

## Panel 35. Technoscience for (Good) Ecological Transitions: What Spatial Justice?

### Convenors:

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**Keywords: care, ecological transition, green extractivism, operations of capital, space**

In recent decades, the ecological crises of contemporary societies have become so apparent that something needs to be done to stop catastrophes such as climate change. Technoscientific developments are pivotal in the ecological transition mantra. However, they can create marginalized social groups and spaces. Not only philosophers of science and technology, historians and designers but also geographers and other urban thinkers have started to engage with questions of epistemic and spatial (in)justice, while the territorial healing, care and repair perspectives are still in their infancy. Places as productive territories, functional hinterlands, operational landscapes, extractive zones, economic zones, and sacrifice zones are at the core of the study of epistemic and environmental violence, spatial injustice dynamics, and green extractivism unfolded by infrastructures and operations of capital (Mezzadra, Neilson, 2013). The reliance on techno-fix is exemplified by

technoscience innovation related to the strong capital interest in various 'green' markets and 'clean' technologies such as:

- solar parks;
- data centers (requiring technologies with as-yet unknown impacts on water demand);
- logistics hubs (e.g., Special Economic Zones and their borders, or progressive automation resulting in job losses);
- carbon capture and storage;
- critical minerals commodification (e.g., lithium extraction for electric vehicles)

These involve uneven processes, harming and exploiting communities, bodies, and territories they traverse, reconfiguring space and societies in neoliberal terms (Cowen, 2014). This panel points to fostering a multi-disciplinary dialogue around the operations of capital, positioning them as objects of inquiry for researchers in STS, critical geography, economic and political geography, spatial planning, and other fields filling the scholarship lacunae concerning new alternatives opened by care studies (Tronto, Fisher, 1990; Puig de la Bellacasa, 2017), minor studies (Katz, 2017), repair studies (Denis, Mongili, Pontille, 2015) and maintenance as socio-material practice (Jackson, 2014). This session aims to lay the foundations for a discussion that can overcome disciplinary boundaries and bring together distinct concepts and perspectives. We welcome submissions that include, but are not limited to:

- reporting the path-dependency of contemporary technologies, analyzing the role of the State, private investors, and local actors;
- acknowledging the sociomaterial impacts of technologies and their consequences for quality, diversity, and justice;
- exploring formal and informal practices that respond to the violence of operations of capital through (also technoscientific) acts of resistance or subversion from within;
- reflecting on multi-disciplinary approaches studying the socio-material alternatives of these operations (through care, repair and maintenance operations).

The panel is open to presentations of a variety of artefacts (e.g., slideshows, papers, videos, short stories, storyboards, or others). Feminist, minor, queer, crip, decolonial, and more perspectives are encouraged. This session is connected to the research project "New Italian Geographies of Logistics. Between Global Challenges and Policy Responses," which is financially supported under the National Recovery and Resil-



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12 JUNE 2025 09.00 - 11.00

## ID 237 - Energy infrastructures and spatial transformations: The Ravenna Energy Hub, Italy

Leonardo Ramondetti, Politecnico di Torino

**Keywords: energy projects, urban and landscape transformations, infrastructures, port-cities, ecological transitions**

This contribution stems from the ongoing MSCA research Integrating Energy and Logistics Hubs: Sustainable Infrastructure Development in Second-tier Mediterranean Ports at the Interuniversity Department of Regional and Urban Studies and Planning, Politecnico di Torino. The study investigates the redefinition of spaces, environments, and economies in the wake of major European and national investments in logistics and energy infrastructures, with a particular focus on the Adriatic region.

Over the last five years, the Adriatic ports have received over one billion euros from the EU and national governments to modernise their infrastructures (Bodewig 2020; Twrdy and Zanne 2020; Catalano et al. 2022). While most investments prior to 2022 targeted logistics and commerce, the Russian-Ukrainian War has shifted priorities toward energy (Berisha 2023). Current strategies focus on upgrading networks and facilities, diversifying production and supply systems, and accelerating the transition to renewable sources (Falcone et al. 2021). These efforts have spurred a wave of infrastructural projects, driving significant transformations in both inland and maritime spaces. Drawing upon the case of Ravenna, this contribution examines how long-established infrastructural sites are reshaped under the ecological transition mantra, and the challenges these transformations pose to spatial planning.

The port-city of Ravenna, located in northern Italy, provides a compelling context for this investigation. The port was founded by Enrico Mattei in the 1950s as the centre for offshore gas extraction in the Adriatic Sea. Under the impetus of European and national energy policies, the Port Authority, in partnership with local stakeholders, has undertaken several projects since 2020. These are acting on three fronts. First, the production of renewable energy with a 300-MWe offshore wind farm, a 100-MWe floating solar farm, and a 50-MWe energy storage facility. Second, the optimisation of the gas supply chain with a new LNG terminal. Finally, the reclamation of industrial sites and the development of carbon capture storage facilities to stock CO<sub>2</sub> in depleted offshore gas fields. These initiatives aim to position Ravenna as the largest green energy hub in the Mediterranean. However, they carry significant implications for the surrounding environment, including alterations to maritime ecology, changes to the urban landscape through new functions, and increased complexity in the relationship between energy infrastructure, urban spaces, and environmental systems. Furthermore, these transformations are unfolding in a fragile region. The Adriatic Sea is already heavily polluted, and Ravenna has experienced severe flooding over the past two years.

By analysing the energy projects in Ravenna, this contribution reflects on two critical issues: 1) The specialisation of EU green energy policies and funding; 2) The emergence of new energy landscapes and their environmental implications. These reflections aim to contribute to the discussion on alternative planning approaches and methods for achieving a more sustainable integration of energy infrastructures into existing landscapes.



12 JUNE 2025 09.00 - 11.00

## ID 392 - Infrastructure, Injustice and Power. Representing the Belt and Road Initiative

Weibo Mi, Politecnico di Milano

**Keywords: Logistics Infrastructure, Belt and Road Initiative, Territoriality**

As revealed by the topic, in the contemporary world, capital is deeply involved in reshaping the global political and economic landscape through tech-fix approaches. Against this backdrop, an "infrastructure turn" (Dodson, 2017) has emerged as a theoretical and empirical trend. Therefore, this study seeks to explore how tech-fix shapes the quality and justice of territoriality by examining the expansion of a logistic infrastructure on a global scale.

As exemplified, in 2013, China's national government proposed the Belt and Road Initiative (BRI), aiming at enhancing trade connectivity across the Eurasian region. Over the past decade, significant progress was made along the development corridors, including substantial improvements in infrastructure, strengthened trade connectivity, and socio-economic advancements. However, with the deepening impacts of the post-pandemic era and the persistence of global economic stagnation, the declining efficacy and slowing progress of BRI projects have fueled increasingly critical narratives about its future trajectory and scrutinizing the "infrastructure turn".

This study takes BRI as a case, examining the contextualized disparities in expectations across BRI regions and re-evaluating the initiative through a tripartite lens encompassing infrastructure, inequality, and power dynamics (Graham & Marvin, 2001), analyzing the narrative and the several representations of the BRI.

The analysis draws upon a combination of literature review, data analysis, internet-based investigations, and preliminary fieldwork. Firstly, the paper will outline the overarching vision and strategic goals of BRI. Secondly, it will delve into the current situation of infrastructure construction and collateral inequalities. Thirdly, it will explore the complex networks of power entities and actors and locate their roles in the implementation of the initiative. Amid the volatile political and economic landscape, this paper provides a more nuanced understanding of BRI, contributing empirical insights for policymakers and urban planners seeking to navigate its challenges and opportunities.

### References:

Graham, S., & Marvin, S. (2001). *Splintering urbanism: networked infrastructures, technological mobilities and the urban condition*. Routledge.

Dodson, J. (2017). The Global Infrastructure Turn and Urban Practice. *Urban Policy and Research*, 35(1), 87-92.

12 JUNE 2025 09.00 - 11.00

## ID 511 - Value chains beyond corporate control. Investigating logistical interstices in Barcelona

Laura Eccher, Gran Sasso Science Institute

**Keywords: logistical interstices, platform cooperativism, value chain, Last Mile Logistics, Barcelona**

The platform cooperative movement has emerged as a key alternative to the dominant platform economy. In Europe, certain segments of this movement have intersected with the undergoing ecological transition in urban spaces, fostering the development of cooperative enterprises in the urban cycling logistics sector. This study advances the concept of logistical interstices through a grounded analysis of the value chain of a Last Mile Logistics (LML) cooperative in Barcelona. It argues that cooperative value chains are more locally embedded and less oriented toward global scalability. Within urban and digital spaces, LML cooperatives prioritise people over profit, fostering value chains that are more inclusive and accessible to a broader range of actors. Barcelona serves as a privileged vantage point due to the goods distribution sys-



tem implemented by the municipality, as well as the financial investments in cycling logistics enterprises and cooperative economies.

This research uncovers the economic relations that underpin cooperative economies, contributing to a reassessment of the cooperative movement's role and offering new insights into the geographies of capitalism. Specifically, I conceptualise logistical interstices as spaces where operations of capital are reconfigured through diverse practices, creating intersections between capitalist and cooperative enterprises.

This contribution consists of a presentation introducing the concept of logistical interstices and a short film documenting the everyday life of the cooperative LML in Barcelona. Grounded in extensive ethnographic fieldwork, the study employs participant observation, interviews, shadowing, and autoethnography to reconstruct and analyse the cooperative's economic relations.

12 JUNE 2025 09.00 - 11.00

## ID 715 - The Post-Logistic Sacrifice

Andrea Foppiani, Politecnico di Milano

**Keywords:** sacrifice zones, logistics landscapes, Po Valley, post-logistics, ecological renewal

The highly automated and optimized human activities that define logistics are inherently tied to the creation of "sacrifice zones." Logistics, a military-derived discipline focused on spatial organisation and flow management, is fundamentally intertwined with the extractive exploitation of the land. "Logistics landscapes" (Waldheim & Berger, 2008) represent a form of monocultural extraction, a systematic process of resource appropriation that spans centuries of human history, rooted in a quantitative framework that organizes, sacrifices, and transforms human and non-human resources for economic gain.

In its landing on the territory of the Po Valley, such a hierarchy of spaces obliterates other existing forms of land and goods production, sacrificing large portions of permeable ground in the name of a higher profit. Here, fragile rural ecologies are profitably replaced by the "visual order" (Otero Verzier 2019, 119) of logistics developments; the commodification of daily life in our capitalist society continues to imply the commodification of landscapes. Being crushed and sacrificed today, alongside workers' rights, are the survival rights of entire ecologies.

This contribution critically interrogates the ecological potential of an alternative form of "sacrifice." What would occur if the very principle of sacrifice — the spatial ordering and exploitation of land — were reversed? By adopting a post-logistic framework, we can examine the ecological consequences of this shift and reframe logistics not as a finality of land consumption but as an opportunity to leave vital space for new ecologies. In this speculative reimagining, the transformation of agricultural land into logistical zones already contains the potential for ecological renewal, fostering unexpected "assemblages" (Tsing, 2021) that challenge the current condition of extraction and exploitation.

Under a post-logistic paradigm, the sacrificial act no longer pertains to the environmental potential of the land itself but rather to its monocultural use. A fragment of peri-urban countryside does not have to be bound by one unique use defining its large, undistinguished surface: there can be cracks. Along these cracks, a new conception of logistical space is favoured: reversible, itself expendable. This model advocates for a reimagining of logistical space: one that is reversible, adaptable, and, ultimately, capable of returning to ecological cycles.

This paper explores the untapped ecological potential embedded in the Po Valley's environmental and cultural landscape through a series of dismantling scenarios for the components of logistics parks. By shifting the conception of logistics from a system of irrevocable transformation to one that embraces eventual sacrifice and renewal, we can uncover a culturally aware path toward ecological anti-fragility (Taleb, 2013).



12 JUNE 2025 09.00 - 11.00

## ID 797 - Exploring Techno-Adaptation to SLR: Limits and Opportunities of Land Reclamation Practices in the Maldives

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**Keywords:** Adaptation, Land reclamation, Spatial justice, Infrastructure, Maldives

Despite warnings against relying on technology to solve complex socio-environmental and economic problems, techno-fixes remain prevalent, particularly in climate change adaptation. The deployment of adaptation technologies, often framed as disaster risk reduction and socio-environmental adjustments, reveals a persistent view of climate change as an external stressor, disconnected from societal factors. This technical trap (Nightingale et al., 2020) often leads to short-term gains for selected groups and places, exacerbating inequalities for others as well as neglecting non-human needs. Furthermore, it can mask the perpetuation of infrastructure development and economic growth agendas under the guise of climate adaptation, hindering transformative change.

Land reclamation projects, as technoscientific developments that create new land, expand territories, and protect coastal communities and economies, exemplify this issue. While offering potential benefits, they raise concerns about environmental damages (biodiversity loss, pollution, toxic waste) and socio-economic repercussions, including the rise of "sand wars" (Cipriani, 2022). Although expanding habitable land may seem crucial for some low-lying nations, including small island states, reclamation can lead to irreversible environmental and biodiversity changes, socio-spatial marginalisation and emotional distress, challenging its very conceptualisation as an effective adaptation strategy. How, then, can we assess the effectiveness of such projects?

The Maldives, facing an existential threat from sea-level rise (SLR), has embraced land reclamation as a key strategy for coastal protection and development. However, these large-scale projects are profoundly reshaping the archipelago, geographically, environmentally, socially, economically, and politically. The resulting infrastructural development can potentially exacerbate socio-economic inequalities and socio-ecological problems within this rapidly urbanizing island nation.

This contribution, based on a two-year project funded by the NBFC in collaboration with the MarHE Centre (University of Milano-Bicocca), explores the central question: given sea-level rise as an existential threat in the Maldives and land reclamation as a potential, yet problematic, response to international mass migration, how can reclamation be implemented more appropriately and in a sustainable and just way? Using quantitative and qualitative data collected in Magoodhoo, Kulhudhuffushi, and Malé Islands (Maldives), this work examines the complex interplay of environmental, social, and economic factors. It argues for integrated planning approaches that prioritize ecological integrity, community participation, and equitable benefit distribution. Finally, the contribution offers preliminary recommendations for research, policy, and practice aimed at mitigating the negative impacts of reclamation and maximizing its potential for long-term resilience in the face of climate change.

12 JUNE 2025 09.00 - 11.00

## ID 878 - Multiplanetary imaginaries and marginalisation of ecosystemic relationships in space technoscience

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**Keywords:** Multiplanetary imaginaries, space technoscience, ecosystemic relationships

In the so-called New Space Age, deep space exploration projects are developing fast with renewed expectations towards reaching new worlds. Currently, 53 countries have joined the Artemis Accords, the deal promoted by NASA to govern collaborations between private companies and international partners in the



Artemis campaign, the space program that aims to land human crews on the Moon and to prepare future missions to Mars. Space technoscience seeks to transcend the limits of human life on Earth and extend it into outer space, challenging the territorial boundaries of the human species. Multiplanetary life is the "grand challenge" (Konrad et al. 2016) that underlies the imaginary of the NASA Artemis program, which aims to expand the frontiers of the territories inhabited by humans first on the Moon, later on, Mars and beyond. In this contribution, we focus on the NASA Artemis program as a case study to explore the intersections of coloniality, technoscience, and margin. The analysis investigates the phenomenon of space exploration not only as a territorial translation of human life but also as a symbolic and relational production of space (terrestrial and otherwise), as well as the challenges of the technoscience that enables the exploration of space and its use. Through a qualitative analysis of the NASA public documents, the study explores the sociotechnical imaginaries (Jasanoff and Kim, 2017) that underlie research on space missions to identify the power structures in epistemic relations that new space programs are defining. While the "benefit for all humanity" and the Diversity, Equity, and Inclusion (DEI) values are used as narrative devices to legitimate space missions, space technoscience is designing a complex sociotechnical architecture to build multi-planetary infrastructures to colonise other planets thanks to the advancements of autonomous technologies (Campa et al. 2019). If in past centuries the tension towards global expansion has defined the horizon of modernity, in this century these new expansion aspirations are defining a sort of hypermodernism (Latour, 2018) that translates (Callon, 1984; Latour, 1987) the conceptual boundaries within which to discuss environmental issues and scientific visions dominated by the idea of human exceptionalism (Haraway, 2019). However, what emerges from the analysis of the narratives of space technoscience is that the planet Earth, its inhabitants, and the relevant ecosystemic knowledge are left on the margins. Despite the claimed principle of communitarianism (Merton, 1969), space agencies and private companies are negotiating new "enclosures" (Polanyi, 1944) of Earth's orbits and celestial bodies, and the cosmo-colonial and extractivist reasons seem to be the main forces that move the new space economy. Breaking the relationships between humans and the environment that – in an ecological paradigm - define our identities, the new space race could reinforce technoscientific and geopolitical hierarchies creating new processes of dis-embedding between humans, other species, and non-human actors into the cosmos.

