

Session 6 Indoor air policy perspectives

Paul Harrison

Institute of Environment and Health, Cranfield University, Barton Road, Silsoe, Bedfordshire, MK45 4DT, UK

INTRODUCTION

Although there is a long history of regulating and controlling outdoor air quality, the indoor environment has generally been neglected, even though it is well understood that there are significant sources of pollution in the indoor environment and it is indoors where people spend the vast majority of their time.

Pollutants encountered indoors are known to have the potential to cause adverse health impacts (1), so it is reasonable to consider what policies might be helpful for preventing or mitigating these effects. A number of possible approaches to improving indoor air quality are discussed in this paper in relation to a wider strategic approach, including: assessing the impact of particular indoor air pollutants through an appraisal of hazard, exposure and risk; source control and ventilation, development of exposure guidelines and product and appliance emission standards; legislation; information dissemination (e.g. guidance for the public), education and training; and influencing the designers, builders and managers/ operators of buildings.

This paper focuses on policies for non-industrial buildings such as homes, schools and offices, but the principles apply also to enclosed spaces such as vehicles. Industrial and other regulated environments are excluded from consideration. The principal concern is indoor climate and chemical and biological contaminants of indoor air; other aspects such as noise, lighting and electromagnetic radiation are not included.

THE NEED FOR INDOOR AIR POLICY

There is a large body of evidence on the hazardous nature of indoor air pollutants, on their sources, the conditions leading to human exposure, and the significance of the associated health effects. Consequently, indoor air quality is now acknowledged to be an important determinant of health and comfort (2), as evidenced for example by the inclusion of indoor air quality in the European Commission research strategy for the Framework 7 Programme. However, the complexity of pollution sources and the multitude of parties responsible for generating and potentially acting to control indoor air pollution make the coherent development of risk reduction strategies difficult. To be effective, any policies directed at improving indoor air quality need to be part of a comprehensive management strategy involving governments, institutions, professional bodies and individuals. Plans need to be directed at both new and existing buildings and involve action at both local and national levels. Important

considerations include outdoor climate and air quality, building materials and styles, knowledge and behaviour patterns of the occupants, energy and sustainability policies, and building system technologies. In recent years the importance of sustainable energy usage in the context of climate change has come increasingly to the fore.

RESPONSIBILITIES FOR IMPROVING INDOOR AIR QUALITY

The quality of indoor air in any particular building or location is dependent on a number of factors that are themselves governed by a range of different influences. These include the quality of the outdoor air, the condition of the building, ventilation exchange rates, the furnishings present, and the occupiers' lifestyle, habits and behaviours - including their management of the building and use of products. Although acknowledgement of the importance of indoor air quality has often led to calls for legislation, specific legislation for this purpose is often not available (see below), or is perceived as too 'intrusive' on individuals' lifestyle. Thus very often no single profession or authority has overall responsibility for indoor air quality - and the same invariably applies at the governmental level. In the UK, for example, responsibilities for indoor air quality fall variously to the Department of Health, the Department of Communities and Local Government, the Health and Safety Executive, the Department of Trade and Industry, and the Department for Environment, Food and Rural Affairs.

ASSESSING HAZARD AND RISK

Much work has already been done to assess the exposure of individuals to particular indoor air pollutants and to evaluate the risks to health of such exposures. Such understanding is a prime prerequisite for policy formulation. Research of this nature involves monitoring indoor environments and assessing personal exposure, toxicological assessment of chemical hazards, monitoring health effects related to the indoor environment (either in situ or in experimental studies), and health impact assessment. The risk assessment process is crucial and involves the identification of factors that impact on the health and well-being of occupants, quantification of human exposure to these factors, assessment of human responses to these factors, and characterisation of risk. Risk assessment may then lead to specific recommendations for control, mitigation and/or remediation, or more general policy recommendations for improving indoor air quality through identified management options (see below).

There are many publications reviewing the impact of indoor pollution on health, and the work of the European Collaborative Action "Urban Air, Indoor Environment and Human Exposure" has been particularly significant in advancing understanding in this area.

PRINCIPLES OF ACTION

Effective action is best achieved if it is based on good scientific evidence, but there are other important considerations in the establishment of indoor air policy. The following principles are relevant (2):

The precautionary principle: A responsible indoor air policy should not be restricted to combating the danger or repairing the damage, but should be pro-active in addressing emerging problems.

The principle of individual responsibility: Individuals should be informed about hazards inherent in the indoor environment and should then assume responsibility by behaving and acting in such a way as to minimise harm to themselves and to others.

The cooperation principle: Central and local governments and other interested parties – including professional bodies and commercial organisations - should aim to cooperate in formulating sustainable indoor air policies and in implementing appropriate actions.

The ‘polluter pays’ principle: This principle requires the costs of removing the source of indoor air pollution, or compensation for the damage caused, to be borne by the polluter.

The ‘right to know’ principle: People using indoor spaces are entitled to know the possible harm to health arising from the materials, appliances and products in use around them.

Limitations of action: Due consideration must be given to the fact that application of the above principles may conflict with other external principles (e.g. right to personal freedom), which may on occasion limit the action that can be taken.

MANAGEMENT OPTIONS

Risk management for indoor air quality can involve regulatory or non-regulatory strategies. Examples of possible regulatory strategies include bans of chemicals or products, emissions limits, labelling requirements, exposure limits, building design standards, building operation and maintenance requirements and ventilation standards. Non-regulatory approaches include guidelines, market and fiscal incentives, population information campaigns, training and education of involved parties, support of sustainable non-polluting technologies.

Legal tools

Nationally there is little specific legislation aimed at the regulation of indoor air (one primary exception being the ban on smoking in public places now implemented in several countries). Those regulations that do exist are largely associated with building codes (including ventilation provision), control of dangerous appliances, and product safety – for example there are rafts of national and international legislation to regulate

the quality, marketing and use of construction products, consumer products and chemicals. The applicability of current regulation and its effectiveness in improving indoor air quality is generally rather limited, and only relatively recently has concerted attention been given to approaches for specifically measuring, assessing and reducing emissions from construction products into indoor air. Certainly it is problematic to deal with all the facets of indoor air quality in one regulatory system because of the wide range of pollutants, sources and causes.

Guidelines, guidance and labelling schemes

Health-based standards exist for outdoor air and there are good arguments for developing equivalent indoor air quality guidelines (3). In the UK, the requirement for guidelines for indoor air was recognized as early as 1991 by the House of Commons Select Committee which, in its report on indoor pollution, recommended that the Government “develop guidelines and codes of practice for indoor air quality in buildings which specifically identify exposure limits for an extended list of pollutants...”.

Setting guidelines or standards for indoor air quality involves some difficult issues, for example: Where are the guidelines to apply? What is the basis for the establishment of the guideline (i.e. health or comfort)? Who are the guidelines meant to protect? Who is responsible for monitoring and regulating identified indoor pollutants? What are the legal implications? Can indoor air guidelines be different from outdoor air guidelines for the same pollutant? However, there are very clear advantages that the establishment of indoor air guidelines can bring. For example, they could inform the public and other interested parties on typical indoor pollutant levels – i.e. what is ‘normal’ – as well as on levels likely to be hazardous to health. Establishment of numerical guideline levels would in turn allow informed development of product emission standards (and also product labelling schemes – see below) and could be used in housing assessment and rating systems. Some nations, for example Germany, Norway and Poland, have already established target concentrations for various indoor pollutants, and the UK recently issued guidance on indoor air pollutants that includes numerical standards for nitrogen dioxide, carbon monoxide, formaldehyde, benzene and benzo(a)pyrene. Some countries (e.g. Australia) have adopted the approach of identifying indicators of good air quality rather than defining quantitative limits (3).

Importantly, having led the way by defining outdoor air quality guidelines for Europe (which are often, by default, used by individuals assessing indoor air quality), WHO is now in the process of establishing guideline values specifically for application to the indoor environment.

Whatever the potential pitfalls of numerical standards or guidelines for indoor air pollutants, there is much scope for issuing guidance to assist homeowners, building managers, etc., achieve good air quality. Consideration should be given to extending such guidance (e.g. through professional bodies) to others with a role to play, including architects and engineers. For example, the Finnish Society of Indoor Air Quality and Climate, with others, has published the wide ranging report ‘Classification of Indoor Climate 2000: Target Values, Design Guidance and Product Requirements’ (4). However it as achieved, education and training should be an

integral part of any strategic policy on indoor air pollution. The principal objectives of such a programme should be to: raise public awareness and help citizens make appropriate choices; ensure appropriate education and training for professionals; and promote the exchange of information between science and policy (2).

A number of labelling schemes are presently in operation; these are to be encouraged as they have a significant role to play in encouraging consumers (and builders/tradesmen) to make informed choices when selecting materials and products for use within buildings - and thereby influence manufacturers. The ECA report 'Evaluation of VOC emissions from building products' (5) presents ways of distinguishing between acceptable and non-acceptable materials and how to label these accordingly, and in Denmark and Finland, for example, a special labelling scheme for construction products (based mainly on material emission rates) has been introduced that takes account of impacts on indoor air quality (2).

Other approaches

There are a number of other approaches that can be considered when formulating indoor air strategies, including cost-benefit analysis, economic instruments, incentives for the building sector, planning controls, encouraging sustainability, and research to fill knowledge gaps.

EXISTING RESOURCES

A number of reports have been published that provide useful information and pointers on indoor air policy setting. These include 'The Right to Healthy Indoor Air' (6), 'Strategic approaches to indoor air policy-making' (2), and the various publications of the European Collaborative Action on Urban Air, Indoor Air and Human Exposure (e.g. 5) and the series of reports from the pilot study on indoor air quality by the NATO Committee on the Challenges of Modern Society (e.g. 7).

FORMULATING A NATIONAL STRATEGY

Requirements for the establishment of a national strategy include prior justification, goal setting, options appraisal, and political willingness.

Justification

This needs to address the questions: Why is a policy needed? What are the priorities? Can health impacts be prevented? Who is responsible? Until these questions are satisfactorily answered, the policy is unlikely to carry conviction.

Goal setting

The policy must have clear goals on what the policy aims to achieve, what the short, medium and long term objectives are, and which tools and indicators will be used to monitor success.

Management options

These are detailed above and include legal tools, guidelines and guidance, labelling schemes, economic instruments and incentives.

Political willingness: current drivers

There are a number of current developments that are strongly pushing the drive to improve indoor air quality. For example, a major outcome of the Fourth Ministerial Conference on Environment and Health was the publication of the Children's Environment and Health Action Plan for Europe (CEHAPE). In this document, under Regional Priority Goal III, there is explicit reference to indoor air and the specific pronouncement "We aim to achieve a substantial reduction in the morbidity and mortality from acute and chronic respiratory disorders in children and adolescents by developing indoor air quality strategies that take into account the specific needs of children [and] applying and enforcing regulations to improve indoor air quality, especially in housing, child care centres and schools..." There is now a requirement on Member States to produce their own Action Plans. The full text of this document is available at <http://www.euro.who.int/document/e83338.pdf>. Also the European Commission has announced that efforts to monitor indoor pollution and its impact on human health are to be intensified, and the Commission's Joint Research Centre (JRC) is taking the lead to develop new approaches and research methods. The aim is to gather data that may in future "provide the basis for policy initiatives at EU and national level".

The recently released 'Preliminary report on risk assessment on indoor air quality' from the Scientific Committee on Health and Environmental Risks (SCHER) – available at http://ec.europa.eu/health/ph_risk/committees/04_scher_scher_cons_01_en.htm – is likely to further stimulate debate on the impact on indoor air quality on human health and how such impacts can best be addressed.

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