



**FINAL PAPER PREPARED FOR THE**

**AUSTRALIAN GOVERNMENT\***

**addressing**

**CONSIDERATIONS FOR THE DEVELOPMENT  
AND INTRODUCTION OF AN ISSUE-SPECIFIC  
ENVIRONMENTAL IMPROVEMENT PLAN  
(EIP) FOR THE AUSTRALIAN  
FOAM INDUSTRY**

**submitted by**

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\* This Final Paper is the work of Caleb Management Services, a reputable international consultant in this field. However, for the avoidance of doubt, the contents are solely the view of the consultant and do not necessarily represent the views of the Australian Government.

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## **CONSIDERATIONS FOR THE DEVELOPMENT OF AN ENVIRONMENT IMPROVEMENT PLAN (EIP) FOR ODS/SGG USE IN THE FOAM SECTOR**

**Caleb Management Services Limited – September 2004**

### **Background to this Paper**

A series of meetings was held with representatives of the Australian foam industry and other relevant stakeholders in early June 2004 to ascertain views on the introduction of an Environment Improvement Plan (EIP) across the industry. These meetings had been preceded by preliminary informal discussions between the industry and the Commonwealth Government as early as last year. The principal consultant at Caleb Management Services (Paul Ashford) had been engaged to assist the Department of Environment and Heritage and the Australian Greenhouse Office in reaching an appropriate conclusion on the viability of such an EIP and the selection of an appropriate Implementation Framework. A Discussion Paper had been prepared and circulated across the industry in April 2004 that put the proposed Australian approach into an international context.

This summary represents the outcome of this process. However, it should be stressed, that these proposals reflect entirely the view of the consultant and are not necessarily representative of the view of the Australian Government itself.

### **Legislative Framework**

The new *Ozone Protection and Synthetic Greenhouse Gas Management Act 1989* (the Act) was enacted by the Australian Parliament in December 2003, extending the basis of the previous *Ozone Protection Act 1989*. The legislation:

- (1) Extends existing legislation developed for ozone depleting substances (ODSs) into the management of synthetic greenhouse gases (SGGs) for the first time anywhere in the world.
- (2) Seeks to control emissions of ODSs as well as the production and consumption required under the Montreal Protocol.

By combining the legislative framework in the way it has, the Australian Government has created a formal link that has the potential to promote the early adoption of key 'responsible use principles' and to create a level playing field between those still using HCFCs (ODSs) and those switching to HFCs (SGGs) in the foam sector. This approach contrasts to that adopted in Europe, where language in the draft F-Gas legislation has been "borrowed" from existing EU regulations on ODSs (EC 2037/2000) to apply to SGGs, with the pieces of legislation for ODSs and SGGs remaining distinct and separate in this case.

It should be noted that it only becomes illegal to emit either ODSs or SGGs in the foam sector once the Australian Government has implemented the relevant regulations and an Environment Improvement Plan has been formally introduced. This is not expected to happen before further consultation with the industry has occurred and key documentation is in place (e.g. Good Practice



Guidance); a process which may take longer than a year to complete. A potential date for the formal introduction of regulations and the EIP could be, for example, *1st January 2006*. This would be towards the end of the usage period for HCFCs, which are expected to be priced out of the market prior to 2008 as the scheduled import reductions continue under the Act.

An important aspect that has been explicitly considered in the current legislation has been the import of specific products containing SGGs. The Act requires licensing of “pre-charged equipment”, which includes HFC and HCFC containing mobile air conditioning systems within imported cars and some types of stationary refrigeration equipment. However, foams containing, or made with HFC or HCFC are excluded from import, export and manufacture licensing controls.

### **Proposed EIP Implementation Framework**

The EIP Implementation Framework will be required to cover three key areas:

- Reporting the trends in consumption and emission of ODSs and SGGs by foam sub-sector.
- Establishing, maintaining and updating ‘responsible use principles’ and ‘good practice guidance’.
- Defining the structure and operation of the EIP at company level.

The outline set out in **Annex A** emerged as the preferred basis for implementation. The remainder of this document sets out the rationale for this proposed Implementation Framework and discusses how it might work in practice.

#### **(1) Reporting trends in ODS and SGG consumption and emissions**

##### **- Bulk chemical and formulations**

There is a clear need to understand the consumption and emissions of ODSs and SGGs at foam sub-sector level. This need is justified on the simple basis that *‘if you don’t measure it, you can’t manage it’*.

One method of reporting consumption would be to insist that each foam manufacturer<sup>†</sup> covered by the EIP should report its precise consumption of both ODSs and SGGs. However, apart from the obvious burden that this would impose on individual manufacturers, there is an additional problem based on the fact that these manufacturers may not have full information on the precise system formulations that they use. In some cases, such formulations are proprietary to the Systems Houses<sup>‡</sup> that supply them.

In 2001, and thereafter, PURD initiated a voluntary data collection scheme among the Australian Systems Houses which provided information by foam sub-sector on the consumption of ODS by substance (HCFC-141b, HCFC-142b and HCFC-22). The scheme proved to be successful and provided the basis for an on-going annual time series that could now be extended to include the relevant SGGs (HFC-134a, HFC-152a, HFC-245fa, HFC-365mfc & HFC-227ea).

<sup>†</sup> A ‘foam manufacturer’ is any organisation that takes a chemical formulation and creates a foamed product with it. This will include both those who create their own formulations and those who buy their systems pre-formulated by Systems Houses (see below)

<sup>‡</sup> A ‘Systems House’ takes polyurethane chemicals and pre-blends them with other additives, including blowing agents to provide a ‘ready for use’ system. This takes some of the complexity of formulation out of the hands of the foam manufacturer.



The scheme would now need to be formalised with the Australian Government and, to protect the interests of the major Systems Houses, there would need to be a parallel reporting commitment from foam manufacturers to assist the Systems Houses meet their obligations. This would mean that any blowing agent purchased by a foam manufacturer directly from an importer would need to be reported either through a Systems House or directly to the Australian Government.

Government will have the ability to carry out a mass balance calculation each year from the reports of ODSs and SGGs imported each year. Although some adjustment will be required to account for changes in stocks within the supply chain, it should be possible for the Australian Government to work with importers to validate the Systems Houses' declarations.

The role of PURD in these reporting procedures needs further consideration. There is no question that the existing members could continue to use PURD to aggregate and report the consumption identified. However, it is not clear whether non-members of PURD could or should be required to report via PURD also. There is a strong argument that there should be an opportunity for non-members to report directly to Government and a provision to undertake this would be relatively simple. However, in cases where there were only one, or possibly two, non-members, there could be problems with maintaining confidentiality of those reporting directly to the Australian Government. This would be particularly the case if the Australian Government wished to publish aggregate data on consumption, since PURD would then be in a position to establish the value of the direct submissions by deduction from its own declarations.

One possible way around this would be for the Australian Government to declare total emissions of foams produced in Australia rather than consumption. Although there are known algorithms<sup>§</sup> for converting consumption into emissions, these are based at foam sub-sector level. Therefore, aggregated emissions by substance (but not by foam sub-sector) could be declared without fear of disclosing the supporting consumption inputs.

#### *- Trade in foamed products containing ODSs or SGGs*

There is a significant history of foamed products containing, or made with<sup>\*\*</sup>, ODSs (even CFCs) being imported into Australia to compete directly with locally manufactured products. This has been argued by representatives of the Australian foam industry to create an unfair competitive advantage on two counts:

- (1) The importing producer has avoided potentially expensive conversion costs.
- (2) The importer has avoided the on-cost of levies charged by Government on bulk imports of ODSs and SGGs.

These two factors have been seen to have particularly deleterious effects on some foam sub-sectors over the last ten years – one of the most notable of which has been PU flexible moulded foam industry (particularly the office furniture element). The extension of such an imbalance to SGGs is seen by many to be the compounding of an error. This concern is magnified even further

<sup>§</sup> UNEP Foams Technical Options Committee (2002) based on the work of AFEAS/Caleb

<sup>\*\*</sup> Foamed products can have either open or closed cells. Where they are open celled, the blowing agent will have been released at the point of manufacture and the term 'made with' (or 'blown with') is applied. Where they are closed cell, the blowing agent will normally still be present and the term 'product containing' is applied. Although only closed cell foams carry ODSs or SGGs into the country on import, the open celled products still benefit from the financial advantages of non-conversion.



by the potential burden of the new regulations in both administration and cost as the industry rightly seeks to minimise its emissions of both ODSs and SGGs.

Caleb agrees with the basis of this concern. Effectively, the on-going permission to import products containing ODSs and SGGs amounts to a decision to import a future liability for Australian society without penalty. As noted earlier, there is a precedent with both mobile air conditioning units in cars and with other types of stationary air conditioning to adopt a licensing scheme by which imports can both be tracked and levied proportionately in accordance with the current duty levied on imported bulk ODSs and SGGs.

However, an extension of the licensing and levy system to foam products containing ODS and / or SGG would require an amendment to the legislation.<sup>††</sup> While amending legislation can be complex and lengthy, the process can be streamlined somewhat if a strong case for an amendment is made that has industry and government support.

The foam industry will need to work closely with the Australian Government over the coming years (mirroring the constructive approach the refrigeration and air conditioning industry associations took in the development and implementation of ODS and SGG end-use regulations in their sector) if the case for the specific inclusion of imported foamed products containing ODSs and SGGs is to be successfully developed and implemented under the Act.

As a first step, and following substantial debate during the week of meetings, the Australian Government suggested that a research project could be conducted by the foam industry to establish the case for the inclusion of products containing ODSs or SGGs in the foam sector. Such a project would add value by focusing on three key areas:

- (1) The materiality of the current imports of products containing ODSs and SGGs in the foam sectors.
- (2) The ability of any licensing (or other) provisions to be enforceable and capable of being policed.
- (3) An assessment of the on-costs and related benefits gained by changing the treatment of imported products containing ODSs or SGGs under the Act.

Early feedback from the industry, supported by anecdotal experiences from other parts of the world, suggests that markets are well enough defined to encourage a degree of self-policing by suppliers to the markets in question. This might not extend to small block foam imports, but would certainly be the case in more significant markets such as architectural panels. Whether or not a self-policing system would be the best available option and be accepted by the Australian Government needs to be explored further.

In conclusion, Caleb fully supports the proposal for a study by the foam industry and stands ready to assist from an international perspective in this on-going assessment.

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<sup>††</sup> A formal review of the Act, which may include amendments, will take place in 2006.

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## **(2) Establishing, maintaining and updating ‘Responsible Use Principles’ and ‘Good Practice Guidance’**

### **- Responsible Use Principles**

The development of ‘Responsible Use Principles’ in the foam sector globally has been a slow and tortuous process. Despite the best efforts of Caleb and others to encourage other Governments into the development with industry of appropriate benchmarks, the outputs to date have been limited to a set of fairly weak proposals from the Alliance for Responsible Atmospheric Policy (ARAP), US EPA and UNEP DTIE<sup>##</sup>. In this context, the initiative now being offered to the Australian foam industry is ground-breaking in its intent and may form the basis of a much wider geographical application, if successful.

The approach being adopted in current global reports (most notably the draft Foams Chapter of the IPCC/TEAP Special Report on HFCs and alternatives) is to split the ‘Responsible Use’ assessment into three simple questions:

- (1) Does the application require the use of ODSs or SGGs?
- (2) Are the formulations being used minimising the reliance on ODSs and SGGs (e.g. by using co-blowing agents)?
- (3) Does the ODS or SGG used in the formulation offer the lowest environmental impact, while delivering the product properties required?

These three questions (or a version of them!) were set out in Section 3.3 of the Discussion Paper distributed prior to the June meetings. During the subsequent discussions, there was no particular dissent to the sentiments embodied in these questions. However, it was recognised that these basic principles would need to be developed into a formalised commitment that could be subscribed to by all Systems Houses and foam manufacturers operating in Australia.

There was some debate about whether such a commitment could be established consistently across all foam sub-sectors and Caleb certainly believes this to be the case. However, care will need to be taken in the elaboration of the basis on which the use of ODSs and SGGs are justified. The IPCC/TEAP Special Report draft currently identifies three basic justifications:

- Additional thermal performance benefits (including longevity of performance)
- Product safety requirements (to meet building codes and/or insurance demands)
- Process safety requirements (both generic process risks and cost-related barriers)

If these principles are applied as an exclusive positive list (i.e. listing those uses that are justified as opposed to those that aren’t), there may be occasional ‘justified’ applications that fall outside of these three criteria. The text may therefore need to be sufficiently qualified to allow for the consideration of exceptional cases. If such a case were to arise, there would be a need to have the ability to seek opinion external to the local industry in order to avoid competitive pressures. This will require the industry to keep in contact with the international foam community in order to seek such advice where necessary. It is also likely that the Australian Government would also seek

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<sup>##</sup> DTIE stands for ‘Division of Technology, Industry and Economics’ that is situated in Paris, France.



international review of these cases. As will be seen, this will also be a consideration for the Good Practice Guidance provisions that follow.

In order to establish the generic text across all foam sub-sectors, it is proposed that the foam industry sets up a sub-committee to establish these in conjunction, if necessary, with Caleb. In any event, the Australian Government may require international peer review of any responsible use principles written by industry sub-committees.

#### - Good Practice Guidance

It is proposed that Good Practice Guidance be developed across a variety of foam sub-sectors in accordance with patterns of use in Australia. This is best done at industry level and it is possible that PURD are well placed to act as the focal point for the establishment of sub-groups in each of the respective sub-sectors. The principle purpose of these sub-groups will be to define the following:

- The significant sources of emission throughout the processes in question;
- Practical means by which such emissions can be minimised (including an indication of cost/benefit parameters) throughout the lifecycle (including end-of-life); and
- Emerging alternative technologies.

Again, these 'Good Practice Guidance' outputs will need international peer review in order to keep them consistent with international good practice and the latest developments in industry thinking. Sub-groups are currently envisaged in six sub-sectors:

- Systems Houses
- Continuous and Discontinuous Panels
- Spray Foam
- Block Foam
- Commercial Refrigeration
- Water Heaters

Following the submission of an industry stakeholder outlining concerns about technologies potentially adopted in products imported into Australia (notably the use of PFCs as nucleating agents and surface active agents), there may be a case for establishing a seventh sub-group to cover good practice in domestic appliances (excluding water heaters). This sub-group would then be able to prepare an appropriate stance to deal with products containing ODSs or SGGs as and when modifications to the legislation are made. Whether such measures could extend as far as a specific technology ban would need to be the subject of further consideration between the relevant sub-group and the Australian Government. However, a precedent does exist in Europe within the enactment of the European Union ODS regulation (EC 2037/2000).

If it is not deemed appropriate to establish a separate domestic appliances sub-group to deal with refrigerators and freezers (because of lack of SGG use in Australia) this could be combined with the water heaters sub-group. However, it is Caleb's opinion that this outcome would be second-best.





### **(3) Banked blowing agents and End-of-Life issues**

The nature of closed cell foams is such that they retain much of their blowing agent during the use phase, which can last for 50 years or longer, when used in buildings. This also means that there can be a substantial bank of blowing agent that will be released at end-of-life when the foam is decommissioned. In regions where foam-based building insulation is widely used, these banks can be quite substantial and global estimates suggest that both the CFC and HCFC banks may exceed 1 million tonnes each.

However, in Australia, the historic use of foams in buildings has been limited. Therefore, the main accumulation of blowing agents has been in the domestic appliances sector. Since domestic refrigerators only have an average lifetime of 15 years and the phase-out of use of ODSs in foams was in 1994, there is likely to be only around 5 years worth of banked blowing agent remaining at this stage. This would be further reduced by the time any measures had been introduced to handle the bank. These issues were explained and quantified in the Discussion Paper circulated prior to the June meetings.

Although this situation would seem to obviate against the introduction of end-of-life measures for the foam sector, the gradual increase in the use of foams in the construction and transport sectors (based on HCFCs) means that there may be future issues to be managed. This is likely to transpose to the SGG scenario as the transition from HCFCs to HFCs takes place in certain sectors. It is anticipated that growth in building insulation is likely to be more dramatic over the next ten years than it was in the previous ten. Measures are already in hand to increase the overall energy performance of new buildings and foams are likely to take a significant share of this activity. It is therefore viewed as prudent to keep a close watch on the development of end-of-life recovery techniques as they develop on the global stage and to re-appraise the potential for action in Australia. To this end, PACIA/PURD has been asked to submit a proposal to the Australian Government to conduct a relevant study on the potential for end-of-life management in foams. Since the UNEP Technical and Economic Assessment Panel (TEAP) will be preparing a global review of the technologies and economics associated with such activities for publication in April 2005, it may be prudent to conduct such a study in late 2005 or early 2006 in order to capture the latest views.

### **(4) The introduction of the 'Active EIP'**

In the April Discussion Paper, one of the key issues raised was the mechanism by which the EIP should be introduced. Essentially, three options were proposed:

- (1) That the covering trade association (PACIA/PURD) signs on behalf of its members or the industry as a whole.
- (2) That a "template" EIP be developed at trade association level for replication and signature at company level.
- (3) That each company develops and signs its own EIP by following guidelines issued by the trade association.

As noted at that time, option (2) looked to have the potential to be most effective, by avoiding the administrative burden of option (3), while avoiding the legal complexities and potential liabilities for PACIA/PURD of option (1).





These liabilities are even greater than originally assessed because of the nature of the Legislative Framework enacted. Since the industry would only act on dispensation from the Government to emit (no foam process is completely without emissions) a breach in the terms of an EIP could jeopardise the exemption of an entire foam sub-sector, or even the industry as a whole. In addition, PACIA/PURD would need to act on behalf of the industry as a whole and would therefore assume liability for non-members over whom it would have no control.

The Australian Government would also be less happy with this type of structure, since a decision to withdraw dispensation would carry with it such implications for the industry that it would be harder to enact. Indeed, such a blunt instrument is viewed as inappropriate.

For these reasons, discussions quickly focused around option (2). It was viewed that a 'template' EIP could be created at industry level, containing the following elements:

- Commitment to report (or to assist Systems Houses to report) consumption by substance and foam sector.
- A generic commitment to the 'Responsible Use Principles' espoused by PACIA/PURD.
- An overview of the specific emission points affecting the foam sub-sector(s) in which the company operates.
- An analysis of the current equipment installed and practices followed for each foam sub-sector process, together with a comparison against Good Practice.
- Identification of economically viable measures that could be taken to reduce emissions with an indication of their affordability to the company<sup>§§</sup>.
- An action plan for the reduction of emissions, where appropriate.
- A commitment to the provision of a short Annual Report.

It is envisaged that a 'template' could be produced by the foam industry for each foam sub-sector. This will become a further task for each sub-group, although a common format will need to be provided by the foam industry. For companies involved in two separate foam manufacturing activities, it might be most appropriate to sign one EIP for each activity rather than try and create a composite document.

Wherever possible, the 'template' would probably be based on 'tick boxes' in order to simplify and speed up the completion process. In addition, model calculations will be made available for the economic viability and affordability of proposed measures. It is expected that the Systems Houses will provide important assistance to smaller foam manufacturers as part of their on-going customer service programme.

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<sup>§§</sup> In the choice of the terms '*economic viability*' and '*affordability*' Caleb is seeking to distinguish between the rationale for any expenditure in policy terms (i.e. how the investment compares with other means of abating emissions) and the ability of a specific company to make that investment. It is often the case that economically viable measures might not be affordable and it might even be the case that a measure is affordable but is not economically viable (i.e. it does not represent best use of the funds). This will be a major subject for future discussion between industry and the Australian Government as the EIP framework develops.



Some Systems Houses raised the issue of small, occasional users (e.g. for boat buoyancy applications). While the volumes used might be small, the allowance of ODS or SGG usage without an active EIP could provide a loophole that would be very difficult to ascertain and control. Caleb therefore believes that all users must be captured under the EIP scheme irrespective of size. The alternative would be for Systems Houses to take responsibility for these uses under their own EIP provisions. However, this would mean that their total EIP status could be jeopardised by mal-practice of the smaller users. This would seem to be a commercially unacceptable risk, although further comment is invited on this subject.

The signed EIP will, of course, need to carry a clause confirming the Government's right to withdraw its dispensation under the *Ozone Protection and Synthetic Greenhouse Gas Management Act (2003)* should it need to do so because of the failure of the company to comply with the provisions of the EIP.

It is proposed that the existence of a signed and current EIP will be required to permit the purchase ODSs or SGGs from Systems Houses and/or bulk ODS and SGG importers. This may require the issue of annual certificates by either the Australian Government or its chosen agent.

#### **(5) Costs and Funding Issues**

The 'active EIP' process is expected to work as a 'registration' process rather than a 'licensing' process. Therefore it is possible that only a nominal administrative charge would be levied in accordance with cost recovery principles.

Additional funding (drawing on part of the funds available from the levy on the import of bulk chemicals) may be available to cover other aspects requiring resources. These include:

- Awareness raising within the industry to ensure completeness of cover (should be assisted by the Systems Houses too)
- Research projects (e.g. tracking of imports, bank management etc).

Discussions were held between Caleb, the foams industry and DEH and AGO regarding funding options for industry to adopt emission reduction measures (e.g. through grants or loans)<sup>\*\*\*</sup>. These discussions were very preliminary in nature and didn't go into specific detail about how these options may work in practice. From the DEH and AGO's perspective no commitment was made to provide such funding arrangements now or in the future. However, the DEH and AGO are willing to consider this issue further and possibly work with industry on the feasibility of such options in the future. Any such arrangements would require further work by industry, in consultation with the DEH and AGO, to demonstrate that measures were in line with funding provisions under the Act, which includes:

- a) ODS phase-out programmes; and
- b) Emission minimisation programmes for ODS and SGGs.

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<sup>\*\*\*</sup> From Caleb's perspective two schemes that might inform discussions on funding options are the Texas Loan STAR scheme and the UK Carbon Trust Action Energy Loan Scheme, although these schemes are both targeting energy efficiency measures. Whether such an arrangement would also prove beneficial and effective in Australia, however, could only be determined through further government/industry consultation.



The burden of proof would therefore fall on the foam industry to demonstrate the benefits of such a funding approach, which would also need to be negotiated further with the DEH and AGO. Any funding requests from the foams industry would be considered by the DEH and AGO against those from other sectors that address ODS phase-out or emissions minimisation of ODS and SGG.

## **(6) The Way Forward**

The following actions are required to move the process forward:

- (1) The foam industry, possibly through PURD, to submit a proposal (or proposals) to the Australian Government for the following:
  - a. The development of generic Responsible Use Principles.
  - b. The establishment and facilitation of Sub-Groups to determine and document Good Practice Guidance by foam sub-sector.
  - c. The development and maintenance of appropriate Foam Sub-Sector 'template' EIPs.
- (2) The foam industry, possibly through PURD, to submit research proposals to cover the following issues:
  - a. The appropriateness, enforceability and cost/benefit of measures to monitor and control the import to Australia of foam products containing ODSs and/or SGGs.
  - b. The current status and likely future development of blowing agent banks in Australia, together with an assessment of good practice management options.
- (3) Australian Government to liaise with stakeholders over the best means of collecting and reporting consumption and emissions data, to ensure confidentiality of inputs.
- (4) The foam industry, possibly through PURD, and the Australian Government to jointly consider the best means of outreach to the foam manufacturing community, including events and flyers giving details of the plans for the implementation of the EIP. Consideration may also be needed for a web-based approach.
- (5) Australian Government and the foams industry, possibly through PURD, to give consideration to possible financial mechanisms required to support the EIP programme.

It is expected that the developments targeted under item (1) will take approximately one year to materialise. This would imply that the requirement for active EIPs at company level would not come into force until January 2006 at the earliest. Formal reporting provisions could be finalised within six months, but may be more appropriately introduced to coincide with the introduction of EIP programme itself. Other measures are not specifically on the critical path but may be funded from existing ODS levies as resources allow. It may be necessary to contract out some of the facilitation and developmental processes in order to keep to the required time-line, bearing in mind that core resources in the foams industry may be already fully committed.

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**ANNEX A**

