

PVC PRODUCT STEWARDSHIP PROGRAM

The annual progress report for the Australian PVC industry's
Product Stewardship Program.

2012



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PVC
PRODUCT
STEWARDSHIP
PROGRAM
2012
ANNUAL
PROGRESS
REPORT

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Progressing Product Stewardship

The PVC industry established the Product Stewardship Program in 2002 to provide a voluntary framework of commitments addressing the life cycle impacts of PVC. Through the ten year operation of the Program Signatories have made progress against environmental and health objectives associated with the production, use and disposal of PVC products. This report reviews the progress made in 2012.

In 2012 the PVC industry adopted a new commitment focused on energy and greenhouse gas management. The Energy Efficiency and Greenhouse Gas Charter outlines principles to guide Signatories in improving energy efficiency and reducing greenhouse emissions. A survey of Signatories informed the development of workshops and resources to support Signatories in the process. Such ongoing development of the Program demonstrates industry awareness of emerging issues, response to stakeholder expectations and a willingness to act.

Improving recycling remains a key focus. Representatives from Signatory and other stakeholder groups are developing and implementing the Vinyl Industry Recycling Strategy. This aims to establish a viable and sustainable PVC recycling practice in Australia, with greater availability of recyclate in the market for use in new products, increased demand for recyclate from manufacturers and attraction of new investment and recyclers into the industry.

The PVC industry can demonstrate that it has an exemplary voluntary Product Stewardship program in place, with active industry participation delivering substantive and measurable progress. By taking a life cycle approach and utilising PVC's inherent properties, Program Signatories can extend PVC's environmental benefits by supplying vinyl products with low embodied energy, high thermal efficiency, recycled content and versatile design.

Vinyl is used in wide variety of applications throughout the Australian economy, including in building, construction and infrastructure, power and telecommunications, health and education, automotive, consumer goods, fashion and textiles.

The Program welcomes businesses from throughout the PVC supply chain and in 2012 Karndean Flooring and Australasian Solvents and Chemicals Company became Signatories. CMS Electracom and Rehau joined the Program in early 2013.

Annual public reporting demonstrates the PVC industry's commitment to transparency and complements Program activities. An independent third party auditor has verified this report, and data provided by eight Signatory companies. To enhance transparency and engagement, the Vinyl Council provides detailed information on the Program through information sessions, a website upgraded during 2012, and social networking conversations.

The Technical Steering Group (TSG) met four times during 2012 and has been actively supported by the NSW EPA and federal Department of Sustainability Environment Water Population and Communities. We appreciate the role Sustainability Victoria and the Green Building Council of Australia play as observers to the TSG, and the support of CSIRO. We value the input of these and other external stakeholders, and appreciate the opportunity to engage and demonstrate the Program's effectiveness.

After ten years of operation an evaluation review assessing longer term Program outcomes, broad trends and context, and feedback from Signatories and others, is currently underway. This review will evaluate the effectiveness of the Program, and recommend changes to ensure continued delivery of environmental benefits through industry action. Stakeholder feedback has been sought as part of the review, to assist in shaping the Program for the future. We also welcome feedback from readers of this report at any time.

George Macovaz
Chairman, Technical Steering Group

Current Signatory Status	Nine Signatories to the Program met all relevant commitments in 2012.
Lead stabiliser phase out	The phase out of lead stabiliser use by Program Signatories was completed in 2012. Use of 2.6 tonnes [lead metal content] in 2012, was reported by only one Signatory, who ceased use by the end of the year. This is a reduction of 99.8% from the 1190 tonnes used in 2002.
PVC recycling	Participation increased and interest continued to grow in the PVC medical waste recovery program. A new trial commenced in NSW. Funding support allowed the development of an education resource kit to assist hospitals implement the program.
Energy Efficiency and Greenhouse Gas Emissions	The Energy Efficiency and Greenhouse Gas Emissions Charter was included as a commitment in the Product Stewardship Program in 2012. A series of workshops to support the Charter implementation commenced.
Use of Phthalate Plasticisers	NICNAS released its DINP risk assessment. The Vinyl Council engaged with NICNAS to share industry information and recent scientific research.
Reporting	The 2011 annual progress report was published earlier than in previous years, allowing timely information sessions for stakeholders.
New signatories	Two new Signatories joined the Program. The total number of Signatory companies assessed in this report was 34.



ARMSTRONG FLOORING'S ECO-ACCOLADE
INCORPORATES RECOVERED AND RECYCLED PVC

Report Scope

This report details the 2012 performance of the Australian PVC industry Product Stewardship Program Signatories, relative to the commitments made for the year. The Australian PVC industry is defined for the purposes of this report as the Vinyl Council Australia (VCA), its member companies, and other PVC companies that are Signatories to the Program. The VCA estimates that Signatory companies represent approximately 80 per cent of the local vinyl manufacturing sector in Australia, plus key raw material and additive suppliers, and a number of importers of finished vinyl, or PVC, products.

Signatories to the Program are required to supply data for analysis and monitoring by the Program's Technical Steering Group (TSG) for preparation of the Program's annual progress reports and to show evidence of meeting the Program's commitments. There were 38 Signatories to the Program at the end of calendar year 2012, including three industry

associations. A business joining the Program at the end of 2012 was not asked to report. This report therefore outlines the results of data submitted by 34 Signatory businesses. An audit process completed by an independent organisation verified a sample of eight Signatory submissions, and this final report.

The relevance of each commitment to each Signatory varies depending on whether they are a supplier, compounder, converter, importer/distributor or fabricator and also the type of product produced or supplied. Some Signatories participate in several supply chain activities, or produce or supply multiple product types. Signatories only submit data for commitments that are relevant to their activities.

Figure 1: Signatories by supply chain activity

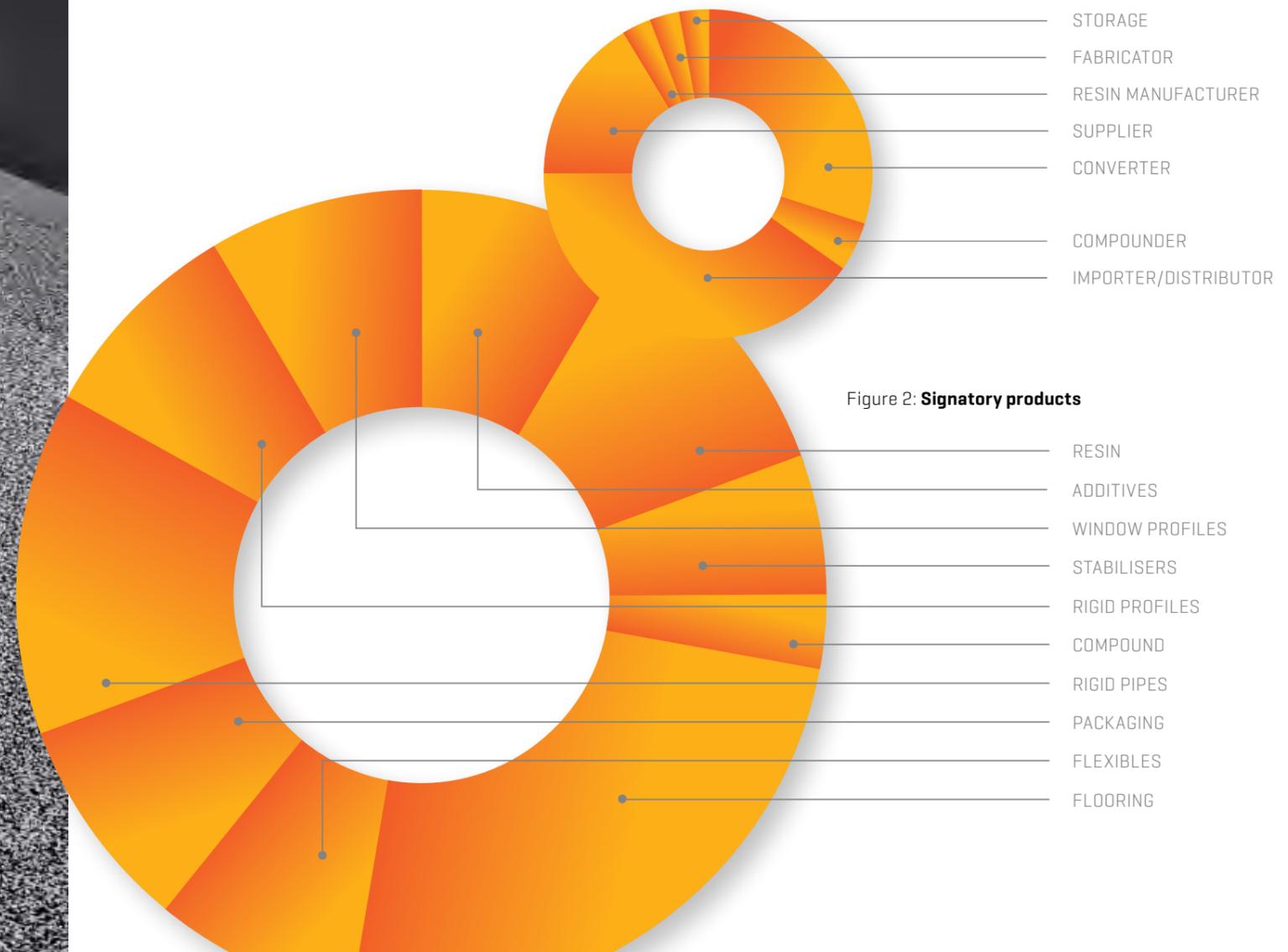


Figure 2: Signatory products

ISSUE	2012 COMMITMENT	2012 PROGRESS	2012 COMMITMENT
1. Production and Storage			
Suspension PVC [S-PVC]:			
VCM in finished suspension resin	Residual VCM in finished S-PVC, not greater than 1 ppm in 99% of batches tested.	70% compliance*.	Ongoing.
VCM emissions resulting from local suspension manufacturing	VCM emissions no greater than 30g/tonne.	Emissions of 14.6g/tonne PVC as at 30 June 2012.	Ongoing.
Emulsion PVC [E-PVC]:			
VCM in finished emulsion resin	Residual VCM in supplied E-PVC resin not greater than 1 ppm.	50% compliant or partially compliant. Implementation standards reviewed by the TSG.	Ongoing.
VCM emissions resulting from manufacture of emulsion resin supplied to Signatories	VCM emissions no greater than 1000g/tonne E-PVC.	63% compliant or partially compliant. Implementation standards reviewed by the TSG.	Ongoing.
Environmental management systems	Comply with or exceed the industry's minimum acceptable standard.	77% compliance. Of the 7 Signatories not fully meeting the standard, 4 are either implementing an EMS or have plans.	Ongoing.
	Embed Program commitments into companies' Business Management Systems.	68% compliance.	Ongoing.
Mercury avoidance	Ensure avoidance of mercury in the PVC supply chain for PVC products marketed in Australia.	73% compliance.	Ongoing.
Energy efficiency and GHG emissions	Not applicable.	Adopted an Energy Efficiency and Greenhouse Gas Emissions Charter.	2013 ACTION: Continue implementation and provision of resources.
2. Use of Lead and Cadmium			
Code of Practice	Adhere to PVC industry Code of Practice for the use of lead and cadmium.	100% compliance.	2013 ACTION: Review this commitment. Revise to reflect lead and cadmium stabiliser phase out and the intention of Signatories to maintain avoidance, while agreeing phase out time periods with new Signatories as required.
Cadmium Use	Maintain avoidance of cadmium stabiliser use.	100% compliance.	
Lead Use	Complete phase out of the use of lead stabilisers in all applications (target was 2010). Maintain avoidance of lead stabiliser use.	Completed by the end 2012. One Signatory used lead stabiliser prior to phase out.	
Pigments	Substitute lead, cadmium & hexavalent chrome pigments (target was 2010), where technically and commercially feasible alternatives are available.	One Signatory reported use of lead pigment. Total use was down 55% from previous year. One Signatory reported use of hexavalent chrome pigment. Total use was down 79%.	
Other additives	Monitor any pertinent overseas developments.	Monitoring maintained.	
Open disclosure	Provide information on additives used in PVC products or components to stakeholders upon request.	81% compliance. An additional 6% partially compliant, a further 6% implementing systems in 2013.	

ISSUE	2012 COMMITMENT	2012 PROGRESS	2012 COMMITMENT
3. Use of Plasticisers			
Phthalate plasticisers	Implement the industry Policy on Plasticiser Use.	90% fully compliant, an additional 5% partially compliant.	2013 ACTION: Ongoing.
	Report plasticiser data.	75% fully compliant, an additional 13% partially compliant.	Ongoing.
	Share relevant information with NICNAS.	Dialogue maintained with NICNAS.	Ongoing.
4. Waste Management			
Australian Packaging Covenant (APC)	All relevant** Signatories to submit waste management Action Plans under the APC and maintain compliance with APC obligations.	Four Signatories that are part of the PVC packaging supply chain have action plans lodged.	2013 ACTION: Review this commitment. Consider extension to all Signatories using packaging, and revision to provide equivalent outcomes to the APC.
Recycling	Implement the Vinyl-2-Life action plan.	A range of actions completed and new actions set (refer Appendix I).	2012 ACTION: Review this commitment to develop more specific targets.
	Develop an industry wide strategy to improve PVC recovery and recycling.	Strategy implementation commenced.	Continue implementation, with reporting through Vinyl-2-Life.
	Monitor overseas developments.	Information on recycling developments overseas shared with Signatories and TSG.	Ongoing
Consumer responsible care	Provide information to end consumers on management options for end-of-life PVC.	52% fully compliant. An additional 15% partially compliant.	Ongoing.
Life cycle thinking	Consider whole-of-life environmental impacts in the development of new products.	80% of Signatories developing new products fully compliant. Updated inventory for Australian PVC prepared.	Ongoing. 2013 ACTION: Support preparation of an Environmental Product Declaration (EPD) for Australian manufactured PVC resin.
Waste management reporting	Optional reporting encouraged.	17 Signatories reported a range of post industrial and post consumer recycling.	2013 ACTION: Review to develop more specific targets.
5. Research			
Research	To monitor national and international scientific research and share pertinent information with Signatories and stakeholders.	Information on a range of issues was shared with TSG members and Signatories.	Ongoing.
6. Public Reporting			
Performance against commitments	Publish 2012 annual performance report by 1st April 2013.	This 2012 report was published in May 2013. The report was verified by an independent third party, and audit statements provided.	Ongoing.
PVC life cycle impacts	To publish annual product stewardship issues review.	Review for 2012 published in this document.	Ongoing.
Review implementation and effectiveness of the Product Stewardship Program.	Complete a review by end 2012, to be published by March 2013.	The review commenced in 2012, and completion time was aligned with this report to reflect latest performance results. To be published May 2013.	Implement recommendations.

* Compliance rates are based on the percentage of Signatories, for whom the commitment is relevant, who complied.

** Defined as companies operating directly in the PVC packaging production supply chain.

 Commitments currently under review.



Residual Vinyl Chloride Monomer

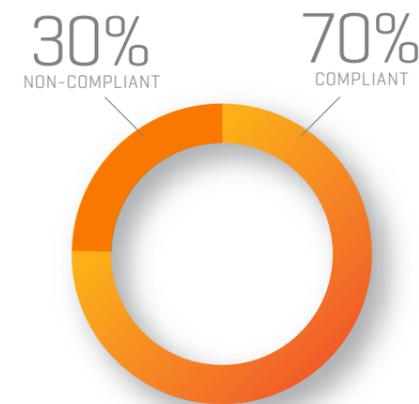
Vinyl chloride monomer (VCM) is a hazardous substance and known carcinogen. Once polymerised to PVC resin, the resin is essentially inert and does not revert back to the monomer; however, minute amounts of unreacted VCM may remain in the resin. Under the Program, the Australian industry has set a standard for the concentration of residual VCM (rVCM) in finished resin powder. Such a standard protects the health of workers from exposure to VCM during conversion of the resin into finished goods.

SUSPENSION PVC (S-PVC)

Under the Product Stewardship Program, the concentration of residual VCM in finished S-PVC must be no greater than 1 part per million in 99 per cent of resin batches tested. Australian Vinyls Corporation, the only local manufacturer of suspension PVC resin, and a further 20 Signatories who import S-PVC resin or goods from overseas, reported results meeting the standard. Nine Signatories were non-compliant, largely due to non-reporting.

Signatories not supplying residual VCM data were mostly importers of PVC goods, sometimes with multiple suppliers and complex supply chains. Several of these Signatories have requested information from their suppliers, some are still in the process of confirming details with suppliers, or have experienced difficulty obtaining complete information due to supply chain complexity.

Figure 3: Residual VCM compliance [S-PVC]



ACTION 2013

Review support required by Signatories with complex supply chains. Improve access to resources developed by the Vinyl Council.

EMULSION PVC (E-PVC)

This commitment was introduced in 2011. During 2012 the TSG reviewed 2011 results and agreed to maintain the commitment standard originally set. Under the Product Stewardship Program, the concentration of residual VCM in finished E-PVC must be no greater than 1 part per million in 99 per cent of resin batches tested. Three of the eight Signatories who imported E-PVC from overseas reported compliance, a rate of 38%. Audit results showed an additional Signatory partially compliant, since not all suppliers had provided the necessary documentary evidence. Three of the other four Signatories did not provide data.

In 2011, four Signatories were compliant with this commitment and three were non-compliant. Incomplete reporting has continued, with some Signatories experiencing challenges obtaining data from suppliers.

Figure 4: Residual VCM compliance [E-PVC]



ACTION 2013

Review non-compliance issues. Review support and resources required by Signatories to improve reporting rates.

Manufacturing Emissions

The Program includes a commitment to limit VCM emissions during the production of PVC. For the Program commitment VCM emissions measurement includes the total VCM emissions to air and water, including point source and an estimate of fugitive emissions for the year, divided by the total tonnes of PVC produced for the same period.

SUSPENSION PVC (S-PVC)

The Program standard for the manufacturing of S-PVC is for VCM emissions no greater than 30g/tonne S-PVC. Australian Vinyls Corporation, the only local manufacturer of PVC, reported VCM emissions were 14.6 g/tonne PVC for the period of the financial year 2011-12, compared with the previous year's result of 20.7 g/tonne PVC.

EMULSION PVC (E-PVC)

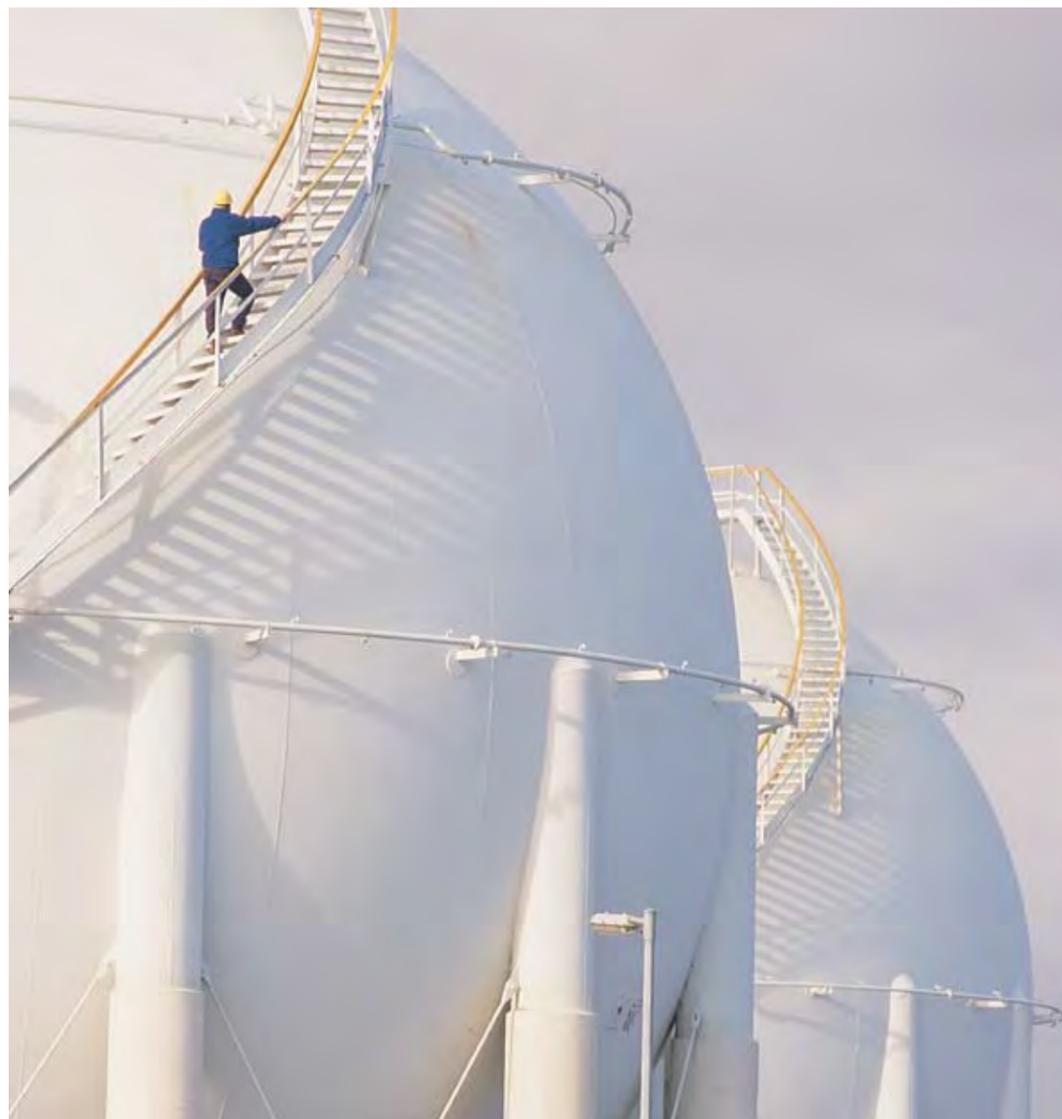
There is no local manufacturer of E-PVC, but it is used in some imported products, particularly flooring. This commitment was introduced in 2011, with a standard for the manufacturing of E-PVC of VCM emissions no greater than 1000g/tonne E-PVC, measured on a 12 month basis. During 2012 the TSG reviewed 2011 results and agreed to maintain the original standard set, consistent with the European Industry Charter for EPVC.

For 2012, eight Signatories reported the relevance of this commitment. Four Signatories, 50%, were compliant, reporting that their suppliers confirmed VCM emissions no greater than 1000g/tonne E-PVC. In addition, one Signatory was partially compliant, since complete documentation from only a part of the overseas supply chain was available for audit. Three other Signatories were non-compliant since they did not submit results of supplier VCM emissions, or were waiting on supplier information.

In 2011, four Signatories were compliant with this commitment and three were non-compliant due to incomplete reporting. Incomplete reporting continues, despite some Signatory efforts to obtain the information.

ACTION 2012

Review non-compliance issues, which appear to relate to the complexity of obtaining data from multiple suppliers further up the supply chain. Assist Signatories to implement complete reporting.



Manufacturing Emissions – Overseas Developments

The new PVC Maximum Achievable Control Technology (MACT) Standard was published by the US Environmental Protection Agency (US EPA) in April 2012 and established a compliance date of April 17, 2015. Industry collected and prepared a robust data set for the US EPA to use in this rulemaking. The new MACT sets new emissions limits for American PVC manufacturing plants and focuses on currently available control technology. Both industry and ENGOs have challenged a number of aspects of the rule. US EPA has agreed to reconsider the limits. The US EPA is now collecting information from industry.

Environmental Management Systems

The objective of the Environmental Management System (EMS) commitment in the Product Stewardship Program is to demonstrate environmentally responsible manufacturing, storage and transport practices by the PVC industry in Australia.

Under the Program, Signatories commit to having an EMS that meets one or more of the following standards:

- > ISO14001
- > The international chemical industry's *Responsible Care* program
- > The Program's *Minimum Acceptable Standard for Environmental Management*.

Signatories are further expected to embed the Product Stewardship Program commitments into their company's business management systems.

Thirty one Signatories have manufacturing, storage or distribution operations. Of these 24 advised that they have an EMS meeting the commitment standards. Fourteen of these Signatory companies are ISO 14001 accredited and four are Responsible Care signatories. Twenty one Signatories have Program commitments embedded in their company's business management systems.

Figure 5: Signatory EMS compliance



Three Signatories reported on EMS implementation during 2012. Two Signatories introduced an EMS meeting the Program Minimum Standard. One of these has engaged an external consultant to assist them achieve ISO certification by the end of 2014. One Signatory reported plans last year for the ISO 14001 certification of their overseas supplier, and this has been completed.

By the end of 2012, seven Signatories with manufacturing, storage and transport operations had not implemented a formal EMS. Five of these Signatories had also not embedded Program commitments into business management systems. The verification process showed that one Signatory reporting no EMS has procedures in place reflecting EMS approaches, and although formalised documentation was not sighted, the auditor considered this Signatory partially compliant with the commitment. Three Signatories without an EMS have advised progress.

- > One Signatory underwent ownership changes during the year, which impacted on planned activities. The environmental systems and processes at this site will now be reviewed in the context of the new owner's environmental management program.
- > Another Signatory is currently implementing an EMS in line with the guideline provided by the Vinyl Council, and expect to complete this work by June 2013.
- > One Signatory, reporting for the first time after joining the Program in 2011, is a small business planning to extend its activities to manufacturing in Australia. It is intended that EMS plans will be addressed as part of that business growth.

The EMS objective was introduced to the Program for manufacturing and storage facilities in Australia. A growing number of Signatories, such as trading companies, are not directly involved in manufacturing, transport or storage operations and have no formal EMS framework. These Signatories were not asked to report on this commitment for 2012. During 2012 work on an appropriate environmental risk management approach for these Signatories commenced, and this will be finalised during 2013.

ACTION 2013

Encourage use of the EMS implementation kit, to assist Signatories develop and employ environmental management systems.

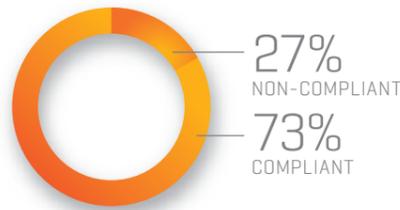


Figure 7: Mercury avoidance compliance

Mercury Avoidance

Under the Program Signatories who import VCM, PVC resin or PVC products into Australia are asked to verify via suppliers that the imported material is sourced from mercury-free processes. To meet this commitment 98% (by weight) of the Signatory product needs to be verified as from mercury free sources.

Following the introduction of this commitment in 2010 it became apparent that some Signatories importing product from Europe have established supply chains linked to the voluntary European chlorine industry agreement to phase out mercury based production by 2020. Acknowledging the mismatch in timing between the Program objective and the European plans, and to encourage impacted Signatories to progressively reduce use of materials sourced from mercury based production, in 2012 interim stepped targets for this group of Signatories were developed.

The number of Signatories reporting on this commitment continues to increase. Of the 30 Signatories importing VCM, PVC resin or PVC products during 2012, 22 advised that they had verified the materials were sourced from mercury-free processes, a 73% compliance level. Eight companies have not met the commitment.

Of the six non-compliant Signatories sourcing flooring products from Europe, three have commented on the amount of their PVC product supply which avoids mercury-based processes. One Signatory estimates 40% of supply avoids mercury use; another estimates 88% mercury avoidance; and the third reported that all suppliers except one avoid mercury.

Figure 6: Mercury avoidance reporting



ACTION 2013

Continue to provide resources to Signatories seeking confirmation of mercury avoidance from suppliers.

New Commitment for 2013: Energy Efficiency and Greenhouse Gas Charter

A new commitment to improve energy efficiency and reduce greenhouse gas emissions was added to the Program in 2012, following the development of the Energy Efficiency and Greenhouse Gas Charter in 2011. The PVC industry has identified rising energy costs and government, business and community responses to climate change as key influences on the industry's sustainable future. Energy and emissions management are considered fundamental elements of a sustainability framework.

The Energy Efficiency and Greenhouse Gas Charter includes the following key principles:

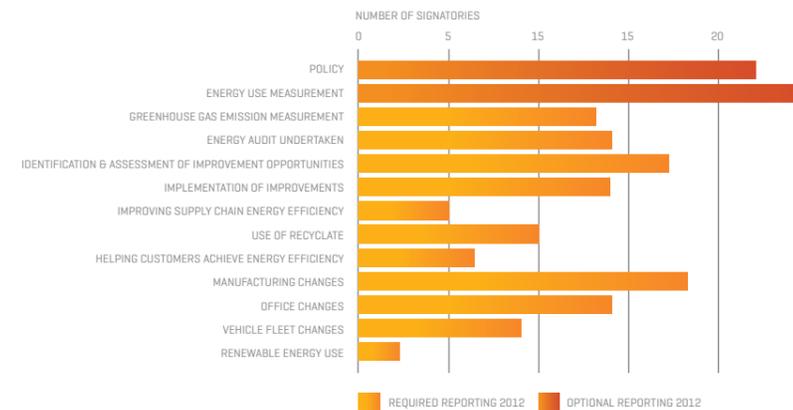
- > To have in place a formal focus on improving the energy and greenhouse gas emission profile of the business and its PVC products over an appropriate timeframe.
- > To encourage major suppliers in the supply chain to improve, through cost effective measures, the energy and greenhouse gas emissions associated with products and services.
- > To consider the potential of available recycled post-consumer PVC to reduce the carbon footprint of PVC products where feasible.

A survey of Signatories conducted during 2012 indicated that key drivers for energy management are rising energy costs, pressure on profit margins and competition from alternative materials. Greenhouse gas management is motivated primarily by the delivery of environmental benefits; however customer interest and the relative energy benefits of PVC were also noted.

Recognising the diverse range of organisations that are Signatories to the Program, and the different stages individual companies are at in their energy and greenhouse gas emission management, the Charter provides flexibility for individual companies to determine specific actions appropriate for their circumstances. Reporting for this commitment in 2012 has focussed on policy development and measurement of business energy usage. Twenty seven Signatories provided additional information on energy use and management activities that they

have undertaken, including measurement of greenhouse gas emissions, assessment and implementation of opportunities for improved energy efficiency and abatement of greenhouse gas emissions, as shown in Figure 8.

Figure 8: Energy and Greenhouse Gas Management



In response to results from a Signatory survey the VCA commenced a series of workshops from November 2012 to support the implementation of the Energy Efficiency and Greenhouse Gas Charter. The on-line delivery of the workshops demonstrates the Vinyl Council's intention to avoid potential travel related energy use.

Presentations during the year included:

- > Gill Coleman, Product Stewardship Manager at the VCA, outlined the next steps for the Energy and Greenhouse Gas Charter in a presentation at the VCA general meeting in May.
- > Anna Perejma, from AusIndustry, described the Clean Technology Investment Program and the availability of grants for energy efficiency projects in a presentation to the VCA general meeting in May.
- > Genevieve Petch, Process Engineer at Australian Vinyls presented to the TSG on energy and greenhouse gas management and the activities of the Australian Vinyls' Water and Energy Efficiency Team. This team continues to deliver a range of energy saving initiatives, some at no cost, contributing significant energy savings. This presentation was made available to all Program Signatories.

ACTION 2013

Continue Charter implementation and provision of on-line workshops and resources.

Signatory energy efficiency initiatives in 2012

Manufacturing actions

- > Substitution of an old and highly energy inefficient manufacturing process.
- > Changes to factory operation hours.
- > Introduction of start up staging.
- > Reduced use of equipment such as pumps and fans when not required.
- > Reduced lighting.
- > Investigation of compressor leaks.
- > Thermal imaging of switchboards and electronics.
- > Replacement of old plant and equipment with energy efficient options.
- > Replacement of hydraulic motors with energy efficient motors in new machines.
- > Installation of variable speed drives on pumps.
- > Replacement of compressors and water chillers.
- > Installation of lower energy lighting.
- > Warehouse equipment replaced with energy efficient options.

Office improvements

- > Replacement of lights with more efficient options such as LEDs.
- > Installation of lighting sensors.
- > Adjustment of automated heating and cooling times.
- > Behavior change through prompts to switch off lighting.

Vehicle fleet changes

- > Review and downsize of a vehicle fleet.
- > Replacement of vehicles with newer and more efficient vehicles (such as diesel options or reduced engine sizes).

Supply chain energy efficiency

- > Signature Flooring reported that their key supplier, IVC Group, received an environmental permit for three wind turbines to power their production plant in Belgium. Installation is planned for the end of 2013, with start-up anticipated in early 2014.

Recyclate use

- > Improved energy and emissions profile through increased rates of recycling for end of life product and installation waste, and improved production yield.

Learning

- > Development of energy best practice guidelines, including active participation in energy forums.

Commitment 2: The Use of Lead and Cadmium

Under the Program, Signatories commit to:

- > adhere to the industry Code of Practice for the use of lead and cadmium in PVC products in Australia
- > maintain the avoidance of cadmium-based stabilisers
- > phase out lead-based stabilisers by 2010, and then maintain the avoidance of these
- > substitute lead, cadmium and hexavalent chrome pigments where technically feasible and alternatives are available, by the end of 2010.

Stabilisers

The phase out of cadmium-based stabilisers by Signatories was completed in 2004, and avoidance of use has been maintained.

The phase out of lead stabiliser use by Signatories was completed during 2012. The one Signatory using lead stabiliser during the year phased out use by December 2012. This followed the testing of many alternatives, and required changes to production practices and modification of extrusion equipment.

The quantity of lead stabiliser used was 2.6 tonnes (lead metal content) in 2012, compared to 9 tonnes the previous year, a reduction of 71%. Due to this voluntary commitment initiated by Signatories lead stabiliser use has reduced by over 99.8% since the Program began in 2002, as shown in Figure 9.

It was reported last year that during 2011 one Signatory discovered that product they imported contained cadmium and lead. It has since been confirmed that lead and cadmium based stabilisers are not used in the product, which meets Restriction of Hazardous Substances (RoHS) standards. Potential contamination is being addressed as this is believed to be contributing to the low levels found upon testing.

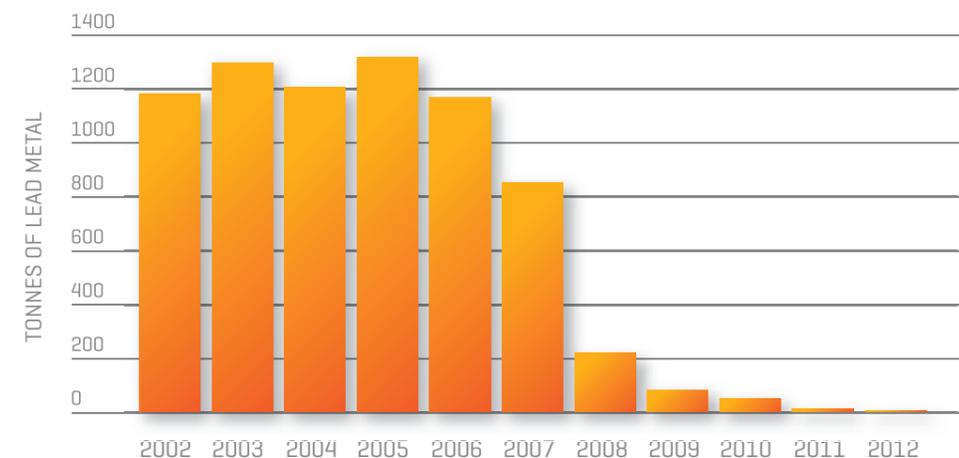
Any new Signatories to the Program who are using lead stabiliser are required to agree a timetable for prompt phase out.

Pigments

In response to this commitment, Signatories have largely ceased to use lead, cadmium and hexavalent chrome pigments.

In 2011, two Signatories reported the use of lead pigment. One of these Signatories did not use lead pigment in 2012, ahead of the phase out plans reported last year. The other Signatory has plans to phase out use of lead pigment by the end of 2015 and continues to trial alternatives to establish technical feasibility. The process of finding alternative pigments which provide equivalent performance on a cost effective basis is progressing slowly. The total quantity of lead pigment (metal content) used in 2012 was 65 kilograms, a 55% decrease from 2011.

Figure 9: **Lead stabiliser use by Program Signatories**
[tonnes lead metal content]



One Signatory reported use of hexavalent chrome pigment in 2012, however during the year sourced a technically feasible and commercially available alternative and ceased using hexavalent chrome pigment in line with the phase out date they reported last year. Another Signatory reporting use of hexavalent chrome pigment in 2011 phased out use by the end of that year, ahead of the timetable reported. The total quantity of hexavalent chrome pigments used in 2012 totalled 1.2 kilograms (metal content). By year end phase out of hexavalent chrome across the Program was completed.

Open Disclosure

Under the Open Disclosure commitment, Signatories agree to provide general information on the additives used in their PVC products or components, to stakeholders upon request. This will include a list of all hazardous substances intentionally added, although disclosure of exact amounts of each additive used is not required as it is proprietary, commercially sensitive information. To demonstrate compliance with this commitment, Signatories require a system or process to track receipt of and responses to requests, and staff should be aware of this commitment.

During 2012 disclosure of substances ‘upon request’ was challenged in a media article (The Fifth Estate, 2012). The Vinyl Council response clarified substance disclosure is provided on request “because it is in addition to the product specification information more routinely provided by manufacturers”. Existing legislation, regulation, standards, material safety data sheets, industry practices and Product Stewardship Program reports address the raw materials used, or not used, in PVC products. Some stakeholders/consumers may remain concerned that full information is not disclosed, so the intention of the open disclosure commitment is to address this concern by providing a list of ingredients.

This commitment is relevant to Signatories marketing finished or semi-finished PVC goods or components in Australia. During 2012, 11 Signatories reported receiving disclosure requests. Twenty-five Signatories, including a number of raw material suppliers, reported that they had an open disclosure system in place in 2012. Six Signatories did not fully meet the commitment. One of these has since implemented a system in early 2013.

Two Signatories are partially compliant: one has received no requests however outlined the intended procedure during an audit, and the other responds and can track requests via email systems. Another Signatory has found product data sheets meet customers’ needs to date, but is currently implementing a system; and another will introduce a system during 2013 as part of a product stewardship webpage development. Although disclosure request frequency is low, the TSG confirmed the importance of open disclosure in demonstrating industry commitment to transparency.

Overseas Initiatives and Trends

The South African Vinyl Association (SAVA) Product Stewardship Program, signed in early 2012, includes a commitment to use lead free stabilisers and pigments in all PVC products by January 2015. A compliance date of January 2013 was set for the use of cadmium free additives (including pigments).

Under VinylPlus, the European PVC industry is targeting lead replacement in EU-27 by the end of 2015. From 2007 to 2012 lead stabiliser consumption decreased by 76% in the EU-27.

In Europe lead use is restricted in electrical, automotive, food contact and drinking water applications. Additional lead based substances were added to the REACH candidate list during 2012. Regulation covers the use of cadmium in polymers. European industry is working with regulators to address how legislation applies to recycled PVC containing legacy additives.

ACTION 2013

Review and revise Commitment 2, The Use of Lead and Cadmium, given the progress achieved.



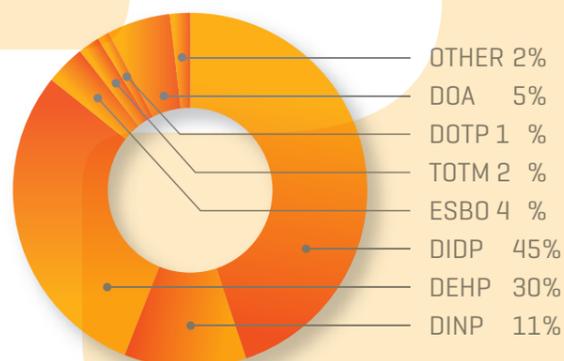
Commitment 3: The Use of Plasticisers

Plasticisers are added to PVC resin for flexibility, allowing PVC to be used in products such as resilient flooring, electric cable insulation, hoses, packaging films, clothing and footwear, toys and medical devices.

Historically the most commonly used type of plasticisers are a group of substances called phthalate esters, which have been in wide use for over 60 years. Each type of phthalate ester has a unique chemical profile and properties which lead to suitability in certain applications. The most common phthalate plasticisers used in products manufactured in Australia are DIDP (di-isodeyl phthalate), DEHP (di-ethylhexyl phthalate), and DINP (di-isononyl phthalate).

An approximation of the Australian plasticiser market is shown in Figure 10, based on assessments volunteered by some suppliers.

Figure 10: : Estimated Plasticiser Use in Australian manufacturing, 2012



Each phthalate has its own toxicity and safety profile and can be categorised by its chemical structure. Low Molecular Weight (LMW) phthalates, or low phthalates, have a molecular backbone of three to six carbon atoms. High Molecular Weight (HMW) phthalates, or high phthalates, have seven or more carbon atoms in their backbone. The longer carbon chain of high phthalates, including DINP and DIDP, appears to provide more permanency and durability.

Low phthalates, including diethylhexyl phthalate (DEHP), have been considered of potential concern. Over the past decade in Europe a shift from low phthalates to high phthalate plasticisers has occurred. The four most common low phthalates now represent less than 11% of the European market.

Plasticiser Commitment

Signatories to the Product Stewardship Program commit to implement the Policy for the Use of Plasticisers and in doing so acknowledge their responsibility to use phthalate plasticisers where they are reasonably and properly regarded as safe in the light of available scientific evidence of their environmental and health impacts. Signatories agree to cease the use of a phthalate plasticiser in any application where available scientific evidence shows it to have unacceptable health or environmental impacts. The commitment also requires reporting of plasticiser types used in various applications, and covers plasticisers used in imported PVC goods in addition to locally manufactured products.

Twenty Signatory companies reported the use or supply of plasticisers in 2012. Of these, 18, or 90%, confirmed adoption of the industry Policy, up from 76% in 2011. An additional Signatory was confirmed, through the audit process, as partially compliant with the Policy. Of the 16 Signatories marketing PVC products or compound containing plasticisers all reported data on the types of plasticisers used and the applications of the PVC products. However, for audit two of these provided incomplete documentation, and two had not obtained supporting evidence from suppliers.

Four Signatories reported using a low phthalate plasticiser in their products sold in Australia in 2012. High phthalates were used by a larger number of Signatories, with DINP use noted by eight Signatories and DIDP use reported by three Signatories. Eleven Signatories also reported using one or more non-phthalate specialty plasticisers, including adipate esters, DINCH, and ESBO, in their products. Innovative specialty plasticisers such as bio-based plasticisers have been introduced as Signatories investigate phthalate alternatives.

The Vinyl Council engaged actively in the DINP risk assessment process undertaken by the National Industrial Chemicals Notification and Assessment Scheme (NICNAS), Australia's industrial chemical regulator. The VCA made submissions including provision of additional supporting science. Constructive liaison with NICNAS included a briefing session hosted by the VCA allowing industry to hear directly from NICNAS' scientists who explained and discussed the methodology and findings of the risk assessment. The VCA also organised a visit to Australia by Dr Rick McKee, representing the European Council for Plasticisers and Intermediates. Dr McKee's presentation to

NICNAS staff focussed on recent industry scientific work, DINP dose-response studies assessing developmental and post-natal effects. Dr McKee also made presentations to vinyl industry participants and stakeholders about plasticiser safety for workers, consumers and the environment.

Australian Developments

NICNAS has been conducting a review of phthalates since 2006, including risk assessments of nine phthalates.

- > During 2012, NICNAS completed and published a risk assessment for DINP. The NICNAS review was based on sensitive end use applications, toys and childcare articles. It also considered cumulative exposure of children to DINP and another phthalate. NICNAS concluded that "current risk estimates do not indicate a health concern from exposure of children to DINP in toys and childcare articles even at the highest (reasonable worst-case) exposure scenario considered" (NICNAS, 2012). No recommendations to public health risk management for the use of DINP in toys and childcare articles were considered necessary. There are currently no restrictions on the use of DINP in Australia.
- > Further risk assessments including dibutyl phthalate (DBP) and DIDP are expected to be finalised in 2013/14.

Overseas Developments

REACH

Diethylhexyl phthalate (DEHP), benzyl butyl phthalate (BBP) and dibutyl phthalate (DBP) were added to the REACH Annex XIV authorisation list in February 2012. These substances must not be marketed or used unless authorisation has been given for a particular use, and where economically and technically feasible alternatives exist a substitution timetable must be submitted. Authorisation submissions are due by August 2013. Ongoing consultation between the European industry and regulators seeks to clarify whether recyclers will also need authorisation, as this would jeopardise investment in recycling flexible PVC and limit volumes recycled.

TOYS

The European Chemicals Agency (ECHA), at the request of the European Commission, reviewed the scientific evidence on the risks posed by articles containing the phthalates DINP and DIDP. Under

existing restrictions, these phthalates cannot be used in toys and childcare articles which can be placed in the mouth by children. The draft report concluded that no further risk reduction measures are needed to reduce children's exposure to DINP and DIDP. The Committee for Risk Assessment (RAC) is undertaking an assessment of the draft report and submissions received through public consultation.

DENMARK

The RAC and the Socio-Economic Analysis Committee (SEAC) found that a Danish proposal for restricting four low molecular weight phthalates (DEHP, DBP, BBP, and DIBP) in certain applications was not justified. The RAC found that the available data does not indicate a current risk from combined exposure to the four phthalates. The SEAC concluded it had no basis to further restrict the already classified phthalates.

Scientific News in 2012

In addition to the briefings by Dr Rick McKee, results of scientific papers were shared with the TSG and Signatories during the year. These included

- > Carlstedt et al (2012) study measuring the urinary metabolites of DEP, DBP, BBzP and DEHP in infants, and suggested higher exposure related to vinyl flooring
- > Bachman and McLee's (2012) comparative estimates of daily DINP intake for population groups, showing intake estimate means converging on 1-2 µg/kg/day lower than the health-based guidelines established by regulatory and other authorities of 120 to 290 µg/kg/day.

In Europe, human biomonitoring studies (COPHES and DEMOCOPHES) have assessed exposure to chemicals of concern, including phthalates. The DEMOCOPHES project used a harmonized approach across 17 countries, determining biomarkers in 3688 children and mothers. Results varied by location, however "Overall, exposure levels are well below the health-based guidelines used" (DEMOCOPHES, p17).

The Barwon Infant Study, a local cohort study being undertaken in the Geelong region of Victoria, will research the impact of modern chemical exposures, including phthalates, on child neurodevelopment.

ACTION 2013

Continue liaison with NICNAS and monitoring scientific developments.



Commitment 4: Waste Management

Packaging

Any Signatory engaged in the packaging supply chain is required under the Product Stewardship Program to be a signatory to the Australian Packaging Covenant (APC), to submit Action Plans in accordance with the Covenant and to maintain compliance with APC obligations.

Four Signatories involved in the PVC packaging supply chain are signatories to the APC and have current action plans lodged with the APC. These are the packaging manufacturers Integrated Packaging, Berry Plastics, and Plaspak Peteron, and Australian Vinyls, a resin supplier to the industry.

The current waste packaging commitment focuses on PVC packaging, however waste packaging regulation and APC scope now cover a range of business-to-business packaging, including commercial and industrial packaging. Brand owners with turnover greater than five million dollars are subject to state based regulation unless they are compliant signatories to the APC, or engaged in another program which delivers equivalent outcomes to the APC. Through voluntary reporting, a number of Signatories have demonstrated ongoing packaging diversion and recycling initiatives to reduce such waste. During 2012 packaging such as pallets, packing crates, tillages, PVC bulk bags, wrapping paper, cartons and metal drums were re-used or recycled. Review and adaptation of packaging design, such as the use of recycled packaging, was also reported.

The VCA held discussions with Victorian and NSW EPAs to understand the implications for Program Signatories and the relevance of the Program for addressing waste packaging. The current waste packaging commitment will be reviewed, and the introduction of a commitment meeting the regulatory requirements, and delivering equivalent outcomes to the APC will be considered.

ACTION 2013

Review the waste packaging commitment.

Waste Management Performance

Reporting on reprocessing or recycling of factory, installation, and post-consumer waste is optional for Signatories. Signatories may also choose to report on other business waste such as packaging. Seventeen Signatories have reported on their waste management performance for 2012 (data provided has been aggregated for this report).

The reprocessing of PVC factory waste is now standard manufacturing practice. In total, ten Australian PVC product manufacturers reported reprocessing a total of over 8800 tonnes of their own factory waste either internally, or by using a third party in Australia. Initiatives reported by Signatories include avoidance of manufacturing waste generation to improve production yield, recovery of installation waste, the design of packaging to reduce waste, and plans to improve measurement and reporting of waste data.

PVC waste and non-PVC waste are recovered and recycled at Signatories' Australian operations:

PVC

- > Six companies reported recovery and recycling post-installation waste from their PVC products, totaling 190 tonnes in 2012.
- > Three companies reported recovery and recycling of post-consumer waste from their PVC products, totaling 112 tonnes in 2012.
- > Two companies reported sourcing post-industrial PVC waste externally and recycling for use in their own products.
- > Four companies reported sourcing post-consumer PVC waste externally and recycling for use in their own products, totaling 307 tonnes.

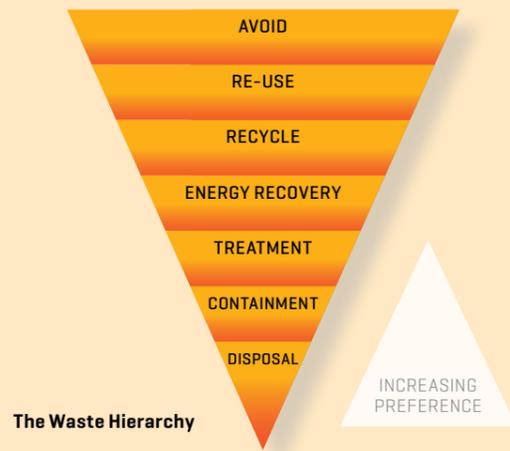
NON-PVC

- > Thirteen companies reported recovery and reuse or recycling of non-PVC waste from their own operations. This waste included packaging such as pallets, packing crates and stillages, PVC bulk bags, wrapping paper, cartons and metal drums. Glass, waste oil, oil filters, fluorescent tubes, aluminum, steel, cardboard and paper were also recycled. More than 545 tonnes of material was recycled.
- > Two companies reported using recycled non-PVC waste in PVC products.

The waste management information voluntarily provided allows glimpses of activities undertaken by the PVC industry. The introduction of quantitative industry targets for PVC recovery and recycling, and more complete reporting was discussed by stakeholders at Product Stewardship Program information sessions held during 2012. Quantitative targets will be considered in the context of the Program five year evaluation and review.

ACTION 2013

Quantitative waste management targets to be considered.



IMPROVING RESOURCE EFFICIENCY

The waste hierarchy principle underpins waste policy and legislation at state and commonwealth levels. It prioritises action on waste management to promote resource efficiency, with preference given to avoiding waste, then re-using, then recycling. The least preferred option is disposal, such as landfill.

Program Signatories have continued to work on waste avoidance and reduction, and recycling of PVC and other materials.

Examples of 2012 Signatory Activities

- > Plustec avoids waste when fabricating uPVC windows through optimization of profile cutting. For example, shorter sections of window profile are used for smaller windows, minimising waste. Future plans for window profile extrusion in Australia could allow optimisation of the extruded lengths.
- > Envorinex, an Australian manufacturer of PVC products, has established its own recycling business in Victoria and Tasmania and in 2012 collected approximately 17 tonnes of rigid PVC waste from fabricators of uPVC profiles. All PVC waste is tested for lead, and only lead free waste is accepted into the Envorinex program. Envorinex have begun researching flexible PVC waste for recycling.
- > Altro and Polyflor both import and distribute vinyl flooring in Australia and together have introduced the Recofloor program. Operating across Australia, Recofloor recovers post-installation waste, old stock and some uplifted flooring which is returned to Europe for recycling.
- > Armstrong World Industries, an Australian manufacturer of resilient vinyl flooring, have targeted reductions in waste sent to landfill. In 2012, net waste sent to landfill was cut by 58% relative to 2011. Their target for 2013 is zero waste to landfill.

Advancing PVC Recycling: The Vinyl Industry Recycling Strategy

The Vinyl Industry Recycling Strategy was established in 2011 to achieve a viable and sustainable PVC recycling practice in Australia, with greater availability of recyclate in the market for use in new products, increased demand for recyclate from manufacturers and attraction of new investment and recyclers into the industry. A viable ongoing PVC industry in Australia delivering competitive product solutions meeting future needs, would benefit industry, as well the environment, economy, and community.

The Steering Group and Implementation Groups established to drive the strategy were composed of stakeholders representing PVC manufacturers and suppliers, industry bodies, government, and environmental project specialists. Outcomes from the process included:

- > Development of a knowledge matrix on PVC recycling in Australia.
- > Development of a business viability model.
- > Identification of key streams of waste.
- > Identification of strategies to develop market pull.
- > A market survey to assess demand for recycled PVC.

The survey of PVC manufacturers using PVC recyclate indicated unmet market demand for PVC recyclate, and therefore potential for increased recycling of PVC. Barriers to increased PVC recycling identified by the survey include inconsistent recyclate quality, constrained availability of suitable quality recyclate, contamination issues, and historical additives. Assessment of the business viability of recovering and recycling different PVC waste streams has been a key activity undertaken by the implementation group during 2012. A knowledge matrix capturing information about key players and resources has been developed.

ACTION 2013

Continue Vinyl Industry Recycling Strategy implementation.

Vinyl-2-Life Waste Action Plan

The Vinyl-2-Life Waste Action Plan monitors and reports on recovery and recycling of PVC from key waste streams: medical waste, pipes and profiles, floor coverings, bottles, and banner and signage material. Highlights and developments during 2012 include:

PVC MEDICAL WASTE

The program for recovering PVC medical waste at Western Hospital in Melbourne continued, with PVC intravenous fluid bags, oxygen masks and tubing collected and recycled into hose. A trial commenced at Liverpool Hospital in NSW, and other hospitals began to participate. During 2012 Baxter Health, NSW EPA, Sustainability Victoria and Liverpool Hospital committed funds to enable the production of educational resources for hospitals to implement the program, based on the learning from the Western Hospital experience. The education kit for the medical PVC recovery program was completed in early 2013 and was launched in March 2013. For more information, visit www.vinyl.org.au/PVCRecovery.

PIPES AND PROFILES

To progress the objective of developing a more consistent supply of pipe and profile material for reuse and recycling, Vinindex and Iplex worked towards collection and processing activities, with recovery through major trade outlets. In conjunction with Iplex, TradeLink offer take back of PVC material from plumbers at five NSW stores. In addition, some PVC piping manufacturers have take back arrangements with key customers and contractors.

FLOOR COVERINGS

Signatory companies have been taking individual action on recovery and recycling of vinyl floor covering waste. The Vinyl Council continues to encourage development of broader initiatives where industry-wide issues present barriers to improved resource efficiency. Some Signatories are returning recovered PVC flooring to European manufacturers for recycling, however work has continued with local recyclers to develop recycling systems.

BOTTLES

After more than 12 years encouraging and facilitating kerbside collection and recycling of PVC bottles, Vinyl Cycle, the industry program, has commenced transition of the program to

a fully commercial operation. Established to enhance recovery and local recycling of PVC bottles, the program had achieved its objectives, including widespread inclusion of PVC bottles in kerbside collection of recyclables. More than 95 percent of households now have access to PVC bottle recovery. The bottle recyclate continues to be used in manufacturing vinyl floor tiles.

BANNER & SIGNAGE MATERIAL

Signatory company Rojo Pacific explored potential uses for recycled banner material, however commercially viable local options for the PVC and polyester fibre recyclate have not yet been established. Rojo is now investigating overseas recycling of banner and signage material. Samples of the material were collected for laboratory scale testing to assess potential results of VinyLoop processing.

EDUCATION

Signatories and other industry stakeholders learnt more about the innovative VinyLoop recycling technology used in Europe for difficult to treat flexible PVC waste such as coated fabric. Visiting Australia in November 2012, Mr Richard Thommeret from Solvin gave presentations at an SPE Australia Waste Seminar and the VCA General Meeting about the technology, its application at the Italian plant, and the environmental benefits achieved. The VCA arranged for Richard to meet with organisations in the local vinyl sector interested in understanding more about the process.

Consumer Responsible Care

To assist end-consumers of PVC products understand and best manage end of life disposal options, Signatories commit to make information publically available on how and where to re-use, recycle or safely dispose of their products. Fourteen Signatories have fully implemented this Program requirement, and four have partially addressed consumer responsible care.

ACTION 2013

Continue to encourage public communication to end-consumers and provide the template and industry examples to Signatories developing communication tools.

Life Cycle Thinking

This commitment recognises the importance of life cycle management of Signatory products and the use of life cycle thinking and data in the development of new products. Under the Program, Signatories commit to considering whole-of-life issues in the development of new products containing PVC.

Recognising the highly variable approaches taken to life cycle thinking by Signatories, during 2012 the TSG considered introducing a requirement for the use of formal tools or methodologies in the application of this commitment. However, due to the diversity of Signatory operations and variation of resource availability, formal approaches have not been added to the commitment. Additional guidance on the commitment and links to resources appropriate for small to medium businesses were provided to Signatories.

Fifteen Signatories developed or introduced new products in 2012. Twelve Signatories fully addressed life cycle thinking, and one other was partially compliant. A wide range of life cycle aspects was considered, including the sustainability of raw materials, resource and energy efficiency in manufacturing, the use of recycle, packaging

design, durability and maintenance during the product use phase, and end of life recoverability and recyclability.

Australian Vinyls has established the greenhouse gas profiles of a range of resins, taking into account emissions related to VCM manufacture and transport, and PVC manufacture. The VCA commenced work to submit a Life Cycle Inventory (LCI) for Australian PVC resin to the National LCI database and/or Building Products database so that it will be available for any LCA work conducted on Australian PVC products or for eco-labels or rating tools. Preparation of an Environmental Product Declaration (EPD) to ISO standards is underway.

The VCA contributed comments to the Green Building Council of Australia discussion paper on using Life Cycle Assessment principles and methodology to assess the environmental impact of materials for Green Star. The Council support the use of LCA in rating tools where robust objective methodology is applied.

ACTION 2013

Support the release of an updated inventory and EPD development for Australian manufactured PVC.



ENVORINEX ENVOFLECT GUARDRAIL DELINEATORS



ARMSTRONG COLLECTS MATERIAL FOR RECYCLING



AUSTRALIAN PLASTIC PROFILES RECEIVES PIPE OFF-CUTS FOR RECYCLING FROM CUSTOMER BUILDING SITES

INNOVATION THROUGH LIFE CYCLE THINKING ...

- > **Altro** has built sustainability into their new product development process. Introduced during 2012, Altro Aquarius has 10% recycled content, installation off-cuts are 100% recyclable, it contains a bio-plasticiser, and is wrapped in 100% recyclable packaging. The coating selected allows reduced maintenance, and therefore lower use of water, energy and cleaning chemicals through the product lifetime.
- > **Armstrong** uses a whole of product life approach, illustrated in the development of their Eco-Accolade commercial sheet product. Eco-Accolade incorporates up to 64% recycled and reclaimed content, including post consumer and post industrial plastics such as PVC bottles as well as reclaimed Armstrong flooring off-cuts from construction sites.
- > **Envorinex** introduced Envoflect™ guardrail delineators, made out of 100% recyclable uPVC. Considering a cradle-to-cradle pathway, Envorinex considered a wide range of environmental impacts. The use of recycled PVC improves resource efficiency, and reduces embodied energy. Envorinex use certification of the material formulation to ensure the product does not contain lead additives. The product design allows quick and easy installation and easy removal for repair or recovery at end-of-life.
- > **Innova** imports and distributes Serge Ferrari composite membranes. Life Cycle Analyses undertaken by an independent testing authority and peer reviewed, addressed all aspects of procurement, production, distribution and potential disposal methods. A key result was confirmation that the environmental benefits of shipping end of life PVC fabric from Australia to France for recycling significantly outweighed the environmental costs of landfill or incineration.
- > PVC cornices and skirting boards manufactured by **Pacific Plastics** have a gloss finish, so they do not need painting, or repainting, during their lifetime. These products are installed in locations prone to termite attack, so the use of PVC ensures a longer life span. The products are recoverable for recycling at end of life.

Commitment 5: Research

TSG meetings provide the opportunity to monitor national and international developments in scientific research relevant to the potential health and environmental impacts of the PVC product life cycle. During 2012 four TSG meetings were held.

During 2012 the TSG was advised of published scientific research into exposure to vinyl chloride, PVC dust, and phthalates, and information on childhood lead toxicity.

Commitment 6: Reporting

Annual Progress Report

Under the Program commitment for reporting, this 2012 annual report was to be published by 1 April 2013, and include a review of PVC life cycle impacts. This report was published during May 2013 following verification audits conducted by an independent third party.

Where relevant, this document contains up-dates on PVC life cycle impacts.

The 2011 annual progress report was published in May 2012. Information sessions for stakeholders and Signatories were held in Melbourne, Sydney and Canberra during 2012, and provided an opportunity to share performance results and receive feedback. Participants acknowledged the benefits of industry's action and engaged in constructive discussions about future challenges. Energy and waste were identified as important ongoing issues.

Program and Report Verification

As in previous years, the 2012 report has been independently verified by NetBalance Foundation. The purpose of the verification process is to provide an independent opinion on the accuracy of the data and statements made in the report.

In 2012, NetBalance made a number of recommendations following the verification of the 2011 report. These included:

- > Engage with Signatories regarding the format of the data submission document and preferred method for reporting and consider alternative reporting methods. Ensure consistent language throughout the data survey.
- > Finalise criteria for determining commitment relevance and review the Program commitments with each Signatory to determine and confirm relevant commitments.
- > Communicate compliance criteria to all Signatories, and consider engaging with each Signatory to discuss and clarify commitment requirements and explore pathways towards compliance. In particular focus on Codes of Practice, Environmental Management Systems, and Consumer Responsible Care.
- > Finalise compliance criteria for existing and new commitments and communicate to all Signatories. In particular focus on Open Disclosure, Waste Management, and Life Cycle Thinking.
- > Provide additional guidance to Signatories regarding the verification process.
- > Continue to document the organisational knowledge, refine internal systems, and ensure robust, consistent and verifiable internal processes.

- > Develop strong and measurable new commitments as current commitments are achieved.

To address these issues, the VCA took the following action during 2012:

- > Formal Signatory feedback on all aspects of the Program was sought as part of the 5 year evaluation review.
- > Alternative methods for reporting were considered, also taking into account past experience with on-line reporting. Alternatives investigated did not meet all current requirements, in particular relating to ease of individual Signatory review and verification. The existing data submission document was therefore used again, with some adaptation, including revision to ensure consistent language.
- > Individual Signatory results from 2011 reporting, indicating relevant commitments and compliance results were provided to each Signatory. Areas of low compliance were followed up. Codes of Practice, Environmental Management Systems and Consumer Responsible Care were discussed with Signatories when relevant.
- > All commitments are now documented in a Commitment Guide. Relevance criteria and commitment standards for new and existing commitments were reviewed and documented in a Reporting and Verification Guide. This document also describes the verification process and evidence required. Both Guides were provided to all Signatories in 2012, and from early 2013 have been available in the members' section of the VCA website, together with supporting resource material.
- > Open Disclosure, Waste Management and Life Cycle Thinking commitments were all considered by the TSG, as described in this report.
- > A number of procedures and processes have been documented and implemented.
- > Potential revisions and extensions to existing commitments identified during 2012 are noted in this report. In addition, the 5 year evaluation review commenced in 2012 will review longer term progress, broader trends and context, and Signatory and stakeholder feedback and provide recommendations for future development of the Program.

2012 Verification

The verification of this report involved eight Signatory site visits to examine data sources and confirm data and statements.

A copy of NetBalance's Verification Statement is shown on page 32.

OBJECTIVE	ACTIONS	2012 PROGRESS
Objective 1 – Medical Waste		
Develop PVC medical waste recovery program.	Continue Western Hospital program.	> Separation of PVC waste now enables recycling of other plastics.
	Extend trials to other hospitals.	> Liverpool Hospital trial commenced. > Seven hospitals involved, at various stages.
	Produce a promotional and educational resource kit to aid implementation of the PVC medical waste recovery program.	> Baxter (major sponsor), NSW EPA, SV and Liverpool Hospital agreed to fund the educational resource. > The resource kit was launched in March 2013, and will be made available to all hospitals wanting to implement PVC medical waste recovery.
Objective 2 – Pipes & Profiles		
Develop a more consistent supply of pipe & profile material for reuse/recycling	Maintain recovery program in Sydney, Melbourne, and Brisbane.	> Iplex commenced collection of material for recycling at five Tradelink outlets in NSW. > Vinidex is planning collections at retail outlets in Brisbane. > Enviroinex maintains a recycling business in Victoria and Tasmania, collecting rigid PVC waste from uPVC fabricators.
Objective 3 – Floor Coverings		
Develop and implement a voluntary scheme(s) or initiative(s) aimed at encouraging higher recovery and recycling rates for vinyl floor covering waste.	Flooring Signatories are progressing with individual take back and recycling schemes.	> Gerflor's first end of life product recovered was recycled in H1 2012. > Armstrong collected 80 tonnes of installation off-cuts for recycling into locally manufactured products. > Polyflor and Altro have introduced the Recofloor collection service in Australia. Installation off-cuts are collected and returned to Europe for recycling. > Cryogrind has worked with flooring Signatories to develop recycling systems.
Objective 4 – Bottles		
Wind up the Vinyl Bottle Group and enable smooth transition to fully commercial-based activity.	Support the transition to a commercial arrangement. Monitor funds and conversion of bottle stocks.	> Transition completed. > Remaining funds will be used to reimburse bottle purchases until depleted.

OBJECTIVE	ACTIONS	2012 PROGRESS
Objective 5 – Banner Material		
Assist development of trials for the removal and recovery of PVC from the composite material commonly used in the printing and signage industry.	Identify possible end uses for the PVC recyclate and PE fibres.	> Continuing investigation.
	Identify and research overseas options for recycling.	> Samples of original banner material and recyclate sent to Europe for Vinyloop lab trial. > Options for overseas recycling under investigation.
Objective 6 – Management		
Address barriers to increased recycling of PVC.	Identify and engage with relevant stakeholders.	> A survey of Australian PVC manufacturer's identified unmet demand for PVC recyclate. Variable recyclate quality was identified as a barrier to increased PVC recycling.
Implement the Vinyl Industry Recycling Strategy.	Maintain regular Steering Group and Implementation Group meetings.	> Regular Steering Group, Business Viability Group and Marketing Group meetings were held during the first half of the year. > Implementation Groups merged after the appointment of a new project manager. > Activity focussed on development of – a business model to determine focus waste streams. – a knowledge matrix describing key industry organisations and activity.
Objective 7 – Education		
Increase awareness of PVC recycling and recyclability	Promote, encourage and support PVC recycling activities	> Solvin representative, Richard Thommeret, visited Australia during Nov 2012 and gave presentations on Vinyloop technology at the SPE Plastics and Waste Seminar and the VCA General Meeting. > Recycling activities included in Product Stewardship Program information sessions held in June and July 2012. > Media articles about PVC, including recyclability, published in WME (February 2012) and BNP (October 2012). > Recycling and Product Stewardship are key sections of the new VCA website. The higher visibility of the Recycling section has resulted in more on-line activity. > A new Product Stewardship Program brochure was produced.



Verification Statement

To the Signatories and Management of the Vinyl Council of Australia:

The Vinyl Council of Australia (VCA) commissioned Net Balance Foundation Limited (Net Balance) to provide independent verification of the information presented within the VCA Product Stewardship Program Progress Report 2012 (the 'PSP Report').

The PSP Report presents the performance of the Product Stewardship Program Signatories (the 'Signatories') against the commitments of the VCA Product Stewardship Program (PSP) over the period 1 January 2012 to 31 December 2012. The VCA was responsible for the preparation of the PSP Report and the verification statement represents Net Balance's independent opinion on the reliability of information presented within it. Net Balance's responsibility as an independent verification provider is to the VCA alone and in accordance with the agreed terms of reference. Other stakeholders should perform their own due diligence before taking any action as a result of this statement.

Verification objective

The verification objective is to provide VCA and its stakeholders with an independent opinion on the accuracy of the information presented within the PSP Report. This is achieved through verification of information provided in a sample of data surveys completed by PSP Signatories and review of the PSP Report prepared by VCA. Signatories submitted completed data surveys to VCA who made a determination as to whether they were compliant based on the data. The verification included review of VCA's determination of Signatories compliance, data and claims made by Signatories in their data surveys, reporting processes, aggregated data and claims made in the PSP Report and accuracy of reported information.

Verification process and limitations

The level of verification provided is defined by the methodology described in this verification statement. The verification engagement covered the complete PSP Report and focused specifically on the systems and activities of a selection of eight Signatories during the reporting period, with the following limitations:

- Eight Signatories were selected for verification by the VCA. These signatories were selected by the VCA to provide an appropriate representation sample of the Signatory group. Similar to past years, it is expected that future verification programs will select a different group of Signatories and thus allow for breadth of coverage across the PSP over time.
- The scope of work was limited to verification of data and statement accuracy.

Verification methodology

The verification process comprised two stages, and was undertaken between February and May 2013. This involved:

1. Review of the Signatory data

Review of the accuracy and source of data and statements submitted by the Signatories to the PSP. This included the following tasks:

- The examination of 137 selected data points¹.
- Interviews with key Signatory personnel responsible for collating and submitting data to the PSP to verify the veracity of the submitted data. This took place by undertaking site visits and examining the relevant site-based data for the eight selected Signatories.
- Completing a logic review for compatibility and consistency on the remaining data submitted by Signatories, which was not formally verified by Net Balance.

¹ Total excludes data points considered to be not applicable for individual Signatories.



Signatories subjected to site-based review were:

- Pegulan Floorcovering Pty Ltd
- Polyflor Australia Pty Ltd
- Signature Floorcoverings Pty Ltd
- Specialty Polymers & Chemicals
- Pacific Plastics (QLD)
- Gerflor Australasia Pty Ltd
- Pipemakers
- Ubique

2. Review of Product Stewardship Program Report

A review of the accuracy and source of aggregated data and statements contained within the PSP Report was undertaken. This included the following tasks:

- The aggregation of data and statements submitted by Signatories to allow analysis of overall performance against the commitments of the VCA Product Stewardship Program.
- Review of the process for collating, analysing and assessing commitment relevance and compliance.
- The examination of 38 selected aggregated data points and statements.
- Interviews with the key VCA personnel responsible for aggregating data and statements from the submitted Signatory data and preparing the PSP Report to verify the veracity of the reported data. This took place through a site visit and various e-mail and telephone dialogues.

Our independence

- Net Balance was not responsible for preparation of any part of the PSP Report. This project was determined by VCA and Net Balance to be complementary to the assurance role according to Net Balance's independence policy.
- Net Balance provided VCA with advice on the potential impacts to the PVC industry of a carbon pricing mechanism during 2011. This work was determined not to be in conflict with Net Balance's role as an independent verification provider.
- Net Balance therefore confirms that it is not aware of any issue that could impair objectivity in relation to this verification engagement.

Our competency

- The verification team was comprised of individuals with expertise in environmental performance measurement. Our verification business line has collectively undertaken over 120 verification or assurance engagements in Australia over the past 10 years and is led by a Lead Sustainability Assurance Practitioner (Lead CSAP) accredited by AccountAbility UK.

Our opinion

Overall, it is Net Balance's opinion that the information presented within the Vinyl Council of Australia (VCA) 2012 Product Stewardship Progress (PSP) Report is fair and accurate and that the report is a reliable account of the VCA and the PSP Signatories' performance during the reporting period.

Net Balance's opinion with regard to the provision of data by signatories is:

- Data trails selected were in general identifiable and traceable, and the personnel responsible were able to demonstrate the origin(s) and interpretation of data.
- The level of accuracy for the information submitted by the Signatories to the VCA Product Stewardship database was found to be within acceptable limits.



Net Balance's opinion on the PSP report is:

- The findings of the PSP Report verification provide confidence in the reporting processes established.
- The database used to collate, aggregate and report 2012 Signatory data was easily auditable with well documented decision and data trails. The personnel responsible were able to reliably demonstrate the origin(s) and interpretation of data.
- The level of accuracy of the data and statements made were found to be within acceptable limits.
- The statements made in the Report appropriately reflect the environmental performance achieved during the period.
- All suggested changes were satisfactorily addressed by VCA prior to finalising the Report.

The way forward

To ensure that VCA and the PSP Signatories continue to improve, Net Balance has provided a series of recommendations. These recommendations are highlighted below.

- *Recommendation one:* Review and refine compliance criteria and evidence requirements with Signatories.
- *Recommendation two:* Heighten engagement with the Signatories regarding audit requirements.
- *Recommendation three:* Focus on future development of commitments and reporting.
- *Recommendation four:* Develop templates and standardised procedures for provision to small operators in order to provide a simple basis of compliance.
- *Recommendation five:* Continue to improve the format and clarify the content of the data survey and supporting documentation.
- *Recommendation six:* Continue ongoing efforts to review and test the relevance criteria with Signatories.

On behalf of the verification team
22 May 2013
Melbourne, Australia

Terence Jeyaretnam, FIEAust
Director, Net Balance & Lead CSAP (AccountAbility UK)



Two Signatories joined the Program during 2012:

- > **Australian Solvents and Chemicals Company Pty Ltd**
- > **Karndean International Pty Ltd.**

Signatories joining after November were not asked to report on 2012 activities. Advance Cables and Dincel Construction left the Program during 2012.

At the end of 2012 the following companies were Product Stewardship Program Signatories:

Armstrong World Industries Pty Ltd
 Australian Resilient Flooring Association
 Altro APAC Pty Ltd
 Karndean International Pty Ltd
 Signature Floorcoverings Pty Ltd
 Pegulan Floor Coverings Pty Ltd
 Polyflor Australia Pty Ltd
 Tarkett Australia Pty Ltd
 Australian Solvents and Chemicals Company Pty Ltd
 Australian Vinyls Corporation Pty Ltd
 Berry Plastics (Australia) Pty Ltd
 Chemson Pacific Pty Ltd
 Deceuninck Pty Ltd
 Envorinex
 Gerflor Australasia Pty Ltd
 Innova International Pty Ltd
 Integrated Packaging
 Kenbrock Flooring Pty Ltd
 Pacific Plastics Qld Pty Ltd
 Pentair Water and Environmental Systems
 Plastics Industry Pipe Association of Australia Ltd.
 Australian Plastic Profiles Pty Ltd
 Iplex Pipelines Australia Pty Ltd
 Pipemakers Pty Ltd
 Vinidex Pty Ltd
 PlasPak-Peteron Pty Ltd
 Plastral Pty Ltd
 Plustec Pty Ltd
 Primaplas Pty Ltd
 Profine International Profile Group
 Rojo Pacific Pty Ltd
 Specialty Polymers and Chemicals Pty Ltd
 Sun Ace Australia Pty Ltd
 TechPlas Extrusions Pty Ltd
 Terminals Pty Ltd
 Ubique Polymers Pty Ltd
 Vinyl Council Australia
 Welvic Australia Pty Ltd

NOTES:

INTEGRATED PACKAGING REPORTED IN PREVIOUS YEARS AS APERIO GROUP.
 PENTAIR WATER AND ENVIRONMENTAL SYSTEMS PREVIOUSLY REPORTED AS TYCO WATER.
 CMS ELECTRACOM AND REHAU JOINED THE PROGRAM IN EARLY 2013.

The Technical Steering Group met four times during 2012. Members of the Technical Steering Group attending meetings in 2012 were:

Representative	Organisation
Peter Byron	Armstrong World Industries Pty Ltd
Nigel Jones / Andrew Ferguson	Australian Vinyls Corporation Pty Ltd
Chris Low / Wendy Davis	Gerflor Australasia Pty Ltd
Alan Whittle	Iplex Pipelines Australia Pty Ltd
Andrew Simmons	NSW EPA
Craig Brown	Plastral Pty Ltd
Jeremy Naug	Polyflor Australia Pty Ltd
John Candela	Specialty Polymers and Chemicals Pty Ltd
Ian Lilja / Neil Stewart	Sun Ace Australia Pty Ltd
Stuart Glasse	Tarkett Australia Pty Ltd
George Macovaz (chair)	Vinidex Pty Ltd
Gill Coleman (secretary)	Vinyl Council of Australia
Sophi MacMillan	Vinyl Council of Australia
Stephen Dowling	Welvic Australia Pty Ltd
Observers	
Declan O'Connor Cox	Department of Sustainability, Environment, Water, Population and Communities
Shlomi Bonet	Green Building Council of Australia
John Polhill	Sustainability Victoria

Glossary

APC	Australian Packaging Covenant
ARFA	Australian Resilient Flooring Association
Converter	A manufacturer of PVC product from resin or compound.
EMS	Environmental Management System
ENGO	Environmental Non Government Organisation
GHG emissions	Greenhouse gas emissions
NICNAS	National Industrial Chemicals Notification and Assessment Scheme. The Australian Government regulator of industrial chemicals.
The Program	The Product Stewardship Program, signed by members of the Australian PVC industry.
Phthalate plasticisers	Softeners from the phthalate family of chemical added to PVC resin to impart softness and flexibility. BBP Butylbenzyl phthalate DOA Di-octyl adipate DBP Dibutyl phthalate DOTP Di-octyl terephthalate DEHP Diethylhexyl phthalate ESBO Epoxidised soybean oil DIDP Diisodecyl phthalate TOTM Tri-octyl trimellitate DINP Diisononyl phthalate
PIPA	Plastics Industries Pipe Association
PVC (vinyl)	Polyvinyl chloride
REACH	Registration Evaluation and Authorisation of Chemicals – the European Community Regulation on chemicals and their safe use.
Signatories	The members of the Australian PVC industry who have signed the Program as an indication of their Commitment to product stewardship.
Stabiliser	A compound used to improve the thermal stability during processing and the heat and/or UV stability of the end-use product.
Stakeholders	The PVC industry, its employees, suppliers and customers, the local and wider communities, consumers, government and regulators, and any other groups significantly impacted by the industry.
TSG	Technical Steering Group
VCA	Vinyl Council of Australia
VCM	Vinyl chloride monomer

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ADDITIVES RESIN STABILISERS
COMPOUND CABLE FLOORING
FLEXIBLES PACKAGING RIGID
PIPES RIGID PROFILES WINDOW
PROFILES ADDITIVES RESIN
STABILISERS COMPOUND CABLE
FLOORING FLEXIBLES RIGID
PROFILES PIPES PACKAGING
WINDOW PROFILES ADDITIVES
RESIN STABILISERS COMPOUND
CABLE FLEXIBLES PACKAGING
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