2nd Seminar of the UsinoVerT Chair

"Planning Green Infrastructures for Industrial Cities"

ESALQ-Piracicaba, Brazil & UniLaSalle-Rouen, France

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THE MANY SUSTAINABLE WAYS TO GREEN INDUSTRIAL CITIES - FUTURE RESEARCH PERSPECTIVES

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Theoretical Framework

Territory, City, and Infrastructure

Territory – a socially produced and appropriated space, shaped by the State, capital, and citizens. *(Lefebvre, 1974; Raffestin, 1980; Santos, 1996)*

City – not a neutral or purely physical space, but a living territory where social, political, and economic relations take form. *(Harvey, 1973; Brenner, 2019)*

Infrastructure – the material and political foundation of territories; it connects spaces and materializes political choices that can either reinforce inequalities or foster inclusion and sustainability. *(Harvey, 1985; Santos, 1994; Larkin, 2013)*

And green infrastructures show that the city's future lies in restoring balance — between people (life + job), nature, and the spaces we share.

The Crisis and Contradictions of Industrial Cities

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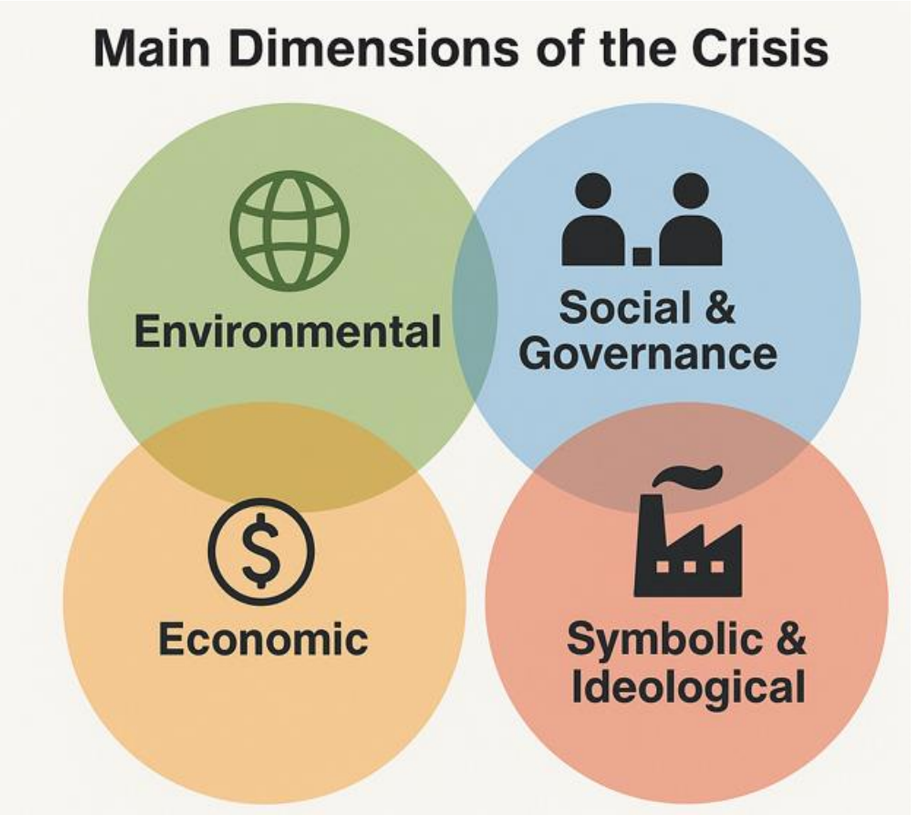
Main Dimensions of the Crisis

🌍 Environmental
Legacy of pollution and degraded ecosystems.
Persistent brownfields and loss of green areas.

👥 Social & Governance
Vulnerable communities exposed to long-term risks and inequalities.
Fragmented governance weakens trust and participation.

🏭 Economic
Industrial decline, unemployment, and unequal redevelopment.
New challenges: technology, investment, green & circular jobs

🏙️ Symbolic & Ideological
Loss of industrial heritage and erosion of collective memory.
Challenge of redefining identity in post-industrial territories.



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Questions of the UsinoVerT Chair

How can the industrial city also become a livable and sustainable one?

- Growing **competition for land**: industry × housing × green spaces
- A **historical conflict** that still continues today
- Need to **balance** production ⚙️, ecology 🌿, and quality of life 😊

How to rebuild trust in territories marked by inequality and environmental risk?

- Legacy of **pollution and fragmented governance**
- Trust built through **transparency, fairness, and participation**
- Requires **shared responsibility** among **citizens, institutions, and industries**

Shared Vision

The regeneration of industrial cities relies on governance, justice, participatory approaches, and collective responsibility, framed within a **new territorial contract** (Brédif, 2022).

Regenerative and Inclusive Pathways

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•Industrial cities require **transformative approaches** that restore both ecosystems and social relations.

•Cities function as **living systems** where ecology, culture, and governance interact.

•Regeneration means moving beyond mitigation toward **repair, inclusion, and renewal (**Mang and Reed, 2012).

•*Regeneration transforms what was damaged into a source of new life and inclusion*, restoring economic, social, and ecological vitality (Roberts & Sykes, 2000).

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Frameworks for Transformation -
Ecological and Territorial Regeneration

GREEN INFRASTRUCTURE & REGENERATION

- Integrating **ecology, heritage, and community** in urban renewal.
- Rehabilitating ecosystems and social relations in post-industrial landscapes.
- **Main mechanisms:** nature-based solutions • heritage reuse • inclusive urban design.

Cases: De Sousa (2025) – Canada & USA; Jayasooriya (2025) – Australia; Kato (2025) – Japan; Chowdhury (2025) – Sweden; Frandoloso & Kurtz (2025) – Brazil / RS.

CIRCULAR LANDSCAPES

- Transforming degraded territories into **productive and resilient ecosystems**.
- **Territorial circularity** links ecological restoration, material reuse, and local identity.
- **Main mechanisms:** adaptive reuse • landscape regeneration • energy and knowledge loops.

Cases: Loures (2025) – Portugal; Laperche & Boutillier (2025) – France; Frandoloso & Kurtz (2025) – Brazil / RS.

INDUSTRIAL ECOLOGY

- Reconnecting **industry, territory, and sustainability** through shared resources and symbiosis.
- Extends the principles of **industrial metabolism** to urban and landscape infrastructures.

Main mechanisms: decarbonization • cooperation networks • territorial metabolism.
Cases: Laperche & Boutillier (2025) –Loures (2025) – Portugal (*bridging ecology & landscape regeneration*).

Frameworks for Transformation

Social, Cultural, and Institutional Transitions

⚖️ GOVERNANCE, CULTURE & ENVIRONMENTAL JUSTICE

Promoting **inclusive and transparent governance** to rebuild trust and ensure fairness.
Links participation, policy, and cultural memory in territorial transformation.
Main mechanisms: co-governance • social fairness • cultural identity.

Cases: Foster (2025) – Canada; Doğan & Battisti (2025) – Italy; Pereira & Silva (2025) – Brazil / SP; Loures (2025) – Portugal.

💡 CO-CREATIVE & PARTICIPATORY FRAMEWORKS

Creating **living laboratories** where citizens, researchers, and industries co-design transitions.
Transforms scientific knowledge into collective territorial action.
Main mechanisms: living labs • co-design • experimentation • adaptive learning.

Cases: Doğan & Battisti (2025) – Italy; Chowdhury (2025) – Sweden; Pereira & Silva (2025) – Brazil / SP.

🗺️ ECONOMIC & POLICY INSTRUMENTS

Developing **financial, legal, and institutional tools** for circular and green transitions.
Main mechanisms: green finance • fiscal innovation • regulatory integration.

Cases: Pereira & Silva (2025) – Brazil / SP; Pin et al. (2025) – France; Laperche & Boutillier (2025) – France.

The Many Sustainable Ways to Green Industrial Cities

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🌍 Diversity of Territories

Each city has its own identity, rhythm, and balance between production, ecology, and daily life— shaped by its own *geohistory*. *(Santos, 1996; Raffestin, 1980, Fabri F. & Sauvée L. (Dir.) (2025)*

🔬 Science + Governance + Participation => interdisciplinary approach

Integrated action that connects research, policy, and community engagement for sustainable transitions.

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The Many Sustainable Ways to Green Industrial Cities

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Territorial Observatory

- Shared data & open indicators
- Continuous monitoring of environmental, social, and economic change
- Builds transparency and collaboration among stakeholders

Strategic Territorial Planning (Guided by Evidence)

- Decision-making based on reliable data and collective learning — turning observation into action.

Territorial Sovereignty

- Empowered local governance leading ecological and social transitions through cooperation and inclusion.

Industrial cities should gain autonomy to lead their own paths toward sustainable and inclusive transformation.

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Future Research Perspectives

Key methodological issues for the research on greening in industrial cities

🔬 **Integrated Dimensions** – environmental • economic • social • cultural • territorial

🤝 **Collaborative Work** – science • technology • governance • communities

⚙️ Innovation **& Research** – advancing nature-based, circular, low-carbon, and AI-powered smart city solutions => for sustainable, low-emission future

Future Research Perspectives

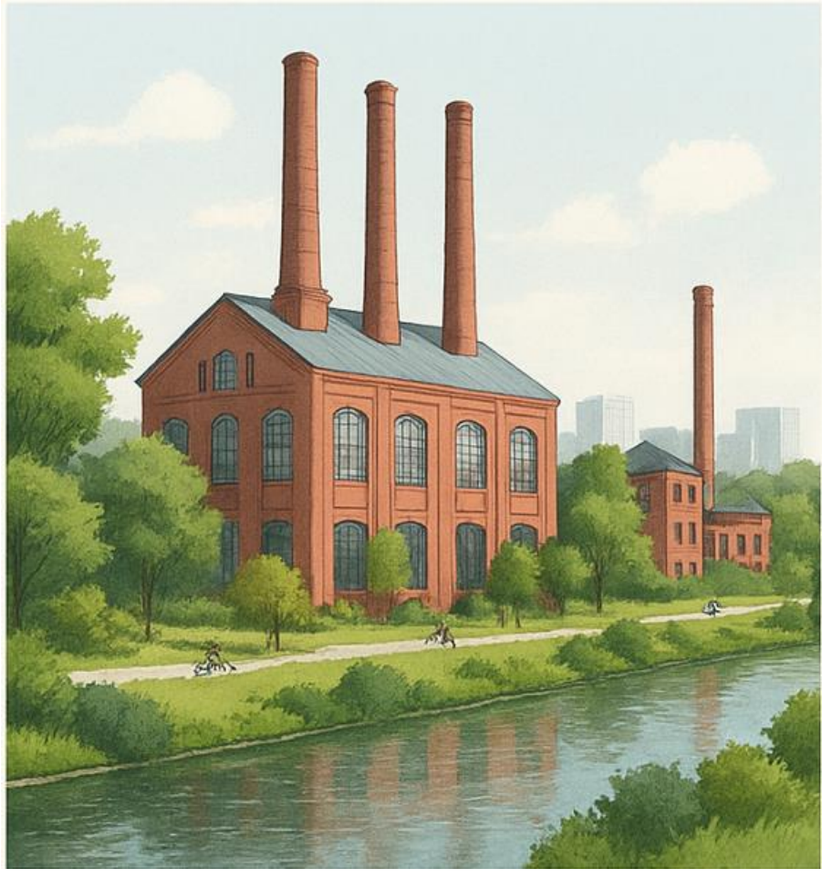
From Observation to Transformation: Building Resilient Territories

📊 Strengthen Territorial Observatories
- Open data, shared knowledge, collaboration
- Strategic planning & evidence-based policy

🌍 Build Resilience to face Global Challenges
- Climate change, energy crises, water scarcity
- Adaptive and thriving territories

🤝 Reinvent Governance Models
- Participatory, transparent, rooted in place
- Rebuild trust and align knowledge with action

🏭 Transform Industrial Heritage
- From past to future
- Foundations for shared, resilient cities (a modern industrial culture)



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