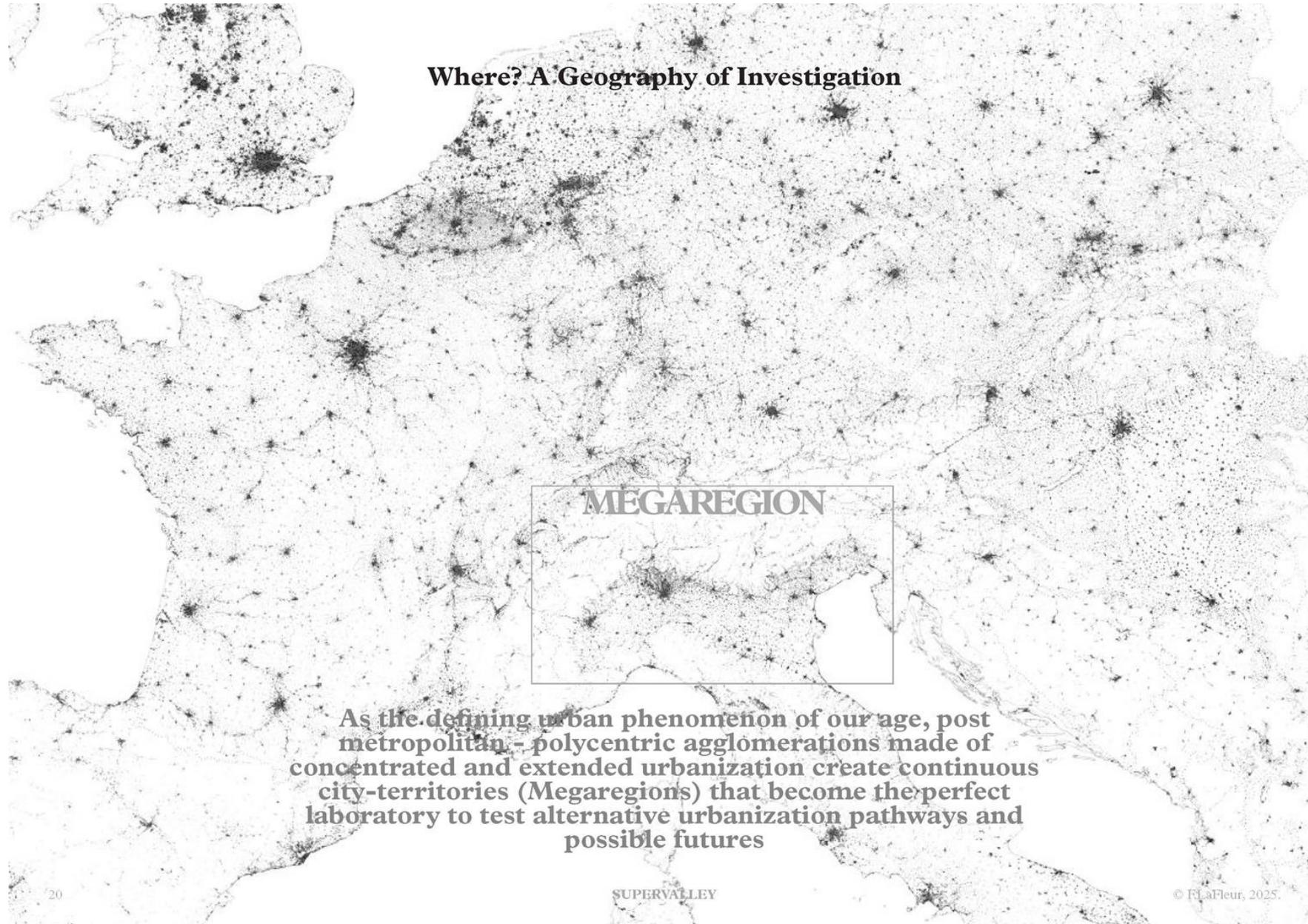
**SUPER VALLEY: SOIL REGENERATION
AND THE ARCHITECTURE OF
THE AGRARIAN SPACE**

FILIPPO LAFLEUR

Research Assistants: Gloria Signorini, Letizia Alderighi, Johnatan Annaboldi

PAYSAGE 19 e 20 giugno 2025 - Triennale di Milano

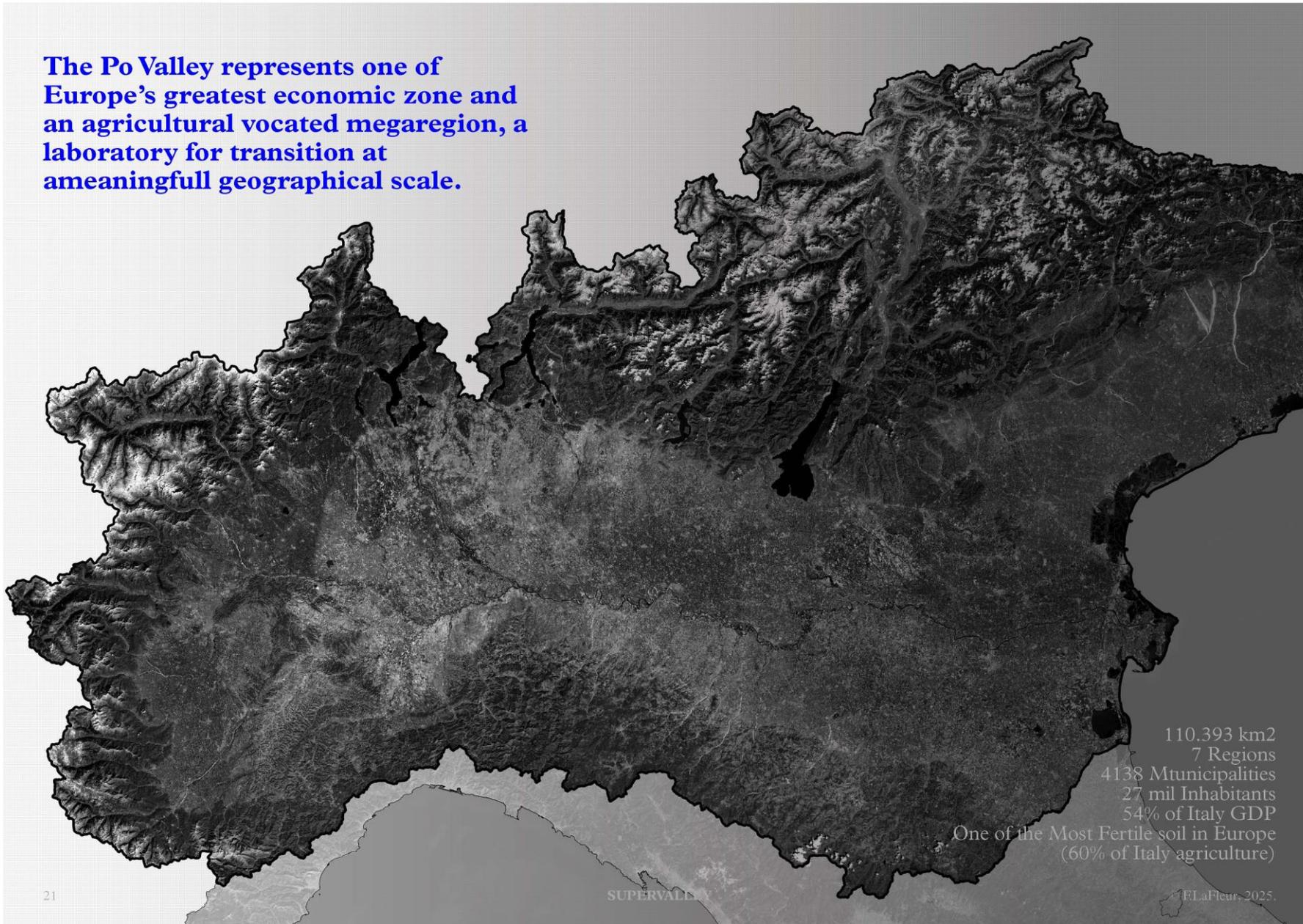
Where? A Geography of Investigation





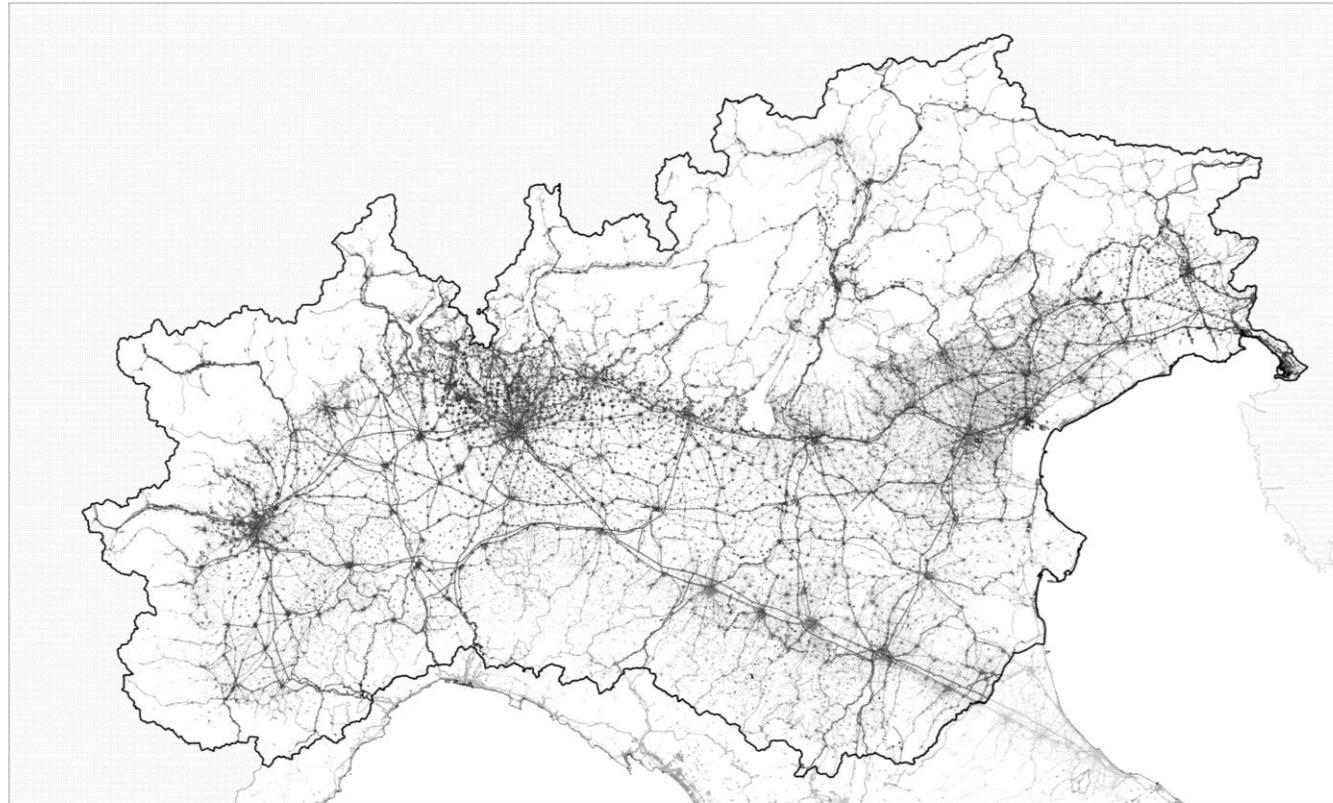
The Po Valley represents one of Europe's greatest economic zone and an agricultural vocated megaregion, a laboratory for transition at a meaningful geographical scale.

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Built Up System

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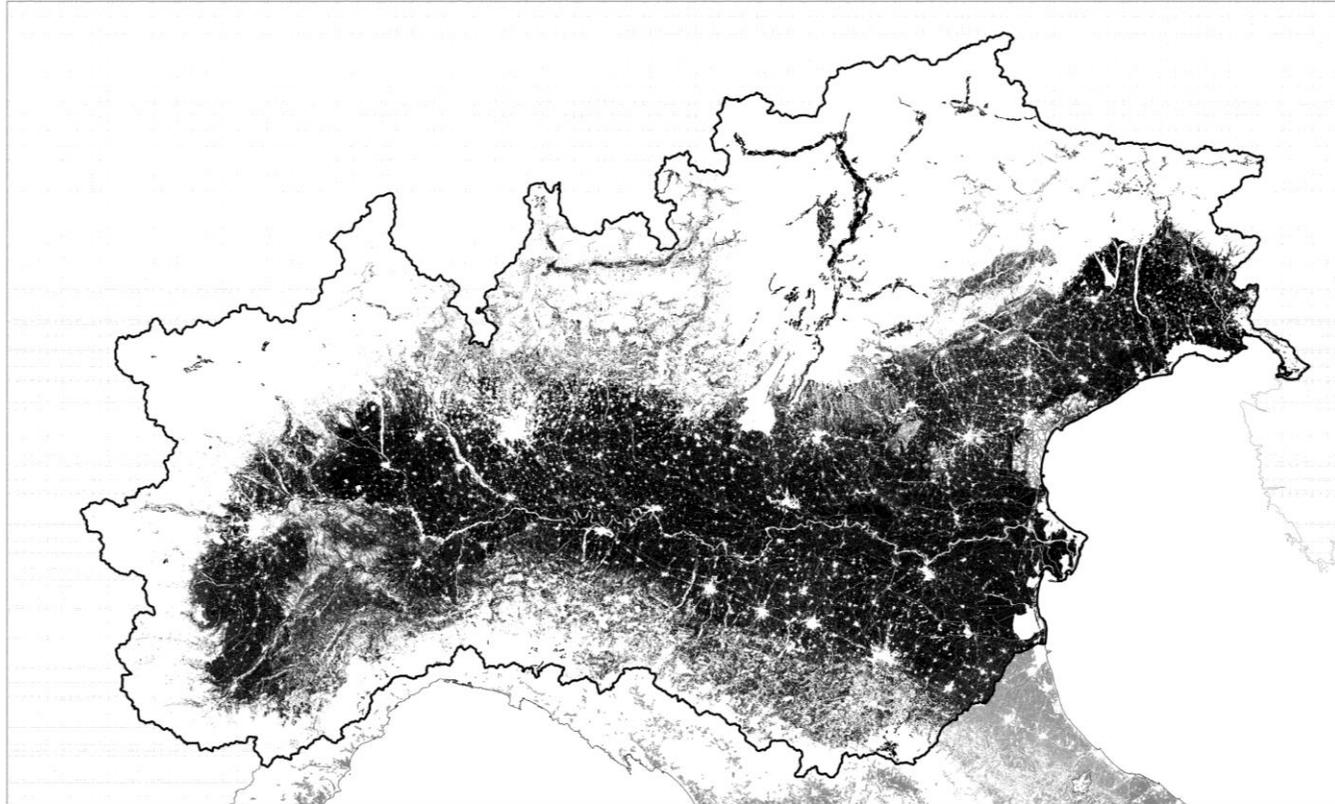


- railway network
- Motorway
- Primary roads
- Secondary roads
- Occupation

7.027 km²

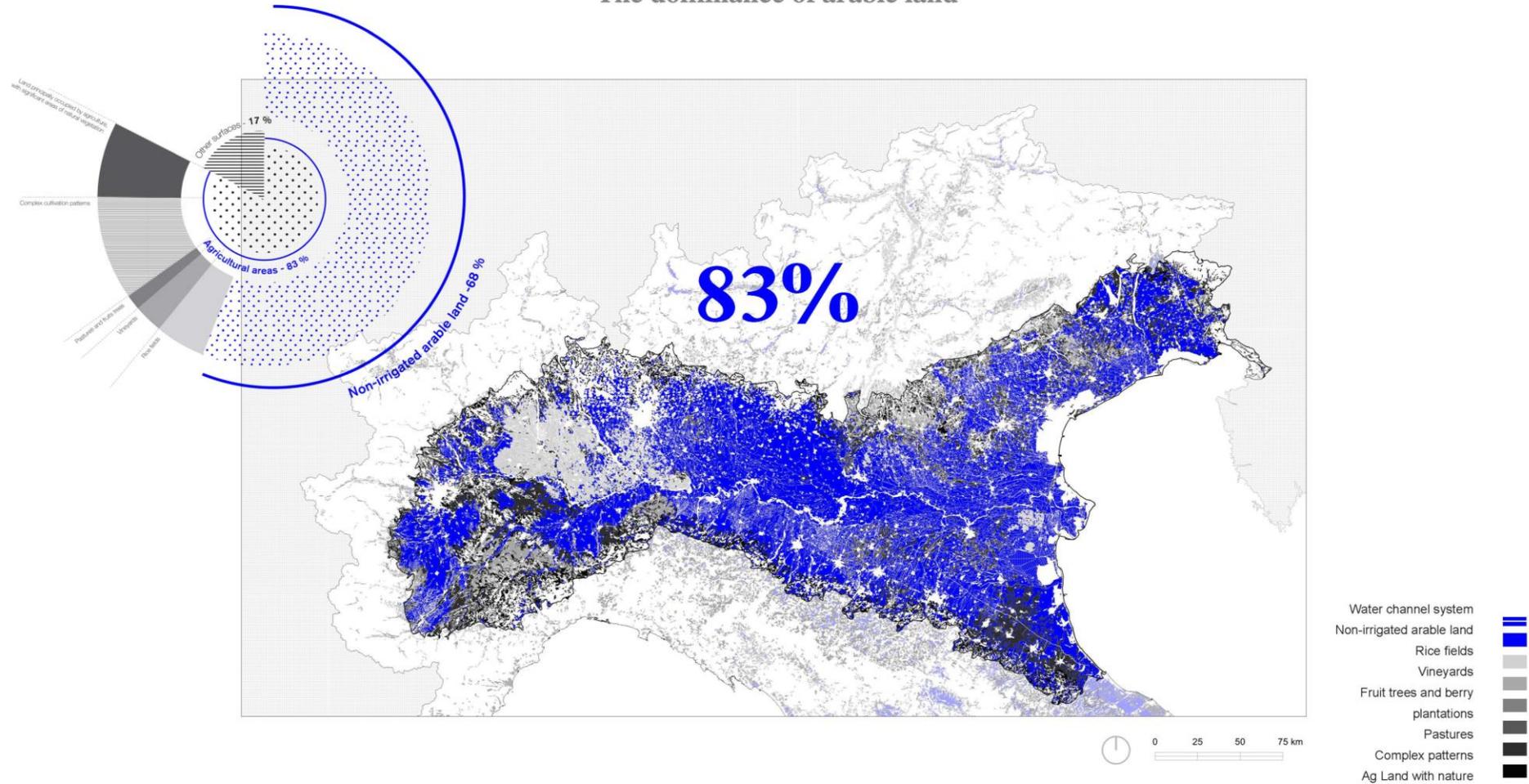
Agricultural System

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49.714 km²

The dominance of arable land



4.925.000 Hectares



Luigi Ghirri





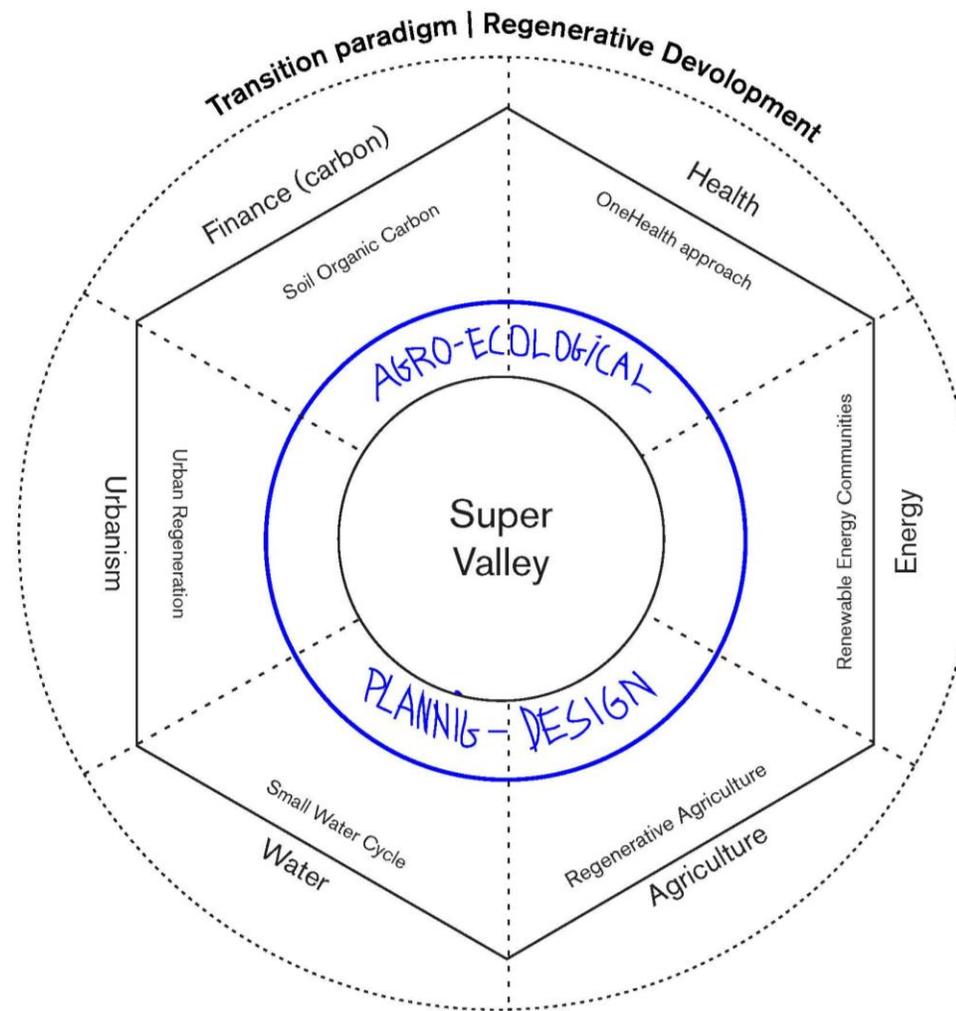


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From Agricultural Desert To Agro-Ecological-Energy Laboratory

ENERGY AS A KEY DRIVER

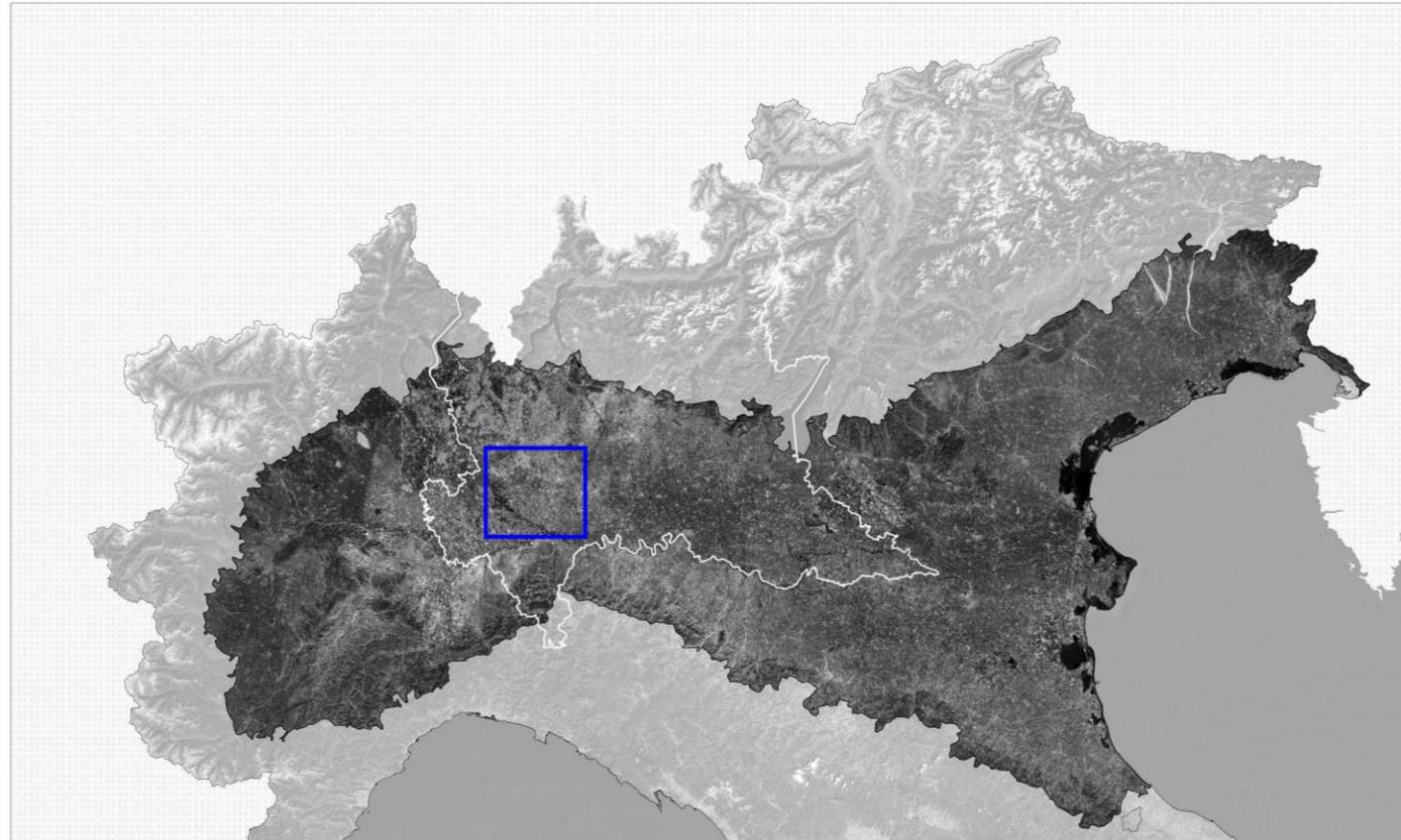
The
enabling drivers of the transition



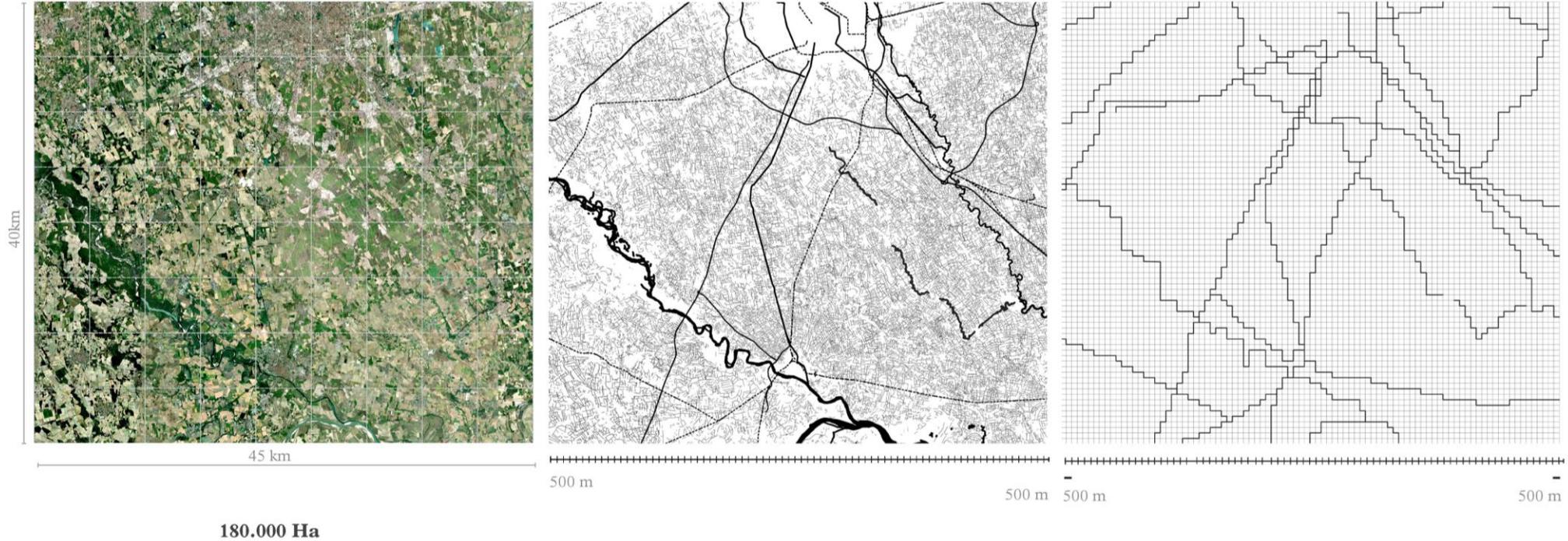
Spatial Application Regeneration Paradigm Manifestation

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A Sample of the plain: Transect Selection



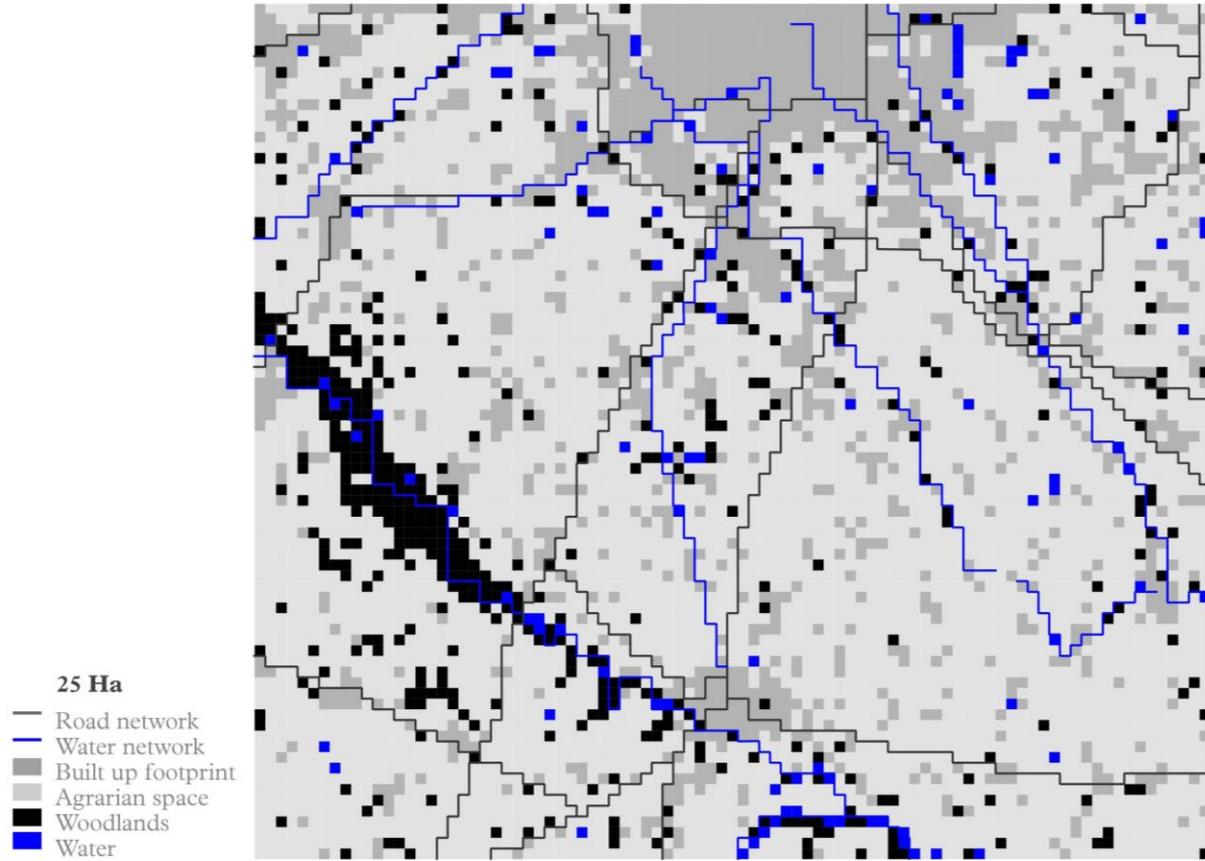
From the territory to a 25 Ha cell (Landscape Unit)



The 5 Elements in a Simplified mosaic of the territory



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25 Ha

- Road network
- Water network
- Built up footprint
- Agrarian space
- Woodlands
- Water

180.000 Ha

142.483 Ha

Agrarian space



Built up footprint



Woodland



Road network

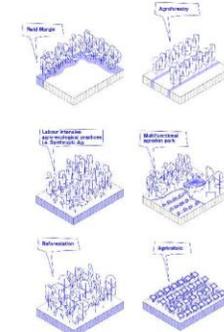


Water network

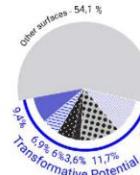
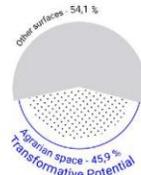
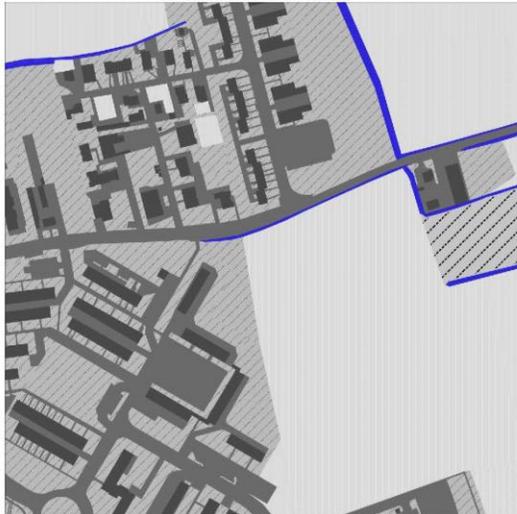
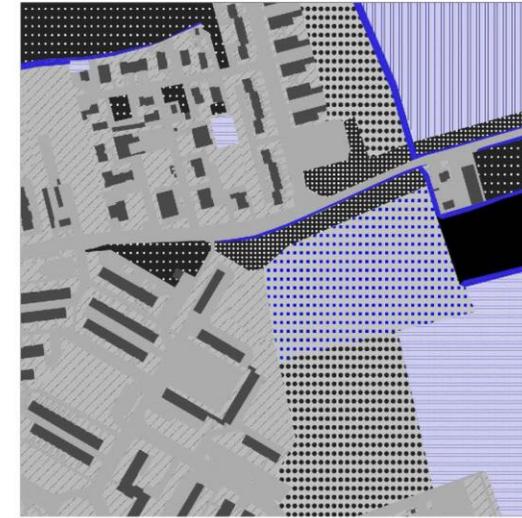


Built-up footprint (urban-rural fringe)

Ecotone



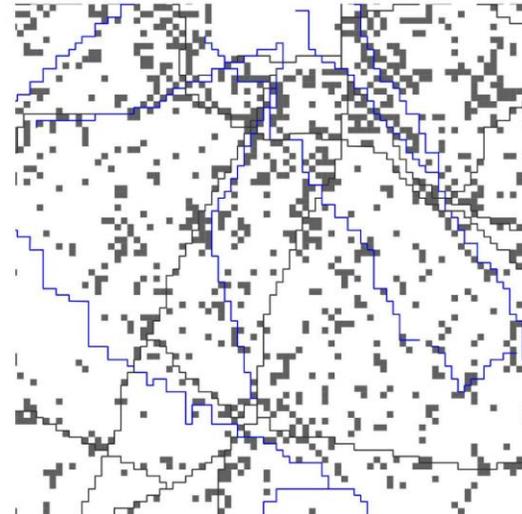
- Spatial grammar elements:
-  Reforestation
 -  Environmental field margin
 -  Agroforestry
 -  Agri voltaic
 -  Syntropic agroforestry
 -  Multifunctional agrarian park



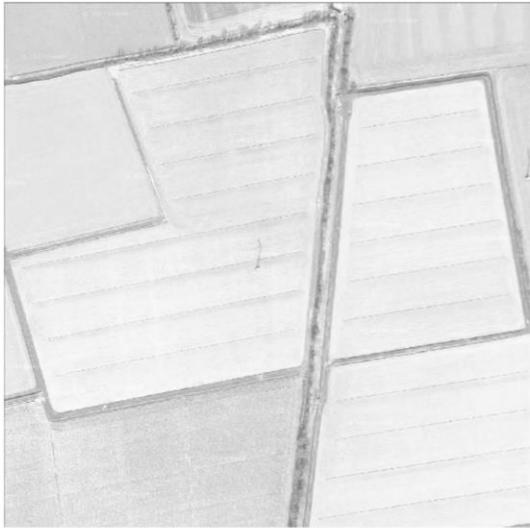
- Woodlands 
- Water bodies 
- Agrarian space 
- Urban green areas 
- Buildings 
- Infrastructure 

25 Ha

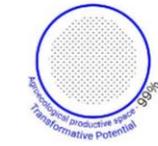
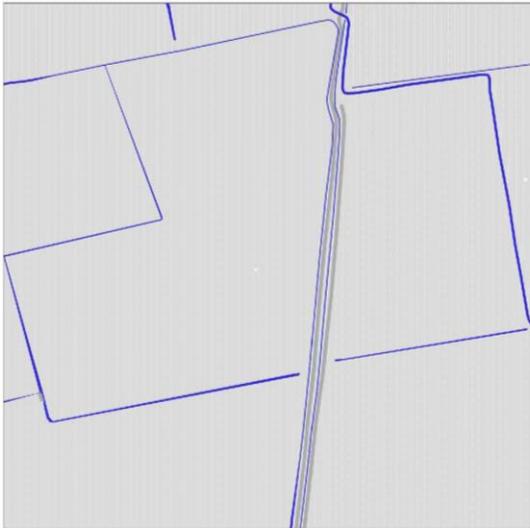
Ecotone
12.983 Ha



Agrarian space

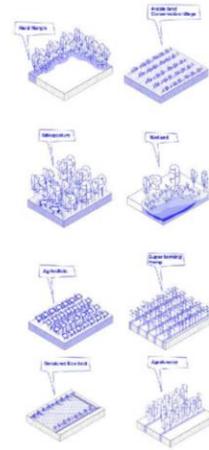


500 m



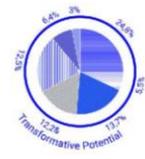
- Water bodies
- Agrarian space
- Infrastructure

25 Ha



Spatial grammar elements:

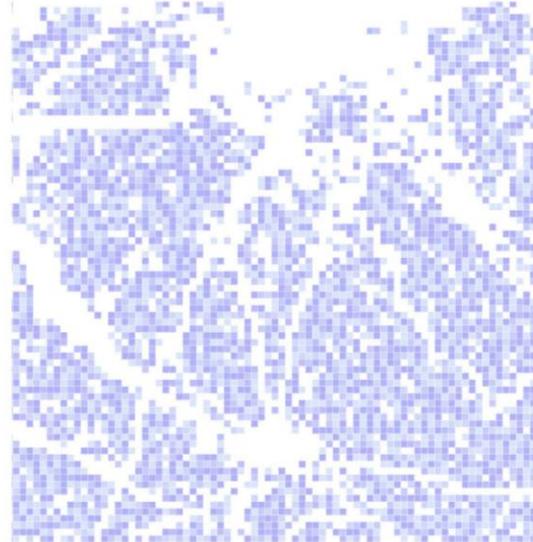
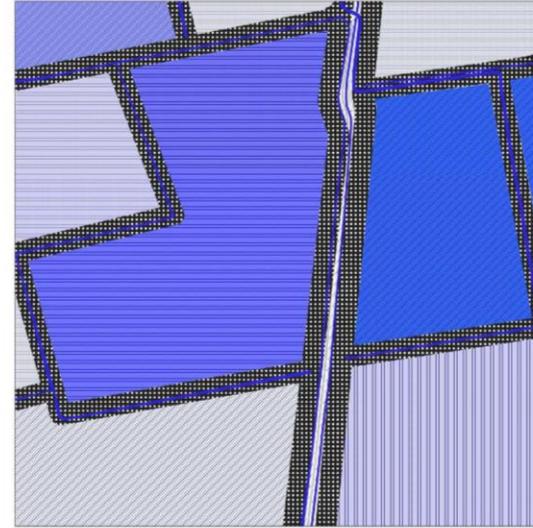
- Environmental field margin
- Arable lands
- Renatured rice fields
- Silvopasture
- Wetland
- Agroforestry
- Agri voltaic
- Hemp



- Agroecological productive surface

109.246 Ha

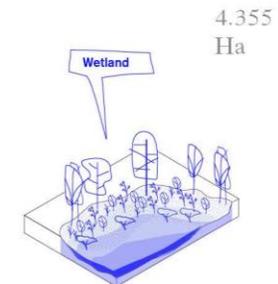
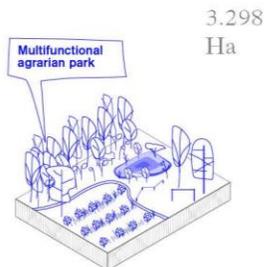
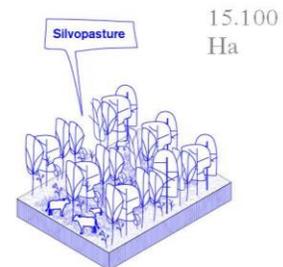
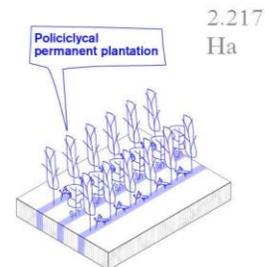
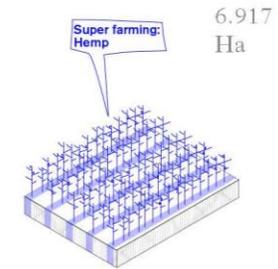
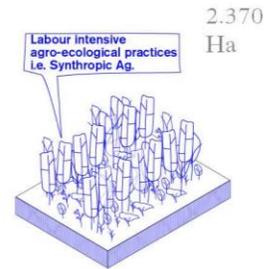
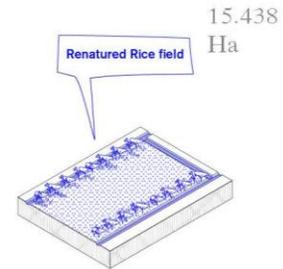
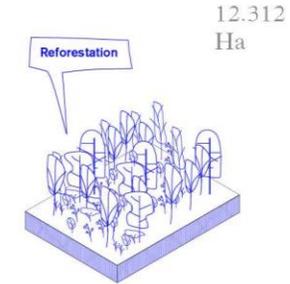
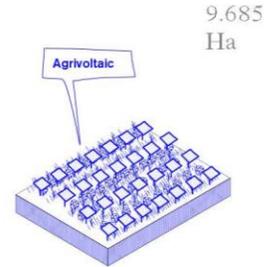
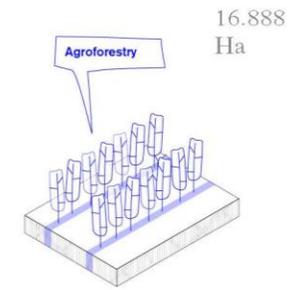
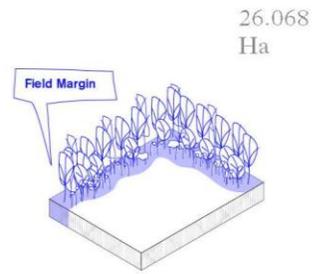
Agroecological productive surfaces



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Elements of Recomposition

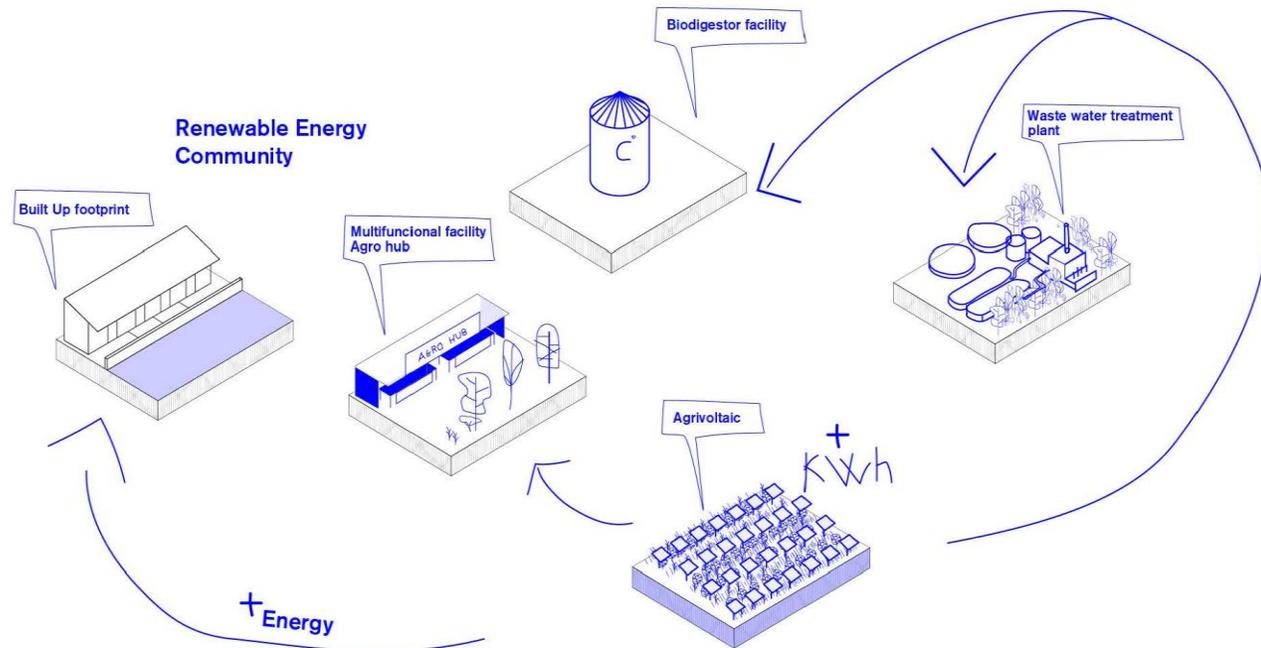
The 9,685 ha represents approx **6 % of the total agrarian space in transition** (142,483 Ha)



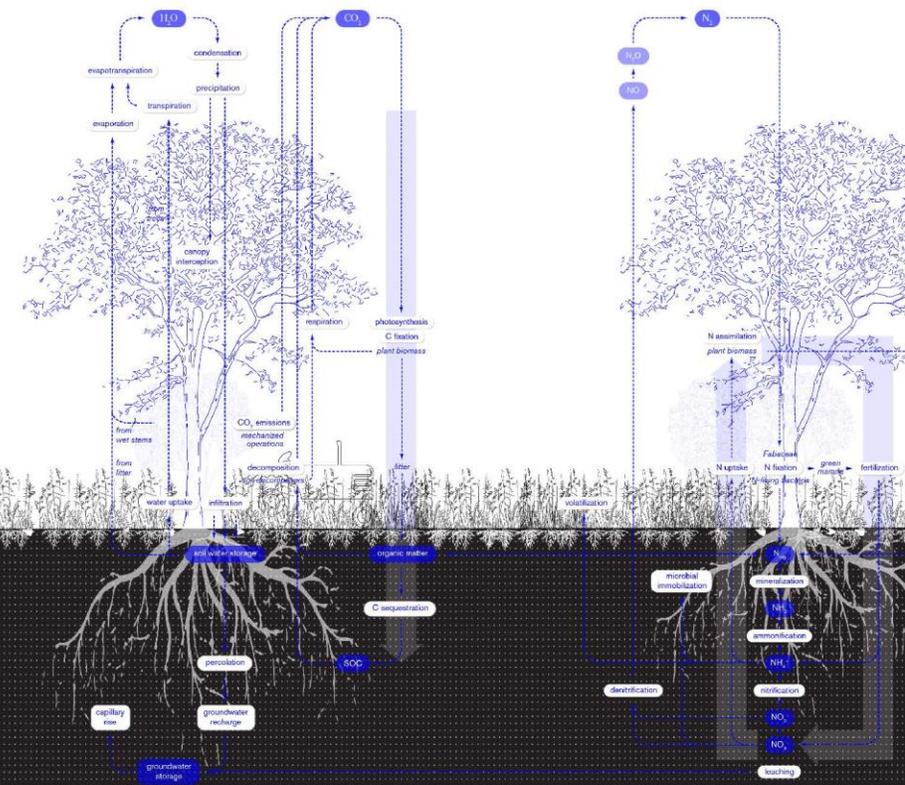
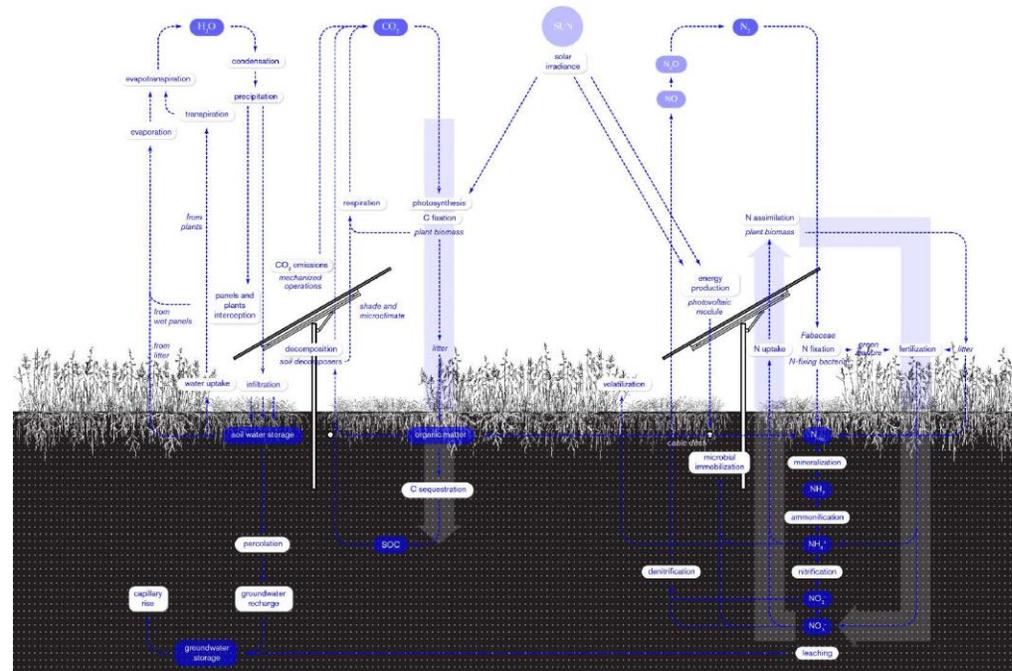
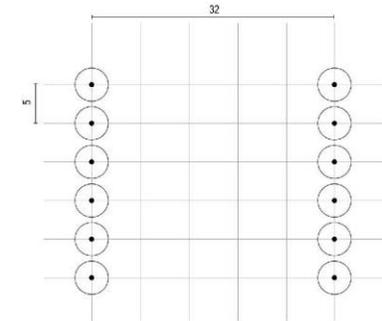
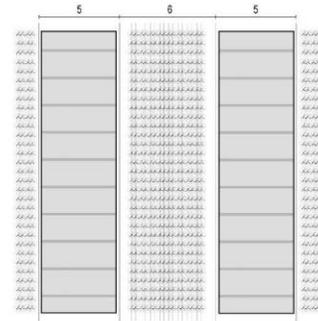
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The Energy Cycle: Energy – food nexus through distributed agrivoltaic systems
KW / Ha

- 9,685 ha (agrivoltaic installations) × 800 kW/ha/year = **7,748,000 kW = 7.7 GW annually**



**+7,7 Giga Watt
Electricity produced / year**





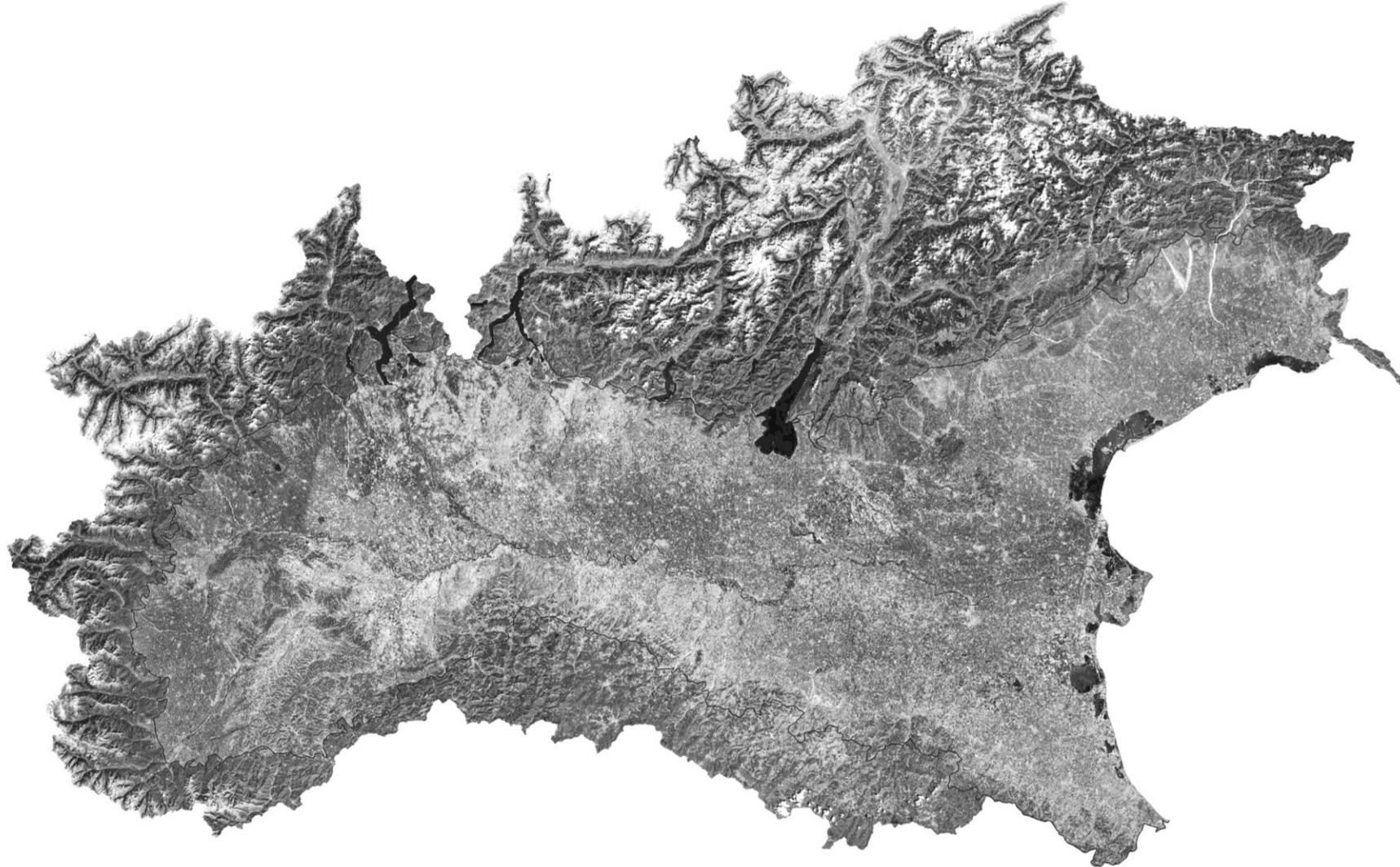


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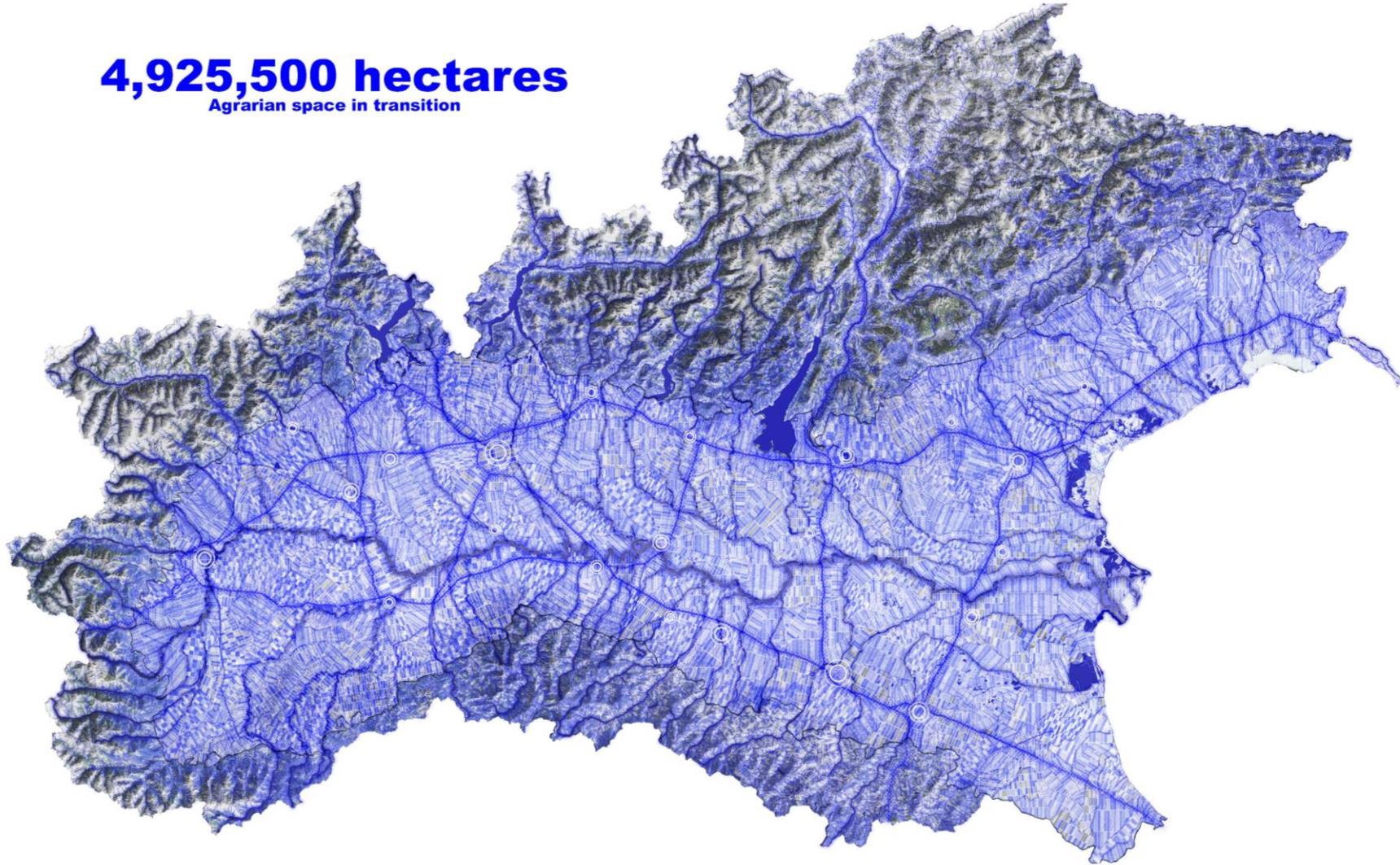
sunenergy



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4,925,500 hectares
Agrarian space in transition



ENERGY

- Renewable energy generation potential
267,8 GW

This output **exceeds Italy's 2030 renewable target of 131 GW**

Equivalent to **134 large nuclear power plants**

The regeneration of soil and of the territory as an Agro-Ecological-Energy landscapes



Nature Positive Energy Landscapes

Castelguglielmo, **Repower**. Case Study
LAND

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Our projects always start with a story

Walking through a scenery, observing and listening to the heart of a place and its community while stepping back somewhat, creates an important understanding of how areas evolve and landscape develop. In fact, every landscape has its own soul and is a mirror of the society, who formed it.

Our approach has its unique style, shaped with generosity and longevity, targeted at the protagonists of the story. This approach enables us to overcome and unite complex and seemingly fragmented landscapes. Only by doing so can we truly develop places.

Our work is multidisciplinary, embracing the uniqueness of every single area, to define a common vision that enables process and follows a strategy.

Our LANDscape architecture offers a response to today's challenges of a sharing society. It never loses sight of the people, the protagonist of our story. So, nature becomes a tangible reality, able to give room to everyone's dreams.

LAND Landscape Architecture Nature Development

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Change of Paradigm: **from NET ZERO to NATURE POSITIVE**

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Paris Climate Agreement
2015

Kunming - Montreal Global Biodiversity Framework
2022

da

a

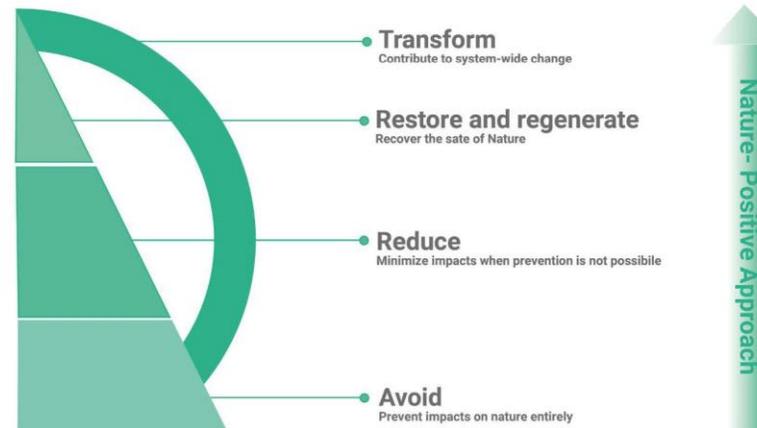
NET ZERO



NATURE POSITIVE

Clima

Natura = Biodiversità = Clima



Source: ARST model da Science based Target Network – SBTN sustainability system

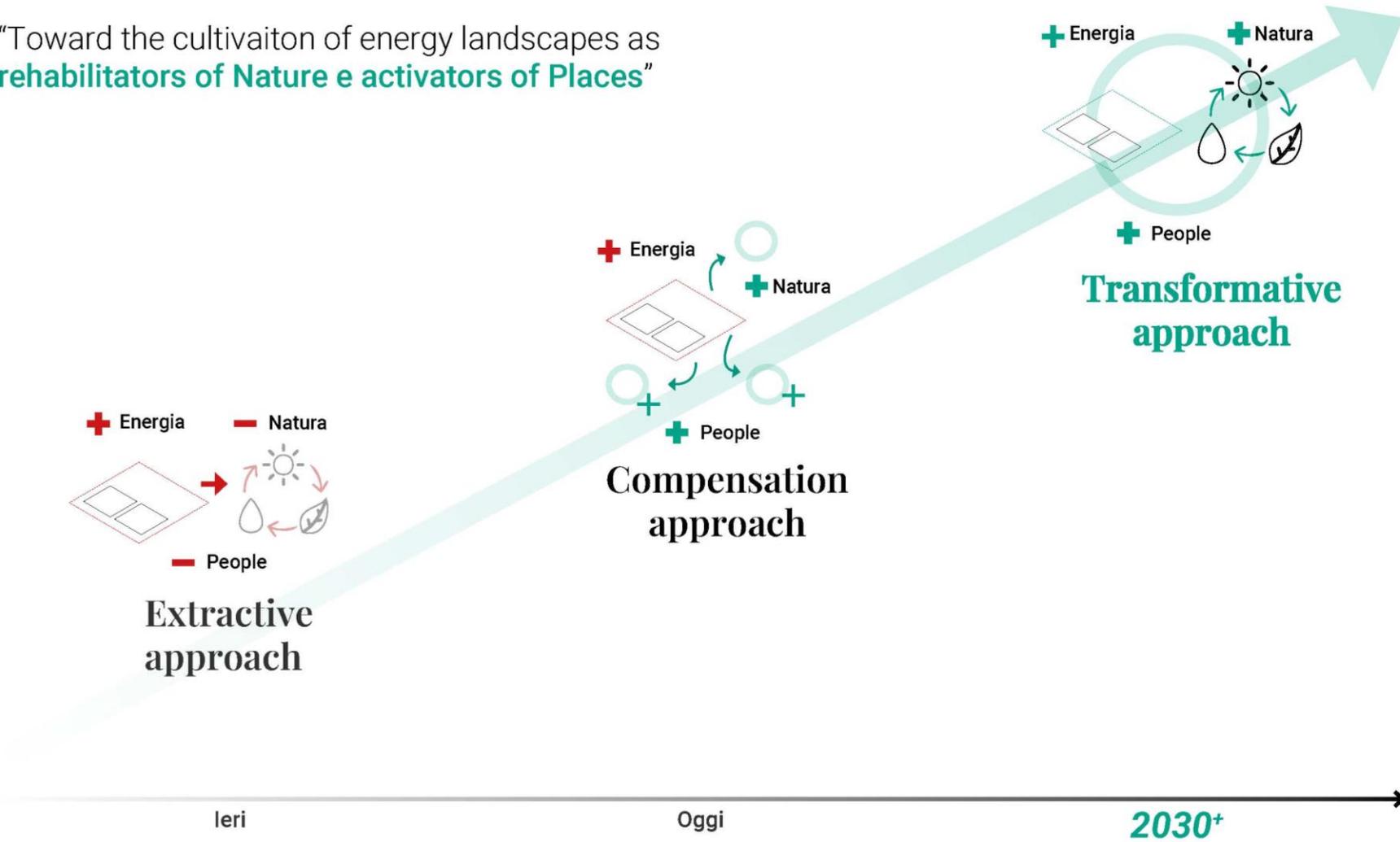


Energy Landscapes within the new Nature Positive Paradigm

From compensation to transformation

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“Toward the cultivation of energy landscapes as **rehabilitators of Nature e activators of Places**”





Toward a concrete project application

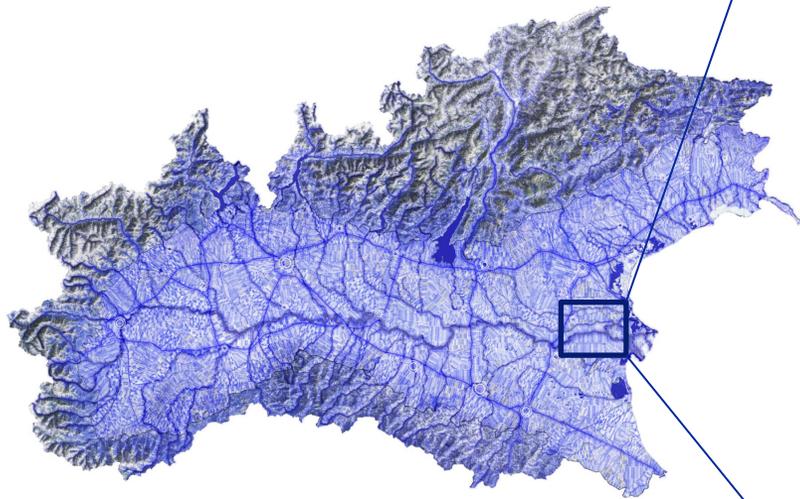
Agrivoltaic power plant in Castलगuglielmo (RO)



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Castelguglielmo
Rovigo



YESTERDAY

TODAY 2013 -

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- 34 HA
- Cultivation of wheat, soybean, protein pea ETC.

• 7,5 MW

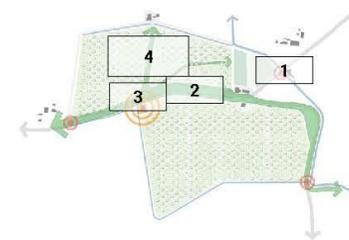


The Repower Plant: an agro-ecological-energy oasis in the Po Valley agricultural "desert"

Energy landscape enhancement through ecosystem restoration, identity and multifunctionality



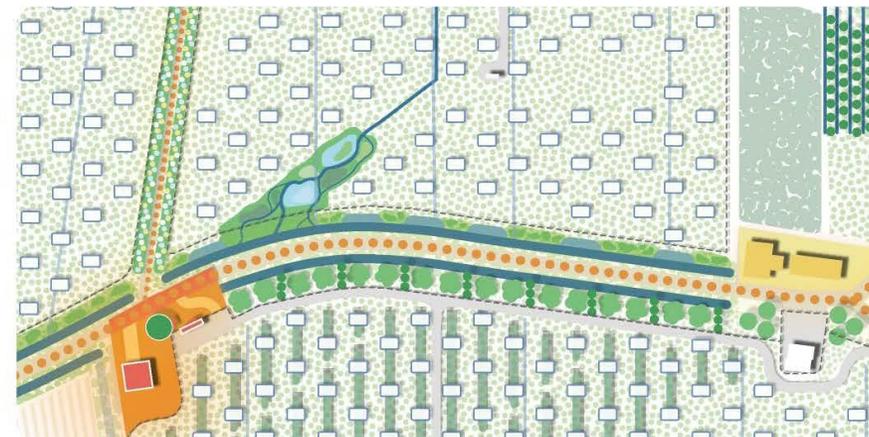
The principal areas of the project



1 - The Threshold: a Highly Recognizable Gateway



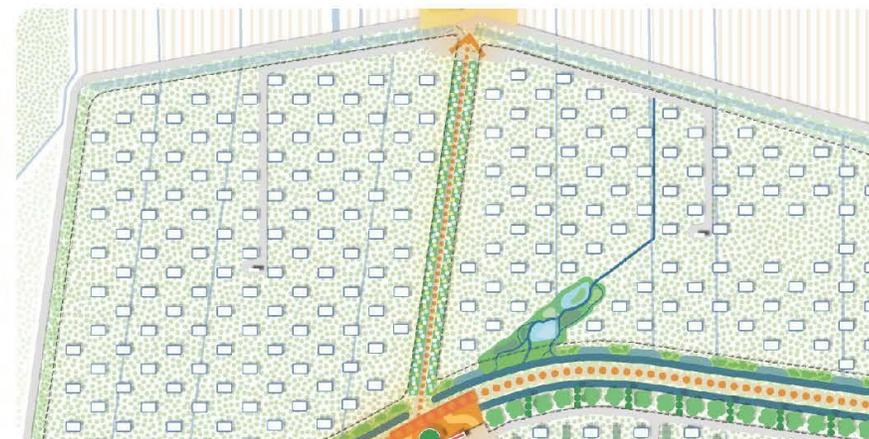
2 - The Central Spine: a New Ecological Infrastructure



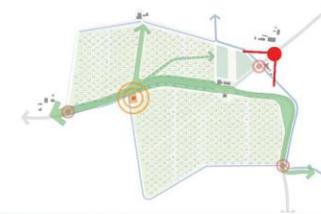
3 - The Square: an attractive place to stop and recharge



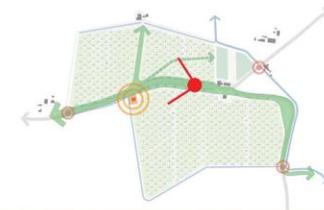
4 - The Farmstead Entrance Avenue: a Colorful Landmark for Pollinators



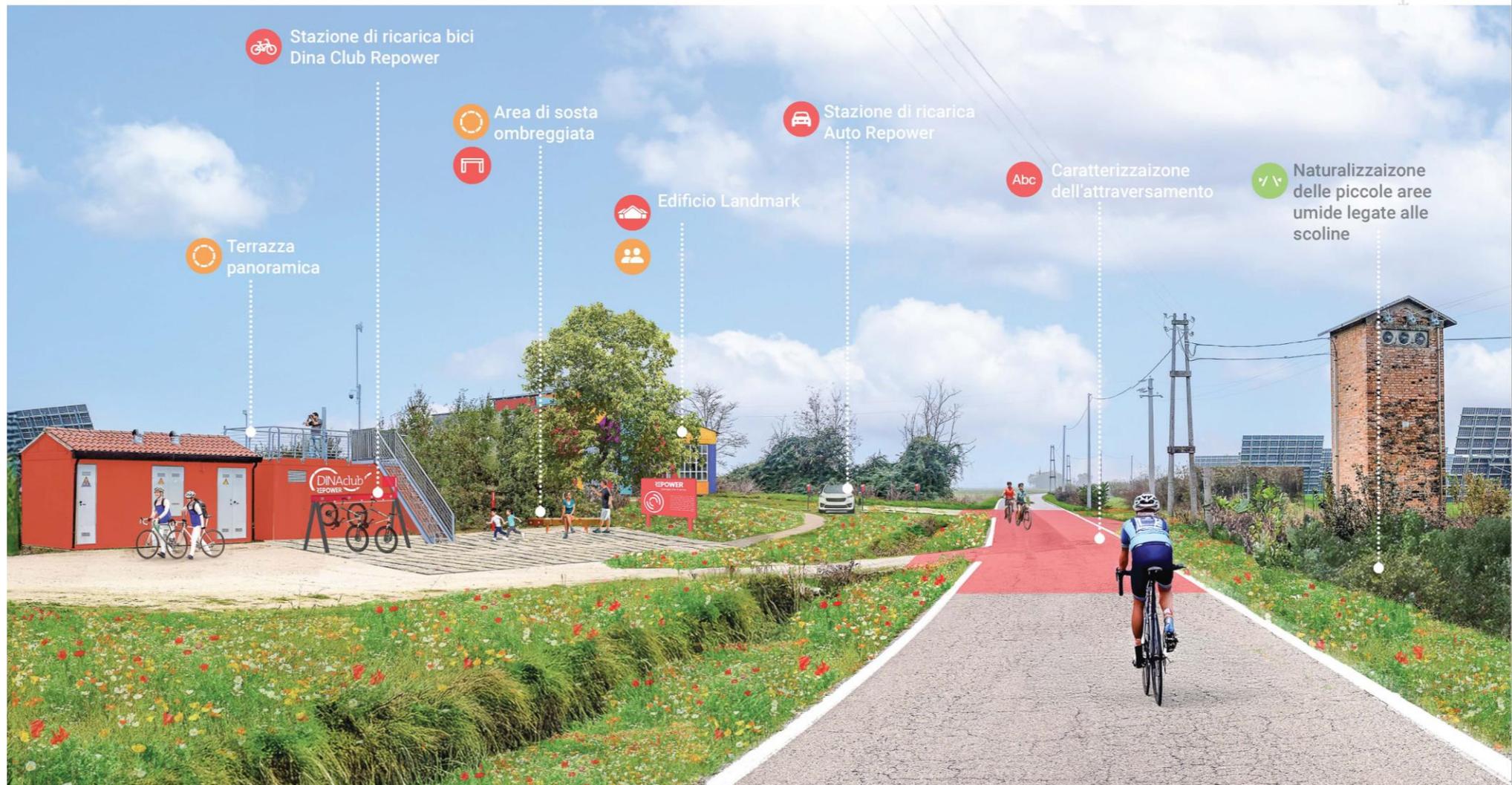
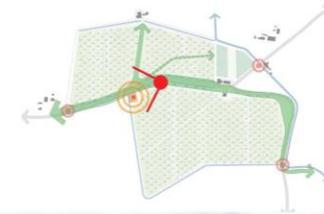
1 - The Threshold: a Highly Recognizable Gateway



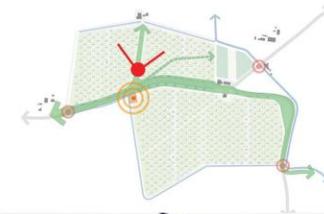
2 - The Central Spine: a New Ecological Infrastructure



3 - The Square: an attractive place to stop and recharge



4 - The Farmstead Entrance Avenue: a Colorful Landmark for Pollinators



Positive Energy Landscape Measuring Framework

KPIs del progetto

Ripristino ecosistemico

- +96 alberi messi a dimora
- +15 specie vegetali
- +0.2 ha di nuove aree umide
- +0.3 ha di nuove aree boscate
- 11 ha di modelli di gestione agricola sostenibile
[pari al 32% della superficie agricola totale]

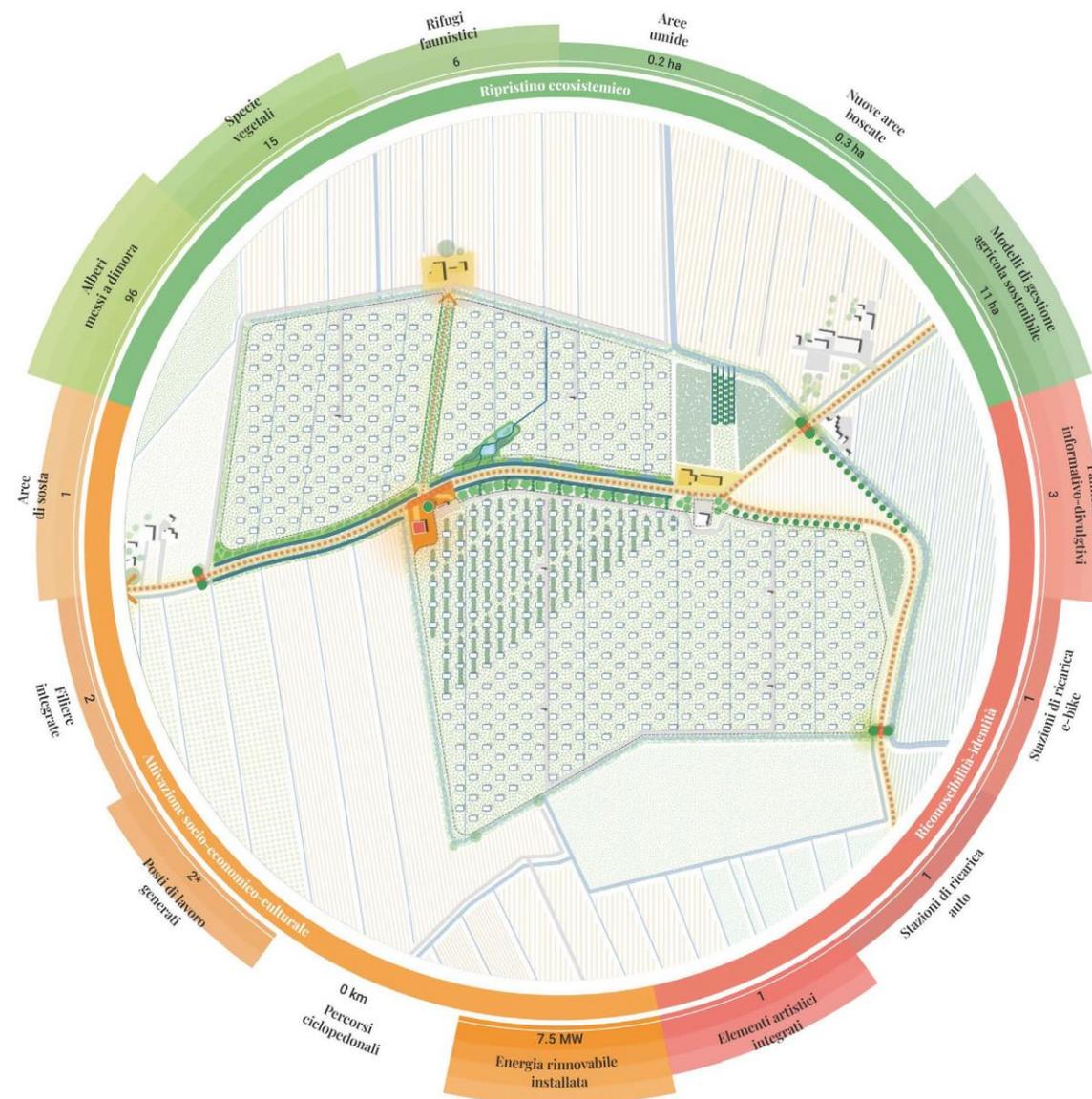
Attivazione socio-economico-culturale

- 1 area di sosta
- 2 filiere integrate
[colture sperimentali di tintorie + apicoltura]
- 2 posti di lavoro generati*

Riconoscibilità-identità

- 3 pannelli informativo-divulgativi
- 1 stazione di ricarica e-bike
- 1 stazione di ricarica auto
- 1 elemento artistico integrato
[call di artisti per la valorizzazione dell' ex essiccatoio]

*NB: I valori specificati all'interno del framework sono stimati in riferimento ad una fase preliminare e strategica, pertanto potranno subire variazioni nel corso delle successive fasi di sviluppo del progetto.





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***NEXT
STEP***



From Vision / Feasibility to Execution - 2026



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Thank you!

[+393894372009](tel:+393894372009)

Filippo.lafleur@landsrl.com

Filippo.lafleur@polimi.it

LAND

This is an initiative of



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