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Sustainable Construction and Policy Learning in Europe: cascades, networks or fragmentation?

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INTRODUCTION

The mix of design and construction features required to minimise the environmental impact of new buildings and developments can broadly be termed sustainable construction and design. Many of these features require new ways of developing and constructing and a shift away from established decision making by all those involved in urban development: planners, construction companies, developers, building materials suppliers, etc. The shift towards more sustainable construction and design, therefore, requires innovation and learning - learning to do development differently. This learning process is complicated by the multiple interpretations of what specifically constitutes practices of sustainable construction, as this can vary greatly by issue, sector and policy mandate. Proponents of sustainable construction might promote technological shifts in terms of materials, energy use and waste reduction, or they might encourage cultural and behavioural adaptations to how society views, uses and plans its urban built environments. This bifurcation into two arguably complementary but practically disparate agendas - a technological agenda and an urban environment agenda – implicitly suggests to many that 'sustainability' can be reduced to a function of innovation in construction and building technology trends.

Thus learning in the area of sustainable construction is by and large considered to be an arena for applied learning. The technology involved is a mix of high and low tech, existing and cutting-edge and the actors involved in urban development need to learn how to incorporate sustainable technology within their designs and construction practice. Furthermore, there is applied learning in policy contexts where actors need to understand how to encourage the application of sustainable technologies and modes of construction. The planning system also needs to learn how to promote sustainable urban developments and encourage private sector actors to embed sustainability in their development proposals. This requires the reshaping of policy systems to ensure that technical knowledge penetrates the planning policy process. Moreover, the bifurcated sustainable construction agenda, by inference, implies the necessity for policy learning across multiple levels of urban governance in order to overcome a lack of knowledge and policy co-generation arising from poor communication between industry and policy networks.

This chapter examines how policy learning about sustainable construction is being promoted across European and national levels, and reflects on the lessons for understanding European governance. It focuses on the more technical aspects of constructing new development and leaves aside the spatial planning aspects concerning patterns of land uses and transport infrastructure, for example. It draws on empirical work undertaken within the SusCon Project at the London School of Economics during 2004-6[i], which included a phase focused on European and British national policy and knowledge networks. A total of 21 semi-structured face-to-face interviews were conducted as part of this phase with a range of network actors, predominantly in London and Brussels, involved in promoting sustainable construction in policy and practice. The primary aim of the SusCon Project, as a whole, was to address the perceived gaps between knowledge generation, use and learning, and the necessity of bridging such gaps for the successful translation of knowledge into practice. The project sought to examine how knowledge about sustainable construction can become embedded in planning practice and, by

implication, how planners and associated practitioners and organisations learn and handle new knowledge in this area.

One of the original themes of the SusCon Project questioned the seemingly common assumption amongst policy makers and practitioners alike that effective knowledge transfer and policy learning is reliant upon a successful cascade effect (i.e. from the European level to national to regional and local level, and eventually to the sector, industry or practitioner levels). Evidence from our interviews conducted with a range of policy, research, industry and professional stakeholders within European, British and London-based sustainable construction networks suggested however that this ideal cascade is not occurring. To understand how and why this is the case, we turn first to the nature of policy learning and how this relates to models of European governance, in particular the application of multi-level governance perspectives. This is followed by a discussion of the nature of European networks concerning sustainable construction as identified within the empirical component of the SusCon Project and how these networks relate to the capacity for policy learning across European-national boundaries. The key issues affecting the transfer of sustainable construction policy and knowledge between the different levels of governance (i.e. EU, national, local) are identified and discussed in brief. The chapter concludes on the nature of this transfer process, commenting on the oft-posited notion of the knowledge and policy cascade or trickle-down and its relationship to models of multi-level governance.

POLICY LEARNING AND EUROPEAN MULTI-LEVEL GOVERNANCE

The idea of policy systems having a cognitive dimension and centrally concerned with change has received increasingly attention over recent years. This has been termed policy learning and Nilsson (2005c) identifies three types: technical or instrumental; conceptual; and political (p. 209-211). Thus in the case of sustainable construction, policy learning could range from the identification of new technologies to reduce carbon emissions from buildings and, more significantly, their promotion through policy instruments, to the incorporation of sustainability as a relevant goal for construction and development sectors and the development of arguments for the importance of assessing construction and development *per se* in sustainability terms.

The essence of the policy learning approach is that learning occurs through relationships between policy actors and that mapping the pattern of such relationships can help understand why learning is (or is not) happening and the form that it takes. Nilsson and Persson (2003, p. 353) argue that environmental concerns will be strongly integrated into policy across domains where new networks are created that break across established linkages. This allows a problem-solving approach to decision-making, which underpins mutual learning, and a new outlook on the problem; in other words, a new policy frame. By contrast, where existing networks and frames are cemented and the policy problem is not mutually shared across policy territories, learning is replaced by bargaining. In such a situation, recourse is to forms of mediation, negotiation and deliberation to handle the conflict over the issue, rather than learning to advance solutions to the issue (Nilsson and Dalkmann, 2001, p. 315).

So this suggests the value of studying the relationships between actors involved in learning about sustainable construction and identifying the orientation towards mutually sharing, reframing and problem solving. These relationships would focus

around knowledge acquisition, information distribution, interpretation and organisational memory (Nilsson, 2005, p. 3). When working across boundaries (whether territorial, organisational or sectoral), interpretation is particularly important; this can also be termed lesson drawing, where knowledge is interpreted to gain new understandings of the cause-effect relations involved in policy problems and how to resolve them, leading to the devising of new lessons for specific goals, strategies and activities.

This sets a particular challenge for learning within Europe and across European-national boundaries. Here learning within policy systems has to interface with the nature of European governance and the role of national and sub-national governmental organisations within that European governance. European governance has been the subject of considerable academic attention and debate (Jordan, 2001; Jordan et al., 2005; Fairbrass and Jordan, 2003). While at first conceived by sovereign nation states to serve their economic and political purposes, the European Union has now "metamorphosed into a much more complex and unpredictable political system" (Jordan, 2001, p. 194). This system is characterised as fractured, decentralised and lacking in spatial and functional lines of authority. In particular, the decentring process has involved the "relative empowerment of sub-national actors, hence the term multi-level governance" (ibid.). Broadly defined, multi-level governance refers to the "dispersion of authority away from central government – upwards to the supranational level, downwards to subnational jurisdictions, and sideways to public/private networks" (Hooghe and Marks 2001, p.3; see also Peters and Pierre, 2001).

Hooghe and Marks (2001) identify two types of multi-level governance. Type I is argued to be "a hierarchical approach which focuses on the ways in which competences and authority are shaped between different levels of government" (Bulkeley and Betsill 2005, p. 48). This describes a vertical model wherein there is "a simultaneous movement of political power … up to trans-national levels of government and down to local communities, but in a coordinated manner" (Eckerberg and Joas 2004, p. 407). Learning within such a model would also be hierarchical, emanating from higher and larger authorities and trickling down to more local contexts, where it can be applied or shaped for local application.

Type II is characterised by Hooghe and Marks (2001) as "a complex, fluid, patchwork of innumerable, overlapping jurisdictions' which can be functionally split into still other jurisdictions that 'may come and go as demands for governance change" (p. 4). Bulkely and Betsill (2005) summarise Type II as "a polycentric model in which multiple overlapping and interconnected horizontal spheres of authority are involved in governing particular issues" (p. 48). The general thrust of the shift in responsibility is from governmental actors and authorities towards non-governmental actors, and this is significant because it implies that "both national and local governments' autonomous position is constrained by new political actors participating in the 'normal' political process" (Eckerberg and Joas 2004, p. 407). Learning within Type II multi-level governance would be more fluid operating across complex networks. Following the policy learning literature (see above) it can be supposed that such learning would be more effective, since it would break down established barriers by building links between actors in different tiers and organisations, while within a

trickle-down model the transfer would be from tier to tier in a more structured manner.

EUROPEAN POLICY LEARNING NETWORKS ON SUSTAINABLE CONSTRUCTION

There is general evidence that policy development within Europe goes along with an emphasis on learning, both operating within a fairly fluid network approach. The process of policy coordination, principally within the European Commission (the executive of the EU), follows 'the open method', which Kjer describes as involving benchmarking and mutual monitoring with an emphasis on mutual learning (2004, p. 113). This means that the EU places significance on knowledge for strategic policy delivery. It is instructive to highlight a few general characteristics of European networks where knowledge is concerned. Jönsson and Strömvik (2005, p. 19) point out that participation in EU networks rests on a combination of 'know-how' and 'know-who'. Networks are issue based, and expertise in a particular area is a prerequisite for involvement in networks. At the same time, networks are not limited to accredited experts but connect to a range of actors in heterogeneous organisations. EU networks also tend to transcend organisational boundaries and involve the governmental, non-governmental and private sectors as well as ranging across levels. Thus the EU provides an unusual abundance of access points to the policy making process for interested actors. However, given the large number of possible actors involved on any issue, there tend to be means of limiting access; prompting some of our interviewees to refer to the EU networks as 'clubs'. Some actors have accumulated considerable political capital through their knowledge and experienced use of these access points. But while EU networks are not hierarchical, neither are they entirely horizontal. There are multiple linking organisations and the role of the Commission itself is predominant within these networks.

To help structure the European system of formal and informal links between bureaucratic and non-bureaucratic contacts (Ruzza, 1996), the EU has adopted a thematic approach running across multi-sectoral policy areas. The Thematic Strategy on the Urban Environment (UTS) is one such example. Sustainable construction was included as one of four themes in the consultation draft of the UTS (CEC, 2004a) alongside urban environmental management, urban transport and urban design. Yet, the final version of the strategy, adopted by the Commission in January 2006 (CEC, 2006), was structured rather differently, with more emphasis on process than substantive themes. Under discussion of the synergies with other policies, sustainable construction was specifically mentioned though as a means of addressing climate change. We should note that the research programme within the EU also follows a thematic approach and is set up to favour the funding of projects that foster negotiation, partnership and non-hierarchical exchanges between institutions at different governmental levels and scales in order to implement the Thematic Strategies.

However, there is also a sector-based approach. Under the banner of promoting the competitiveness of the construction sector, a European Working Group for Sustainable Construction produced an agenda report in 2001. This drew on the work of task groups on environmentally friendly construction materials, energy efficiency in buildings, construction and demolition, and construction life cycle costing. This

sector-based work has fed into work standardising the assessment of environmental impacts across Europe (see below). It also meshes with sector-based work within nation states. For example, in Britain, the Department of Trade and Industry (DTI) has also developed a sector-based strategy on sustainable construction. A first strategy was published in 2000 (DTI, 2000) and a revised version in 2006 as a consultation draft (DTI, 2006). This is a broad ranging document that identifies six areas for improvement:

- establishing effective construction programmes;
- developing and supporting well focused and capable public sector clients;
- designing and decision making based on 'whole-life' value;
- using the appropriate procurement and contracting strategies;
- working collaboratively through fully integrated teams; and
- evaluating performance and embedding project learning.

The European Construction Technology Platform (ECTP) has also developed a twenty-five year Strategic Research Agenda that has quickly become the *de facto* agenda for the future of construction. It comprises a comprehensive wish list of different elements of change in the construction industry. The European Council for Construction Research, Development and Innovation (ECCREDI) and E-Core (a research network) are seeking to create and link national platforms under the ECTP umbrella and use this to influence future EU research funding. Within the UK, the national platform has only recently been established, supported by a £3m Knowledge Transfer Network under the auspices of the DTI. ICT, off-site methods and modern construction methods are likely to be prioritised by the DTI since the sustainability agenda in Britain is strongly driven by an understanding of construction technology trends.

The reliance on best practice

While these networks exist to foster the transfer of ideas and knowledge, there has been an overwhelming emphasis on best practice as the means of effecting this. There has been a heavy reliance on best practice and voluntary accreditation schemes as a way to encourage change, as regulation in this area is only slowly emerging, compared to some other sectors. For example, the National Focal Points Programme is one such best practice-focussed project working across the European Commission and member states. Within the network each member state has a national focal point and the network office provides links and support to aid local problem solving, etc. Existing best practices are evaluated against a template that is then used on the national and sub-national/local levels to assess construction and development practices. Other individual examples of best practice on construction and development sites abound; the Constructing Excellence website, for example, emphasises such cases, arguing that they prove sustainable construction is practicable and that the business case can be made (http://www.constructingexcellence.org.uk; see also Constructing Excellence's website for a profile on the Joint UK-Sweden Initiative on Sustainable Construction (http://www.constructingexcellence.org.uk/uksweden/default.jsp).

While such best practice examples are laudable and the publicity surrounding them integral to the learning processes of urban planners and the construction industry, the emphasis on them also reinforces a degree of passivity on the part of the planning

system and a limited use of the regulatory potential of this system. The reliance on best practice cases also often means that problems of transferability of practice from locality to locality and from context to context are ignored (Bulkeley, 2006). Bulkeley (2006) argues that the way that the concept of best practice is used can de-contextualise the complex problems of achieving a more sustainable outcome in a specific local site. The adoption of best practice within sustainable construction networks may appear to promote dissemination but it actually constructs a boundary object that may fail to move effectively between the more generalised networks where knowledge is constructed to the local networks of implementation. A boundary object can be understood as a compound of an artefact with associated discourses and processes; it allows the transformation of knowledge generated in academic or regulatory contexts into usable knowledge in a bureaucratic context.

Rather than providing a template that can be adopted in any locality, best practice does not remove the necessity for localised construction of sustainability knowledge. It throws the emphasis back onto the role of local government and local governance. In the European context this also raises the issue of subsidiarity (discussed further below). As one of our interviewees emphasised, the continued attempt to develop generalisable practice guidance at the European level often leads to vacuous statements with little real impact. Referring to the idea of a 3-D matrix for sustainable construction, which could apply in a variety of contexts (builder, researcher, policy makers in any locality), he commented:

> "When one puts this into the context of the EU level – if you can come to any agreement on anything at all given these three levels (and about something that is inherently local) it is difficult to avoid coming up with a lot of platitudes."

This has not prevented the ongoing search for ways to make generalised European stances and knowledge on sustainable construction more available and relevant to specific local contexts.

Voluntary and regulatory approaches

The reliance on best practice is rooted in the preference for voluntary as opposed to regulatory approaches in this policy area. Several of our EU interviewees pointed to the lack of implementation powers at higher levels to ensure the adoption of research and policies across different governmental levels and across sectoral boundaries. The interviews also pointed to a dearth of knowledge brokers and spanners; i.e. those who work to improve the handling and circulation of knowledge within policy and research networks. In the UK, Constructing Excellence stood out in this regard as a self-acknowledged 'broker' and was identified as such by other interviewees. There does not seem to be an equivalent organisation taking up the broker role within the European context. Rather, most brokering seems to occur within specific projects and initiatives not across the sustainable construction issue as a whole.

Regulatory measures, however, would be a means of forcing the adoption of new technologies. In the absence of such measures or their limited applicability, the emphasis falls instead on exhortation or a persuasive flow of knowledge and information about new practices. But the lack of regulation can itself inhibit interest in learning. As one interviewee commented:

> "[it is] sometimes difficult for federations to get their members interested. It is a matter of nationality as well. We have Dutch and French members that are extremely interested in what is happening, mainly the Netherlands because so much is regulated."

He went on to make the point that "it is only when it comes to the time when it is transposed into national legislation that they realize in the companies that they will have to do something." The lack of knowledge brokers able effectively to link the European and national technical and policy networks is critical to the poor dissemination and translation of knowledge into formats appropriate to the various actors involved in promoting sustainable construction in different contexts. The development of checklists, codes and toolkits to prioritise sustainable construction have, in the UK for example, been less effectively devised and used than anticipated. This in part is due to the lack of individuals and agencies championing the transfer of knowledge from the domain of policy learning to the domain of organisational learning within firms, federations, agencies and local authorities.

In Britain, there has been a recent shift towards more stringent regulation being proposed, at least where housebuilding is concerned. The Building Regulations, which regulate the construction methods used in development, have recently been upgraded. With effect from 6th April 2006, all new buildings will have to comply with revised regulations contained in Part L that increase energy efficiency by at least 20%, a cumulative increase of 40% since 2002. But the draft of *Building A Green Future: towards Zero Carbon Development* promises to ramp up this regulation to the point where all new housing will be carbon-zero by 2016. General planning policy guidance has also been supplemented to try and ensure that this regulation is matched by urban planning practice (http://www.communities.gov.uk/pub/142/ConsultationPlanningPolicyStatementPlanningandClimateChangeSupplementtoPlanning1_id1505142.pdf). This is an attempt to try to bridge the gap between a largely aspirational planning agenda for local sustainable development and the practices of the development and construction industries in actually delivering this kind of development. However, this has largely happened without reference to European policy frameworks. European regulation in this area has tended to focus on the promotion of standardisation in environmental assessment.

Standardisation of environmental assessment

Conceptually, it can be argued that sustainable construction operates as an *informing ideal*. A type of invisible or even impossible yardstick that has come to be accepted and legitimated as a register enabling a common vocabulary for discussing the interconnectedness of all phases in the design, construction, use and management of buildings across multiple disciplinary and sectoral divisions. The characteristics of how each individual stakeholder conceptualises and prioritises issues, ideas, and approaches under the banner of sustainable construction is then understood as the means by which each actor makes use of his/her own repertoire of practices, experiences and conventions to render the invisible yardstick 'real' (cf. Guy and Shove 2000). But the proliferation of definitions that arises can be problematic for practice and so there has been considerable effort going into standardisation of what is meant by more sustainable building materials and a more sustainable (or at least energy efficient) building. While this does not remove the need for tailoring the

interpretation of sustainable construction to a specific context, it does represent a European response to the problems of diverse interpretations.

A significant case of standardisation is provided by the Council of European Producers of Materials for Construction (CEPMC), which started work in 1995 on the eventual standardisation of product standards for building products from an environmental perspective (EPDs) and tested it on four major insulation products. A major conference was held in Brussels in 2000-1 and work moved on to compare the emergent EU scheme with major national schemes. Following arguments made by CEPMC for a European scheme, the Commission provided some funding for a consultant's report undertaken by EcoBalance, part of Price Waterhouse Coopers (PWC). The Directorate General for the Environment within the Commission also did a study on EPDs, followed by another PWC report, this time for the Directorate General for Enterprise. This led to a final recommendation for European standardisation on building products. This is quite a significant move. A federation representative within the construction industry in Europe commented once a performance standard is codified in a formal contract document, a requirement to fulfil the specification is set and a precedent made for further contracts. However, the process of rolling out EPD standardisation is proving a lengthy one and it will take several years to complete the process.

Standardisation work is also being undertaken by the Standing Committee on Construction (CEC, 2004b) focused on the standardisation of methods for the assessment of the environmental performance of buildings through life-cycle analysis. The 2002 Directive on the energy performance of buildings (CEC, 2002) also required a standard methodology for assessing this performance, alongside setting minimum energy efficiency requirements for all new and larger refurbished buildings, and requiring energy certification on completion, sale or lease. It should be noted however, that the Directive fell short of actually specifying a European methodology that would operate across different countries.

A European construction sector?

The economic context for the difficulties of establishing strong European learning networks is the split within the construction industry between the national/regional and the global contexts. The absence of a European-wide construction industry to match the R&D and policy effort at the European scale was noted by several of our interviewees (see also Barr, 2004), particularly in relation to housebuilding. As a result European construction industry federations often have limited contact with their local members; "There is a barrier, because we are a federation of federations or associations, so we don't always know what gets down to the companies themselves unless they come to our meetings." . This can prove problematic when the attempt is made to convey information, ideas and knowledge emanating at the European level to more local contexts. Some organisations, such as the Architects' Council of Europe, operate exclusively on policy making at the European level obviously limiting the potential for broader network linkages.

There is a particular issue with reaching the smaller firms that actually make up the majority of the industry (although not its workload). One interviewee refereed to small firms to being in effect "off the radar". Even within the national context, the

importance of regional construction firms may mean that national policy and knowledge discussions are not able to engage with commercial actors and their networks. Furthermore, learning within the industry more generally is constrained by the extent to which firms fail to exhibit the characteristics of 'learning organisations' (Easterby-Smith, 1997) and the problems of forcing innovation through long supply chains, geographically extended across national, European and global markets, given that existing national networks and frames are cemented and the policy problem is not mutually shared across territories.

The role of European local and regional government

There are similar problems of forcing or promoting a change towards sustainable construction through the sub-national regional and local government networks. There is an underlying basis for this in that urban policy and planning is a slightly problematic area for the EU; the Union has no formal competence here unlike the environmental and economic policy domains. This shapes the way that it can address the issue of sustainable construction and urban development. In part, it has thrown the emphasis back onto policy learning. One tactic that the European level has adopted in response to problems of competence is to use knowledge and learning to seek influence in areas where it does not have formal powers.

But this highlights a problem, in so far as very localised action is needed to achieve the goal of sustainable construction. For example, the anticipated impact of the EU Thematic Strategy on the Urban Environment, from the DG ENV perspective, is said to be at the local and regional level, with the responsibility falling to national member states to integrate the Strategy into their national plans: in other words, "success depends on an effective cascade" (Interview 2005, DG ENV). Yet, practitioners in the field suggest that no strategic link exists between construction and planning at the local authority or central government level, let alone the pan-EU level. It was commented that the EU is waiting for service deliverers to operationalise the necessary synthesis.

UK-based consultants in the field indicated that the UK is past the agenda-setting stage on sustainable communities and sustainable construction, and the priorities are now being passed onto the local and regional public sector to implement. But, in practice, sustainable construction is not explicitly or uniformly prioritised. As a result, aspirational policy imperatives continue to be delivered but there is little or no alignment with local and regional delivery mechanisms and best practice is not trickling down from evidence-based demonstration projects. As one interviewee said: "Success demands trusting regional organisations to deliver EU knowledge, best practice and policy at the local levels. This needs only one connection to fail for a problem to arise. The hope is that the failed connection happens low in the policy and knowledge chain where there are multiple networks or other possible agents to pull up the slack. If it happens high up, then the information and knowledge never makes it to the networks of knowledge transfer." Another interviewee commented that these problems of transfer could slow down implementation considerably. The estimated time lag between the announcement of a Thematic Strategy or Directive at the EU level to that of having an impact on local practice in a member state was identified by interviewees as three to eight years. Simple language translation is also implicated in these problems. Translation is becoming increasingly problematic in the European context given the enlargement of the Union and financial constraints. Documents are

now translated into fewer (usually three) languages and are often reduced in length to keep costs of translation down, leading one DG ENV representative to remark on the UTS:

> "there was a cap on the number of characters allowed and the technical annexes are only published in English. The final document was boiled down and boiled down to the point where I have to remind myself what stayed v. what was cut"

An inherent lack of information at the European level about what is happening at the level of the locality was consistently highlighted by our interviewees as a cause for concern. Some suggested that the principle of subsidiarity combined with a pan-EU scope will mean a lowest common denominator in policy development. Others noted the very informal network of communication that seems to be operating within local government may also hinder knowledge and policy transfer. It seems that only the largest local authorities are able to engage directly with European initiatives. For example, the Greater London Authority is able to employ a European Office that looks two ways, informing the GLA and its funding partners of what the EU is doing and highlighting potential impacts for London, while also informing the EU of what London is doing. The national context also shapes the nature of linkages between Europe, nation state and local/regional government. For example, Germany has construction codes but this is delivered at the tender level, while in Sweden it is carried out at the local level and is a key role for local government.

POLICY LEARNING IN EUROPE: A CASCADE?

Despite the identification of these barriers to successful policy learning, many of our interviewees nevertheless adhered to the notion of a knowledge cascade – that is to say that sustainable construction knowledge (e.g. technologies, methods, practices etc.) are being 'cascaded' from international, to national, to regional, and finally to local scales (Bulkeley 2005). Constructing Excellence defined itself as depending on 'a trickle-down effect' and the Association of London Government European Service also claimed to play a role in tricking down information: "We help with the information gap between local and EU levels."

Some interviewees, while espousing the ideal of a cascade or trickle-down effect, were however very clear about the deficiencies of this model. "We are unaware of how effective this cascade effect is down from Europe". A prominent sustainable construction analyst claimed that "trickle down is left to chance, with no flow management in place". In response to this understanding, Constructing Excellence offered an alternative model of how they actually operate:

> "I think it is about connecting circles, because you get that core component that is both learning and disseminating. Then you have got to get someone disseminating beyond those people with direct experience, and you have also got to get the learning to feed into that group so they look more widely than their immediate current experience. Flows in and flows out. They are connected yet separate as well. But it is also a bit like a 3-D matrix."

Adopting a model like this implies abandoning the language of barriers and instead focussing on the nature of relationships between actors, across tiers, across sectors, across nations, that will advance policy learning. As Guy and Marvin (1999) argue:

> "Rather than focusing on the notion of barriers, an alternative approach would acknowledge that action is shaped by a multiplicity of factors that cannot be reduced to a simple view of a 'barrier' to change. Instead there is a multiplicity of local contexts within which individual and organisational behaviour is shaped. This way of seeing views social action not in terms of individualized and manageable behaviour, but rather as the capacity of socialized actors to innovate within highly constrained and dynamic contexts of action that may sometimes enable, and sometimes inhibit, environmental innovation" (p. 272).

In policy and decision-making terms, Guy and Marvin's logic suggests the need to look more closely at how "the changing social organisation of environmental innovation structures the potential of different coalitions of actors to shape sustainable cities" and to identify "windows of opportunity arising from the coexistence of different social, political and commercial interests in alternative forms of environmental innovation" (ibid. p.272). Donovan et al. (2005) likewise argue that the barriers typology generates a tendency for actors to adopt "tried and tested patterns of behaviour in the face of uncertainties surrounding how to interpret sustainability" (p. 22). This risk-averse behaviour thus dissuades innovation because it "pre-figures failure by assuming some ideal end-point for sustainability" (ibid. p. 22). The solution according to Donovan et al. (2005) is to re-frame the barriers as opportunities, wherein it is explicit that sustainability is not an end-point but a journey. Moving beyond the barriers approach and seeing sustainable construction networks as constrained and dynamic contexts of action offers us a new vantage point to re-engage with the utility of the multi-level governance perspective.

From a policy perspective sustainable construction is viewed as an issue that can be addressed through the channels of a Type I governance arrangement – a normative framework within which 'functions are bundled, and the levels of government are multiple but limited' (Hooghe and Marks 2001, p.4). Thus from a DG ENV perspective a successful EU Thematic Strategy or Directive will have its greatest impact at the local level but this is dependent on the intermediate levels of government 'performing' their intended role. However, at the level of practical implementation of sustainable construction knowledge and innovation the technical agenda has advanced further than the policy agenda because of its affinity with a Type II governance model. Again, in Type II 'the number of jurisdictions is vast, rather than limited; in which jurisdictions are not aligned on just a few levels, but operate at diverse territorial scales; in which jurisdictions are functionally specific rather than multi-task; and where jurisdictions are intended to be flexible rather than fixed' (Hooghe and Marks 2001, p. 6). In other words, the sustainable construction technical agenda has surpassed that of a multi-faceted, yet vertically coordinated policy approach because it is goal-oriented and supported by a strong network of horizontal functional associations.

More specifically, the sustainable construction technological agenda fits succinctly with the policy provision design principles which, according Hooghe and Marks (2001, p. 14, characterise Type II governance:

- Functional specificity – Specific competencies are hived off, and insulated, in separate jurisdictions. Jurisdictions are numerous and intersect, but they are relatively inert with respect to each other

- Low level of distributional conflict – The emphasis in each jurisdiction is on Pareto optimality in problem solving rather than distributional bargaining with societal-wide consequences.
- Ad hoc, policy-specific architecture – The unit of political engineering in Type I governance is the jurisdiction; in Type II governance it is the individual policy problem.

Thus the concentration within the technological agenda on specific sector-based deficits in performance of more sustainable construction methods, techniques, and approaches fits within the Type II approach to policy solutions targeted at particular problems. These are seen as best addressed by functionally differentiated networks of actors with particular skills and knowledge related to the problems at hand. Again, here we underscore the applicability of the policy emphasis on technical problem solving as opposed to more holistic planning for societal-wide 'sustainability'.

In our particular application to sustainable construction we have found that within policy arenas, the relatively stable framework of Type I with its dispersion of authority via the rational but simultaneous empowerment of sub-national and supranational institutions has supported the continued relevance of a knowledge and policy 'cascade'. However, at the level of practice, a Type II logic appears to be advancing at the edges of the classical Type I jurisdictions, that is to say where central government still remains accountable, but is not the primary service provider, nor the only source of formal authority. There is a burgeoning industry of issue and task-specific standard-setting jurisdictions that operate at arm's length from traditional government, which are largely autonomous but overlap territorially (Hooghe and Marks 2001, p. 10). This suggests that policy and research actors are forced to negotiate a much more complex, fluid, transient web of networks with significant barriers to the smooth trickle-down of new knowledge and policy on sustainable construction.

The lack of a common definition of sustainable construction has not constrained development of initiatives on it, both within industry practice and urban planning policy. The expectation of an ideal vertical 'cascade' of sustainable construction knowledge, research and policy is, however, undermined by how little is done to encourage, facilitate and monitor its execution or flow management. This expectation is also undermined by the growth in Type II governance structures which suggests that the hierarchical or vertical path dependency of a cascade is outdated, and moreover, counter-productive to the co-generation of sustainable construction knowledge, policy and practice. The purpose of this chapter has not been to highlight the barriers to a successful cascade in order to reinstate the validity of the cascade as a policy tool or management approach. Nor were we in the process, attempting to identify the means to overcome said barriers to the transfer of sustainable construction knowledge and hence the improvement of policy. Rather we have attempted to open up a discussion of the nature of multi-level governance networks involved in this particular urban policy issue and how these influence learning and the flow of knowledge aimed at promoting sustainable urban development.

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[i] The full results of which are reported in a number of publications, including: Rydin et al., 2006; Rydin and Nye, 2006; Rydin and Vandergert, 2006; Rydin and Burchell, 2006, Cooper, 2006; Rydin and Nye, f/c; Rydin, Whitaker and Amjad, f/c; Rydin, Moore and Nye, 2007. These are also all available on the LSE website for the Centre for Environmental Policy & Governance: http://www.lse.ac.uk/collections/geographyAndEnvironment/CEPG/sustainableConstruction.htm . The SusCon project was funded by the Higher Education Funding Council for England under its Higher Education Initiative Fund Tranche 2.