Integrating climate change management into the local air quality management process at a local and regional governance level in the UK

E. T. Hayes, T. J. Chatterton, N. S. Leksmono
& J. W. S. Longhurst
Air Quality Management Resource Centre, Faculty of Applied Sciences, University of the West of England, Bristol

Abstract

Environmental policies should not be treated in isolation due to the synergistic and antagonistic relationships within the policy arena. For example, a combined strategy for climate change and local air quality can make better use of the possibilities to improve energy efficiency and introduce alternative fuels. In other words, combining environmental policies can achieve much more without additional costs. The Local Air Quality Management (LAQM) process has been in place since 1997 and through adaptation and diversification the system is now well established and can be most effective if managed correctly. Part of the LAQM process is the statutory requirement to develop an Air Quality Action Plan (AQAP) (should exceedences of an air quality objective be identified) and the non-statutory development of a local Air Quality Strategy (AQS). These and other facets of the LAQM process can be successfully adapted to integrate climate change management.

To date, 183 local authorities in the UK have declared an Air Quality Management Area (AQMA) for different pollutants; predominantly for NO_2 and PM_{10}. The sources of these pollutants are commonly found to be transport, industrial and domestic related; the same sources that are primarily responsible for CO_2 emissions. During the development of the AQAP to alleviate the exceedence, careful consideration should be made as to whether the solution(s) utilised have a co-beneficial effect on both climate change and local air quality or if a trade-off has to be made. Due to the overlapping nature of air quality and climate change, these two facets of the LAQM system may be adapted to successfully integrate the management of local air quality and climate change and in doing so a significant and cost effective environmental benefit may be accrued.

Keywords: climate change, local air quality management, co-management, co-benefit, trade-off.

WIT Transactions on Ecology and the Environment, Vol 86, © 2006 WIT Press
www.witpress.com, ISSN 1743-3541 (on-line)
doi:10.2495/AIR06044

1 Introduction

Local air quality and climate change management are often considered to be separate issues. A local air quality policy considers the management and reduction of 'traditional' pollutants such as nitrogen dioxide, carbon monoxide, sulphur dioxide and particulates etc. Current climate change policy aims to reduce greenhouse gas emissions (carbon dioxide, methane, nitrous oxide etc.) from various sectors (energy, transport, domestic etc.) and attain the climate change targets set by the UK government. Carbon dioxide (CO_2, the primary greenhouse gas) currently accounts for 80% of UK greenhouse gas emissions. The UK government and Devolved Administrations (including the Welsh Assembly Government, the Scottish Executive, and the Department for the Environment for Northern Ireland) have agreed to go further than the targets set by the Kyoto Agreement and will attempt to reduce its domestic CO_2 emissions by 20% below 1990 levels by 2010 [1]. Currently the UK is on target for their Kyoto agreement but is falling significantly short of their domestic goal. Air quality and climate change are directly linked as they affect quality of life, increase risk to health, safety, and property and, therefore have costs and benefits for individuals and the private and public sectors [2]. Van Vuuren et al. [3] concluded that an integrated approach to climate change and regional air pollution can harvest considerable ancillary benefits in terms of environmental impacts and costs. This is because both issues are caused to a large extent by the same activity (fossil fuel combustion).

Local and regional governance bodies can make a significant contribution to carbon management and to the UK's efforts to meet its emissions targets. The UK Climate Change Programme states, "local authorities have a special status as local, directly elected bodies. They are uniquely placed to provide vision and leadership to their local communities, and their wide range of responsibilities and contacts means that they are critical to the delivery of this programme" [1]. While the Energy White Paper [4] also identified local authorities and regional bodies as pivotal in delivering change.

Integration of CO_2 management into aspect of the LAQM process will need to address technical issues such as source apportionment and pollutant abatement/minimisation in parallel with non-technical issues such as changing human behaviour and socio-economic structures. The aim of this paper is to assess the levels of understanding among local authorities in relation to LAQM and climate change, to identify a framework for the integration of CO_2 management into the established local air quality management system at a local governance level and to identify key drivers and advantages of successful CO_2 management integration into LAQM and other policy areas.

2 Local authorities with Air Quality Management Areas and those that have signed the Nottingham Declaration on Climate Change

To date (February 2006) there are 183 local authorities in the UK with current Air Quality Management Areas (AQMAs) (Figure 1). Table 1 outlines the

number of AQMAs in England, Scotland, Wales and Northern Ireland (Figure 1) and the proportion of each AQMA per pollutant and per source. Currently 90 local authorities have signed the Nottingham Declaration on Climate Change (Figure 1). Twelve County Councils have also signed the declaration. A full list of signatories and further information on the Nottingham Declaration can be found at: www.est.org.uk/housingbuildings/localauthorities/NottinghamDeclaration/

Of the 90 local authorities and the 13 County Councils that have signed the Nottingham Declaration, 41 local authorities and 12 County Councils have current AQMAs within their region. If they have AQMAs then they have a statutory requirement to produce an AQAP. This affords these authorities an opportunity to integrate CO_2 management into their plans and programmes. The AQMA data indicates that NO_2 and PM_{10} are pollutants predominantly responsible for the declaration of most AQMAs in the UK, with transport, industry and domestic the principal sources. Similarly transport, industry and domestic are primarily responsible for emissions of CO_2 in the UK [1]. For a full description of the Review and Assessment process see Beattie, et al. [5].

Table 1: Current AQMAs in the UK and proportion of pollutants and sources.

Area	No of AQMAs	Percentage of AQMAs per pollutant			Percentage of AQMAs per source			
		NO_2	PM_{10}	SO_2	Trans	Ind	Dom	Other
England [(1)]	166	93	36	7	92	12	2	5
Scotland	4	100	50	-	100	-	-	-
Wales	4	75	25	-	75	25	-	-
N Ireland	9	22	78	11	22	-	78	-

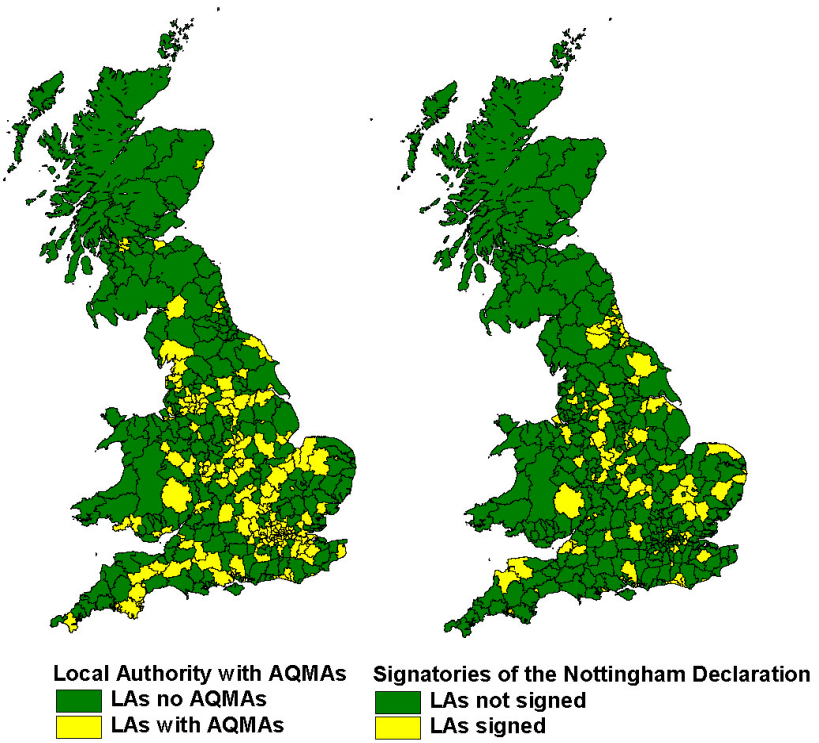
[(1)]Including London Local Authorities. There is also one AQMA declared for Benzene in England.

Note: AQMA = Air Quality Management Area, Trans = Transport, Ind = Industry, Dom = Domestic

3 Understanding of climate change and local air quality management among local and regional authorities

A survey by the Local Government Association [6] found that the majority of local authorities in England and Wales (68%) had not considered the influence of climate change on their locality. The Royal Commission on Environmental Pollution [7] stated that the limited response of local governance to climate change is partially due to a perceived difficulty in accessing and interpreting good quality environmental information. This would appear to be in agreement with a survey undertaken by Demeritt and Langdon [8] in which over three quarters of local authority respondents felt that they did not have access to

adequate information and that government sources, although regarded as accurate and reliable, were not consulted as often as media or internet sources. It also reported considerable cynicism and futility among local authority officials that complicated communication efforts.



Note: LAs = Local authorities

Figure 1: Local authorities with Air Quality Management Areas and signatories of the Nottingham Declaration on Climate Change in the UK (as of February 2006).

Following the publication of the first National Air Quality Strategy, local authorities expressed concern about the lack of necessary tools and expertise to undertake their LAQM responsibilities effectively [5]. This resulted in resources being made available to local authorities including specific guidance documents, web based information including monitoring data, emissions inventories and telephone and email helpdesks [5]. Hassan [9] reported that local authorities were generally satisfied with the guidance provided to local authorities (in terms of technical and policy guidance documents) and with the web based tools and helpdesk. Government sources are now considered invaluable for local authorities to ensure that the process is managed to an acceptable quality threshold which complies with good practice expectations.

When assessing the level of climate change understanding at local and regional levels it is clear that there is some confusion and a distinct sense of difficulty in accessing relevant data. This is not the case for LAQM. However it would be careless to assume that simply making more locally specific information about carbon reduction available will motivate appropriate action. The agencies and groups that are currently providing information and support to local and regional government needs to be restructured, focused and simplified to ensure that local authorities can avail themselves of a more comprehensive service to fulfil their current and anticipated needs.

4 Integrating carbon dioxide management into the LAQM process

Carbon dioxide emissions and local air quality can be co-managed by three main aspects of the LAQM process. These are through the successful establishment and management of a detailed emission inventory, integration of carbon management into the AQAP process and integration of carbon management into local and/or regional AQS.

4.1 The emissions inventory

Emission inventories have a role in establishing baseline data to assess the emissions to the atmosphere from within a local authority. They can assess priority polluters, assist in setting effective emissions reductions targets and assist in monitoring progress [10]. Emission inventories are well established in the LAQM process, however, if managed effectively, emission inventories can assist local authorities to establish baseline data that can be utilised as a basis for Air Quality and Climate Change planning, actions and strategies. An integrated local air quality and climate change emissions inventory would draw on data from local and national guidance and expertise, local data (planners, housing, transport), national data (traffic, energy use, greenhouse gases, air quality pollutants), planning appraisals, local and/or regional climate change and/or air quality strategies and the AQAP and air quality review and assessment processes [10]. However, it should be remembered that emission inventories are only as useful as the data inputted into them. Issues such as accuracy and availability of data influence the usefulness of the inventory.

4.2 Air quality action plans

An AQAP relies upon the integration of a variety of local government functions, resting with regional plans and collaboration with external agencies [11]. Some AQAPs just provide general statements of non-air quality impacts, perceptions, cost and feasibility. In the action planning process consideration of CO_2 should be introduced as early as possible and CO_2 emissions reductions should not be considered as an ‘add-on’ to the process but rather an integral component.

The basic stages of a combined action plan include establishing a baseline (i.e. current air quality and CO_2 data and trends, source apportionment, population affected and area (also see Section 4.1 Emissions Inventory), development of options (i.e. what is available, what is already being done in existing plans and policies), consideration of elements (i.e. air quality and CO_2 improvements, cost effectiveness, perceptions and practicability) and finally prioritisation of the options and the drafting of a plan. All of these basic stages should be underlined and supported by consultation with appropriate stakeholders (i.e. other local authorities, external agencies and wider consultees) and adequate communication of information.

A combined action plan is primarily about identifying synergistic or 'win win' options rather than options where a trade-off will be required. Perhaps the most problematic aspect of a combined action plan is the prioritisation of options to be implemented and in what order. It should be remembered that the prioritisation process is not an 'either' 'or' process. Utilising a matrix approach to determine a prioritised list (e.g. relative scoring, ranking of options) can apply a qualitative or quantitative value for a particular option [11]. When prioritising the options issues such as combinations of options and temporal aspects also need to be considered.

The effectiveness of a combined action plan should be considered at various stages of development. By assessing a combined action plan prior to implementation it can be verified that the proposed action will achieve the intended outcomes. After the combined action plan is implemented its progress should be monitored to establish if it is having its expected impact. This may be done by the development of indicators. Depending on the actions being implemented indicators other than air quality concentrations and CO_2 emissions can be implemented. These 'surrogate' indicators can provide information such as traffic flows and mixes, businesses with travel plans and correlated policies. There is a statutory duty for those local authorities with an AQMA to report annually on progress of their action plans; CO_2 management aspects can also be included in these reports, however, uptake of this could be encouraged by making CO_2 reporting a statutory duty.

4.3 Local and regional air quality strategies

The co-management of climate change and air quality through a combined local or regional strategy could ensure equal understanding and priority is applied to both. A combined strategy should carefully reflect any local AQS and any commitments the authority has made either internally or publicly such as signing the Nottingham Declaration on Climate Change. The combined strategy should meet any council obligations such as Environmental Health related policies (e.g. noise, Integrated Pollution Prevention and Control, water, contaminated land), Non-Environmental Health policies (e.g. land-use planning, transport planning) wider policy integration (Local Agenda 21, Community Plans) and regional policies (e.g. Health Action Zones, Regional Spatial Strategies). Through addressing these policy areas the combined strategy will also incorporate national measures and strategies.

In undertaking an AQS a consultation group is usually established. By integrating CO_2 management there is the added advantage of utilising the experiences and knowledge of this diverse group. A combined strategy can also be used as a standard for the assessment of the impact of new developments such road networks or industry. A combined strategy can be used as a framework for addressing regional issues as new standards and technical developments emerge and can be seen as an additional way of securing potential funding for specific combined initiatives. A combined strategy can provide focus for an authority through indicators and targets (these must be challenging but realistic) and through the establishment of a strategic framework for their evaluation. The Centre for Sustainable Energy [12] has recommended to government that there should be a legal duty for local and regional bodies to address CO_2 emissions within their strategies and activities.

5 Key drivers and advantages of successful integration

For CO_2 emissions to be successfully co-managed within the LAQM process and indeed integrated into other policy areas a number of key drivers are required. These include identifying wilful and proactive individuals within your local authority, improving the provision of training, guidance and support for local authorities and improving the channels of communication both within the authority (interdepartmental) and with external stakeholders. Should these key drivers and any associated problems be address then CO_2 emissions can be successfully co-managed with local air quality and successfully embedded into other local authority priorities such as such as land use planning, regeneration, transport, environmental health, education, housing, energy and waste management. The advantages of integrating CO_2 management include the identification and implementation of co-beneficial actions, health and quality of life benefits, sustainable decision-making and development, cost effectiveness and dissemination of relevant information to individuals and businesses.

6 Conclusions

Although addressing CO_2 management at a local and regional level in the UK currently faces substantial obstacles, it also has substantial potential to be effective in developing and implementing mitigation and adaptation strategies. The existing LAQM process is a useful, and importantly a familiar, tool for local authorities to integrate CO_2 management as a starting point. However, for CO_2 to be managed effectively and efficiently it should be integrated across all service areas within a local authority.

The difficulty in integrating CO_2 management into the action planning process and the air quality strategy process is trying to find the illusive balance between synergistic actions and trade-offs. However if this co-beneficial balance can be attained then integration can be cost-effective while at the same time improving the sustainable development of a region and ultimately improved health benefits and quality of life.

References

[1] DETR (Department for Environment, Transport, and the Regions) (2000) *Climate Change: The UK Programme,* The Stationary Office, London.
[2] Southampton City Council (2004) *Climate Change and Air Quality Strategy* [Available at: http://www.southampton.gov.uk/environment/climate-change/Default.asp]
[3] van Vuuren, D.P., Cofala, J., Eerens, H.E., Oostenrijk, R., Heyes,C., Klimont, Z., den Elzen, M.G.J., Amann, M. (2004) *Exploring the ancillary benefits of the Kyoto Protocol for air pollution in Europe*, Technical Report 93, European Environment Agency.
[4] Energy White Paper (2003): Our Energy future – creating a low carbon economy. Department of Trade and Industry. The Stationary Office, London. 2003.
[5] Beattie, C.I.; Longhurst, J.W.S.; Woodfield N.K. (2001) Air Quality Management: Evolution of Policy and Practice in the UK as Exemplified by the Experience of English Local Government, *Atmospheric Environment*, Vol. 35, Issue 8, p1479-1490.
[6] LGA (Local Government Association) (2002) *Climate Change: A survey of local authorities,* LGA Publications, London.
[7] Royal Commission on Environmental Pollution (2002) *Environmental Planning,* The Stationary Office, London. ISBN 0-10-154592-4.
[8] Demeritt, D., Langdon, D. (2004) The UK Climate Change Programme and communication with local authorities, *Global Environmental Change*, 14, 325-366.
[9] Hassan, S.M. (2006) *Evaluation of the Local Air Quality Management process in Great Britain in its second round of Review and Assessment*, PhD Thesis, University of the West of England, Bristol, UK.
[10] Conlan, B. (2006) *Emission inventories for all. Adaptation, Protection and Management*, Integration of Climate Change & Environmental Protection. NSCA/UWE Conference, Bristol Zoological Gardens, Bristol. 26th January 2006.
[11] NSCA (National Society for Clean Air and Environmental Protection) (2001), *Air quality – Planning for action. Part 2 of the NSCA's Guidance on the development of Air Quality Action Plans and Local Air Quality Strategies,* NSCA, Brighton.
[12] Centre for Sustainable Energy (CSE) (with Impetus Consulting, Quantock Energy and Environment) (2005) *Local and regional action to cut carbon, A report to Defra for the UK Climate Change Programme Review*.