

**Governance, Knowledge and Sustainability: the Implementation of EU  
Directives on Air Quality in Southampton**

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# **Governance, Knowledge and Sustainability: the Implementation of EU Directives on Air Quality in Southampton**

This article describes the implementation of the EU directive relating to air quality and the setting up of the Local Air Quality Management regime in the city of Southampton. This case study research was part of the Governance for Sustainability project (G-FORS) a three-year project financed by the European Union's Sixth Research Programme. The objective of GFORS was to develop an innovative analytical model for the study of governance for sustainability with a particular emphasis on how knowledge was drawn upon and utilised in practice. We explain how the governance arrangements have helped or prevented the transfer of different forms of knowledge through policy implementation and therefore had an impact on the effectiveness of the local policy. Document review and analysis, actor mapping and interviews have helped us in this process. We have also drawn some policy lessons on the delivery mechanisms of air quality management in England.

Keywords: air quality, EU directive, urban governance, knowledge, sustainability

## **1. Introduction**

This article is based on research carried out as part of the Governance for Sustainability (GFORS) research project, a three-year project financed by the European Union's Sixth Research Programme. The objective of GFORS was to develop an innovative analytical model for the study of governance for sustainability with a particular emphasis on how knowledge was drawn upon and utilised in practice. Here we focus on one of the UK case studies of the Local Air Quality Management regime in the city of Southampton.

The governance arrangements for Air Quality Management in the UK can be characterised as hierarchical and our starting point suggested a rather negative view of hierarchy as a governance mode, as traditionally bureaucratic in the worst sense of the word. What the research has revealed is a more nuanced picture. There are strengths and weaknesses associated with the top-down, hierarchical, expert dominated system of air quality management.

## **2. The GFORS research: governance, knowledge and sustainable development**

### ***2.1 Governance, knowledge and sustainable development***

It is argued that environmental policies, and more broadly the pursuit of sustainable development, presents particular challenges in terms of knowledge and institutional arrangements. The notion of sustainability has moved to a much more complex approach that takes into account environmental, economic and social dimensions in an integrated manner (Giddings et al 2002). Sustainability therefore puts enormous pressures on the sectorised and multi-level organisations of government and governance, and it has become the conventional wisdom to argue that addressing sustainability requires significant institutional change. Calls for horizontal integration between different parts of government, the private sector and civil society have been central to the discourse of sustainability. Alongside this, vertical integration is sought between levels of government, acknowledging that environmental problems impacting on localities are shaped by wider national and international developments and decisions (Owens and Cowell 2002)

However, as Owens and Cowell and many others have demonstrated, while the rhetoric of policy integration in pursuit of sustainability is pervasive, the mechanisms to achieve it are unclear. This applies particularly where beliefs about problems and solutions are divergent and where there are fundamental contradictions between economic and environmental goals. Sustainability is an essentially contested notion in theoretical, policy and practice terms. The contested nature of sustainability means that it is frequently mobilised by actors to justify contradictory policy measures and competing problem definitions and policies. From our perspective in this project these struggles are in part disagreements between experts, politicians and laypersons in their assessment of the relevance of different forms of knowledge to the particular problems and their solution.

Of course, expert, scientific knowledge is especially significant in the field of environmental policy and politics. Environmental policy is surrounded by an extensive knowledge infrastructure (and related epistemic communities, Haas 1990) that produces a substantial body of technical and scientific expertise, shapes discourses on sustainability and influences political decisions (Hajer 1995). There may, however, be a marked gap between experts in different fields of scientific knowledge and also between experts and scientific knowledge and lay or non-expert knowledge on an issue. For example, experts frequently challenge lay interpretations of environmental risk as exaggerated or based on misunderstanding. The other side of this issue is where expert knowledge points to serious environmental risks (for example, of climate change or air

pollution), but where the problems are invisible or difficult for non-experts to apprehend.

It is suggested that this gap can be closed by the development of participatory and deliberative processes that serve to both enhance democratic politics, but also to question the complexities and uncertainties of science (Fischer 2000). Planning theory and practice offer a wide variety of processes to bring together actors, to pool their different “knowledges” and, hopefully, to generate consensus (see Healey 1997, Innes and Booher 1999). However, as Rydin (2007) points out, it is important to distinguish knowledge claims from other kinds of claims that generate disagreement over policy, for example ethical or other kinds of value-based beliefs. Policy-makers therefore have some responsibility for testing the validity of knowledge claims as part of the policy process:

“there needs to be space for giving voice to these various claims- *opening-up*- but also for testing and ultimately recognising these claims- *closing down*. Contemporary planning theory has tended to be better at discussing opening-up rather than closing-down” (Rydin 2007 p. 58).

We would also acknowledge that a more pluralist perspective on knowledge and its use in the policy process may be resisted by policy-makers. This may be to avoid the conflicts that different knowledge forms and claims bring, or the challenges of integrating contributions from different actors and sectors, or even to avoid the problems of knowledge “overload”. The facilitation of engagement by other stakeholders, expert and non-expert, challenges many policy-makers, as does the testing

and evaluation of different knowledge claims with a view to synthesising different perspectives (see also Davoudi 2006).

In summary we can say that the literature points towards a need for policies for sustainability to be developed in the context of governance arrangements that facilitate integration across levels and sectors, that incorporate a range of different types of knowledge and that include processes that can evaluate and test different knowledge claims, thereby promoting learning. We therefore set out to investigate the interaction between governance arrangements, forms of knowledge and policies for sustainability. Our broad hypothesis was that network forms of governance are more likely to be open to new participants and forms of knowledge, and consequently more effective at problem solving and promoting learning. The next section goes on to discuss how we defined and assessed governance arrangements and forms of knowledge for the purposes of the research.

## ***2.2 Research questions***

The GFORS research is more fully reported in an edited collection (Atkinson, Terizakis, Zimmermann 2010). Academics from nine countries participated in the project and each national team carried out local cases studies that examined the implementation of EU Directives relating to Air Quality, Strategic Environmental Assessment and Emissions Trading. This article focuses on the case study of air quality management in the UK (the city of Southampton). The research aimed to examine the synergy between different forms of governance and different forms of knowledge, and to draw some conclusions

on which combination is most appropriate for policy learning that supports sustainable development. Below, we discuss briefly the key theoretical concepts which underpinned the research.

## ***2.3 Key concepts***

### *2.2.1 Knowledge*

The starting point in this project reflects a wider shift in the way in which the role of knowledge is conceptualised, both more generally, and in the policy process. On the one hand there has been recognition that knowledge should not be considered as a unified category, but as a set of multiple claims that reflect multiple ways of knowing, assumptions about “causality” or “conditionality” as well as normative judgements about what constitutes a problem and why it should be solved. Hence knowledge not only differs across sciences, but also at a societal level. As such, knowledge plays a key role in building the capacities to act and hence in decision-making processes. Closely related with this recognition is the view that knowledge is not just the domain of the scientist or policy expert, but is rather associated with a variety of actors in a variety of settings. Hence, different forms of knowledge were conceptualised for our project, as potentially falling into nine separate categories that reflect different worldviews. In the course of the research, however, we used a somewhat simplified four-fold categorisation that distinguished between the following:

- Expert/professional/scientific knowledge, a category that encompasses codified expertise that derives from science, technology and other academic disciplines, and professional expertise, for example of planners, engineers or lawyers;
- Institutional/steering knowledge, referring to knowledge of how organisations, institutions and systems work; how things get done in and through organisations. It therefore includes the administrative, managerial and political knowledge of politicians, civil servants and managers in the public and private sectors;
- Milieu and local or lay knowledge refers to the knowledge held by individual residents and community groups, and deriving from everyday experiences. It is valued for its capacity to enhance or challenge expert perspectives on environmental problems, as well as contributing to, or establishing the political acceptability and legitimacy of proposed solutions;
- Reflective knowledge is a special category that possesses mediating or transcendent qualities. Reflective knowledge questions or confirms the validity claims of other knowledge forms. It is necessary to effect translations between different expert and non-expert cultures, and in its strongest form can promote learning, adaptation and policy innovation.

### *2.2.2 Governance*

A parallel trend concerns the ways in which institutional and governance arrangements can engage and give a meaningful role to a wider range of stakeholders. This reflects the problems of policy coordination and implementation in a more fragmented public sector, but also acknowledges the need to engage private sector and civil society



interests in addressing problems that strain the capacity of state action and institutions. New participants also bring new and different forms of knowledge into the policy process, raising the question of how, institutionally, multiple knowledge claims are best handled (Rydin 2007). The notion of governance used in the political science context of urban and regional studies (Le Galès 1998; Stoker 2000) and environmental politics (Cashmore 2002) was a key concept in the research as it gave us the tools to compare across case studies how governance arrangements filter knowledge in or out of environmental policy decision-making. In particular, an assumption underlying the research was that network forms of governance, as potentially more open and inclusive, would display a stronger capacity to incorporate a wider range of participants and blend diverse forms of knowledge. Empirically, however, we aimed to investigate the interaction of case-specific governance arrangements and the use and exchange of knowledge, and how this could contribute to a more integrated, effective and legitimate understanding of sustainability. In doing this we sought to understand if particular governance arrangements and knowledge forms were more or less conducive to the production of reflective knowledge.

The governance forms identified were the well-established notions of hierarchy, markets and networks, and their associated institutional forms, rules and actor constellations. In terms of air quality management we were mainly concerned with the distinction between hierarchy and networks. Hierarchy refers to conventional forms of hierarchical government with rules, procedures and participant roles defined through legislation and associated guidance, and decisions taken in the political arena through majority voting. Network forms of governance are based on arrangements that reflect

the coming together of autonomous, but interdependent actors, potentially from different sectors (state, business and civil society) who interact through arguing and bargaining, with decision-making reflecting a negotiated agreement between the participants. The network form of governance has been seen by the literature as a response to failure of the state to solve societal problem (Jessop 1998) or reflecting the hollowing out of the state where non-hierarchical, consensus-based and often decentralized means of guidance informed policy-making (Rhodes 1996; H  ritier 2002). These governance forms are, of course, ideal types that are unlikely to exist in a “pure” form (Bradach and Eccles 1989; Lowndes and Skelcher 1998), but the distinction serves to contrast bureaucratic government in a conventional sense, and more open arrangements that extend participation in governance to actors outside of the state.

### **3. The case study of Air Quality management in Southampton**

Here we describe one of the UK case studies, the implementation of the Local Air Quality Management (LAQM) regime in the city of Southampton. The Environment Act, 1995 establishes the duty of each local authority to periodically review and assess air quality in their locality in relation to seven regulated pollutants, against specific national objectives. The objectives are contained in the national Air Quality Strategy (latest version 2007), and reflect the limit levels for pollution established in EU directives on air quality. The UK LAQM system is therefore one of the means by which the UK government seeks to ensure its compliance with the European regulations (Council of the EU 1996).

Where the review and assessment process show that air quality objectives are unlikely to be achieved and public exposure exists an *Air Quality Management Area (AQMA)* must be designated. Subsequently, an *Air Quality Action Plan* is required setting out the measures that are necessary to improve air quality to acceptable levels. Prior to formal AQMA designation residents and businesses in the affected areas are consulted, and there are statutory consultees, including neighbouring authorities, the Government Office for the Regions, the Highways Agency and Environment Agency. Consultation with the same set of organisations and interests also takes place on the *Air Quality Action Plan*. In making AQMA declarations and drawing up action plans local authorities are required to consider the relative contributions of industry and other sources of air pollution. Where road traffic is the main cause of problems of poor air quality, as it is in many areas, local authorities are advised to integrate the action plan with the local transport plan, (DEFRA 2007) and also to take account of air quality issues in their land-use (spatial) plans and decision-making (ODPM 2004). Local authorities can use a range of powers in pursuit of air quality objectives, including smoke control, land use regulation, local traffic management and declaring Low Emission Zones. Any action they propose must be cost-effective and proportionate.

Local air quality management is supported in important ways by a national knowledge infrastructure, which includes the work of the Expert Panel on Air Quality Standards, responsible to DEFRA for recommending standards on the basis of medical and scientific evidence of how each pollutant affects human health. This group has now been incorporated into the Committee on the Medical Effects of Air Pollution, under the Department of Health. The objectives (or policy targets) contained in the national Air

Quality Strategy are based on these standards but also take account of the technical and economic feasibility and the timescales over which improvements in air quality can be made. It is also important to note that LAQM is more than a simple legal framework (see Chatterton et al 2008). A package of knowledge support tools and other activities are also in place, for example, technical guidance on carrying out reviews and assessment of air quality, technical consultancy support, advice on developing action plans, and monitoring and oversight through DEFRA.

### ***3.1 Background to the case study***

Southampton is a growing city in the south of England, and one of the UK's principal ports. Southampton City Council's air quality management process is lead by a steering group that includes officers from environmental health, planning and sustainability and transport. A detailed air quality assessment report was published towards the end of 2004, and six AQMAs were declared for the pollutant NO<sub>2</sub> in mid 2005. Two further AQMAs were declared in 2008. The AQMAs correspond to key routes into and through the city, and points of congestion at junctions. Unsurprisingly road traffic accounted for over half of the local NO<sub>2</sub> concentrations, and port-related freight traffic were estimated to account for more than 50% of traffic related emissions. Emissions from shipping were also significant, particularly in areas adjoining the port of Southampton. The process of developing an Air Quality Action Plan commenced in 2005, and following public consultation the city council approved plan was submitted to central government in early 2008. An up-dated action plan was published in 2009.

The Action Plan proposed a series of measures, over-lapping in large measure with policies and proposals included in the Local Transport Plan. The proposed actions include partnerships with local bus companies to improve the performance of vehicles; promoting the use of more sustainable modes of transport in the council's own transport activities, various measures to reduce congestion, active travel initiatives, and rail gauge enhancement to enable transfer of freight from road to rail. In addition a set of more “aspirational” measures are outlined that *could* be adopted including designating a Low Emission Zone; minimum engine standards for freight vehicles; a public awareness strategy; new road links to the port; and shore-side electricity supply at the port to counter pollution from ship-based generators.

### ***3.2 Governance arrangements and knowledge forms: theory and practice in Southampton***

In terms of governance arrangements for UK air quality management, hierarchy is the dominant form. In as much as network forms existed in Southampton, these were very much in the shadow of hierarchy, and could be more accurately described as either cross-departmental working, or consultation arrangements within a hierarchical policy process.

National government sets air quality objectives, and measurement and assessment procedures through national legislation and associated technical guidance. Each local authority is required by law to follow the process described earlier. Within these hierarchical arrangements environmental scientists, transport and spatial planners were

the key actors, with councillors having responsibility for formally declaring AQMAs and adopting the action plan. Other local actors, from the health authority, the business community, in particular the Port Authority, and local residents were consulted at key points in the process.

In terms of knowledge, expert and scientific knowledge dominated the process. This included the health-related objectives, indicating acceptable and unacceptable levels of air pollution, set by a national expert panel, the expertise of environmental health officers who conducted assessments, with technical assistance from consultants and central government, and the professional expertise of local transport planners whose remit covers action planning to remedy problems of air pollution. Expert knowledge was made to count, however, through the mediating use of steering/ institutional knowledge of local authority officers who steered the air quality management process through the statutory and administrative stages mandated in the legislation.

There are certainly opportunities for deliberation and the sharing of different forms of knowledge. The air quality steering group arrangement in Southampton facilitated the coming together of diverse professional perspectives, and, in principle at least, a more integrated response to the air quality problem. The consultation arrangements facilitated the beginning of closer links with the health authority over the issue of air quality. In this case, however, wider engagement by actors from outside the local authority with the process was extremely limited. This reflects the technical nature of air quality measurement and modelling, and also the invisibility of problems of pollution to the wider public in a context where general perceptions are of 'good' air quality, partly due

to the city's coastal location. One of the ways in which it was acknowledged that the political profile of air quality could be raised was through making stronger links between pollution and health impacts. The local health authority was drawn into the air quality management process through the consultation arrangements, and contributed evidence to show how problems of poor air quality and higher levels of ill-health, and respiratory disease in particular, co-existed in the city's poorer neighbourhoods. There are uncertainties, however, over the relative contribution of poor air quality and other factors such as poor housing or smoking. Collaborative work on this issue will continue.

It was apparent, however, that issues beyond the technical and scientific case for declaring AQMAs and designing mitigation measures did influence decisions and outcomes in a number of ways. For example, in declaring AQMAs there was some debate concerning the appropriate spatial extent of the declarations, essentially whether there should be a number of targeted declarations confined to the locations where AQ objectives were unlikely to be achieved in the target time periods, or whether a city-wide AQMA was appropriate. The targeted approach was thought to carry risks of blighting properties within the designated areas. On the other hand a city-wide approach was thought to be potentially sending out the wrong message about the scale and extent of air quality problems in the city. The decision to focus on pollution hot-spots is consistent with the way in which the national air quality policy regime is designed, but it remains the case that actions to respond to these problems have to encompass city-wide transport and planning policy, and, in addition, have implications for investment decisions in the private sector and at national government level.

Throughout the process, of making declarations and drawing up the action plan, the relationship of the local authority to the Port Authority also played an important, if indirect, role. The Port Authority, through the consultation process, was concerned to downplay the contribution of port-related traffic to modelled air pollution. Part of the debate here concerned the uncertainties regarding the precise sources of air pollution, partly it reflected uncertainty over future freight traffic levels in the context of growth forecasts and prospective improvements in rail infrastructure. The local authority was also cognisant of the importance of maintaining good relations with the Port Authority, the most significant economic interest in the city, and of limiting constraints on the Port's ability to expand, or of demands on the Port to invest in infrastructure in ways that could affect its competitive position internationally. This is indicative of market knowledge playing an (indirect) structuring role in the sense that assumptions and decisions about the economic impacts of particular courses of action have either limited the scope of debate, or defined what is 'feasible' in terms of possible courses of action.

Our starting point suggested a rather negative view of hierarchy as a governance mode, considering it as somehow closed and exclusive -- as traditionally bureaucratic in the worst sense of the word. This contrasts a positive view on networks as open and inclusive. What the research has shown is a more nuanced picture. There are both strengths and weaknesses associated with the top-down, hierarchical, expert dominated system of air quality management.

#### **4. Strengths and Weaknesses of the UK process**



The national Air Quality Strategy in the UK has established a policy framework that steers local authorities through a rigorous air quality review and assessment process. Because of the statutory requirements, to undertake regular monitoring, to assess the likelihood that objectives will not be met, and to declare AQMAs where this is the case, all local authorities have developed a level of knowledge and expertise in a relatively short period of time. Central government has also provided tools and resources, including guidance and consultancy support, which assists and underpins the local process. The universal nature of the process has also encouraged environmental health professionals to form networks in which expertise can be shared. A significant strength of the local focus of the process is that local knowledge of sources and exposure can be used to detect air quality problems in a more precise way, for example the detection of pollution associated with the use of generators on shipping that emerged from the Southampton LAQM process.

As a consequence pollution problems that were “invisible” have been made “visible” as a result of the process. As Chatterton et al (2008) have noted, initial expectations when the LAQM process was launched in 1997, that few local authorities would be required to declare AQMAs, have been confounded. More than 200 local authorities have identified AQMAs where air quality objectives are unlikely to be achieved. In Southampton initial perceptions of “good” air quality because of the city’s coastal location, have been tempered by the detection of several pollution hot-spots. This in turn has led to local authority/ health authority joint working to investigate further the relationship of air quality, social deprivation and problems of ill-health. It has also led

to a joint initiative with a neighbouring port city to pursue funding for shore-side electricity supply to counter pollution from ships. The alignment of the air quality action plan with the local transport plan is a further strength, raising the profile of the problems of air quality, and the legal framework associated with pollution, amongst transport planners, who potentially hold the most significant powers and resources to mitigate problems. Local environmental policy has therefore gained a new, albeit at times limited, forum for discussion and knowledge exchange about air pollution measurement, management and control.

The local focus of the LAQM process is also a weakness as well as strength. The problem of air pollution cannot be solved locally as the causes of problems, and therefore solutions, lie outside of the locality. In the case of Southampton there were major constraints that limited the potential effectiveness of the (local) air quality action plan. First, the local authority is unable to control the number of vehicles travelling on its roads, and national transport policy continues to plan for an increase in road traffic. Neither can it force freight companies to improve the engine performance of freight vehicles. Second, solutions to the problems of air pollution required major infrastructure investment, either to divert traffic travelling to the port or to achieve a significant switch of freight traffic from road to rail, and decisions on infrastructure investment lay with regional and national government. Third the local authority cannot effectively challenge port operations or plans for port expansion that contribute to existing and future pollution problems. In fact, as the port is a significant local employer the local authority is unlikely to want to restrict operations, and is highly supportive of maintaining the city's role as an international gateway and regional transport hub.

In a wider sense it is important to note that Southampton is a designated growth area within the South East region. There has been rapid growth of housing and employment in areas adjoining the city, a significant expansion of the city's retail centre, and population and employment growth is planned to continue. Levels of freight movement and passenger traffic through the port are projected to grow in the context of planned port expansion. All of these features contribute to traffic growth in the city, and hence to poorer air quality. National planning policy (PPS23, see ODPM 2004) advises that development should not go ahead where its effect would be to contribute to national air quality standards not being met, but there is little evidence in this case, or nationally, that development is effectively prevented for reasons connected to poor air quality. Chatterton et al (2008) claim that poor air quality has been used on occasion to refuse residential development in locations where air quality is already poor, but that there are few cases where it has been used to limit or restrict commercial development. Again, there is a gap between strategic decisions- on spatial planning, transport and economic development- taken at national and regional level to promote growth and economic development, and the identification of environmental impacts at the local level.

In comparison with the local air quality management policy frameworks operating in other case study cities and countries included in the GFORS programme the UK system is relatively rigorous and effective, particularly in terms of identifying problems and encouraging inter-professional networking. In all of the case study cities and countries investigated local policy makers were aware that the air quality problem could not be resolved locally, with causes spanning administrative boundaries, and solutions

requiring intervention by higher levels of government and across different policy sectors. There was little evidence of the degree of vertical or horizontal coordination needed to tackle the air quality problem effectively in any of the cases. In most of the cases the air quality policy framework required local actors to identify air pollution problems, and to propose solutions, but provided limited resources and powers to implement solutions. There were some important exceptions to this general picture, in cities where more radical initiatives were introduced as a result of air quality standards not being met. In Milan, for example, a congestion charge was introduced for the city centre, and in Potsdam, a Low Emission Zone was designated. In both cases, however, the reasons for taking these actions reflect local environmental and political contexts more than the governance arrangements and knowledge exchange. In Milan the extreme severity of air pollution problems, partly as a result of geography, combined with the politicisation of the issue in city politics to impel a local response. In Potsdam the political priority to protecting a sensitive and historic built environment overrode economic and social objections to the Low Emission Zone. Another kind of exception is the Dutch case where the air quality management process is embedded in domestic legal procedures for land-use planning and environmental impact assessment. As a consequence new developments could be, and were, blocked where it could be demonstrated that the impact on air quality would contravene the EU limit levels. The decision to implement the EU air quality limit levels in this way gives the policy “teeth” in a manner not seen in other cases, but also imposes what were eventually seen as unacceptable economic and social costs, overcome through manipulation of national air quality objectives to allow development to take place even where the air quality impacts are adverse.

## **5. Conclusions**

In a general sense the GFORS research confirmed the continuing importance of hierarchy as a governance mode in relation to the implementation of EU air quality directives, and the dominant role of expert knowledge. The outcome-based hierarchical regulation of air quality is both strength and weakness. The key strength is that local policy makers are forced to carry out assessments, consult with local interests and draw up action plans in circumstances where air quality objectives are likely to be breached. The key weakness is that local actors lack the powers to effectively respond to problems of air pollution, particularly where economic interests may be affected. In the context of the GFORS conceptual framework these conclusions are somewhat discouraging because they indicate that outcomes are primarily a matter of legal requirements on the one hand, and economic priorities on the other. The effects of governance modes on the use and exchange of knowledge, and the capacity to develop reflective knowledge, are of somewhat marginal significance in the case of air quality management. There is, however, some indication of weak reflectivity in the development of the UK air quality management process- through the development of local capacity to assess problems, and to publicise these, through the integration of environmental and transport policy processes, and through the growing awareness at local level that air quality issues need to be incorporated into regional and strategic planning and transport policy decisions.

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## References

- Atkinson, R., Terizakis, G. and Zimmermann, K., 2010. *Governance, knowledge and European environmental policy*. London: Routledge.
- Bradach, J. L. and Eccles, R. G., 1989. Price, authority and trust: from ideal types to plural forms. *Annual Review of Sociology*, 15, 97-118.
- Cashmore B., 2002. Legitimacy and privatization in environmental governance: how non state market driven (NSMD) governance systems gain rulemaking authority. *Governance* 15 (4), 503-529.
- Chatterton, T.J., Longhurst, J.W.S., Leksmono, N.S., Hayes, E.T. and Symons, J.K., 2007. Ten years of Local Air Quality Management experience in the UK: an analysis of the process. *Clean Air and Environmental Quality*, 41 (4), 26-31.
- Council of the EU (1996). Directive 96/62/EC of 27 September 1996 on ambient air quality assessment and management. *Official Journal L 296* , 21/11/1996, 55-63.
- Davoudi, S., 2006. Evidence-based planning: rhetoric and reality. *DISP* 165 (2), 14-24.
- DEFRA, 2007. The Air Quality Strategy for England, Scotland, Wales and Northern Ireland Cm 7169 NIA 61/06-07. Norwich: The Stationary office.
- Fischer, F., 2000. *Citizens, experts, and the environment: the politics of local knowledge*, Durham and London: Duke University Press.

Giddings B., Hopwood B. and O'Brien G., 2002. Environment, economy and society: fitting them together into sustainable development, *Sustainable Development* 10 (4), 187-196.

Haas, E. B., 1990. *When knowledge is power: three models of change in international organizations*. Berkeley: Univ. Calif. Press.

Hajer, M., 1995. *The politics of environmental discourse: ecological modernisation and the policy process*. Oxford: Clarendon Press.

Healey, P., 1997. *Collaborative planning - shaping places in fragmented societies*. Houndmills and London: MacMillan Press.

Héritier, A., ed., 2002: *Common goods: reinventing European and international governance*. Lanham and New York: Rowman & Littlefield.

Innes, J. and Booher, D.E., 1999. Consensus building and complex adaptive systems: a framework for evaluating collaborative planning. *American Planning Association Journal*, 65 (4), 412-423.

Jessop, B., 1998. The rise of governance and the risks of failure: the case of economic development. *International Social Science Journal* 50 (155), 29-46.

Le Galès, P., 1998. Regulations and governance in European cities. *International Journal of Urban and Regional Research*, 22 (3), 482-506.

Lowndes, V. and Skelcher, C., 1998. The dynamics of multiorganizational partnerships: an analysis of changing modes of governance. *Public Administration*, 76 (2), 313-333.

- ODPM, 2004. Planning and policy statement 23: planning and pollution control. Norwich: The Stationary Office.
- Owens S. and Cowell R., 2002. *Land and limits: interpreting sustainability in the planning process*. London: Routledge.
- Rhodes, R. A .W., 1996. The new governance: governing without government. *Political Studies*, 44 (4), 652–667.
- Rydin, Y., 2007. Re-examining the role of knowledge within planning theory. *Planning Theory and Practice*, 6 (1), 52-68.
- Stoker, G., 2000. Urban political science and the challenge of urban governance. In J. Pierre, ed. *Debating governance*. Oxford: Oxford University Press, 91-109.

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