Job offer: Two Post-Doctoral Contracts

Université Gustave Eiffel in Paris/Marne La Vallée opens two post-doctoral positions within the project conducted by LISIS, Interdisciplinary Laboratory on Sciences, Innovations and Societies (http://umr-lisis.fr/) entitled

City Sustainability: form 'de facto' via 'proactive' to 'transformative' innovation policies

And managed by Mireille Matt (LISIS), Matthias Weber (LISIS and AIT) and Philippe Larédo (LISIS and MIOIR, University of Manchester).

(see text attached for a short project description)

The positions are for two years, starting September 2020.

The location is split between Paris (LISIS) and Vienna (AIT).

Candidates need to have obtained their PhD with a specialisation either in urban studies (and in particular Urban planning) or in innovation policy studies, with demonstrated interest to the other domain.

Candidates need to be fluent in English and at least in one of the two national languages French and German.

Candidatures should be made of a detailed CV, a motivation letter and one relevant publication (book chapter or journal article). They should be addressed to Mireille Matt, mireille.matt@inrae.fr

Deadline of application: June 12th 2020

Urban sustainability: from 'de facto' via 'proactive' to 'transformative' innovation policies

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Background: What kinds of transformative challenges are we talking about?

There are different types of transformative changes under way that need to be addressed by policy, driven by combinations of disruptive technological developments as well as societal concerns about the sustainability of socio-technical systems (of provision). Transformative change often implies an ambition to reconfigure these systems through system innovations (Geels, 2005), i.e. changing both their components and their architecture (Henderson and Clark, 1990).

Policies affecting these transformations are implemented at different policy levels simultaneously. Urban policy (and governance) is particularly relevant in areas, where local competencies can be brought to bear. Mobility, energy supply, waste management or food supply are typical examples where urban policies play an important role, and where urban policies strongly shape the demand-side of these system by way of regulation, public procurement, and planning.

In other words, urban agglomerations are often the arenas where many of the forces of change come together and are in need of coordination. Transformative innovation in cities needs to be seen as embedded in their regional context (Coenen, Raven and Verbong, 2010; Hansen and Coenen, 2015; Dignum *et al.*, 2020). This is most obvious in the case of mobility, but also of growing importance for food and other materials supplies (e.g. construction materials); cities are the inter-sections of a wide range of such material flows.

In terms of innovation policy, cities as administrative entities have tended to play a secondary and less visible role as compared to European, national and regional policies until recently, and it is certainly true that major structuring elements of research and innovation systems continue to be driven at these higher levels. New research-based innovation opportunities either emanate from private or public research-performing organisations. Other kinds of innovation, such as social, organisational or business model innovations, tend to be nurtured in local milieus. With the growing interest in the co-shaping and co-design of new transformative solutions that integrate supply-side (S&T-driven) and demand-side/contextual (i.e. organisational, regulatory, social, behavioural) contributions, as well as with the need for more integrated solutions (e.g. mobility/energy nexus), urban agglomerations move increasingly centre stage (Bulkeley *et al.*, 2016; Raven *et al.*, 2019). Some cities have therefore

not only intensified their innovation policy efforts but also sought *new and more comprehensive approaches to urban innovation policies*.

This raises three questions, namely:

i)   how to conceptualise this new generation of urban innovation policies?
ii)   what examples of this new generation of city innovation policies can we observe empirically, and how can we systematise them?
iii)   what kind of advice can we give, and to whom, on differentiated "good practices" of governing, designing and implementing this new generation of city innovation policies?

Conceptual framing: Moving from "de facto" to "proactive" and "transformative" innovation policy

From Paris to Tokyo, from London to San Francisco, all metropolitan areas, as well as most mid-sized cities have developed and develop a multiplicity of activities (Castán Broto and Bulkeley, 2013) to address persistent societal problems such as climate change, loss of biodiversity, inequalities, resource depletion. Resilient, sustainable or smart cities have developed experimentations in a wide spectrum of domains such as mobility, energy, water management, greening, waste management, food supply to support sustainability transitions and generate transformative changes (Bulkeley and Castán Broto, 2013). Smart cities encountered a digital revolution with the proliferation of connected ICT technologies and platform (Carvalho, 2015) that reshape the social and material life in cities and beyond and serve their sustainable and social objectives (mobility platforms supporting the use of common transportation, collective bikes, etc.). This 'platformisation' widely transforms access to goods and services by inhabitants and visitors (tourists becoming in many cities a major dimension of urban economic life).

The alignment to the Paris agreement by multiple cities, even in countries that did not sign it or rejected it, corresponds to the idea, that:

- global problems may also be, or even better addressed at the local level ("think global, act local"), (Diercks, Larsen and Steward, 2019)
- the balance in the search for solutions is shifting from the all-technological (e.g. turning cars electric) to solutions that require changes in practices and thus entail a strong social and organisational dimension,
- solutions are an issue of multi-facetted change, dealing with new practices, new infrastructures, new ways to deliver certain services, and a reconsideration of the ways these can be developed (through participation of, and co-creation with people who are at the same time inhabitants, citizens and users).

Urban agglomerations thus face transformative change and get involved in problems and activities that have been associated for a long time with European, national or regional policy levels. The aim of 'upper level' transformative innovation policies (Schot and Steinmueller, 2018) is to overcome transformational system failures (Weber and Rohracher, 2012) and not only optimize existing market and innovation systems. They imply new modes of governance where 'policy arenas' involving all stakeholders play a central role in building alignments (such as shared visions of the future) and compromises (in particular about what counts and who should be involved) (Kuhlmann and Rip, 2018). There are consequences in terms of relevant

'policy mixes' that will involve a portfolio of experimentations rather than classical R&D subsidies or pilot projects, manage different time horizons, and articulate different levels of democratic representations (from the urban to the European Union level).

There is a striking difference when we compare what operates at the State level and what happens in cities. It does not lie in the absence of innovation-geared activities. Participative developments and forms of co-creation with inhabitants and/or their 'spoke-persons' (mostly from civil society organisations) is more important at the urban level than at State level. The difference lies in the governance of such experimentations (Bulkeley and Castán Broto, 2013), nearly always located in the sectoral departments, driving to a strong fragmentation of initiatives and measures (Bulkeley and Kern, 2006).

The current situation is comparable to that at State level in the 1960s, when different approaches were pursued in sectoral policies and in emerging research policy in terms of conceptualising and anticipating future change. It led to a progressive separation between 'sectoral' departments that deal with the present-day situation and its optimisation (what is called 'incremental' or 'cumulative' innovation) and one department dedicated to supporting the production of knowledge and 'options' for the future, with evolving terminologies over time – science, research, technology and/or innovation. This separation has proven lasting, even if more recently, inter-departmental linkages are considered critical to address 'societal challenges'.

We make a first overarching hypothesis that we shall witness a similar dynamic at urban level, and that cities will progressively move from 'de facto' innovation policies to 'pro-active' innovation policies. In fact, several cities have made that step towards proactive innovation policies already.

However, we also argue that cities need to go further than just being more proactive in the current situation. Proactive policy of the kind pursued at national level for many years is not enough for addressing major societal challenges, and to address them quickly. Proactive and resilient planning approaches have also become more widespread at urban level in recent years (Brunetta *et al.*, 2019), but cities should overcome the separation of innovation policy from sectoral policies and move to more integrated and harmonised policies to foster transformative change. The problem of isolated, albeit "proactive" innovation policy lies in the very narrow policy mix (discrete forms of interventions such as specific buildings, demonstration projects, tree planting schemes) mobilised, and in the 'paths' considered, mainly focusing on social experimentations and innovations, and ending at best with a pilot or demonstration activity that in most cases is not pursued further.

A key question for innovation policy is how to move pilots and demo projects from individual cases of novelty creation to wider uptake or generalisation of innovations. For innovation to become widely employed, actors need to be able to mobilize scaling, replication and generalisation mechanisms. The most common mechanism that helps accelerate the uptake of innovations are economies of scale and scope, leading to cost decrease and multiple benefits. Learning from users is yet another such mechanism. In order for innovations to be transformative (e.g. in the sense of a techno-economic paradigm shift), (Freeman and Perez, 1988) suggest that it needs to fulfil a number of specific conditions: i) clearly perceived low and rapidly falling relative costs, ii) apparently unlimited availability of supply over long periods, and iii) clear potential for the use of the new key factor (or innovation) in many products and processes throughout the economic system.

In the context of system innovation and especially for urban agglomerations, many of these well-known mechanisms from the world of product and process innovations are not sufficient. This has to do with the nature of innovations in the urban context, which, for instance, may well have a strong social dimension, implying that collective benefits/goods rather than individual economic returns are sought, and where sharing rather than competition is crucial. Often, there is only one infrastructure system in place, with limited room for testing alternatives. Competitive mechanisms that often ensure that the "best" solutions come to dominate the market are thus often lacking as continuous pressure for improvement. Other improvement mechanisms thus need to be found to enable learning as one pre-condition for improving new systemic solutions in the urban context.

The deliberate creation of spaces and niches for experimentation can be a first step, aiming to learn with and about the interaction of different facets of innovation, from technology to behavioural to policy. The sharing of experiences among cities and urban agglomerations, for instance, can be a powerful mechanism to drive both learning processes and replication/adaptation dynamics. For (Loorbach *et al.*, 2020) translocal networks enable the development and diffusion of local initiatives to form transformative innovations. These translocal networks facilitate the exchange and translation of shared ideas, objects and activities across different contexts

Inspired by research on social innovations (Rehfeldt, D., Schartinger, D., Weber, M., Rhomberg, 2017) and sustainability transitions (Naber *et al.*, 2017), there are further mechanisms at play to underpin the generalisation and institutionalisation of new solutions that could drive system change in cases where common or public good characteristics matter. For instance, social innovators are often willing to share their innovations freely with others (at least as long as it does not threaten their "local" business model). Digital platforms can be a quite cheap mechanism to accelerate the generalisation of (social) innovations. "Top-down" regulatory measures can also be a powerful instrument to support the generalisation of innovations.

However, scaling and generalisation alone are not enough to help govern transformative system change in a "desirable" or "sustainable" direction. There is a continuous need to adjust a transformation path along the process of its unfolding to changing circumstances, opportunities and knowledge. Processes and mechanisms of reflexivity can be useful to achieve a common orientation and help facilitate coherence of strategies and actions of a variety of actors and stakeholders along a sustainable transformation pathway. According to (Voß and Kemp, 2006), five principles should guide the design of reflexive governance, namely i) integrated transdisciplinary knowledge production, ii) adaptivity of strategies and institutions, iii) anticipation of long-term systemic effects of action strategies, iv) iterative participatory goal formulation, and v) interactive strategy development.

We thus suggest a second overarching hypothesis that we shall also witness first instances of truly 'transformative' innovation policies as the adequate response to sustainability challenges at urban level, as a second stage of development beyond 'proactive' innovation policies, and that these transformative innovation policies will be characterised by pronounced reflexive mechanisms to foster and support generalisation dynamics.

Working hypotheses

If the two overarching hypotheses on 'transformative urban innovation policies' are followed, we propose five more operational working hypotheses that cities should witness changes in five core aspects, relating to the two stages of policy development sketched above:

Regarding stage 1:

- *Structuring elements of innovation system:* the situation may differ between countries, but often cities have little influence on key local public research and HE institutions. They can try to orchestrate/coordinate and incentivize the activities of these organisations around topics of major interest to cities. Given limited resources of cities, the scope for financial incentives is limited.
- *Demand and supply side of innovation policy:* specific to cities and their embedding urban agglomerations are regulatory and planning competencies, but also the responsibility for operating systems of energy supply, mobility, waste management, etc. In cities with a broad spectrum of competencies, there is scope for experimentation employing this range of policy instruments.

Regarding stage 2:

- *Developing 'anticipatory capabilities'* at the whole urban level, dealing with shared long-term visions of urban areas, the identification of core transformations required, the development of desired 'pathways' that will enable to operationalise these transformations and build strategies and policies implementing these (often associated with roadmaps)
- *Framing policies* at multiple time horizons enlarging the remit of activities considered to test *within 'protected spaces' new potential solutions*. Based on existing literature, four potential anticipatory paths could be considered: (i) the search for science and technology based solutions (privileged up to now by national States); (ii) collective experiments, frequently mobilized by cities (e.g. bounded socio-technical experiments, grassroots experiments, urban experimentation (Sengers, Wieczorek and Raven, 2019)); (iii) the support to 'market niches' that help testing firm-based solutions (e.g. electric cars in the city, thanks to organised and/or free electricity supply) and; (iv) the development of experimental physical infrastructures (e.g. new 'soft transport' organisation of 'avenues' between cars, common transport, cyclists and pedestrians).
- *Deployment policies that drive to the generalisation* of some solutions tested within the urban context. Nurturing mutual learning and exchange among cities is one of the options available to promote and improve potentially transformative innovations. Several European and transnational funding programmes are currently doing that (e.g. REFLEX project), aiming to produce collective knowledge goods (e.g. handbooks) and targeted knowledge exchange. Other complementary mechanisms could be staff exchange programmes ("ERASMUS for urban professionals"). These policies could also use tools developed by association of cities organized around issues of sustainability and/or resilience (like the 100 resilient cities project…) and that exchange about their experiments and 'good practices', but also engage in shared experimentations and testing (especially on longer-term potential solutions).

We also make the cross-cutting hypothesis that such developments will be influenced strongly by national and European levels through available incentives (e.g. 'smart city' programmes, smart specialisation strategies), regulatory developments (e.g. zero plastic bags), high level choices (e.g. taxation impacting the investment capability of cities) and their portfolio of new technological options available (e.g. common transportation systems vs. 'clean' types of individual vehicles). These potential elements of transformative innovation each time need to be contextualised locally; they represent a "menu" of opportunities that comprises certain "promises". These promises and local context need to enter into a process of mutual articulation (demand and supply articulation) to evolve into truly promising innovation options.

Approach and methodology

The project we develop will 'test' and 'qualify' these hypotheses

It wishes to do so in a first stage by

- taking hold of the knowledge developed about urban involvement in sustainability/resilience, the types and locus of activities developed, and the governance modes associated with these.
- In depth analysis of on-going developments in 12 'mid-sized' urban agglomerations in two different national environments in Europe (France and Austria) in particular to analyse the role of the national environment of the types and modes of engagement of cities, as well as the role of sharing problems and practices between cities
- Deriving from the set of activities analysed conditions for further systemic move towards urban 'innovation policies', for instance in terms of a characterisation or typology of cities and associated models of innovation policies.

Competencies needed

For this, we open two post-doctoral positions

- Duration 2 years, starting September 2020 latest
- Employer: Université Gustave Eiffel, Paris
- Location: within LISIS (in Paris) and AIT (in Vienna)
- Language: fluent English and at least one of the two languages (French and German)
- PhD obtained before employment
- Specialisation either in urban studies (and in particular Urban planning) or in innovation policy studies, with demonstrated interest to the other domain.

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