Energy transition and city-region planning: understanding the spatial politics of systemic change

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Energy transition and city–region planning: understanding the spatial politics of systemic change

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This paper contributes to an emerging literature focused on cities and regions as strategic sites for systemic sustainability transformation processes. We analyse how aspiration and ambition for transformation of the energy system in the Paris–Ile-de-France region of France translates more vividly into the transversal strategic spatial planning policy arena than in the energy policy sector. The intensity of inter-actor tensions here suggests that these are key contested issues for future orientations of energy systems on any level. Some of the contradictions and competing viewpoints around energy-concerned planning issues are discussed. It is argued that this highlights the importance of understanding the socio-political geographies of systemic change. We suggest that thinking through the multiple spatio-temporal rhythms of transitions could be a useful way of pushing research and policies towards more explicit, sympathetic and political engagement with the socio-spatial differentiations and inequalities inherent to place-based transformations.

Keywords: energy transition; regional planning; politics, systemic change; governance; society; technology; environment; Paris; France

Introduction

The idea that we need to shift our energy provision and consumption systems onto more sustainable pathways that take into account the constraints associated with climate change, peak oil, resource security and energy affordability has great currency and purchase among both the scientific and the policymaker/practitioner communities. The dominant technological focus of the discussion is increasingly complemented by an interest in how urban, housing and transport policies as well as changes in social practices may contribute to this shift. At stake also is the scale of apprehension of energy issues. Although energy systems are defined and conceptualised mainly on national and supranational levels, overlapping contexts of liberalised markets, borderless climate change, fiscal crises in the public sector, etc. mean that environmental/energy governance is being consistently rescaled, downwards as well as upwards, within a multi-level governance framework (see Bulkeley 2005; Bulkeley and Betsill 2005). Some work has begun therefore to explore the possible or actual...
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roles that cities and regions can play in this systemic transformation process (Hodson and Marvin 2009; Monstadt 2007). In a policy context where urban areas are often held to be responsible for a high proportion of energy consumption and CO$_2$ emissions (but see Satterthwaite 2008; Dodman 2009), this work has recognised that many city and regional governments are strategically positioning themselves in this policy domain as major actors in ‘energy transitions’. Even a quick perusal of the current urban and environmental policy documents of many European city regions reveals an apparently renewed enthusiasm and engagement of local and regional actors for playing a major part in any transformation of unsustainable energy systems. It is also clear that as centres of population, business, industry and innovation, cities have strategic ‘value’ both in terms of their environmental ‘weight’ and the potential they offer for developing and trialling sustainable solutions. There is then increasing recognition of the need for action at the level of the city/region, a policy level which is closer to users/consumers and more attuned to local conditions, rendering the stakes more pertinent and contextualised, and thereby offering, in theory, the possibility of more effective policies. From an analytical angle, an urban/regional perspective offers the benefit of situating processes and practices of socio-technical change (or resistance to change) in relation to specific, ‘local’ contexts – even though these contexts are themselves constructed relationally through their links to other, more or less distant, spaces (see Amin and Thrift 2002; Massey 2005). We argue that this perspective can allow for a more ‘co-evolutionary’ understanding of how the ‘social’, the ‘technical’ and the ‘environmental’ are inherently intertwined through the multiple practices of, and relations between, different actors.

As in many other urban regions, increasing recognition of the need for action is certainly apparent in the Paris–Ile-de-France region in France. A host of regional actors and institutions have identified that transformation of the (regional) energy system onto a more sustainable track is both desirable and necessary. Medium to long term goals have been set for reducing CO$_2$ emissions by 75% by 2030 from the 1990 level (Région Ile-de-France 2008), and increasing the share of renewables in the regional energy mix towards the 20–25% target for 2020 set by the major nationwide conference on environmental issues (Grenelle de l’Environnement) in 2007. Yet, in spite of these ambitious goals, it is striking that actual material energy policy actions are so far very limited in their approach and reach. This gap or deficit between discourse and action raises questions about the capacities of regional policymakers to work concretely towards realising these goals, where their work is actually located in policy circles, and how it intersects with the (diverging) positions and practices of other actors (e.g. among local authorities themselves, with national government, or with private sector interests). Thus, by analysing the forms and implications of energy-related policy change (proposed or actual) on a regional level and the tensions between actors involved in or concerned by these policies, the aim of this paper is to explore the different socio-political geographies through which systemic transformations such as energy transitions are filtered, and how these comprise differing understandings of what sustainable regional development should or could be.

The paper is structured in four sections. In the first section, we position the focus and argument of the paper in relation to some of the existing work on systemic change, notably distinguishing our energy transition approach from that of socio-technical transitions. In the second section, we discuss the major ambitions of the Ile-de-France region with regard to its energy policy and how these have strongly shaped its strategic regional planning policy in which it has a more central role. In the third section, we explore how this broader strategic policy arena has become the focus for debate and conflict between actors with diverging interests, and most notably around three energy-concerned policy areas/questions. The final section interprets and analyses the nature and implications of these energy-concerned policy tensions both for the practice of more sustainable
urban/regional development in a context of divisive local and regional politics, and in terms of extending existing work on place-based transitions and the socio-political geographies of systemic transformation.

**Energy transitions and the politics of systemic sustainability transformation processes: the other half of ‘factor 4’**

The ongoing evolution and transformation in energy policy at different scales has been a recurring focus for articles in this journal (see, e.g. Lovell 2008; Verbong, Geels, and Raven 2008; Raven and Verbong 2007; Jacobsson, Sandén, and Bångens 2004; Elliott 2006). Some of this work has adopted a socio-technical transitions perspective to understand and analyse the complex, interacting conditions under which various new or ‘niche’ technologies and techniques are (or might be) diffused throughout society (cf. Schot and Geels 2008). Although questions of agency, power and governance have consistently been an important element in research on socio-technical transitions (see Smith, Stirling, and Berkhout 2005; Voss, Bauknecht, and Kemp 2006), the politics of transitions have been argued by some authors to have been understated. Two main critiques have been developed.

First, it has been argued that the dynamics and practices associated with socio-technical transitions are overly portrayed as cosily consensual, elite-driven, and with few, if any, visibly negative externalities, implications or consequences for wider social groups outside the process (see Shove and Walker 2007). Some work on systemic socio-technical change has begun to draw out the politics and inter-actor power relations, which, almost inevitably, underpin (and more often than not obstruct or slow down) transition processes (see Meadowcroft 2009; Avelino and Rotmans 2009; Scrase and Smith 2009).

Second, and more importantly, there has been a quite fundamental divergence of opinion over where boundaries should be drawn in relation to stakeholders in transition processes. Discussions of the governance or ‘management’ of socio-technical transitions have more often than not been considered exclusively within the quite narrow boundaries drawn loosely but identifiably around the set of (regime) actors participating actively in steering the desired transformation process. The impacts of this exercise of power on stakeholders and social groups outside these boundaries have been less deserving of attention, as has any debate and dissent surrounding what desirable change (i.e. the goals and objectives of sustainable policy-making) might (and might not) be. As Shove and Walker put it: ‘our concerns about the “winners and losers” in transition processes relate not to businesses who do or do not emerge as leaders of the pack, but rather to the very many social actors and bystanders whose lives and interests are wrapped up in processes of transition-managed sociotechnical change’ (Shove and Walker 2008, 1012).

In short what is argued is that the politics of transitions have been insufficiently addressed. In this paper we would like to contribute to the (re) politicising of transitions research through a change of focus. The paper examines and discusses energy transition policies, which can be defined as the policies aimed at fostering radical/systemic change to sustain energy–climate objectives,
e.g. so-called ‘factor 4’ policies.\(^3\) We share the commonly held view, among policy makers in particular, that energy transitions at whatever scale (European, national, regional, local) cannot in fine just be concerned with bringing about a socio-technical transition within the energy sector, whether it be, for example, increasing the market share of photovoltaic electricity or biomass, or promoting a ‘hydrogen economy’. Social practices and the structural factors and policies which shape these practices (forms of urban organisation, ‘green taxes’, housing and transport policies, etc.) are central to how energy transitions play out in any given context. They are, in this regard, the other half of ‘factor 4’ policies, as without action aimed at these elements there is little chance of radical change taking place whatever the time scale.

This change in focus from socio-technical to energy transitions implies that the policy issues at stake are also changed. Energy transition policies may include, for example, the promotion of energy efficiency in existing or new buildings, the articulation between transport and land use, as well as the coordination and division of ‘labour’ between all kinds of institutions. Thus, the key actors, processes, priorities, conflicts and issues involved in this ensemble of policies differ to a significant extent from those involved in, for example, technological niche management aimed at promoting the diffusion of geothermal technologies. Radical transformations and innovations are required across social, economic, political and cultural, as well as technical domains (Giddens 2009). In light of this, we conceptualise energy transitions as political processes in/through which ideas and interests diverge, socio-technical choices can never be unanimous, and the policies which are decided upon and implemented always necessarily produce ‘losers’ as well as ‘winners’. In this regard, it is notable that much of the recent work promoting more systemic understandings of energy transitions has also been focused on change at, or from the perspective of, the urban/regional level (Hodson and Marvin 2009; Bulkeley and Betsill 2005; Rohracher and Späth 2009). This focus may well be one way of moving between socio-technical transition and energy transition perspectives, thus going beyond concern for technological innovation and diffusion to concentrate on the socio-economic and political factors at play in systemic sustainability transformation processes. With this in mind, we turn to our focus on how the energy system in the Ile-de-France region is being presently transformed.

**The energy system in Ile-de-France: towards Factor 4, energy security and the compact city–region**

The Paris–Ile-de-France region is one of the largest urban regions in Europe. A population of around 11 million people (19% of the national population), which represents an increase of approximately 500,000 between 1995 and 2005, on a surface area of 12,000 km\(^2\) (2.2% of the national territory) makes for a density of 922 inhabitants/km\(^2\). Yet although the regional population is 96% urban and only 4% rural, fully 80% of the region consists of natural or agricultural land. Economically the region is responsible for 29% of national gross domestic product (GDP) (€396 billion), of which 82.8% is derived from services, 17% from industry and 0.2% from agriculture. The region is functionally and administratively divided on various scales: there are three main geographical zones (Paris, petite couronne, grande couronne), eight departments and no less than 1300 municipalities. There is great intra-regional diversity therefore, for example, between the relatively small, very dense central city of Paris (2 million inhabitants) and the large, predominantly rural department of Seine-et-Marne to the east. This situation translates into both a rather fragmented governance in which state control has tended to decline in the 1990s and 2000s (although this may be on the return) and the regional level of government is restricted in its powers, and an internal–external development tension in which tackling issues of socio-spatial inequality
and ‘local’ solidarity must take place at the same time as reinforcing the ‘global’ economic position of the Paris region (Lefèvre 2003; Estèbe and Le Galès 2003).

Prompting an energy transition in Ile-de-France?

Within this diverse regional context, transformation of the energy system of Ile-de-France has nevertheless been viewed by local, regional and national level actors as both a means to and an ongoing objective for sustainable regional development for a number of years. The various policy documents refer to three major interrelated stakes or objectives.

First, local officials emphasise the need to reduce the energy dependence of the Ile-de-France region on ‘imports’ from outside the region and on fossil fuels, in particular through the promotion of local and renewable energy production, and thus avoid leaving the region at the mercy of continuous fossil fuel price hikes. The Ile-de-France region imports fully 93% of its energy needs (Agence Régionale de l’Environnement et des Nouvelles Energies Ile-de-France (ARENE) and Agence de l’Environnement et de la Maîtrise de l’Energie (ADEME) 2006). As Table 1 makes clear, although in declining use, petrol still drives almost half of all regional energy consumption, while regional production and storage capacity have strongly decreased. Ile-de-France imports 100% of its gas, while such is the reliance on nuclear power for electricity production in France that the region’s eight (coal, fuel or gas) power stations provide less than 10% of regional electricity needs. Within this context, there are notably a number of endogenous resources which many actors and policy documents highlight as a potential way of better securing the region’s energy future through increased autonomy and reduced dependence on fossil fuels. For example, there are 112 sites in the region offering co-generation of heat and electricity. There are also 120 existing heating networks which already derive 35% of their production from local, renewable sources (11% geothermal, 24% waste incineration) in order to serve 460,000 homes and some tertiary buildings. Furthermore, there is held to be vast possibilities for increasing use of renewable energies such as geothermal, biomass and solar power.4

The second major stake requires a drastic reduction in regional greenhouse gas emissions, within a logic of ‘Factor 4’, i.e. reducing CO$_2$ emissions by 75% from their 1990 level by 2050 or earlier. The region was responsible in 2005 for emissions of around 50 million tonnes of CO$_2$ (9% of national emissions for 20% of the population and 30% of national GDP) (AIRPARIF 2005), which represents only a small decrease since 1990. ‘Factor 4’ even by 2050 appears therefore to be very optimistic. The transport sector is responsible for almost half these emissions (ARENE and ADEME 2006), although emissions attributable to aviation vary widely (from 2% to 50% of the total according to the method used. There is a very strong spatial dimension to this issue. Indeed, although the intensity of emissions per km$^2$ increases the closer one gets to central Paris

<table>
<thead>
<tr>
<th>Resource</th>
<th>1990 (%)</th>
<th>2002 (%)</th>
</tr>
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<tbody>
<tr>
<td>Renewable energies</td>
<td>2.8</td>
<td>4.5</td>
</tr>
<tr>
<td>Combustible mineral solids</td>
<td>6.1</td>
<td>3.1</td>
</tr>
<tr>
<td>Electricity</td>
<td>17.8</td>
<td>22.0</td>
</tr>
<tr>
<td>Gas</td>
<td>17.4</td>
<td>25.6</td>
</tr>
<tr>
<td>Petrol products</td>
<td>55.9</td>
<td>44.8</td>
</tr>
</tbody>
</table>

Table 1. Energy consumption in Ile-de-France by resource.

(75,000 tonnes/km\(^2\) there compared to just 3500 tonnes/km\(^2\) in the periphery of the region), if we measure by inhabitant, the result is quite different, with the Seine-et-Marne department (the department with the lowest population density) performing worst, which the new regional plan links directly to ‘urban sprawl’.

The third stake is associated with improving local air quality. A regional plan to this effect has been approved and notably includes objectives to control both energy demand and polluting emissions attributable to housing, urban activities, industry and airport activity (Région Ile-de-France 2009). The development of local renewable energies is again seen as directly beneficial here as they have relatively little impact on air quality.

There is (unsurprisingly) a broad consensus over these main objectives or stakes. Yet it is significant that this policy discourse has not really been translated into equally ambitious regional policy actions. The major financial instrument for regional policy remains the strategic contract negotiated between the state and the region concerning joint financial investments for the period 2007–2013, and which includes a project on ‘climate change mitigation’ focused on energy measures. But funding for this particular project is very limited (less than 2% of the overall budget, and less than a fifth, for example, of what the state and the region propose to spend on ‘regional attractiveness’) (Table 2a and b). A Regional Energy Plan was adopted in May 2006 as part of the ‘regional priority’ of making Ile-de-France ‘the first eco-region in Europe’ (Conseil Régional d’Ile-de-France 2006), but it is modest in budget and scope in line with the limits of responsibility and of resources of the Regional Council. The regional budget for 2007 for example allocated only €16 million to the Plan (approximately €1.50 per inhabitant) in order to support and subsidise the domestic diffusion of solar energy and heat pumps, support the development of biomass and refuse-based energy production and encourage energy efficiency through information provision (in particular, through financial support to the creation of local energy agencies\(^5\)). It is therefore focused principally on household-level initiatives.\(^6\)

This raises the question of how a modestly budgeted Regional Plan focusing predominantly on the micro/household level can possibly contribute to large-scale and very ambitious ‘eco-region’ policy objectives. The scale of the proclaimed ambitions and the scale of the policy response (projects, funding) do not, for the time being, seem to match in any way. Even more

<table>
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<tr>
<th>Table 2a. The Contrat de projet Etat-Region 2007–2013 budget.</th>
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<tr>
<td><strong>Domain</strong></td>
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<tr>
<td>-----------------------</td>
</tr>
<tr>
<td>Unemployment</td>
</tr>
<tr>
<td>Social cohesion</td>
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<td>Regional attractiveness</td>
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<td>Higher education</td>
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<tr>
<td>Research</td>
</tr>
<tr>
<td>Sport</td>
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<tr>
<td>Culture</td>
</tr>
<tr>
<td>Poles of competitiveness</td>
</tr>
<tr>
<td>Accessibility</td>
</tr>
<tr>
<td>Agriculture and forests</td>
</tr>
<tr>
<td>Climate change mitigation</td>
</tr>
<tr>
<td>Environmental change</td>
</tr>
<tr>
<td><strong>Total</strong></td>
</tr>
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</table>

Source: Préfecture de la Région Ile-de-France and Région Ile-de-France (2007).
significantly, regional actors do not know how to spend even the limited financial resources available, highlighting instead that ‘the process takes time’ (ARENE 2009, 36). Of the €16 million allocated to the Plan in the 2007 regional budget, only €10 million was actually spent (ARENE 2009, 36). The actual production of renewable energy in Ile-de-France still remains ‘very modest’ (Actu-Environnement 2009). The 2008 regional budget was nevertheless to allocate €18 million to energy ‘because perspectives are more and more encouraging’ (ARENE 2009, 36). In short, regional energy policy has existed since 2001, and willingness to do something on the part of regional actors has been present since before then, but this discursive recognition of the urgent stakes of an energy transition has been followed up by relatively little concrete action in the energy policy sector per se.

Relocating energy-, emissions- and climate-concerned policies

In fact, energy and climate issues can be argued to have had more impact in shaping cross-sector strategic regional planning policy. This primarily reflects the more central role the Regional Executive has in spatial planning than in the energy sector. Local and regional authorities in France have very limited capabilities to directly shape the energy sector as this is configured according to the requirements and strategies of the national state and major actors like EDF and GDF Suez. They can only therefore act within their domains of competence (e.g. spatial planning for the Ile-de-France region, building construction and refurbishment for the city of Paris) which inevitably restricts the impacts of their policies. Nevertheless, we argue that this greater impact in the strategic planning domain than on regional energy policy also reflects a broader recomposition of relations between technology, society and the environment, and hence calls for a broader understanding of what is involved in transformation of the energy system from a local/regional perspective, beyond a narrow focus on technological solutions. From this more transversal point of view, and given the modest nature of explicitly energy-focused policy, the most important energy-concerned regional policies are therefore transport policy with the adoption of an urban mobility plan (plan de déplacements urbains, PDU) in 2000 and the development of a new regional spatial plan (schéma directeur de la Région Ile-de-France, SDRIF) which was definitively adopted by the region in September 2008.

The SDRIF, in particular, is presented by the regional executive as the key step and instrument to make Ile-de-France ‘the first eco-region in Europe’. It is therefore an exemplary strategic document, meant to offer a guiding pathway to regional sustainability over the next 20–25 years. The plan is constructed according to three ‘major challenges’: reducing social and territorial disparities, reinforcing regional attractiveness and economic dynamism, and anticipating evolutions related notably to climate change and increasing fossil fuel prices (Région Ile-de-France 2008). Energy and climate issues are therefore central to the overall orientation of the SDRIF, which aims...
specifically ‘to promote an urban organisation which anticipates energy and climate transformations’ (Région Ile-de-France 2008, 34). The plan wishes therefore ‘to conceive of the compact and economic city’ – or the ‘city of spatio-temporal proximity’ – notably through a process of densification of the central urban agglomeration and secondary towns, and the promotion of public transport use. This will reduce both regional energy consumption and greenhouse gas emissions, allowing the region to state quite clearly that it will aim to reach ‘Factor 4’ before 2030 (Région Ile-de-France 2008, 37), thus going well beyond the national objective of 2050.

In short, the SDRIF develops a regional spatial strategic plan based to a large extent on recognition of the importance of the same energy-concerned stakes as mentioned earlier. The difference with regional energy policy is that these stakes are to be tackled in a more transversal, and to some extent more systemic manner, aimed at improving the ‘robustness’ of the region as a whole, with a reconfiguration of ‘urban organisation’ as the structuring element. For example, the plan recognises that densification of urban areas could be accompanied by the development of heat networks based on a more intensive exploitation of the geothermal energy resources present beneath the region. In other words, technological solutions are seen as one part of a systemic response to increasing regional robustness. We argue therefore that the nature and implications of the proclaimed energy transition in Ile-de-France must be grasped within a broad, cross-sector approach.

Unpacking inter-actor tensions in energy-concerned planning policies in Ile-de-France

The process of constructing and negotiating the SDRIF plan and getting it adopted on a regional level was (and still is) fraught with fractious debate and conflict as the multiple actors involved assessed, and often contested, the proposed measures according to their very divergent sets of interests. This took place during and after the large-scale consultation process between June 2005 and January 2007 which associated all local and regional actors (authorities at all levels, private companies, third sector organisations, inhabitants) to obtain feedback and criticism on the plan from numerous public seminars and questionnaires. Furthermore, for the first time the SDRIF takes precedence in the overall planning domain, having the potential to supersede local plans, a fact which has not gone unnoticed by local politicians. We focus in this section on the three main areas of inter-actor tensions relating to broad energy–environmental questions raised by the SDRIF plan, namely urban form, mobility and the subordination of regional ecology and sustainability to the imperative of global competitiveness. This analysis is based mostly on analysis of the SDRIF itself, various documents and reports and an extensive press review of regional policy debates between 2005 and 2009. Although the analysis of press reports can be held to have its limitations in terms of the selectivity and partial representation of relevant arguments and debates, it does highlight the controversies and politics of the actual planning negotiation process, and thus helps us to get beyond strictly normative concerns with what should be done. The centrality of energy-concerned policy questions to strategic urban/regional planning and the inherently political nature and outcomes of these questions offers a distinctive urban/regional perspective on systemic sustainability transformation processes.

**Tension 1: How compact should the ‘compact city’ be?**

Despite representing 19% of the French population and 29% of national GDP, the Ile-de-France region is responsible for only 15% of national energy consumption and 9% of national greenhouse gas emissions (exuding air transport and indirect emissions\(^8\)). This is clearly related to the
fact that the most heavily energy-consuming (and polluting) industries (chemical, steel, etc.) are located in other French regions, but regional actors argue that it also shows something of the ‘virtues’ of compactness and high density in Ile-de-France (Région Ile-de-France 2008, 36). These virtues were to be pursued and more actively sought through the SDRIF, the central tenet of which was to promote ‘the city of spatio-temporal proximity’ in which homes, jobs and transport are drawn closer to each other, thus putting the emphasis on forms of mobility which are more economic in terms of energy consumption.

The move toward a more compact city is presented in the plan as beneficial for all from every perspective. Economically speaking, it would reduce commuting costs and social costs of urban functions (water supply, sewage, refuse collection and treatment, etc.). At the same time, it is assumed to reduce social and functional segregation. From an environmental angle, it is seen as diminishing the carbon footprint of the average inhabitant as a suburban dweller allegedly produces three times more CO$_2$ than a city centre dweller in her/his daily mobility.$^9$

In the housing domain, the consequences of the SDRIF’s promotion of dense urban living are a firm rejection of the individual suburban house, which for the vice-president of the Regional Council in charge of the SDRIF were responsible for an 88% increase in home-work commuting distances in 10 years in the Ile-de-France region: ‘Why keep supporting the idea that happiness is owning one’s individual house, when at the same time this model generates unacceptable transport needs. What is needed is to arouse a new desire for the city’ (Agence France-Presse (AFP), 10 February 2007).

Inevitably, the SDRIF’s densification policy led to widespread local and regional debate concerning notions of the ideal, or achievable, degree of compactness and where restrictions to urbanisation should be located, which varied substantially between local elected officials. The SDRIF does provide an explicit yardstick by stating that all new residential building projects should include at least 35 dwellings per hectare. Furthermore, building too close to forest areas and rivers was prohibited, as was any intensive urbanisation in the region’s green belt. The urbanised areas of villages and small towns in the region were not to be able to grow by more than 15% in the period to 2030. This last point in particular was an area of strong contention with local authorities. Several mayors of the department reacted strongly to the maps included in the SDRIF draft prohibiting urbanisation in areas where it was already planned or even already achieved! Right-wing departments argued against the SDRIF because it limited their urban and economic development possibilities too much (Les Echos, 5 July 2007). The State representative in the region (the préfet d’Ile-de-France) also voiced concerns about the reduction in space for urban development, but more from a constitutional angle which prevents the control of a local authority by another local authority (speech of the préfet d’Ile-de-France in front of the SDRIF convention, 29 November 2006).$^{10}$ Even the socialist president of the predominantly rural Seine-et-Marne department insisted that ‘we are not opposed to growth, even though we wish to fight urban sprawl which destroys farming land’ (Le Parisien, 18 December 2006). In sum, ‘for many local councillors, including left-wing ones, the ambition of the region to concentrate [new housing projects] in the central suburbs is illusory. Because of the lack of available land (there will be a need to first demolish in order to be able to build) and high land prices, the plan will require building at least 30,000 new dwellings per year [half of the figure planned] in outer suburbs, hence supporting urban sprawl’ (Les Echos, 29 November 2006). This issue is far from settled as the French President himself outlined plans for the construction of 70,000 new homes per year in the region to 2030 as part of his Grand Paris project, supported by a ‘loosening’ of planning regulations (Le Monde, 30 April 2009).
A second area of tension concerned transport policy, a key instrument in energy–environmental policy as outlined in the SDRIF. There is a wide consensus among local actors in favour of public transport and ‘soft transport modes’ such as walking, cycling and roller-skating, but there is a divide between those in favour of mainly penalising car use and those in favour of more ‘balanced’ approaches, as revealed by debates about the SDRIF, but also about the Atmospheric Protection Plan (PPA), the Paris Travel Plan (PDP), and the state–region contract.

Party political membership was a key criterion here. Members of the Green party constitute an important part of left-wing local majorities both at the regional and Paris municipal levels. In both cases, this political configuration has led to a transport policy which explicitly aims at curbing (the growth of) car traffic. In Paris, this has resulted from 2001 in a policy explicitly aimed at reducing road space available for car traffic and parking, while increasing road space reserved for buses and ‘soft’ modes (separate bus and cycle lanes, enlarged pavements). The Regional Council has also strongly prioritised public transport in the region’s expenses in contrast with State priorities: ‘with [the SDRIF], the regional council in fact opposes the large-scale road and expressway projects advocated by the State’ (Le Figaro, 29 November 2006). Furthermore, the Ile-de-France region (like the other French regions run by left-wing majorities) has raised taxes on petrol up to the legal maximum and plans to increase significantly other car-related taxes. In addition, both the Paris municipal government and the regional government have criticised pro-car (or insufficiently anti-car) state policy, in particular the State-established Atmospheric Protection Plan (PPA) for Ile-de-France of July 2006. The PPA was criticised by the Paris municipality as ‘inefficient, incoherent, provocative’, because of the absence of a target in terms of car traffic reduction on a regional level, the exclusion of measures against greenhouse gas emissions and insufficient measures against local air pollution (Le Monde, 2 August 2006; AFP, 11 September 2006; Le Monde, 15 September 2006).

This anti-car orientation raised strong and recurring objections from the municipal and regional right-wing minority – ‘We are in favour of public transport, but we refuse the war on cars’ – and from the state’s regional préfet who insisted he ‘cannot approve the fact that the most recent decisions of the Minister for Transport [two major urban motorway extensions] are not taken into account’. In Paris, projects for additional separate bus lanes met with fierce opposition by right-wing borough mayors and residents who argue that they are ‘useless, costly and potentially dangerous’ (Libération, 1 February 2006). The political consensus within the Paris council gradually decomposed. The Paris travel plan (PDP) provides for substantial additional measures aimed at reducing car traffic in the city by 2025, but all political groups in the municipal council, except the Greens, insist that this new ‘anti-car’ plan has to be preceded or accompanied by a substantial improvement of public transport (Le Parisien, 11 February 2007).

Hence the question whether car traffic should be accommodated or penalised, and to what extent, was a matter of growing local controversy between the left and the right since the election of left–green majorities both at the regional level (1998) and at the Paris municipal level (2001). Rising energy–environmental concerns have given additional arguments for anti-car policies, but the controversy is unresolved with municipal transport policy adopting a more flexible line to car use following the re-election of the Mayor in 2008 (Le Monde, 22 March 2008). On a regional level, the unveiling of the Presidential project for a Grand Paris (in which transport is central) re-animated debate over the increasingly divergent (and competing) visions and plans proposed by the different actors (Le Monde, 30 April 2009).


**Tension 3: The economy or the environment?**

A third area of dispute concerned the balance (or the imbalance) between environmental/ecological protection and economic development objectives. This was at the same time representative of a clash over the rationale and motive for the SDRIF: was it mainly about protecting and securing the current and future resources of the region, or was it more about growth and extending regional influence well beyond the frontiers of Ile-de-France?

In any case, organised economic interests all loudly disapproved of the SDRIF. The regional associations of large enterprises (MEDEF) and small- and medium-sized enterprises (CGPME) joined the Paris and the Ile-de-France Chambers of Commerce in addressing fierce criticism of the regional executive. They considered that the plan ‘does not meet the requirements for a sustainable, job-creating growth of the region over the next 20 years that would allow it to win the competition between the large world metropolises’ (AFP, 28 June 2007). More specifically they pointed to five main weaknesses of the plan: undue limitations placed on the development of the region’s growth poles; insufficient surface and air transport infrastructure; insufficient land availability; lack of explicit reference to economic activities in land use allocations; and inconsistencies between elements of the plan that generate legal uncertainty (Les Echos, 27 June 2007). Both right-wing departments and the national government shared these criticisms on the lack of ambition of the SDRIF in terms of economic development and regional competitiveness (Les Echos, 5 July 2007; Le Monde, 12 June 2008; Le Monde, 23 September 2008).

Economic–environmental tensions were strong with regard to airports. The development of the Roissy–Charles de Gaulle airport to the north of Paris has always been a keystone of regional economic development policy and is likely to remain so, even if this enters into clear conflict with explicitly environmental regional policy goals. It was notable, for example, that at the end of June 2007, just as the Ile-de-France region was announcing its intention to ‘self-tax’ all its CO$_2$ emissions and use the revenue obtained for regional energy efficiency measures, the French President was opening the brand new satellite 2E at Roissy (cost €645 million, capacity 8.5 million passengers per year) and stating that ‘If Ile-de-France wants to remain a major financial centre, if it wants to remain a scientific centre, if it wants to remain shoulder to shoulder with London for the establishment of company headquarters, it must develop Roissy’ (quoted by Reuters, 26 June 2007).

More generally, there are clearly diverging visions between the Regional Council and the national government (supported by some local governments, such as the Hauts-de-Seine département) as to the overall purpose of ‘(sustainable) regional development’ in Ile-de-France. For the former, logically enough, the SDRIF is about balancing the social, economic and environmental sustainability of the whole region, but it is also an instrument for tackling the main issues of everyday life in the region (and not just a means to develop large projects) (Béhar and Estèbe 2006). For the latter meanwhile, Ile-de-France seems to be more of a resource on which to draw for national goals of economic competitiveness and growth and therefore State strategy for the region can be, at least to some extent, quite spatially selective and growth-based, and less concerned with territorial cohesion and planning.

This obviously leads to divergent conclusions as regards the limits to growth that can be imposed for energy or climate reasons. The government has so far refused to validate the definitive SDRIF plan, judging it to lack ambition in terms of economic development as it anticipates annual growth of ‘only’ 2% and annual job creation of ‘only’ 28,000. These figures are held to be unsatisfactory for the capital region of France, even in the midst of a global economic crisis. This controversy would
also seem to reflect a conception common to both parties that climate or other environmental strategies cannot constitute an economic opportunity (cf. the debate on the introduction of a national ‘carbon tax’ in summer 2009).

**Contradictions, contestations and different rhythms of transition**

These three areas of tension in strategic urban/regional planning policy in Ile-de-France reflect the presence, throughout the planning process, of competing views of ‘sustainability’ and in particular of how best to articulate and prioritise between the ensemble of policy areas concerned by energy transitions. Negotiating the other half of factor 4 proves to be as, if not more, contentious than the technological choices required for transforming energy systems. In this section, we first analyse some of the contradictions and multi-level governance conflicts emanating from this systemic transformation process. We then go on to reflect further on what the nature and implications of this process imply in terms of the socio-political geographies of systemic change.

Through each of its prescriptions for energy- and climate-concerned policies in Ile-de-France (and the all-encompassing ‘global’ prescription of a regional master plan), the Regional Executive mobilises particular understandings (and expectations) of society, technology and the environment, and how these notions (should) evolve and interrelate at any one time to contribute to sustainable regional development. Other actors challenge this relational, systemic bundle of understandings and prescriptions, and support competing viewpoints made up of alternative ideas about the intertwined roles of society, technology and the environment.

These views concern actors across the board, from the state down to local municipal politicians, not always following traditional partisan divisions. On one level, this produces a series of conflicting, even contradictory, policy positions, most notably between the region and national government. There are also tensions or contradictions on each side within or between policies in various sectors. More generally, one may of course question the very idea of using this form of ‘master planning’ to identify, let alone to try and ‘solve’, the multiple, complex, interrelated issues and problems of the Ile-de-France region. This top–down approach to sustainable development evidently meets resistance. The resulting document is well-intentioned but must be viewed as a ‘provisional template’ which is only ‘partially inclusive (when there are ever more actors on the social stage), contingent (when conditions are dynamic), and potentially unstable as material forms and practices evolve over time’ (Shove and Walker 2007, 766).

Furthermore, other challenges inherent to multi-level governance remain. While the new SDRIF plan is notable for having been the first to be conceived (in the context of political decentralisation) at the regional level, it is quite clear that the ‘final word’ on the plan rests with the state at the national level, which has not only put pressure on the region throughout the process and through different channels (individual ministries, the regional prefect, the President himself), but has also as of January 2010 still refused to validate the version of the SDRIF approved by the Regional Council in September 2008. For the reasons discussed above, at other times, this top–down hierarchy is recomposed, as for example when the Hauts-de-Seine department bypasses the region to embark on a collusive ‘partnership’ with the national government over development at La Défense, or the municipality of Paris openly rejects the national Plan for the Protection of the Atmosphere (PPA) owing to its lack of consideration for traffic reduction. The objective in the SDRIF of achieving Factor 4 by 2030 instead of the national goal of 2050 can also be read in this light as a reworking of governance hierarchies. In short, transformation of the regional energy system and sustainable
regional development as a whole are cast within a constantly shifting multi-governance framework where the positions and practices of local, regional and national actors are always interdependent and mutually constituted.

Analysing the shifting positions and practices of the different actors, and the various effects of these, becomes therefore a crucial task in understanding the workings, setbacks and failures of systemic transition processes. The tensions and conflicts inherent to the ongoing process of strategic regional planning in Ile-de-France reflect the inherently political nature of systemic change. Interests diverge, choices and priorities are continuously contested, and the impacts of change are likely to be highly spatially (and socially) differentiated – and this is the case for each area of tension highlighted. This socio-political geography of transition processes is crucial. Radical change must be understood as operating both through and within heterogeneous spatial contexts as well as over many varied time scales. In this respect, the turn to understanding the politics of transitions in the literature clearly needs to be extended by more in-depth research exploring and analysing the spatially and temporally differentiated processes and practices of transition within specific contexts.

To this end, we argue that it would be fruitful to develop comprehension of the different rhythms of transitions/change at work through, within and across spaces and timeframes, as it is clear that actors and urban regional spaces engage differently with and experience (or not) in varying forms and to varying degrees the spatio-temporal components and priorities of transitions. This is either because particular actors or spaces are relatively more excluded from or bypassed in the transition process or because their interests and agendas diverge from those of others. Place-based transitions may thus be conceived as assemblages of the many diverse interpretations of the nature, means and spatial/temporal scales of change that actors develop according to their own (shifting) needs and agendas.

It is clear in the Ile-de-France case, for example, that the move towards a compact city form and dense urban living as prescribed by the SDRIF implies different rhythms of transition and has tremendously varying consequences for local municipalities according to whether the latter are located in the predominantly rural Seine-et-Marne département or in or close to central Paris. Likewise, curbing the use of cars and promoting ‘soft’ modes of transport necessitates distinctive rhythms of transition between central Paris and rural areas of Ile-de-France where households have no alternative but to travel by car (and where creating the preconditions for feasible alternatives to develop will or would take many years). In these cases, a new stability is invoked by the SDRIF (based on dense urban planning and public transport) which attempts to impose new spatial and temporal norms (where and how people should live, how frequently and how far they should move around and by which means, etc.) to attain this. These norms are subject to contestation and challenge, particularly from those (local authorities, inhabitants) who do not fit coherently into this reconfigured regional geography. Thus, the composition, sequence and rhythms of systemic change are constantly subject to spatially differentiated tensions between the need for continuity and the need for disruption, processes of ordering and hierarchy and practices of disordering and upheaval, and patterns of recurrence/repetition/regularity and of forms of innovation/syncopation.

This means that studying the diverse rhythms of transition also begins to capture more precisely the political nature of systemic transformation that develops from some actors or spaces being able to ‘move’ more extensively or quicker than others. This ‘inequality’ is the combined result of processes of inclusion and exclusion (in choices, priorities, resources, etc.) and diverging interests and capabilities, both of which may be linked to respective levels of influence and authority. Rhythms of transition can indeed vary between actors and institutions which occupy apparently
similar positions within multi-level governance hierarchies. The Hauts-de-Seine département just to the west of Paris holds a different rhythm to that of the Seine-et-Marne département by virtue of its relative wealth, political status and urban density among other factors. Likewise, municipalities within this latter département hold highly varied rhythms notably according to their size, location, and dominant economic activities (agriculture or service sector).

This is not solely about boundary drawing or hierarchising actors according to their rhythms and capabilities in relation to some desired transition pathway. Further reflection on the multiple rhythms of systemic change could be a useful way of pushing transitions research (and policies) towards more explicit and sympathetic (and political) engagement with the spatio-temporal differentiations and inequalities inherent to place-based transformations. Thinking through the ways in which some actors or spaces are able to adapt and move quicker than others may also contribute to making transitions less deterministic in their outcomes. Different rhythms of transition of different actors or on different levels may, together with any resulting negotiations, arbitrages and conflicts, provoke bifurcations and deviations from initial trajectories. This may well have more progressive, empowering consequences. Various authorities, managers and levels of the state may go around promoting, or attempting to promote, systemic change, which as we have seen in the Ile-de-France case means connecting generic discourses and ambitions of emissions reductions and energy security to some of the main issues of everyday life, e.g. where people live and work, and how they move around. It is not so much a case of orienting transitions to empower citizens (although this may be desirable), but more a matter of drawing from the start on the specific rhythms and capacities of communities, households and individuals themselves for both contributing to and resisting processes and practices of change in order to shape and promote systemic energy transitions that move to the syncopated beat of the majority and not a small minority.

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Notes

1. See, for example, the Paris municipality’s Climate Plan (Mairie de Paris 2007), the Mayor of London’s Energy Strategy (Mayor of London 2004), or the City of Stockholm’s Action Plan against Greenhouse Gases (City of Stockholm 2003).
2. In contrast, many dominant discourses on sustainable development evacuate politics, conflict and the diversity of positions and viewpoints in favour of an eternal search for consensus and unanimity. For example, in the conclusions to a European Commission seminar on the post-carbon society it is argued that ‘Effective action depends upon shared normative visions of the future and agreement about the means to get there’ (European Commission 2007, 47).
3. The original concept of ‘factor 4’ proposed a dramatic increase in resource efficiency/productivity to sustain greater levels of energy production while using/consuming half the resources (see von Weizsacker, Lovins and Lovins 1997). It has been adapted in policy circles, notably in France, to refer to policies which aim for a four-fold division of greenhouse gas emissions (1990 levels) over coming decades (generally to 2050).
4. Solar power only became a political priority again in 2000, so results remain basic in spite of financial assistance and a professionalisation of the sector. 470,000 homes are heated by wood, although there is debate as to how ecological this method actually is, as it draws on the forest resources of the region which are sites of great biodiversity. Wind power is, by contrast, virtually non-existent in the region.
5. We can note, however, that only three such agencies have so far been created, and the contribution of the Region to the one at Vitry, for example, amounts to a paltry €30,000 (Ile-de-France region website).
6. Regional policy previously focused finance on collective housing and public infrastructure such as schools and sports centres. There has therefore been a downscaling from the urban to the household level.

7. The 2007–2008 SDRIF is also the first time that the state has not been responsible for the production of the regional spatial plan for Ile-de-France since the first such plan in 1965. In order to be implemented, however, the national government must validate the definitive SDRIF plan, something which had not been done as of January 2010 (see below).

8. That is, emissions from activities located outside the region but which benefit the region, but including transit traffic.

9. Some studies show however that if long distance, weekend and holiday trips are included in the picture, then the city-centre dweller produces more CO\textsubscript{2} than her/his suburban counterpart. Revenue and social category are key explanations of this difference: on average, wealthier urban dwellers travel more (both for leisure and work) than suburban ones. Yet the question remains open whether, all other things being equal, a ‘desire to escape’ high density city centres significantly contributes to the propensity to long distance, weekend and holiday travel (see, for example, Orfeuil and Soleyret 2002; Holden and Norland 2005).

10. Regional officials countered that the SDRIF’s superseding role does not amount to ‘control’ by one local authority over another, insofar as the planning regulations included in the SDRIF leave enough room for local governments to develop local plans.

11. These divergences are evident in the fact that during the finalisation of the SDRIF plan in 2008, the French President both created a new Secretary of State for the capital region with the task of elaborating a new planning and economic development strategy for the Paris region (and implicitly therefore countering the SDRIF), and initiated a consultation project with ten teams of international architects for proposals for the development of a Grand Paris.

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