A Review of Air Quality Community Education

Key Findings

This document summarises the key findings of a research project which studied effective practice with air quality education programs both in Australia and internationally

Welcome

This summary document was produced following a research project undertaken by the Australian Research Institute in Education for Sustainability (ARIES) and funded by the Australian Government Department of the Environment and Water Resources (DEW). The project aimed to identify those factors that contribute to effective community education programs, particularly relating to air quality, in order to improve existing approaches and guide future programs.

Who is this summary document for?

This summary document will be relevant to you if you are working to develop, monitor, regulate or enhance community programs directed towards improvement of air quality. It will also be of interest if you are a teacher, higher education lecturer, high school or tertiary student with an eye on air quality and sustainability issues. In addition, it will help community educators to identify effective ways of delivering programs about any environmental or sustainability issue.

What can you learn from this summary document?

This summary document highlights some effective approaches to air quality community education in bringing about sustainable change. It details the lessons learnt and case study examples of the programs that have aimed to bring about changes in air quality. The full report is available at: http://www.aries.mq.edu.au

Who was involved?

This project was led by ARIES. Principal researchers were from Southern Cross University and ARIES, Macquarie University. Key personnel in air quality programs in Australia and internationally assisted with information. Leading air quality researchers peer reviewed the validity of the findings.

Why was this project needed?

Poor air quality is a serious international environmental problem and the related human health concerns are on the increase. The Australian community has consistently ranked air quality as the major environmental concern with climate change only recently coming to the fore. Both largely result from fossil fuel combustion and forest destruction.

The Australian Government has been giving increased attention to reducing the health impacts of air pollutants through various types of programs. The introduction of fuel quality standards, regulatory controls on industry, promotion of alternative forms of transport and rebate schemes for wood heaters have all been put in place to address emissions and improve the quality of ambient air. Also, a range of different types of community education initiatives have been used to support and enhance the effectiveness of these programs.

Despite these advances, vehicle emissions still represent a significant and growing environmental threat, especially in urban areas, with motor vehicles being urban Australia's single greatest source of atmospheric pollutants. Localised air pollution resulting from domestic heating and burning is also an ongoing concern, particularly in some localities. These types of air pollution are the consequence of collective decisions and actions of members of the community. In Sydney alone, in 2005, the social costs of air quality impacts related to road transport were estimated at $1223 million (*Sydney Morning Herald* 23 January 2006). For reasons such as this, **community education is an important driver for improving air quality.**

Community Environmental Education Policy in Australia

The Australian Government's Environmental *Education for a Sustainable Future: National Action Plan* recognises the importance of community education in addressing sustainability as a national goal. It supports the engagement of community stakeholders in action-oriented approaches to improving the environment. Internationally there are similar policies, for example, *A Framework for Environmental Learning and Sustainability in Canada* (2002) focuses on environmental learning for a sustainable society: it has been translated into practice through action plans for environmental learning.

What was the project trying to achieve?

The project aimed to determine those factors which underpin the most effective community education programs directed towards improving air quality by answering three key questions:

♦ **How effective are air quality community education programs in creating citizens capable of implementing changes in their lives that improve air quality?**

♦ **What are the key factors which determine if a program is more effective than another?**

♦ **How can the design of air quality community education programs be improved?**

In order to answer these and other questions, this project reviewed national and international air quality community education programs, the environmental learning and the health education literature, to determine the critical success factors associated with effective air quality community education programs.

These critical success factors were then used to assess a selection of air quality community education programs. The research focused on community environmental education and not schools and industry. It should be noted, though, that workplace and school programs may also indirectly influence community decisions and actions. For example, the development and use of air quality school curriculum resources which have been made available by various government and non-government environmental organisations, and interventions such as *AirWatch*, a program for Australian primary and secondary students, have in some instances aimed to influence the wider community.

Six case studies from Australia and internationally are summarised in this brochure which provide examples of some of the education approaches used.

Examples of air quality education programs

Case study A: Launceston Wood Heater Replacement Program (Launceston, Tasmania, 2001-4)

The Launceston Wood Heater Replacement Program (LWHRP), an awareness raising and incentive/disincentive based program, commenced in 2001. Funding for the program of $2.08 million for 2001-04 was provided via the Commonwealth *Air Pollution in Major Cities Program* and Launceston City Council. Based on a scoping study, which provided background information and ideas, a management committee, comprising representatives from all three levels of government and a program manager, oversaw the design of the program. Broad community support was obtained via an extensive consultation process.

Education Strategies: The program included:

♦ a staged roll out of an incentive scheme for replacing wood heaters;

♦ a targeted education program (see Box); and

♦ resources and activities relating to operating wood heaters effectively were organised by a regional air quality officer in Launceston. This included provision of personal advice, information leaflets, advertising, promotion events, website and media coverage.

Launceston Wood Heater Replacement Program:Targeted Education Program

Smoke patrols targeted Launceston households with smoky chimneys and the entire city was surveyed every three to four weeks. A 'friendly notification' card was left in letterboxes of households; previous market research had shown this to be an acceptable method of contacting residents. These cards indicated that during particular times unacceptable smoke levels were observed. If unacceptable smoke levels were observed a second time a 'first warning letter' was issued and, if necessary, on a third occasion a 'final warning' letter. To date no fines have been imposed. Incentives for changing to cleaner wood heating alternatives were offered. This was a staged funding scheme offered to owned, rented residential, and properties operated by community groups and associations.

Impacts: This program was successful due to:

♦ the implementation of a targeted education program to notify households about their smoky chimneys. Mass communication strategies played a less significant role but did alert the community to the project;

♦ provision of financial incentives for replacement of wood heaters;

♦ creation of an air quality vision for the community; and

♦ considerable interaction among various community levels and key stakeholders.

Case study B: Turn-It-off (Toronto, Canada, c.1999+)

Turning off the engine while parked or waiting is potentially a simple way of reducing vehicle emissions compared to convincing people to reduce vehicle use. *Turn-It-Off,* a direct community-based social marketing (CBSM) campaign in Toronto, Canada focused on this issue. *Turn-It-Off* was a multi-sectorial partnership between a social marketing consulting agency and various government departments and school boards. Its aims were to reduce engine-idling, increase awareness about emissions and promote voluntary compliance with idling laws.

Educational Strategies: This CBSM campaign involved:

♦ identifying barriers to changing driver behaviour;

♦ designing a strategy to overcome these barriers involving two CBSM techniques: prompts or signs, and gaining a commitment from drivers to reduce idling in certain circumstances;

♦ piloting and refining the strategy: first, via focus group interviews with typical drivers and second, via piloting at six random locations: two locations had signs only, two had signs and motorists made commitments and received window stickers and information cards, and two control locations had no signs or commitments. Using the signs alone did not reduce idling;

♦ use of signs and commitment was implemented on a large scale.

Impacts: The *Turn-It-Off* campaign was a success due to:

♦ personal contact especially in locations close to schools where drivers were provided with a rationale for idling reduction:

♦ the combination of signs and commitment reduced idling by 32% and idling duration by 73%;

♦ the campaign involved little inconvenience to participants and was financially beneficial due to saved fuel.

Range of approaches used in recent air quality education programs

The majority of air quality community education programs in Australia, as well as internationally, have based their approach on *information/awareness raising, community-based social marketing or community engagement approaches.* These have been used independently or as a combination of all three. Often they are used in conjunction with other interventions such as *regulation or incentives.* Air quality community education programs, which are aimed at going beyond a superficial level of engagement with the community are not common.

'Social Marketing' Defined

Social marketing is 'a process that attempts to create voluntary exchange between a marketing organisation and members of a target market based on mutual fulfilment and purpose'.

Maibach cited in Nutbeam, D., and Harris, E. 2004. Theory in a Nutshell (2nd edn) Sydney: McGraw-Hill., p.42.

Social marketing is 'the application of commercial marketing technologies to the analysis, planning, execution and evaluation of programs designed to influence the voluntary or involuntary behaviour of target audiences in order to improve the welfare of individuals and society'

Egger, G., Spark, R., and Donovan, R. 2005. Health Promotion Strategies and Methods. Sydney: McGraw-Hill. .p.100.

How effective are current approaches in bringing about sustainable change?

♦ **Regulatory measures** have had substantial success in some contexts (e.g. reduction of smoky vehicles) but change is not assured. *Infrastructure changes* can influence community decision-making but the resultant impacts can be complex (e.g. there can be increased public transport use together with increased traffic congestion). The **community needs to be involved** in the formulation, implementation and evaluation of changes related to regulation, legislation and infrastructure.

♦ **Information provision and awareness raising**, when used as a single strategy, can partially raise community awareness (e.g. in a quarter of a population sample). This approach has had very little impact in changing community attitudes and actions.

♦ **Incentives and penalties** by themselves are usually not effective, although there are exceptions (e.g. some cycling programs). When combined with targeted education campaigns some success has been reported (e.g. the Launceston Wood heater Replacement Program) and there are indications that this combined approach **may be effective where a one-off effect is sought** but not where long-term habits, such as motor vehicle use, need to be changed.

♦ **Community-based social marketing** (CBSM) is the most prevalent form of air quality community education associated with reducing the pollution resulting from vehicle emissions. Where the change is relatively easy (e.g. reducing car idling) the short-term results have been impressive although the sustainability of the results are questioned. In other instances, increased change has been documented where the CBSM has embraced more interactive educational strategies, such as facilitation, mentoring and learning in small group contexts.

More examples: air quality education programs

Case study C: TravelSmart (Perth, Western Australia, 2000+)

TravelSmart is a major program targeted at reducing vehicle emissions in Australia. It is based on community-based social marketing using direct or dialogue marketing and similar programs are also used extensively in North America and Europe. They include elements of earlier social marketing style campaigns approaches, but often involve greater engagement with participants with the aim to gain higher motivation. Australia is at the forefront in using *TravelSmart* programs for communities and over 20 programs have been initiated in various cities e.g. in Perth in 2000 **Educational Strategies:** *TravelSmart* programs are:

♦ targeted at individuals in particular suburbs or municipalities. Programs are usually implemented in partnership with state and local governments;

♦ often based on 'Travel Blending' or 'Indimark' (Individualised Marketing) schemes (see Boxes). Indimark is the cornerstone of *TravelSmart* in Perth.
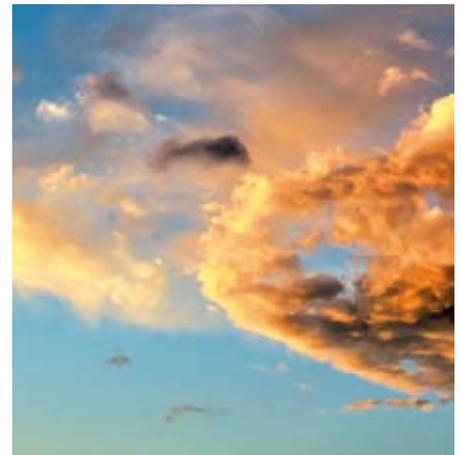
Relative Impacts:

♦ Evaluation of the impacts of *TravelSmart* internationally has shown the impact of programs ranges from zero to a 50 percent or higher change on the particular variable or variables measured.

♦ A recent evaluation of Australian *TravelSmart* programs has recommended their continued use in community education.

'Travel Blending: The Living Neighbourhood' Approach

'Travel Blending: The Living Neighbourhood' approach is based on the idea that people need to understand the issues so that they can make change themselves: changes to suit their own lifestyles. Its intentions are to empower people by having them think about activities and travel blending in advance. Thinking about activities is the key to the program. After completing travel diaries, tips are provided on how travel trips could be reduced, and then after about a month further travel diaries as part of a second kit are completed. Feedback is then provided, together with further tips and a logbook to encourage further travel blending. There is therefore a stepwise provision of kits used. Feedback is considered important in this process as well as encouragement and provision of individualised information. About 40% of those recruited tend to stay in the program. Each community develops its own initiatives with travel blending.

Indimark (from Germany) initially focused on the marketing of public transport but has evolved to encourage walking and cycling.
Contact: All households are contacted by mail and phone to determine if they are regular/ extensive users of environmentally friendly modes, are not interested in changing or are interested.
Motivation: Problems and requests from those interested are responded to.
Information: Participants are offered sources of information from which to select (e.g. maps, timetables) and taught skills in using alternative transport modes. Regular/ extensive users of environmentally friendly modes may receive rewards for their use of environmentally friendly modes.
Convincing: Consultation phone calls and home visits on requests are made, with selected households in the 'interested' group receiving tickets to use on public transport for a limited period.

Case study D: Sustainable Households (New Zealand, 2001+)

An example of where social marketing has been augmented by a deeper community engagement process, which incorporated some Education for Sustainability principles, is the New Zealand program on *Sustainable Households*.

Educational Strategies: *The Sustainable Households* program involves:

♦ social marketing to raise awareness about sustainability including air quality issues;

♦ direct community or group involvement via adult education workshops over an extended period. The facilitator encourages group participation using discussion techniques focusing on developing awareness of why sustainability is important and promotion of small practical and incremental changes such as reduced vehicle use.

♦ more extensive and long-term adult education classes are a subsequent option.

Impacts: In a study of the adult education component of the *Sustainable Households Program,* it was found that:

♦ the program is best suited for those people who have started to make some changes to their lives along sustainable lines;

♦ there was evidence of empowerment, diffusion of ideas beyond the group and encouragement of action research procedures as well as self-reported action changes;

♦ the use of the car was the least affected outcome from the program. Social convention rated highly in participants' reasons for not changing motor vehicle decisions and actions, despite being aware of the environmental effects of running a car. In other areas of environmental impact, e.g. 'paints down drains', participants were more ready to make changes.

How can you enhance the effectiveness of your air quality education programs?

A combination of approaches, including educational and other strategies (e.g. regulation, infrastructural improvements), will be more effective than one single approach.

♦ **Community-based social marketing approaches**, used mainly to reduce harmful vehicle emissions, have influenced some people's actions. Evaluation findings for particular travel mode programs varied across a wide range and, in some instances, reviews of evaluations appeared contradictory and the impact limited.

♦ **Community development approaches**, emphasising individual and community capacity building, although only found to be in limited use, appear to **show potential for more long-term changes** towards sustainable actions. They involve stakeholders and the wider community in environmental decision-making. Ownership of issues and deeper level learning have been shown to be more associated with long-term change. Where community-based participatory action research characterised an air quality program, participants were empowered to take community actions to change policies related to improving air quality.

♦ The **incorporation of Education for Sustainability principles and practices** into existing and future programs will enhance the likelihood that individual and community actions related to air quality will change. It is also emphasised that appreciating the learning assumptions underpinning community education programs provides insight into why some programs may be more effective than others. This is often not appreciated as most evaluations of

community education programs focus on the various types of outcomes rather than the processes used in the program and how the community perceived the educational processes used.

How can air quality education go beyond raising awareness towards achieving change in people's choices and actions?

Awareness of air quality issues is a precursor to changes in decisions and actions. This research indicates that going beyond awareness to achieve change will require a combination of community education approaches. Clearly, community education programs must include information to alert people that there are air quality issues, but for a program to be effective and achieve change it is even more important that the community **build the capacity for individuals to influence policy and take personal action**. To achieve this, new resources are needed that build the capacity of the community to explore the **underlying causes** of their air quality issue(s):

♦ Information provided must **include 'how to' knowledge** of a variety of types such as how to participate as a stakeholder in the community to influence changes in local and other government policies.

♦ Community education which incorporates attributes such as futures' visioning, critical reflection, and action learning is most likely to result in **a change of 'mind-set' in the participants** and bring about sustainable change.

♦ Legislative, regulative and infrastructure changes will also be required, especially to reduce vehicle use. However, to obtain maximum compliance with governmental decisions, communities need to have a real opportunity to engage with these. Such engagement should be more than superficial community consultation. **Forums need to be provided for community learning and decision-making.**

More examples: air quality education programs

Case study E: Sustainability Street (Australia, c.2000+)

Sustainability Street is a localised community development approach to sustainability issues including air quality developed by Vox Bandicoot Pty. Ltd., an Australian environmental education company. *Sustainability Street's* central idea is to get people together as local communities to learn about ecological sustainability and then encourage, assist or 'teach' other individuals and communities to join in. There are about 30 Sustainability Streets in NSW and Victoria and soon is to be piloted in the United Kingdom. A 'street' simply means a geographical or socially connected group of people.

Educational Strategies: *Sustainability Street* is:

♦ based on capacity building, which educates and engages the community in sustainable living practices and initiatives;

♦ implemented via four-stage training period over six months with a teaching and learning approach that revolves around learning, planning, doing and influencing (see Box). It includes a *Train the Trainer Sustainability Street Accreditation Program;* and

♦ used in neighbourhoods in NSW and Victoria and is soon to be piloted in the United Kingdom.

Key Principles of Education for Sustainability (EfS)

Education for Sustainability:

♦ takes an explicit socially critical perspective - people need to be able to locate the causes of unsustainability within society and think systemically;

♦ .There is a focus on people's and community values and the values inherent in institutions, which directs attention to the root causes of environmental concerns rather than simply giving attention to the symptoms;

♦ is futures focused and encourages communities to engage in actions to create a better future and in so doing build capacity for change;

♦ stresses the need for participation in communities so that there is an overall commitment to change, change that has a long-term vision. Communities need to feel that they can take responsibility for, and make, decisions themselves. Partnerships would be integral to achieving many changes; and

♦ argues that change starts locally where it can be seen to be relevant and culturally appropriate and thus being more meaningful.

Education for Sustainability

Education for Sustainability is '…critical for achieving environmental and ethical awareness, values and attitudes, skills and behaviour consistent with sustainable development and for effective public participation in decision-making'

Parliamentary Commissioner for the Environment (2004). See Change: Learning and Education for Sustainability. Wellington, p.37.

Impacts: *Sustainability Street* outcomes have included:

♦ a reduction in resource use of up to 20%;

♦ 30% reductions in household waste and energy;

♦ in Wollongong, NSW, 45% of *Sustainability Street* participants now use their car less; and

♦ the development of community sustainability projects (for example, demonstrations of water tanks).

Case study F: WE ACT (West Harlem, NY, USA, c.2000+)

West Harlem Environmental Action, Inc. (WE ACT) is a non-profit, community-based environmental justice organisation dedicated to building community power to fight environmental racism and improve environmental health, protection and policy in communities of colour. WE ACT strongly believes in community involvement in setting and implementing research agendas to address environmental justice issues and that action needs to be at the 'grassroots' level. WE ACT community-based participatory action research (CBPAR) projects are funded by government and private agencies. The WE ACT approach involves

scientists and community leaders working in partnership across all phases of a project, including planning, implementation, and reporting. An essential component of every CBPAR project is to distribute the research findings to all partners "using language that is understood and respectful of the contributions of each participant".

Educational Strategies: WE ACT's particulate air pollution project involved:

♦ approaching EPA regional departments and developing relationships with researchers about their concerns about particulate air pollution.

♦ building community capacity by developing 'a core of residents and community leaders versed in scientific concepts and monitoring tools' via Leadership Training in Environmental Health 'to improve (the capacity of community residents) to organise for community environmental health and justice in New York City'. Topics included: sources of pollution, how it moves, health effects, monitoring tools and how to incorporate data into community advocacy. The course was 24 hours over six weeks.

Impacts:

♦ Over 80 community leaders have graduated from the training, with many of them playing significant roles in setting public health policy at the local, state and national level.

What can you learn from this project?

Experience with investing in, and implementing air quality education programs to date, has demonstrated that:

♦ awareness raising campaigns on their own have little, or no impact on the community's decisions related to improving air quality in relation to vehicle use.

♦ social marketing approaches influence people's actions in some limited capacity. The success of the *Turn-It-Off* (car-idling) campaign implies that some commuter actions can be changed with simple social marketing techniques, at least in the short-term.

♦ incentives and disincentives, when used with a targeted information

campaign, may be effective when the improvement sought relates to one-off decisions (such as replacing an old wood heater), rather than when applied to programs which need to change actions within a whole society (such as reducing vehicle emissions).

♦ reviews of social marketing and other programs have concluded that including more participative processes do improve long-term outcomes i.e. when participants involved in a program interact over an extended period with facilitators, and each other, in discussing issues and being involved in various policy and action-oriented initiatives, then air quality outcomes are more favourable.

♦ The incorporation of Education for Sustainability principles and practices into existing and future programs will enhance the likelihood that individual and community actions related to air quality will change.

Key Recommendations for Program Designers

♦ Develop **programs** which provide the opportunity for community members to be involved at all stages and in all aspects from their initial planning through to their evaluation.

♦ Develop **specific sub-programs** which target people and organisations in the community such as the susceptible, non-adopters of initiatives, and offenders, to ensure they are not overlooked.

♦ Include **direct health messages** related to deteriorating air quality as a component of awareness raising and community workshops.

♦ Develop **specific air quality resources** which will assist facilitators and mentors to help community groups to build their capacity to engage in decision-making and actions through workshops.

♦ Incorporate an emphasis on air quality issues (vehicle use, wood smoke, indoor air quality) into **broader sustainability related community education programs.**

♦ Develop indoor air quality education programs which **integrate health and environmental issues** and which **target particular community groups,** especially the susceptible.

♦ When making decisions related to improving air quality and community education, ensure there is effective **communication between government departments** (e.g. health, transport, environment, planning and infrastructure) **at all levels** (federal, state and local). This is to maximise the possible synergistic effect on the community.

Key Policy Recommendations

All levels of government should support:

♦ Air quality community education programs with appropriate **legislative, regulatory** and **infrastructure decisions** that are consistent with a sustainability vision. It is also critical that these decisions take into consideration the convenience and cost to the individual and community.

♦ A combination of education approaches where **awareness raising** and **social marketing approaches** are integrated with more participatory approaches to ensure improved air quality outcomes are achieved in the long-term.

♦ Programs that include **substantive opportunities for group participation based on Education for Sustainability approaches,** including mentoring and facilitation.

♦ Programs that **extend over several years** and incorporate a **long-term** plan

to collect **evaluation** data related to **ultimate outcomes** (up to five years after the completion of a program) as well as **qualitative** data related to perceptions of **educational processes** used in programs.

♦ **Capacity building and training of both government and non-government community educators** in the use of Education for Sustainability approaches with community groups, including those from culturally and linguistically diverse backgrounds, so that community environmental capacities are enhanced.

♦ The **development of key personnel** within communities who can assist the community to liaise, negotiate and form partnerships with organisations and local and state government agencies in the development of air quality education programs and their implementation.

♦ Communities who have developed **proposals to increase the capacity of community members in addressing air quality issues** at household and local levels through participatory action research oriented approaches.

♦ Local government and other organisations which engage the **community in prioritising environmental issues**. Through this approach air quality issues can be addressed more effectively as the community can take ownership of the issues.

♦ Provision of **incentives and opportunities** which will encourage the involvement of key community stakeholders and credible community groups and members, including those from culturally and linguistically diverse backgrounds, who can have a multiplier effect on the wider community.

♦ Clarification of **government standards** for indoor air quality in public and private spaces.

Key Research Recommendations

Research should be undertaken into:

♦ how **awareness raising** and **social marketing approaches** can be better integrated with other more participatory approaches to ensure improved air quality outcomes are achieved in the long-term.

♦ **reasons for non-involvement and non-compliance** in air quality initiatives, across the range of air quality issues, in order to inform the development of programs for specific target audiences (e.g. retailers, senior citizens).

♦ development of a **case study resource** for local government and community educators on the principles of learning based change and Education for Sustainability related to air quality issues.

In Summary

This research undertaken by ARIES reviewed numerous air quality community education programs and evaluation data that indicated the effectiveness of specific programs.

The research found that currently the majority of air quality education programs are based on an awareness raising or social marketing approach. Whilst these programs have proved successful in increasing overall community knowledge about issues, they have had limited success in initiating actions or long-term change. Despite the limitations of social marketing, significant change has been documented where this type of approach has embraced more interactive educational strategies such as facilitation, mentoring and learning in small group contexts.

Environmental education policy and program developers need to take into consideration that the effectiveness of air quality community education programs will be increased if they *move beyond* awareness raising and *involve the community in capacity building*. This would enable both individuals and the community to have not only the knowledge but also the skills to influence air quality decision-making and actions at local, state and national levels. To become engaged, awareness of the health and environmental consequences of poor air quality is an initial requirement, but this should be complemented with other capacities, as can be provided by an Education for Sustainability approach to community education.