11 JUNE 2025 17.00 - 19.00

Panel 68. Infrastructural Perspectives on Sufficiency Practices and Policies: Exploring the Materialities and Politics of 'Doing with Less'

Convenors:
Olivier Coutard, Centre National de la Recherche Scientifique
Daniel Florentin, École Nationale des Ponts et Chaussées
Claire Le Renard, École Nationale des Ponts et Chaussées

Keywords: Infrastructures; Resources; Sufficiency; Practices; Politics

Within the broader 'material turn' in humanities and social sciences and given the increasing awareness that ours is a constrained world, issues pertaining to material resources have recently gained salience in infrastructure studies. The major role played by dominant forms of infrastructure development and operation in processes of resource metabolization – i.e., their extraction, depletion, transformation, and degradation – for social purposes of all kinds and the associated general deterioration of the environment is increasingly acknowledged (Cahen- Fourot and Magalhaes, 2023). Recent STS scholarship has examined policies and practices of 'doing with less' (i.e., ultimately, with less resource metabolization), which generally involve the discontinuation of socio-technical systems, be they small or large (Goulet and Vinck, 2022).

In spite of this awareness, and at the same time as they foreground resource (esp. energy) efficiency, current infrastructural developments and dominant visions of collective futures — 'low- carbon, smart, and resilient' — tend to perpetuate patterns of intensive resource metabolization in at least two ways. Firstly, they generally involve massive forms of infrastructural accumulation, in which new (smart, renewable energy, local…) infrastructural layers are systematically added to existing layers (Souviron, 2022). Second, they help sustain the illusion that increased resource efficiency preserves the possibility not to question broader patterns of production and consumption and established lifestyles (Shove and Trentmann, 2019).

The proposed session invites contributions that challenge this dominant perspective and consider the material and infrastructural implications of sufficiency policies and practices. Possible themes for contributions include, but are not limited to:

- conceptualisations of how to handle the material legacy of resource-insensitive infrastructural models, such as what are designated as negative commons, infrastructural ruins, or zombie technologies;
- experiences of infrastructure repurposing aimed at radical dematerialization, resource and ecosystem (re)generation, or/involving the redirection away from resource: intensive practices (whether daily-life or organizational);
- knowledge infrastructures equipping or sustaining policies, practices and experiments aimed at a radically lower level of consumption of energy and material resources;
- resource-sensitive practices of care for and maintenance of infrastructure (including emerging frugal digital perspectives) and their organisational, material and political implications.

References:

Cahen-Fourot, L. and Magalhães, N. (2023), 'The accumulation–metabolism nexus: internationalization, labour–capital relations, and material flows of French capitalism since the post-war era', Socio-Economic Review.
Goulet, F. and Vinck, D. (eds) (2022) New Horizons for Innovation Studies. Doing Without, Doing With Less: Destabilisation, Discontinuation and Decline as Horizons for Transformation. Cheltenham (UK): Edward Elgar.
Shove, E. and Trentmann, F. (eds.) (2019) Infrastructures in Practice: The Dynamics of Demand in Networked Societies. London: Routledge.
Souviron, J. (2022). Glazing Beyond Energy Efficiency: An Environmental Analysis of the Socio- Technical Trajectory of Architectural Glass (Doctoral dissertation, Université Libre de Bruxelles, Belgium).

11 JUNE 2025 17.00 - 19.00

ID 316 - Institutionalized infrastructure disruption: the case of composting in Mexico City

Andrea Bortolotti, Politecnico di Milano
Louise Guibrunet, Universidad Nacional Autónoma de México

Keywords: infrastructures, waste management, composting, Mexico City

On 40 hectares of federally owned land immediately outside Mexico City's borders stands what is one of the largest municipal solid organic waste composting sites in the world. The site is located in the area once occupied by the Bordo Poniente mega-landfill, in operation until 2011. Prior to its closure, the diversion of organic waste from landfills had become a priority in Mexico City's waste programs and policies. The goal was to promote source separation of organic waste and the reduction of waste going to landfills. As an alternative to landfilling, the city government has turned to industrial composting, a relatively low-tech, low-cost technique implemented in other cities. However, the infrastructure implemented to metabolize the city's organic fraction soon ran up against the difficulty of managing massive volumes of (poorly) source-separated material and, at the same time, recirculating the product of its processing, compost. Combining data on material flows with information on organic waste management policies and techniques in Mexico City, the paper analyses the critical operation of an urban metabolic infrastructure and its impact on resource transformation. The results highlight how the rhetoric of composting as a controlled and efficient process to produce organic soil amendment from organic waste conceals the problem of contamination at the source with inorganics and the risks of their migration into urban green and agricultural areas. Ultimately, the notion of institutionalized infrastructure disruption is proposed to describe the reproduction of a poorly functioning sociotechnical system that is maintained to avoid much worse collapses.

11 JUNE 2025 17.00 - 19.00

ID 584 - Doing with less while doing more? An infrastructural perspective on second-home living

Hannele Toivonen, Lappeenrannan–Lahden teknillinen yliopisto
Jenny Rinkinen, Lappeenrannan–Lahden teknillinen yliopisto
Sanna Tegel, Lappeenrannan–Lahden teknillinen yliopisto

Keywords: Multi-local living, sufficient practices, metabolisation processes, spatiotemporality

Social practices are spread across different places, shaped by diverse infrastructures of material provision and institutional rhythms. Modern life is characterized and enabled by infrastructures with high metabolic flows, defined by the spatial distances between resource extraction, transformation, waste disposal, and their negative impacts on ecosystems and biochemical cycles (Coutard & Shove, 2024).

Multi-local living arrangements have become increasingly common, with many people inhabiting second homes that are less connected to large-scale infrastructures with high metabolic flows. In these arrangements, resource provisioning – such as energy, water, and food – can depend less on centralized systems. In Finland, and elsewhere in the Nordic countries, a prominent example of this type of multi-local living is the tradition of visiting a summer cottage. Typically situated in rural areas, these cottages are often less equipped than primary homes. Activities at the cottage commonly include berry picking, fishing, repairs, chopping and collecting firewood, swimming, and rowing – practices that exemplify "doing with less". These activities can be characterized by low metabolic flows or, alternatively, as "sufficient practices". While visiting a modest cottage may provide a retreat from daily urban life and an opportunity to engage in sufficient practices, it simultaneously contributes to higher resource consumption, raising questions about the sustainability of such practices. Cottages are more often equipped with electricity and home appliances, and multi-local living tends to consume more resources than staying in a single location.

This paper examines the dynamics between primary and secondary home living, and the arrangements and interrelations of practices with high and low metabolic flow. Using a "zooming-in and zooming-out" approach, the paper analyses material settings and temporalities of practices in different spatial settings. By "zooming-out" the paper identifies sets of practices and their resource use in different spatial settings, enabling an analysis of the similarities and differences between the different ways of living. "Zooming-in" to the temporal duration and sequence of practices provides a more detailed analysis of the organisation of life in different settings. The study contributes to the research on infrastructures and sufficiency by analysing the arrangements enabling sufficient practices and the processes of engagement and disengagement in these practices. It also contributes to practice-theoretical research on secondary spaces. The study aims to offer insight into the interrelations between space, time, resource use, and practice.

Additionally, it seeks to provide a deeper understanding of the conditions that foster sufficient practices and how these are linked to, or sometimes in tension with, other ways of living.

11 JUNE 2025 17.00 - 19.00

ID 597 - Living with less: the politics and poetics of technical sobriety

Morgan Meyer, Mines Paris – PSL

Keywords: bricolage, technology, low-tech, sobriety

Wood, raw earth, textile, recycled objects, home-made tools: different kinds of materialities are prominent in contemporary discussions about frugal and ecological lifestyles. My paper looks at these materialities and the practices and politics they entail.

The specific gestures that make up these practices are manifold, including sawing, welding, grinding, painting, screwing, fermenting, gluing, and so on and so forth. As such, this bricolage is not something new: do-it-yourself has become a social phenomenon in the 1950s and 1960s, with dedicated shops, tools, magazines, and programs. By the end of the 1990s and early 2000s, there has been a second wave of institutionalisation of do-it-yourself, with the emergence of new spaces - FabLabs, makerspaces, etc. - and new tools. What we observe today, compared to these historical precedents, is a rather strong entanglement between bricolage and ecological concerns. Actors involved in low-tech projects – using raw earth for construction, living in low-tech wooden habitats, handling self-constructed tools on a daily basis – narrate their relationship with technology as a means to care about nature and the environment.

These low-tech projects require knowledge-intensive networks and infrastructures. Considerable efforts are put into the making and sharing of wikis, tutorials, and other kinds of documentation and repositories, as well as the organisation of traineeships, workshops and courses. The idea is not just to do bricolage at home, on an individual basis, but to build collective spaces to share knowledge. These knowledge infrastructures have a variety of political aims: to demonstrate that bricolage is ethical and feasible, but also that it is fun and desirable. My argument, in short, is that experimentation and construction go hand in hand with demonstration and narration. Scholars need to capture both the politics and poetics of technical sobriety.

11 JUNE 2025 17.00 - 19.00

ID 606 - SLIGHTLY ELECTRIC

Fabrizio D'angelo, Università Roma Tre

Keywords: urban planning, energy efficiency, energy sufficiency, energy consumption

Urban environments consume vast amounts of the world's primary energy, not only for large-scale processes, but also to support less evident and fragmented domestic activities. Inf act, residential sector – at least in Europe – accounts for a quarter of total final consumption, with more than half used for indoor climate control. To address this disproportionate consumption, EU policies and Western design cultures

support the "efficiency" paradigm, interpreted as the technological modernisation of housing systems (e.g., high-efficiency HVAC, thermal insulation, LED lighting, energy monitoring systems, etc.). Conceptually, efficiency refers to the property of a process to use energy "better" by improving some conditions, but this does not necessarily imply a reduction in consumption. In this interpretation, energy is considered just a resource supplied in response to a non-negotiable demand and, consequently, treated as a standardised commodity quantified in agreed units. If energy consumption is a standard outcome, then the space in which it occurs is completely neutral and tread as a support to "place a machine". This neutrality consequently affects architectural and planning practices, unable to design energy solutions within specific socio-spatial dynamics and characteristics. For all these reasons, is increasingly evident that efficiency policies are not universally suitable for all contexts and all people. For instance, there are limited application in existing buildings, often subject to stringent regulations, fragmented into multiple ownerships, and equipped with technological configurations hard-to-retrofit. Furthermore, supporting financial instruments have primarily benefited the upper-middle class such as homeowners and users with stable incomes and financial capacity, excluding a large social component.

At this point, it is possible to assume that efficiency alone is not enough and may even be revealed as an inequality driver. New visions are needed, and paradoxically, they could come from those contexts that "resist" these policies, where constraints and inertia force thoughtful solutions within limited means, based on the smart management of energy devices and particularly attentive to prioritising and thus understanding energy needs. This approach speaks more about social practices and local contexts than technologies and financial instruments. It overturns the passive role of the users in favour of a more active role as inhabitants who understand and manage their energy services. All this aligns with the concept of "energy sufficiency", which focuses not on improving energy consumption performance but rather on mitigating the conditions that create the demand.

Based on this assumption, the proposed contribution presents the initial findings of an ongoing research project titled "Electro-Domestic Landscape" based on the neighbourhood of Ostiense in Rome. Using mixed methodologies, including cartographic representation and interviews, and employing various tools such as draws and maquettes, the research explores the influence on energy practices of domestic and urban spaces and local climatic conditions, particularly concerning comfort management. Many workshops conducted with inhabitants in their homes, as well as experiments on energy mitigation devices in public spaces, are providing qualitative insights, constantly balanced between transcalar perspectives and considering contextual aspects that may seem apparently unrelated to energy.

11 JUNE 2025 17.00 - 19.00

ID 740 - Exploring the machinic and experimental regimes of bodies towards sufficiency practices

Grégoire Wallenborn, Université Libre de Bruxelles

Keywords: social practices, ontology, machines, bodies

Modern practices are deeply intertwined with machines that save human labour and time. Since the nineteenth century, productive practices, and since the mid-twentieth century, domestic practices have been both quantitatively and qualitatively expanded through the use of machines. The environment has been progressively shaped, particularly through infrastructure, to alleviate human bodies of various tasks. However, the extensive delegation of tasks to machines is unsustainable, both in terms of the power and metals required, leading to what Halloy (2024) terms "zombie technologies."

To address the critical issue of sufficiency practices within new material configurations, I propose a model that represents energy flows within a system grounded in the theory of social practices. This model identifies two primary energy-consuming entities: machines and bodies. We utilize indeed two forms of energy: biological energy, sustained by a vast network of agricultural surfaces, and mineral energy, primarily derived from fossil fuels since the early 19th century. Biological energy is the energy of our bodies, derived

from other living organisms, and is a resource humans increasingly rely upon. Mineral energy, on the other hand, is composed of various metals, cables, pipes, and machines, and its consumption involves significant metal usage for transportation and consumption. The imperative of sufficiency thus necessitates new arrangements where the role of machines is diminished.

My approach is rooted in a specific interpretation of the theory of practices, where energy demand is described through the interaction of bodies and machines connected by infrastructures. Bodies and machines are considered the fundamental entities of a practice ontology, where energy demand is explicit because they are the active agents. This activity is driven by energy consumption, predominantly exosomatic in contemporary practices (Georgescu-Roegen, 1971). Activity occurs due to energy consumption but is not merely energy use; it takes place within specific social configurations connected through material flows, redistributing materials and products. I term this configuration an "assemblage," comprising bodies and machines that convert energy and material flows. Any activity involves the transformation of energy and can be situated within an assemblage that traverses multiple production-consumption chains, through which energy and durable goods circulate.

In the ontology of practice, bodies and machines are intertwined, requiring the alignment of their unique properties and sometimes blurring their distinctions during an activity. A key feature of assemblages is the distributed agency between bodies and machines. Bodies possess a dual capacity: they can function similarly to machines and material objects, and they can also be affected and oriented towards experience. In its mechanistic aspect, consumption involves the use of resources to reproduce activities. However, in its affective and experiential dimension, consumption produces new relationships, performances, and achievements. In my contribution, I will elaborate on this distinction between the mechanistic and experiential regimes of bodies to envision configurations for sufficiency practices. It will be based notably on research about heating practices, in which I observe that bodies play a crucial but neglected role.

11 JUNE 2025 17.00 - 19.00

ID 754 - Materiality of resistance to doing with less in the energy transition

Tom Cronin, Danmarks Tekniske Universitet
Julia Kirch Kirkegaard, Danmarks Tekniske Universitet

Keywords: Energy, sufficiency, infrastructure, resource, Power-to-X.

Most countries are in the middle of, or embarking on, a process of transforming their energy infrastructure, the main motivation being the need for decarbonisation in order to limit the threat of climate change. In the process of this transition, there are typically three overall strategies that are prominent: substitute carbon fuels with energy from other (preferably renewable) sources; use energy more efficiently both in processes and end uses; and limiting the consumption of energy, sometimes referred to as sufficiency. Our interest is in the socio-material barriers that sufficiency meets in practice when infrastructures undergo (or are predicted to undergo) radical transformation. In this, we use the case of Power-to-X technology (PtX) in Denmark, on which has been pinned high hopes of decarbonising energy-consuming sectors. PtX uses renewable energy to produce green hydrogen, which is then further converted to e-fuels, fertilisers and plastics, amongst other products, to further tackle hard-to-abate carbon emissions. Powerful imaginaries have formed in recent years around PtX from politicians and industry, as e.g. evidenced in energy scenarios depicting the expected energy future, and predicting a rapid increase in the use of PtX and the required exponential rise in energy production from renewables. Critical voices, however, argue that PtX may just perpetuate intensive resource metabolisation, continuing business as usual, rather than making way for energy sufficiency and pathways to 'doing with less'. Based on document studies and interviews with officials in the Danish Energy Agency, we follow energy scenarios related to PtX and the narratives surrounding them as they participate in creating a dominant vision of a collective PtX future founded in a valuation of energy efficiency: PtX is namely predicted to increase energy efficiency by optimising wind power production so more energy can be produced from a finite wind resource in order to 'feed' into PtX production, and is predicted to be able to overcome the issue of otherwise 'wasted' excess wind power

that cannot be transmitted to the power grid to be used for PtX production instead. Further, we show how PtX technology is attributed with value as it can seemingly help to repurpose existing infrastructures such as natural gas pipelines and build upon existing transmission lines by justifying the addition of costly high-voltage direct current (HVDC) networks that can efficiently transport renewable energy across long distances. While argued to provide a silver bullet for solving cross-sector decarbonisation, energy efficiency hereby appears to trump concerns for energy sufficiency. Rather than being framed as a technology for energy sufficiency, PtX promotes continued growth and consumption. Based on our findings that PtX produces infrastructural accumulation and adding to existing layers, while concerns for sufficiency are marginalized, we discuss how PtX helps to avoid asking questions of how to 'do with less'. Our paper thus contributes to the literature on sufficiency as we detect a number of the socio-material resistances to infrastructural change for embarking on the path to sufficiency, displaying some of the materialities and politics of 'doing with less'.