

PVC PRODUCT STEWARDSHIP PROGRAM

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

2011



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PVC
PRODUCT
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PROGRAM
2011
ANNUAL
PROGRESS
REPORT

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Executive Message

Progressing Product Stewardship

The Australian PVC industry voluntarily established the Product Stewardship Program in 2002 to provide a framework for initiatives addressing the life cycle impacts of PVC. The Program has addressed a range of environmental and health aspects associated with the production, use and disposal of PVC products in Australia. During 2011, the Program's ninth year of operation, the phase out of lead stabiliser neared completion, with reported use down 99% relative to the amount used in 2002. The ReSource Summit enabled industry participants to formulate a strategy for advancing PVC recycling in Australia. This report also identifies areas requiring further attention, such as progress on EMS implementation, encouragement of complete reporting, and improved adoption of the Consumer Responsible Care commitment.

Throughout 2011 the PVC industry continued to develop new commitments reflecting stakeholder expectations, and demonstrating its willingness to monitor and address emerging issues. The new commitments set vinyl chloride residual and emission standards for emulsion PVC resin manufacture, complementing the existing standards set for suspension resin. The Technical Steering Group, responsible for overseeing Program development and implementation, in consultation with Signatories, has also established an industry Charter outlining principles to guide Signatories in improving energy efficiency and reducing greenhouse emissions. This Charter will form part of the Program commitments for 2012.

Around 60 delegates representing broad stakeholder interests attended the PVC ReSource Summit held during 2011 to focus on advancing PVC recycling. This event provided delegates with an opportunity to contribute to the future directions for PVC recycling in Australia. The vinyl recycling strategy developed will be driven by a Steering Group and implementation working groups made up of representatives from Signatory and other stakeholder groups.

The PVC industry's commitment to annual public reporting augments the Program activities. An independent third party auditor has verified this report, and the reporting from a sample of Signatory companies. The Vinyl Council extends our objectives of transparency and engagement by providing detailed information on the Program through a dedicated website and via the enabling of social networking conversations.

Vinyl is used in a wide range of applications in all sectors of the Australian economy, including building, construction and infrastructure, power and telecommunications, health and education, automotive, consumer goods, fashion and textiles. Reflecting this broad range of uses, we welcomed a diverse group of businesses as Signatories to the Program in 2011: Deceuninck Pty Ltd, Poly Marketing Pty Ltd T/A Envorinex, Innova International Pty Ltd, Plustec Pty Ltd, Primaplas, and Profine International Profile Group. A number of these businesses are from the windows sector, a group which is utilising the properties of PVC to contribute to environmental solutions through improved energy efficiency in buildings.

With the Program entering its tenth year of operation in 2012, it is timely to recognise the foresight and commitment shown by the Signatories involved since its inception. We congratulate the foundation Signatories on their individual achievements and thank them for the contributions they have made to the progressive development of the Program.

Foundation Signatories

Aperio Group (Australia) Pty Ltd
 Armstrong World Industries (Australia) Pty Ltd
 Australian Vinyls Corporation Pty Ltd
 Berry Plastics (Australia) Pty Ltd
 Chemson Pacific Pty Ltd
 Iplex Pipelines Australia Pty Ltd
 Plaspak Peteron Pty Ltd
 Plastral Pty Ltd
 Sun Ace Australia Pty Ltd
 TechPlas Extrusions Pty Ltd
 Terminals Pty Ltd
 Tyco Water
 Vinindex Pty Ltd
 Welvic Australia Pty Ltd

Recognising the capacity of product stewardship schemes to deliver environmental benefits, the Australian federal parliament passed the Product Stewardship Act 2011. This legislation aims to encourage shared responsibility to reduce waste and prevent harmful substances entering the environment. The Act allows for the accreditation of voluntary product stewardship schemes. Given the experience of the PVC industry, the Vinyl Council has welcomed the opportunity to consult with government on product stewardship and the accreditation process. The PVC industry can demonstrate that it has an exemplary voluntary program in place, with active industry participation delivering substantive and measurable progress.

The Technical Steering Group (TSG) met three times during 2011 and has been actively supported by the NSW Office of Environment and Heritage, Sustainability Victoria, and CSIRO. We value the input of these and other external stakeholders, and appreciate the opportunity to engage and demonstrate the Program's effectiveness. During 2012, the Program's tenth year, stakeholder feedback will be sought as part of a formal review process to help us shape the Program for the future. However, as a reader of this report, your feedback or suggestions for improvement are welcome at any time.

George Macovaz
 Chairman, Technical Steering Group

2011 Highlights

Standards for Emulsion PVC	The Product Stewardship Program was extended in 2011 to include residual VCM and VCM emission standards for emulsion PVC.
Lead stabiliser phase out	The phase out of lead stabiliser use neared completion, with reported use of 9 tonnes in 2011, down 82% from 2010, and a reduction of over 99% since the Program began in 2002. Of the three Signatories using lead stabiliser in 2011, two moved to alternatives. By the end of 2011 one Signatory still required a lead stabiliser replacement for a single product formulation.
PVC recycling	A diverse group of around 60 stakeholders attended a PVC ReSource Summit to formulate a strategy to advance PVC recycling in Australia. A Steering Group and two working groups have been established to drive the strategy implementation.
Energy Efficiency and Greenhouse Gas Emissions Charter	An Energy Efficiency and Greenhouse Gas Emissions Charter was developed in 2011. This will be included as a commitment in the Product Stewardship Program for 2012.
Program integrity	Forbo Floorcovering was delisted following failure to comply with reporting requirements for calendar years 2009 and 2010.
New signatories	Six new Signatories joined the Program.



ARMSTRONG FLOORING AT FLINDERS MEDICAL CENTRE

Report Scope

This report details the 2011 performance of the Australian PVC industry Product Stewardship Program (PSP) 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 PSP. 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 PSP 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 35 Signatories to the Program at the end of calendar year 2011. Of the six businesses joining the Program in 2011, four joined during November and December, and these were not required to report on 2011 activities. This report outlines the results of data submitted by the remaining 31 Signatories. An audit process completed by an independent organisation verified a sample of seven 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

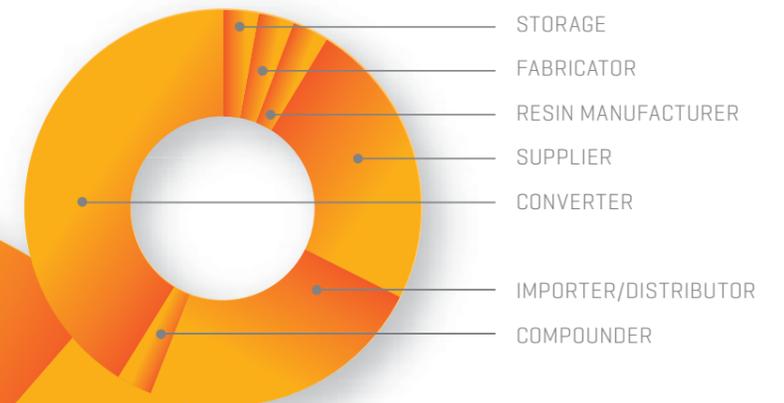
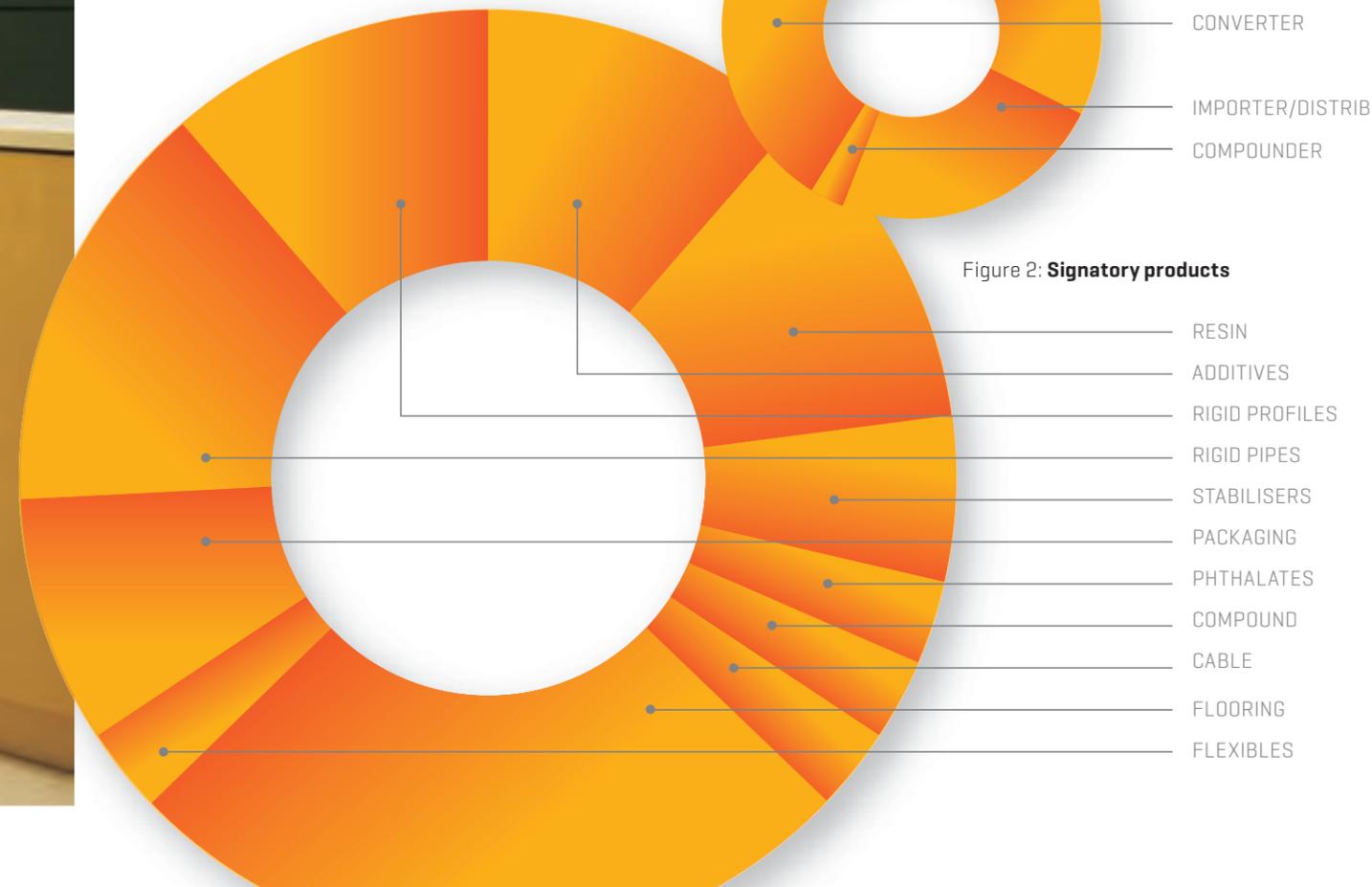


Figure 2: Signatory products



ISSUE	2011 COMMITMENT	2011 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.	Achieved by 16 out of 21 Signatories, representing 76% compliance.	Ongoing. 2012 ACTION: Encourage complete reporting.
VCM emissions resulting from local suspension manufacturing	VCM emissions no greater than 30g/tonne.	Emissions of less than 20.7 g/tonne PVC as at 30 June 2011.	Ongoing.
Emulsion PVC [E-PVC]:			
VCM in finished emulsion resin	Residual VCM in supplied E-PVC resin not greater than 1 ppm.	Achieved by 4 out of 7 Signatories, representing 57% compliance.	2012 ACTION: Review implementation, standards, and non-compliance issues. Encourage complete reporting.
VCM emissions resulting from manufacture of emulsion resin supplied to signatories	VCM emissions no greater than 1000g/tonne E-PVC.	Achieved by 4 out of 7 Signatories, representing 57% compliance.	2012 ACTION: Review implementation, standards, and non-compliance issues. Encourage complete reporting.
Environmental management systems	Comply with or exceed the industry's minimum acceptable standard.	22 Signatories met or exceeded the minimum acceptable standard for an EMS. Of the 9 Signatories without an EMS, 4 advised implementation progress.	Ongoing. 2012 ACTION: Work with new and non-compliant Signatories to progress EMS implementation. Review requirements for Signatories without manufacturing, storage or transport operations
	Embed Program commitments into companies' Business Management Systems.	24 Signatories met this requirement.	
Mercury avoidance	Ensure avoidance of mercury in the PVC supply chain for PVC products marketed in Australia.	20 of 24 Signatories, or 83%, verified VCM, PVC resin or PVC product sourced from mercury-free sources.	Ongoing. 2012 ACTION: Improve Signatory understanding and implementation of the commitment. Review staged targets for Signatories non-compliant in 2011.
Energy efficiency and GHG emissions	Not applicable.	Developed an Energy Efficiency and Greenhouse Gas Emissions Charter.	2012 ACTION: Implement the Energy Efficiency and Greenhouse Gas Emissions Charter in 2012 Program.

2. Stabiliser and Pigment Use			
Code of Practice	Adhere to PVC industry Code of Practice for the use of lead and cadmium.	2 Signatories were non-compliant in that they had not phased out lead stabiliser use.	Ongoing. 2012 ACTION: Work with new and non-compliant Signatories to improve adherence.
Cadmium Use	Maintain avoidance of cadmium stabiliser use.	One Signatory unintentionally used product containing cadmium. A replacement product has been sourced.	Maintain avoidance.
Lead Use	Complete phase out the use of lead stabilisers in all applications (target was 2010). Maintain avoidance of lead stabiliser use.	2 Signatories knowingly used lead stabilisers. 9 tonnes of lead stabiliser (metal content) was reported used, down from 48.8 tonnes in 2010. One Signatory unintentionally used product containing lead.	Maintain avoidance. 2012 ACTION: Non-compliant Signatory to report phase out progress to TSG. Develop Australian Standards to exclude lead use.
Pigments	Substitute lead, cadmium & hexavalent chrome pigments (target was 2010), where technically and commercially feasible alternatives are available.	2 Signatories reported use of a total of 144 kg lead pigment. 2 Signatories reported use of a total of 5.8 kg hexavalent chrome pigment.	Ongoing. 2012 ACTION: Non-compliant Signatories to report phase out progress to TSG.
Other additives	Monitor any pertinent overseas developments.	Monitoring maintained.	Ongoing.
Open disclosure	Provide information on additives used in PVC products or components to stakeholders upon request.	24 Signatories have a system in place to record and respond to such requests.	Ongoing.

ISSUE	2011 COMMITMENT	2011 PROGRESS	2012 COMMITMENT
3. Plasticiser Use			
Phthalate plasticisers	Implement the industry Policy on Plasticiser Use.	76% of relevant Signatories confirmed Policy implementation.	Ongoing. 2012 ACTION: Clarify why relevant Signatories have not confirmed compliance and address barriers to compliance including incomplete data reporting.
	Report plasticiser data.	65% of relevant Signatories provided complete data.	
	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.	4 Signatories that are part of the packaging supply chain have action plans lodged.	Ongoing.
Recycling	Implement the Vinyl-2-Life action plan.	A range of actions completed and new actions set (refer Appendix I).	2012 ACTION: Sustain existing projects while implementing the Vinyl Industry Recycling Strategy (VIRS).
	Develop an industry wide strategy to improve PVC recovery and recycling.	Strategy developed and management structure for implementation introduced.	2012 ACTION: Implement the Vinyl Industry Recycling Strategy (VIRS).
	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% of relevant Signatories complied fully.	Ongoing. 2012 ACTION: Assist new and non-compliant Signatories to achieve compliance.
Life cycle thinking	Consider whole-of-life environmental impacts in the development of new products.	Signatories reported a range of life cycle thinking in the development of new products.	Ongoing. 2012 ACTION: Support release of an updated inventory for Australian PVC. Provide information such as life cycle frameworks, tools and case studies to Signatories

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	Accelerate reporting process and publish 2011 annual performance report by 1st April 2012.	This 2011 report was published in May 2012. Both reports were verified by an independent third party and audit statements provided.	Consolidate earlier reporting process and publish 2012 annual performance report by 30th April 2013. 2012 ACTION: Ensure reporting schedule allows informed and timely setting of actions for following year.
PVC life cycle impacts	To publish annual product stewardship issues review.	Review for 2011 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.	Not applicable.	2012 ACTION: Complete a long term review, including performance progress and feedback surveys of Signatories and stakeholders.

New Commitment introduced in 2011: Emulsion PVC

The two significant production processes used in PVC manufacture are the suspension process and the emulsion process. Impacts relating to the suspension process – residual vinyl chloride monomer (residual VCM) in PVC and VCM emissions – were first included in the PSP in 2002. In 2011 the Program was extended to cover a commitment on residual VCM and VCM emissions from emulsion PVC (E-PVC) to encourage best practice and improvement in the use of E-PVC.

The two processes produce PVC with different morphological characteristics. Suspension PVC (S-PVC) is better suited to the large volume production of a limited number of grades. E-PVC consists of fine powdered products with residual emulsifier content particularly suitable for paste processing. At the resin drying stage, there is less stripping in the E-PVC process, and consequently more VCM is emitted up licensed emission stacks. The regulatory emission limits for E-PVC are higher.

The characteristics of E-PVC benefit a number of specific applications such as carpet backing and some resilient flooring and membranes, for which S-PVC is technically unsuitable. The global market for E-PVC accounts for about 6 per cent of the total market for PVC, with Europe the largest producer region. It is not manufactured domestically in Australia. Seven of the reporting Program Signatories, or 23%, reported using E-PVC in 2011, indicating the importance of setting standards for this product to drive improvement.

The standards introduced to the Program in 2011, to be met and reported on by Signatories using E-PVC are:

- > Residual VCM concentration in supplied E-PVC resin shall be no greater than 1ppm.
- > Signatories shall seek confirmation from suppliers that total VCM emissions (licensed and fugitive) resulting from manufacturing of E-PVC, are no greater than 1000g/tonne E-PVC measured on an annual basis.

These standards are consistent with the European Council of Vinyl Manufacturers' (ECVM) Charter for Emulsion PVC.

ACTION 2012

These new commitment standards will be reviewed by the TSG in 2012, based on data reported by Signatories for this report.

Residual Vinyl Chloride Monomer

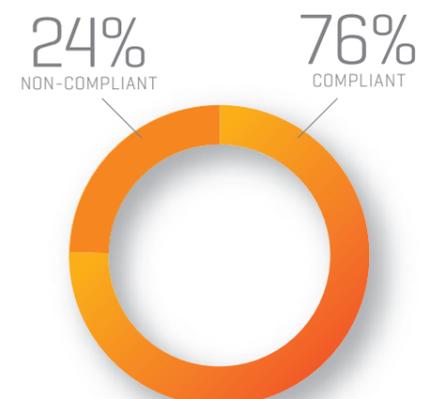
Vinyl chloride monomer (VCM) is a hazardous substance. Once polymerised to PVC resin, the resin is essentially inert and does not revert back to the monomer; however, minute amounts of unreacted VCM may remain in the resin. Under the Program, the Australian industry has set a standard for the concentration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

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. This commitment was relevant to 21 Signatories. Australian Vinyls Corporation, the only local manufacturer of suspension PVC resin, and a further 15 Signatories who import PVC resin or goods from overseas, were compliant, reporting meeting the standard in over 99 per cent of batches. The 5 other relevant Signatories were non-compliant in that no data on residual VCM in resin levels was reported.

In 2010, 18 Signatories were compliant with this commitment and 3 were non-compliant. This indicates a decrease in compliance in 2011 from 2010, due to incomplete reporting.

Figure 3: Residual VCM compliance (S-PVC)



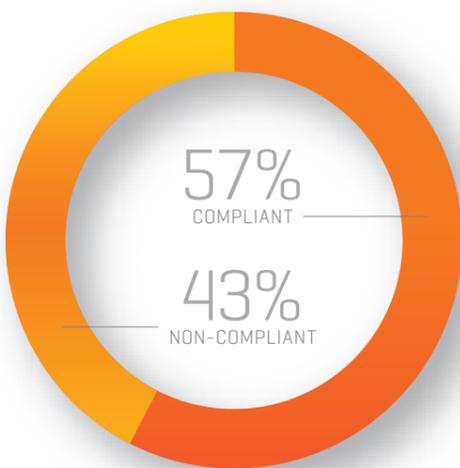
ACTION 2012

Follow up non-compliant Signatories and assist them to move towards compliance, particularly through complete reporting.

EMULSION PVC (E-PVC) – NEW COMMITMENT

Under the Product Stewardship Program, the concentration of residual VCM in E-PVC resin must be no greater than 1 part per million in 99 per cent of resin batches tested. Of the 7 Signatories who import E-PVC from overseas, 4 reported that 100 per cent of batches complied, representing 57% compliance. The other 3 Signatories were non-compliant in that documentation confirming residual VCM in resin purchased was not supplied.

Figure 4: Residual VCM compliance (E-PVC)



ACTION 2012

Review implementation, standards, and non-compliance issues. Follow up non-compliant Signatories and assist them to move towards compliance, particularly through encouraging complete reporting.

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 20.7 g/tonne PVC for the period of the financial year 2010–11, an improvement on the previous year's result of 21.37 g/tonne PVC.

EMULSION PVC (E-PVC) – NEW COMMITMENT

The Program standard for the manufacturing of E-PVC is for VCM emissions no greater than 1000g/tonne E-PVC. Seven Signatories reported the relevance of this commitment. Four Signatories, 57%, were compliant, reporting that their suppliers confirmed VCM emissions no greater than 1000g/tonne E-PVC. The other 3 Signatories were non-compliant since they did not submit results of supplier VCM emissions.

ACTION 2012

Review implementation, standards, and non-compliance issues. Follow up non-compliant Signatories and assist them to move towards compliance.

MANUFACTURING EMISSIONS – OVERSEAS DEVELOPMENTS

The US Environmental Protection Agency (EPA) has proposed an update to rules governing emissions from PVC production facilities in the US (US EPA, 2011). The rule would set limits and standards for total organic air toxics and also for three specific emissions, including VCM. The annual reduction of VCM emissions in the US due to the proposed revised rule is estimated at 135 tons. The new rule if finalised would take effect at facilities from 2015.

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.

A focus on environmental management was included in the initial Program commitments in 2002, with a status review of environment management policy and procedures at manufacturing and storage sites. From 2005, Signatories were encouraged to work progressively towards establishing and implementing an EMS appropriate for their operations by the end of 2010. The Program provides A Minimum Acceptable Standard for Environmental Management for guidance.

Under the Program, Signatories commit to at least one of the following:

- > ISO14001 certification of their EMS;
- > Being a Signatory to the international chemical industry's Responsible Care program;
- > Developing an EMS that meets the Program's Minimum Acceptable Standard for Environmental Management.

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

Of the 31 Signatories reporting, a total of 22 advised that they have an EMS meeting the commitment standards, an increase from 20 in 2010. Of these 8 are ISO 14001 accredited and 3 are Responsible Care signatories. Twenty four Signatories have PSP commitments embedded in their company's business management systems.

Twenty one of the 31 Signatories have both an appropriate EMS and have Product Stewardship Program commitments embedded into their company's business management systems and are therefore fully compliant with this commitment. Four are partially compliant, in that they have either a suitable EMS, or have embedded the Program commitments into business management systems. Six signatories are non-compliant with the overall commitment.

Figure 5: Signatory EMS compliance



At the end of 2011, 9 Signatories had not implemented an EMS, however 4 of these have advised progress. One is currently implementing the industry Minimum Acceptable Standard for Environmental Management and expects this to be complete by end 2012. Another Signatory has audits scheduled for ISO certification during 2012. A third had planned to have an EMS in place by late 2011, however this has been delayed to 2012 due to resourcing issues. A fourth Signatory has developed a draft EMS.

The 2010 report advised that 8 Signatories had not implemented an EMS at their operations, and some plans reported at that time have not progressed. Some smaller companies have experienced difficulties achieving the requirements, with a key barrier being lack of employee resources. In addition, the EMS objective was originally introduced to the Program for manufacturing and storage facilities. A growing number of Signatories, such as trading companies, are not involved in manufacturing or storage operations and may have no formal EMS framework. During 2011 the TSG recognized the need to confirm an appropriate approach for these Signatories, and this requirement will be addressed during 2012.

ACTION 2012

Assist Signatories move closer to compliance. Confirm appropriate EMS approach for Signatories not involved in manufacturing, storage or transport operations.

Mercury Avoidance

Program Signatories are committed to avoiding mercury in the PVC production process. There are two possible routes for mercury use in the PVC supply chain:

- > Chlorine, used in the manufacture of ethylene dichloride (EDC), is produced in some plants using older mercury cell technology. This process is being substantially replaced worldwide by mercury-free processes.
- > Vinyl chloride and PVC resin can be manufactured via an ethylene route, or a carbide-acetylene route. The latter uses mercury chloride as a catalyst and is therefore not a mercury free production process.

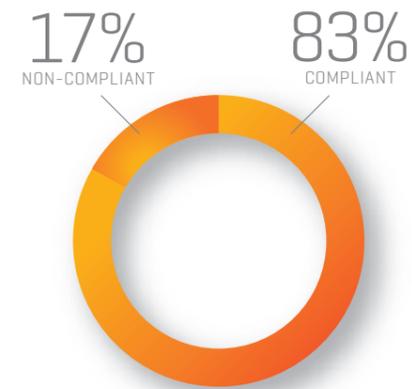
The local resin manufacturer imports VCM; some Signatories are resin traders supplying imported PVC resin; and other Signatories are distributors of semi-finished or finished PVC products made from resin sourced overseas. Under the Program, Signatories who import VCM, PVC resin or PVC products into Australia are obliged to verify via suppliers that the imported material is sourced from mercury-free processes.

Although this commitment to avoid mercury in the PVC supply chain commenced in 2010, compliance was incompletely assessed for the 2010 progress report with 13 Signatories reporting on the commitment. Complete reporting has been made this year, with 24 Signatories advising that they import VCM, PVC resin or PVC products into Australia.

Compliance with this commitment requires Signatories to verify with their supply chains that at least 98% of their PVC product range is from mercury free sources.

Of the 24 Signatories importing VCM, PVC resin or PVC products during 2011, 20, or 83%, advised that they had verified the materials were sourced from mercury-free processes. Three companies are non-compliant with the commitment.

Figure 6: Mercury avoidance compliance



ACTION 2012

Review non-compliant performance and determine staged targets for compliance to encourage these Signatories to progressively reduce use of materials sourced from processes using mercury.

New Commitment for 2012: Energy Efficiency and Greenhouse Gas Charter

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

PVC offers the potential for end-users to improve their energy and greenhouse gas emissions profile by providing relatively low embodied energy and thermally efficient, lightweight products.

Opportunities to further reduce the energy and greenhouse gas emissions footprint of PVC products may be achieved through recycling end-of-life PVC or by applying life cycle thinking to product and process design throughout the supply chain.

The PVC industry developed the Greenhouse Gas and Energy Efficiency Charter to demonstrate the industry's commitment to energy efficiency and greenhouse gas emission reduction measures. Recognising the diverse range of organisations that are Signatories to the Program, and the

different stages individual companies are at in their energy & greenhouse gas emission management, the commitment allows individual companies to determine specific actions appropriate for their circumstances. Within the Charter Signatories have agreed to the following key principles:

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

Compliance with this commitment is likely to require demonstration by Signatories of policy development, measurement of energy usage and greenhouse gas emissions and plans for improved energy efficiency and greenhouse gas emission reduction. Signatory responses to this commitment will be reported in the next annual progress report, and annually thereafter.

Industry Education

In 2011 the VCA commissioned Net Balance to assist preparation for this commitment by advising on the implications to the PVC industry of a carbon pricing mechanism and appropriate Signatory and VCA actions. Net Balance conducted a survey of Signatories, provided four briefing papers, and presented at a TSG meeting. In addition, Dr Kevin Thomson, from the Eco Products agency, made a presentation to the TSG outlining the opportunities for energy efficiency, and therefore reduced environmental impacts and lower business costs, through improved product and process design.

ACTION 2012

- > **Include the Energy Efficiency and Greenhouse Gas Charter in the 2012 PSP commitments**
- > **Consider programs to support Signatory and supply chain endeavors to improve energy efficiency**
- > **Survey Signatories to establish energy and greenhouse gas baseline data**
- > **Explore relevant training and funding opportunities**
- > **Provide briefings on strategy and management frameworks**



Commitment 2: Stabiliser and Pigment Use

Under the Program, Signatories have committed 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 the end of 2010, and then maintain their avoidance
- > substitute lead, cadmium and hexavalent chrome pigments where technically feasible and alternatives are available, by the end of 2010.

Cadmium

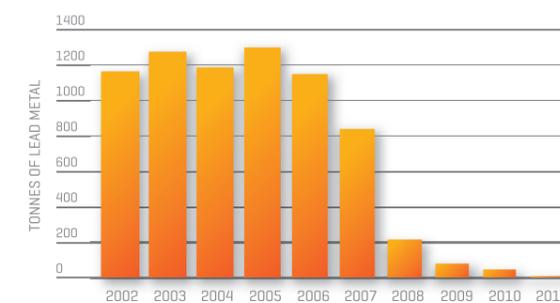
The phase out of cadmium-based stabilisers by Signatories was completed in 2006. However, during 2011 one Signatory discovered (through testing for a recycling project) that product they imported contained cadmium and lead. A lead and cadmium free alternative product was ordered in December 2011, with the intention of ensuring the Signatory's entire range is free of these metals. The amount of lead and cadmium in this Signatory's product in 2011 is uncertain, and data has not been reported. Furthermore, since the lead and cadmium use was unknown, it was not declared for the 2010 annual progress report, which was the year this Signatory joined the Program.

Lead

By the end of 2011, 99% of lead stabiliser use had been replaced since the Program began in 2002, as shown in Figure 6. Two Signatories reported knowing use of lead stabiliser in 2011 (in addition to the unintentional use described above). One of these Signatories concluded use of lead stabiliser in May 2011, consistent with the advice they provided for the 2010 report. The other Signatory continues to use lead stabiliser in one product formulation. Although phase out for this product was planned for June 2011, trials of alternative stabilisers have proved unsuccessful. This Signatory continues to work with their stabiliser supplier, and is undertaking a more extensive reformulation of the product, with phase out of the lead stabiliser due by June 2012.

Two Signatories reported the quantities of lead stabiliser they used. On this basis a total of 9 tonnes (lead metal content) of lead stabiliser was used in 2011, compared to 48.8 tonnes the previous year, a reduction of 82%.

Figure 7: Lead stabiliser use by Program Signatories (tonnes metal)



Note: 2010 and 2011 figures exclude use by a Signatory unaware of the lead content of a product imported during these years.

Although the phase out of lead by Program Signatories is virtually complete, the use of these stabilisers continues in a number of PVC products marketed in Australia by non-Signatories. There are a small number of local manufacturers who are not Signatories to the Program and PVC products continue to be imported into the country that may contain lead-based stabilisers. Australian pipe standards for Drain, Waste, Vent and stormwater products, have been revised to exclude lead as at end 2011.

During 2011 the TSG recommended that product sectors should amend their relevant Australian Standards to encourage the restriction of lead in PVC products.

Pigments

In response to this commitment, Signatories have largely ceased to use lead, cadmium and hexavalent chrome pigments. In 2011, 2 Signatories reported use of lead pigment and 2 Signatories reported use of hexavalent chrome pigment.

The total quantity of lead pigment used was 144 kilograms lead metal. One Signatory committed to a December 2012 phase out date. The other Signatory plans to phase out use of lead pigment when this is technically achievable, and continues to trial alternatives. The process of finding alternative pigments which provide equivalent performance on a cost effective basis is slowly progressing.

The total quantity of hexavalent chrome pigments used totaled 5.8 kilograms (metal content). One Signatory has committed to a phase out date of December 2012. The other Signatory company using hexavalent chrome pigment joined the PSP in 2011, and has advised that use will be phased out by July 2012.

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. However disclosure of exact amounts of each additive used is not required under this commitment as it is proprietary, commercially sensitive information.

To comply, Signatories require a system or process to track receipt of and responses to requests, and staff should be aware of this commitment.

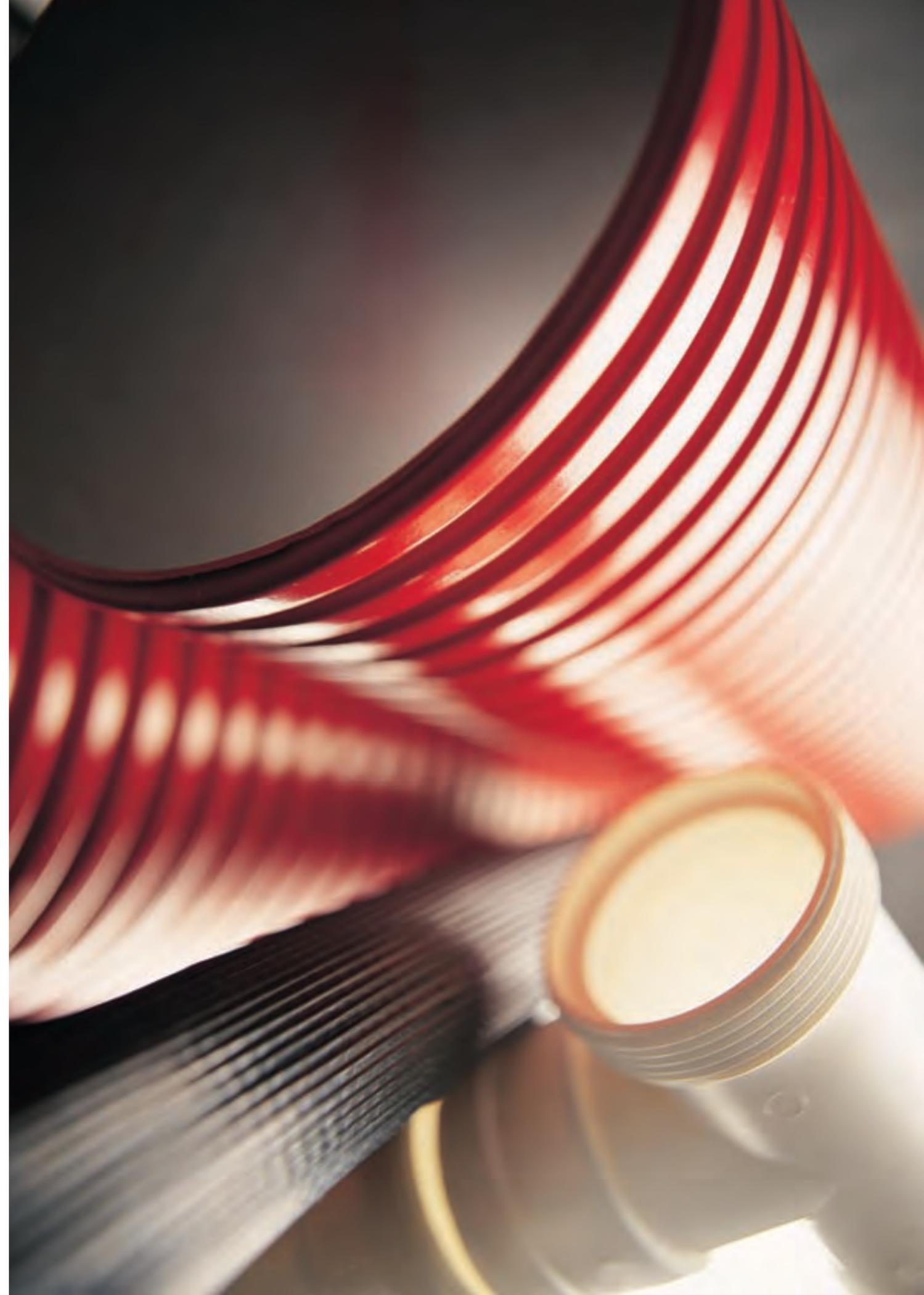
Twenty four Signatories reported that they had a system in place in 2011. Of the four non-compliant Signatories, two did not respond to the question, one has not implemented a register, and one intends to formalise a system and incorporate it into an EMS. The data survey asked all Signatories supplying finished / semi-finished PVC goods to the Australian market to respond to the Open Disclosure question. This commitment is also relevant to some suppliers of raw materials. Some suppliers responded to the question anyway, however some did not, and therefore the result reported here may be incomplete.

ACTION 2012

- > **The VCA will continue to work with Signatories in 2012 to move towards full compliance.**
- > **Signatories that are non-compliant with the industry Code of Practice for the use of lead and cadmium in PVC products in Australia will be asked to provide periodic reports to the TSG on their progress towards implementation of the Code.**

Overseas Initiatives and Trends

In Europe, cadmium will be banned in plastics and jewellery products from December 2012, under European Commission regulation (European Commission, 2011). The regulation notes the voluntary phase out of cadmium in new PVC products by the European PVC industry. The regulation encourages the reuse of recovered PVC containing low levels of cadmium in certain construction products, through a higher limit value for cadmium for these products, to avoid landfill or incineration of PVC containing cadmium.



Commitment 3: Plasticiser Use

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.

The most commonly used type of plasticisers are a group of substances called phthalate esters, which have been in use for around 70 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 in Australia are DIDP (di-isodecyl phthalate), and DINP (di-isononyl phthalate).

Each phthalate ester has its own toxicity and safety profile and can be categorised by their chemical structure as Low Molecular Weight (LMW) phthalates, which have a molecular carbon backbone of less than or equal to C6, and High Molecular Weight (HMW) phthalates, which have a carbon backbone C7-C13. The longer chain of HMW phthalates appears to provide more permanency and durability.

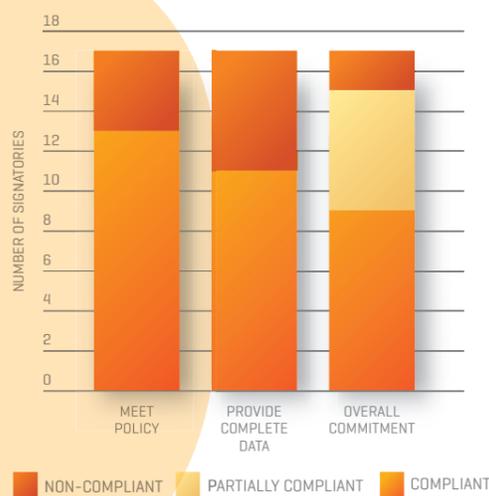
LMW phthalates, including DEHP (C6), have been considered of potential concern. As a consequence, in Europe, the LMW phthalates require REACH registration and authorisation. There is an increasing trend in Europe over the last 10 years to substitute LMW phthalates with HMW phthalates and non-phthalate plasticisers.

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 data reporting of plasticiser types and quantities used.

Seventeen Signatory companies used plasticisers in 2011. Of these, 13, or 76%, confirmed adoption of the industry Policy. Two did not respond to the question and are therefore non-compliant. Of the 17 plasticiser users 11 reported data on the types and quantities of plasticisers used. Five Signatories advised partial data, with 2 citing confidentiality, and another was still in the process of obtaining the data from suppliers at the time of reporting. To be fully compliant, Signatories must both meet the industry Policy and report data. In 2011, 9 Signatories, or 53% of relevant Signatories, were fully compliant in that they complied with the Policy and provided plasticiser data. A further 35% met one of the requirements and were partially compliant. There was a 6% non-compliance level.

Figure 8: Signatory Plasticiser compliance



ACTION 2012

The VCA will continue to work with Signatories in 2012 to move towards full compliance, including complete reporting on plasticiser data.

Australian Developments

The National Industrial Chemicals Notification and Assessment Scheme (NICNAS), Australia's industrial chemical regulator, has been conducting a review of phthalates since 2006, including risk assessments of nine phthalates.

- > Following the 2010 NICNAS review of DEHP, a decision was taken to prohibit DEHP in cosmetic products from 1 January 2012. A permanent ban on children's plastic products with more than 1 per cent DEHP was introduced in February 2011, following an 18 month interim ban declared in 2010.
- > The NICNAS risk assessment report on diethyl phthalate (DEP), a low molecular weight phthalate, was published. The Vinyl Council is unaware of DEP use in PVC manufacture in Australia.
- > During 2011 NICNAS continued to finalise its risk assessment for DINP with, we understand, delays due to revisions based on additional international research.

Overseas Developments

- > DEHP, BBP and DBP were added to the REACH Annex XIV authorisation list in February 2011. These substances must not be marketed or used in Europe unless authorisation has been given for a particular use, and where economically and technically feasible alternatives exist, a substitution timetable must be submitted.
- > The Danish Environmental Protection Agency (EPA) proposed a ban on four phthalates: DEHP, BBP, DBP and DIBP, in the EU and Denmark (Danish EPA, 2011). The proposal is based on the combined effects of exposure to the four substances. The submission for EU regulation will be assessed by European Chemicals Agency (ECHA) committees with a final decision expected in 2012.
- > The International Agency for Research on Cancer (IARC) reclassified DEHP as Category 2B (possibly carcinogenic to humans), from Category 3 (not classifiable as to its carcinogenicity to humans).
- > The US Environmental Protection Agency (EPA) Phthalates Action Plan, released in 2009, covers eight phthalates including DBP, BBP, DEHP and DINP. The Action Plan includes an assessment of phthalates alternatives to be conducted by the US EPA's Design for the Environment Program in partnership with multiple stakeholders, with the first partnership meeting held in 2011 and the assessment due in 2012. The intentions of this assessment are to encourage non-regulatory moves to phthalate alternatives, and extend risk management beyond regulatory measures.
- > The TSG continued to monitor scientific research investigating the health impacts of phthalate exposure.



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 Aperio Group, Berry Plastics, and Plaspak, and Australian Vinyls, a resin supplier to the industry.

Recycling Performance

Reporting on reprocessing or recycling of factory and post-consumer waste is encouraged and, for 2011, 20 Signatories reported continuing efforts to improve resource efficiency. Initiatives include improving the production process to avoid waste generation to the collection of waste product for reprocessing, to using non-PVC waste in PVC products. The reprocessing of PVC factory waste has become a standard manufacturing practice, with 15 Signatories reporting reprocessing internally or by using a third party in Australia.

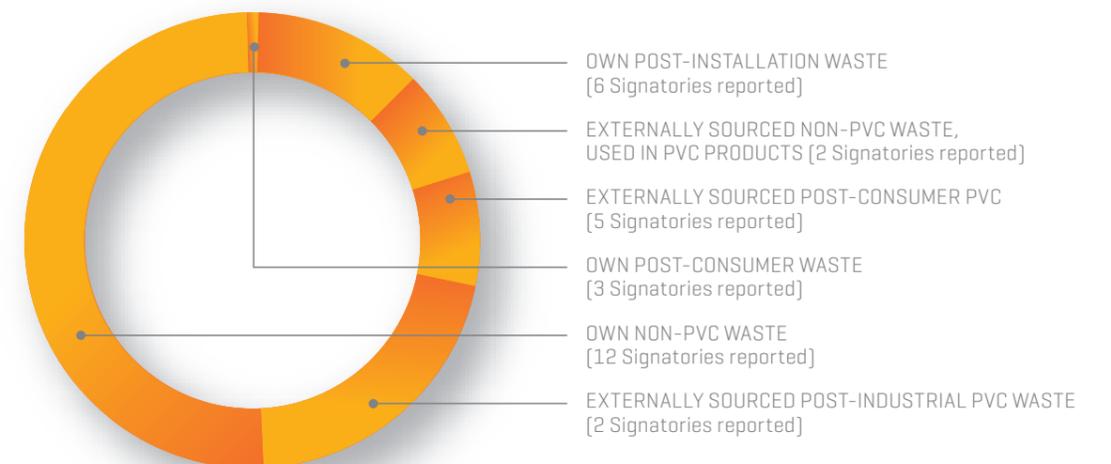
In addition to this, a number of Signatories reported on Australian recovery and recycling of their own and externally sourced waste, totalling over 2100 tonnes, as shown in Figure 9.

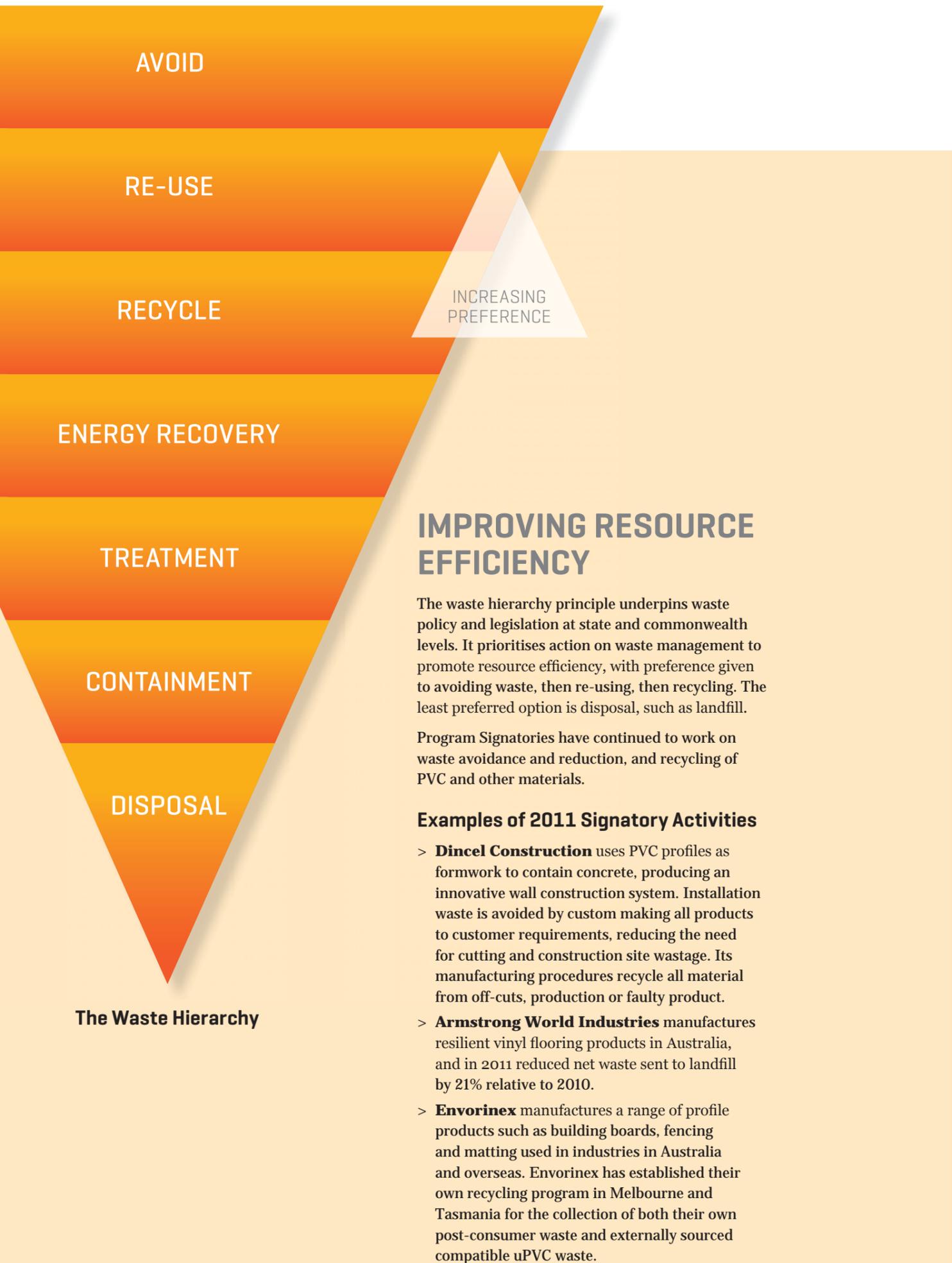
SUSTAINABLE PACKAGING

Plaspak designs and manufactures rigid plastic packaging for food, personal care, household chemicals, agricultural and industrial products marketed in Australia. Supplying a wide range of bottles, containers, caps and closures, Plaspak uses various materials to meet customer needs. PVC is used to manufacture a range of bottles and jars, including custom designs, at Plaspak's Dandenong site.

Plaspak has demonstrated their commitment to recyclable packaging and the objectives of the APC by completing assessments against the Sustainable Packaging Guidelines on existing products that make up over 50% of their manufacturing volume. In addition, the Sustainable Packaging Guidelines are being incorporated into the Plaspak new product development process. During 2011, Plaspak lodged a five year Action Plan with the APC, and this is available on their website. Plaspak is also a member of the Vinyl Cycle bottle recycling group.

Figure 9:
2011 Waste recovery and recycling reported (mass)





Advancing PVC Recycling

A PVC ReSource Summit was conducted in May 2011 to address ways to further progress PVC recycling in Australia. The sixty delegates who attended represented a wide cross section of stakeholders and participated in a facilitated process with a high level of engagement and interaction. The Summit provided a unique opportunity for delegates to influence the future of PVC recycling. Six elements were identified as pathways to a viable and sustainable PVC recycling practice in Australia, as shown in Figure 8.



A Steering Group formed to drive the Vinyl Industry Recycling Strategy is composed of stakeholders representing PVC manufacturers and suppliers, industry bodies, government, and waste experts. The Steering Group met in October and November and has identified a number of required outcomes:

- > An economically efficient market with a well-connected supply chain
- > Standardized, quality PVC recycle that meets market demand
- > PVC products designed to be recycled
- > PVC products designed to minimize environmental impact across the lifecycle
- > Recognition of PVC's recyclability.

The experience gained through the Vinyl-2-Life initiatives has enabled the identification of a number of industry wide barriers to progress, such as the challenges posed by the diverse uses of PVC and the geographical spread of waste. The intention is to address the broad, persistent issues and barriers to PVC/plastics recycling to improve the success of existing and future activities. Key objectives identified by the Steering Group will be progressed in 2012 by two implementation groups: one investigating market opportunities and requirements from a technical perspective, and one focusing on issues of business viability.

Figure 10: Pathways to Sustainable PVC Recycling



Achieving the vision of a viable and sustainable PVC recycling practice in Australia would lead to a greater availability of recycle in the market for use in new products, increased demand for recycle from manufacturers and will attract new investment and recyclers into the industry. Improved resource recovery will assist the industry, as well providing benefits to the environment, economy, and community.

ACTION 2012
Implement Vinyl Industry Recycling Strategy

Vinyl-2-Life Action Plan

The Vinyl-2-Life Action Plan was established in 2006, in response to the findings of a 2005 PVC Waste Audit commissioned by the Vinyl Council. The plan aims to improve recovery and recycling of PVC from key waste streams: medical waste, pipes and profiles, floor coverings, bottles, and banner and signage material. Vinyl-2-Life reporting will continue to record actions for specific projects while implementing the Vinyl Industry Recycling Strategy.

Progress against the Vinyl-2-Life Action Plan and plan developments are reported to the regular TSG meetings. Vinyl-2-Life Action Plan highlights and developments during 2011 include:

PVC MEDICAL WASTE

The program for recovering PVC medical waste at Western Hospital in Melbourne continued. PVC intravenous bags, oxygen masks and tubing are collected and recycled into hose. The feasibility of extending the trial to other hospitals has been assessed, and a trial is planned for Liverpool Hospital in NSW to commence in 2012. Additional hospitals in Victoria and South Australia have expressed interest in participating. Promotional and educational material for extension of the program is planned, based on the learning from the Western Hospital trial. The VCA continued to work on this program with a range of PVC industry, medical and state government stakeholders.

PIPES AND PROFILES

The closure of a reprocessor in Sydney contributed to changes in recycling activities in this sector. To progress the objective of developing a more consistent supply of pipe and profile material for reuse and recycling, pipe manufacturers Vinidex and Iplex have agreed to take on collection and processing activities in Sydney and Brisbane, with collection facilities for installation off-cuts and end-of-life material to be available at major distribution outlets. In addition, Pipemakers and APP have entered agreements with recyclers.

FLOOR COVERINGS

Signatory companies have been taking individual action on recovery and recycling of vinyl flooring waste. The Vinyl Council continues to encourage development of broader initiatives where industry-wide issues present barriers to improved resource efficiency.

BOTTLES

The Vinyl Bottle Group works to enhance recovery and local recycling of PVC bottles. Project meetings were held in March and August and addressed issues relating to liquidity, high processed bottle material stock and supply quality. The recycled material is predominantly used in vinyl flooring products.

BANNER & SIGNAGE MATERIAL

Signatory Rojo Pacific continued trials for recycling PVC coating fabrics, engaging a major installer of billboards and collaborating with their PVC sheet supplier. Uses for the recycled PVC and polyester fibres are being explored.

PVC RECYCLING DATA

The VCA commenced a literature review of PVC recycling data and produced a paper summarising knowledge of PVC recycling.

Progress of the Vinyl-2-Life program for 2011 is detailed in Appendix I.

Consumer Responsible Care

To assist end-consumers of PVC products understand and best manage end of life disposal options, Signatories commit to make information publicly available on how and where to re-use, recycle or safely dispose of their PVC products. This was a relevant commitment for 25 Signatories in 2011. Thirteen Signatories implemented this Program requirement, and 2 partially implemented the commitment. An example of implementing consumer responsible care is:

- > Plaspak, a packaging manufacturer, advises customers that PVC is collected through over 88% of kerbside recycling programs around Australia. Information on PVC recycling is available on the company's website, on both the "Make a Mark" program page and the PVC bottle product page.

ACTION 2012

Work with non-compliant Signatories to review barriers to implementing Consumer Responsible Care, and provide assistance to Signatories to encourage public communication to end-consumers.

Life Cycle Thinking

Program Signatories produce or supply a diverse range of raw materials and PVC products, which have varied environmental and health impacts throughout their life cycles. 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. Signatories commit to considering whole-of-life issues in the development of new products containing PVC, taking into account, for example, raw material sustainability, additive toxicity, embodied energy, de-materialisation, energy efficiency during product use, recyclability, and other end-of-life management options. Ten Signatories introduced new products in 2011 and 9 reported a range of life cycle thinking. Aspects considered included the environmental and health impacts of raw material production, manufacturing, the product use phase and end of life issues.

- > Armstrong World Industries launched a "closed loop" tile product composed of over 60% recycled/re-used content sourced mainly from Australian supermarkets, with less than 40% virgin raw material.
- > Envorinex researched and developed an extruded hollow uPVC profile raised garden bed manufactured from an identified source of waste PVC material. The waste material was selected to provide a 50 year life, with complete recyclability. To reduce the environmental impact and costs of transport and packaging, the product was designed in a flat-packed 'click-together' format. In addition, the product design encourages use by the disabled and elderly.
- > SunAce considered a range of life cycle environmental impacts when developing a new stabiliser system. These included the environmental impacts associated with raw material selection, such as amount of palm oil based derivative used, and waste implications, such as the prescribed waste requirements for waste packaging of zinc containing products.
- > Australian Vinyls commissioned and completed an update of the life cycle inventory for PVC for inclusion in the Australian Life Cycle Inventory database and use in rating tools, ecolabels and life cycle assessments.

ACTION 2012

- > **Provide information such as life cycle frameworks, tools and case studies to Signatories.**
 - > **Support release of an updated inventory for Australian PVC.**
-

LIFE CYCLE THINKING – OVERSEAS LEARNING

Learning on the application of life cycle thinking was outlined in the 2011 review of the PVC policy established for the London 2012 Olympic Games construction program (Jackson & Scott, 2011). The review, published by the Olympic Delivery Authority (ODA), recommended the whole life cycle of products be considered for future projects, to recognise the greater life cycle impacts of some products when manufacturing, transport, fabrication and installation are included. It also noted that for certain uses PVC's properties make it the most appropriate material. The policy encouraged use of PVC with a recycled content of 30% where performance requirements allowed, and preferred closed loop re-use or recycling take back schemes for PVC used temporarily at the Games. The policy preferred PVC using non-phthalate plasticisers, and this prompted development of non-phthalate PVC products for use in building wraps. However, not only did ODA recognize the increased cost, it concluded that different phthalates have different environmental and health effects, and these variations should have been recognized in the policy (and HMW phthalates allowed).



Commitment 5: Research

Technical Steering Group 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 2011 three TSG meetings were held, one less than the usual four. This was due to the retirement of the Product Stewardship Manager, and a delay in the commencement of his replacement.



During 2011 the following information was shared:

- > A survey of chemical migration from food contact packaging materials in Australian food by Food Standards Australia New Zealand (FSANZ) found no detection of phthalates or vinyl chloride in any of the foods tested (Food Standards Australia New Zealand, 2011). The report concluded “dietary exposure to chemicals which may migrate from food packaging is very low. Exposure at the estimated dietary exposure levels does not pose a human health and safety risk” (Food Standards Australia New Zealand, 2011, p. 2).
- > A video review covering the European PVC industry program Vinyl 2010. The ten year program increased PVC recycling across Europe to a record recovery of 260,000 tonnes of post-consumer waste in 2010; reduced lead stabilizer use by 79.5%, on track to phase out by 2015; and phased out cadmium stabilisers.
- > A review of the new European product stewardship VinylPlus program developed by industry in Europe including sustainability criteria based on a movement to greater controlled-loop management of PVC. VinylPlus was developed with the input of The Natural Step (TNS), an international NGO involved in research and dialogue on sustainable development.

In addition, a number of presentations were made:

- > Dr Kevin Thomson from Eco Products agency spoke on energy efficiency through product and process design.
- > Dr Mike O’Shea from CSIRO presented on the development of a bio-based chemical industry in Australia and overseas, in particular noting the potential of bio-ethanol feedstocks, and potential bio-based isosorbide plasticisers and plasticisers developed from eucalyptus oil.
- > Amanda Nutall from NetBalance spoke on the vision and practicality of sustainability and described best practice guidelines for the life cycle of PVC building products.



Annual Progress Report

Under the Program commitment for reporting, this 2011 annual report was to be published by 1 April 2011, and include a review of PVC life cycle impacts.

This 2011 annual report was published during May 2012 following verification audits conducted by an independent third party. As agreed by the TSG, the reporting process was brought forward from previous years and streamlined (the 2010 annual report was published in October 2011).

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

Program and Report Verification

As in previous years, the 2011 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 2011, NetBalance made a number of recommendations following the verification of the 2010 report.

To address these issues, the VCA took the following action during 2011 and early 2012:

- > The data submission document was revised, and reviewed with NetBalance.
- > Application of EMS commitments was discussed at a TSG meeting and was targeted for review.
- > The compliance requirements of the Mercury Avoidance commitment was confirmed with the TSG.
- > Examples of Consumer Responsible Care actions and communication were provided to Signatories requiring assistance.
- > Collection and retention of information requested from Signatories that was additional to data sheet requirements, or in response to clarifying questions has been improved.
- > Additional notes on evidence required for the audit process were included in the data survey sheet.
- > A new commitment regarding E-PVC manufacture was included in the PSP in 2011 and the Energy Efficiency and Greenhouse Gas Charter has been developed for inclusion in the PSP in 2012.

2011 Verification

The verification of this report involved audits of data provided by seven Signatories. Five Signatory site visits were completed to examine data sources and confirm data and statements. Two other Signatories were involved in desk top audits conducted by email and telephone. The verification methodology uses a specified set of principles and standards to assess the quality of a Signatory's reported data and the organisation's underlying systems, processes and competencies that underpin its performance.

The verification process revealed two errors related to commitments of possible relevance to the Signatory that were not identified as applicable, and seven instances where insufficient information was provided to verify compliance against the relevant commitment.

A copy of NetBalance's Verification Statement is shown in Appendix 2, pages 34–37.

OBJECTIVE	ACTIONS	2011 PROGRESS
Objective 1 – Medical Waste		
Develop program for recovery of PVC medical waste.	Progress trial at Western Hospital, Victoria.	<ul style="list-style-type: none"> > Work on contamination issues continued. > Discussion with logistics operators.
	Assess feasibility to extend trial to other hospitals.	<ul style="list-style-type: none"> > Discussions held with Liverpool Hospital, Sydney, and NSW government. Hospital trial planned. > Interest expressed by hospitals in Victoria, NSW and SA. > Discussions held with Victorian Department of Health.
	Engage with product suppliers.	<ul style="list-style-type: none"> > Discussions indicate continued support.
	Production of promotional/ educational material for the project.	<ul style="list-style-type: none"> > Consortium project developed. Alternative funding sources to be sought. > Design & production brief written for “How To” video and fact sheets.
Objective 2 – Pipes & Profiles		
Develop a more consistent supply of pipe & profile material for reuse/ recycling	Maintain recovery program in Sydney, Melbourne, and Brisbane.	<ul style="list-style-type: none"> > Pipemakers and APP signed agreements with recyclers. > Adelaide recycler identified. > NSW recycling operation ceased due to closure of recycling business. > Ongoing discussions held with Melbourne pipe recycler.
	Identify additional sources of waste which can be reprocessed by pipe makers.	
	Review collection and reprocessing arrangements.	<ul style="list-style-type: none"> > Iplex and Vinidex plan collection points at retail outlets, for reprocessing in NSW and Queensland.
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.	Company by company activity.	<ul style="list-style-type: none"> > Company by company activity includes: <ul style="list-style-type: none"> – Collection of offcuts on construction sites – Shipment of waste back to factories. > Take-back programs offered.
Objective 4 – Bottles		
Support the Vinyl Bottle Group in continually enhancing recovery and local recycling of PVC bottles.	Actively engage with the Vinyl Bottle Group to support their activities.	<ul style="list-style-type: none"> > Project meetings held in March and August. > Addressed issues relating to liquidity, high processed bottle material stock, and supply quality.

OBJECTIVE	ACTIONS	2011 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.	Conduct initial trial of PVC coated fabrics with Rojo Pacific.	<ul style="list-style-type: none"> > Trial of 1500kg of sheeting resulted in 80% of PVC separated from the polyester fibre. PVC recovered and recycled into new vinyl products.
	Conduct larger scale trial to examine potential collection systems.	<ul style="list-style-type: none"> > 3500kg of material recycled. Issues with fibre content in the recyclate. > PVC samples tested for contamination.
	Identify possible end uses for the PVC recyclate and PE fibres.	<ul style="list-style-type: none"> > Samples sent to banner manufacturer. > Potential end user of PE identified. > Discussed use of PVC recyclate by mat manufacturer.
Objective 6 – Management		
Address barriers to increased recycling of PVC.	Identify and engage with relevant stakeholders.	<ul style="list-style-type: none"> > ReSource Summit held in May 2011 with 60 delegates attending. Provided an opportunity for the whole supply chain to consider strategies to develop viable recovery and recycling operation for PVC in Australia.
Implement the Vinyl Industry Recycling Strategy.	Maintain regular Steering Group meetings Establish Implementation Groups: <ul style="list-style-type: none"> > Market Design Implementation Group > Business Viability Implementation Group 	<ul style="list-style-type: none"> > Two meetings held: October and November. > Strategy finalised. > Membership of Implementation Groups established. > First meetings scheduled for February 2012.
Develop mechanisms for improved data collection and reporting of PVC recycling.	Identify possible targets for measuring recycling activity.	<ul style="list-style-type: none"> > Literature review conducted. Brief paper published. > To be taken up by the Vinyl Industry Recycling Strategy Steering Group.
Objective 7 – Education		
Increase awareness of PVC recycling and recyclability	Promote, encourage and support PVC recycling activities	<ul style="list-style-type: none"> > In addition to promotion and hosting of the ReSource Summit, trade articles on recycling and Product Stewardship released in September.



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 2011 (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 2011 to 31 December 2011. 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 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 seven Signatories during the reporting period, with the following limitations:

- Seven Signatories were selected for verification by the VCA. These signatories were selected by Net Balance and the VCA to provide an appropriate representation sample of the Signatory group, which comprised 31 organisations in 2011. 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 2012. 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 80 selected data points.
- 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 five selected Signatories.



- Reviewing data from an additional two Signatories via desk-top assessment including telephone and e-mail dialogue.
- Completing a logic review for compatibility and consistency on the remaining data submitted by Signatories, which was not formally verified by Net Balance.

Signatories subjected to site-based review were:

- Berry Plastics: 22 Reserve Street, Preston, VIC
- Rojo Pacific: 1/50 Rooks Road, Nunawading, VIC
- Australian Plastic Profiles: 12 Cawarra Road, Caringbah, NSW
- Tech Plas Extrusions: 321 Wentworth, Pendle Hill, NSW
- Plaspak Peteron: 36–42 Hydrive Close, Dandenong South, VIC

Signatories subjected to desktop review were:

- Kenbrock Flooring: 63 Waterview Close, Dandenong South, VIC
- Tyco Water: 60 Maffra Street, Coolaroo, VIC

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 45 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. Net Balance relied on its own opinion relating to the Certificate of Compliance to the Best Practice Guidelines for PVC in the Built Environment for Corvic PVC Resin manufactured by Australian Vinyls Corporation Ltd. 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 the reporting year. 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. The verification team 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

Based on the verification procedures undertaken, the following represents Net Balance's opinion:

On data submitted by Signatories:

- Due to some ambiguity in the data survey, there was an inconsistent approach as to which Signatories responded to commitment 2.2 open disclosure. VCA will amend the data survey by providing further clarification of relevance in the 2012 data collection process.
- Data survey revised in 2011, however there is still an opportunity to streamline and improve the process. For example, in the data survey there was some inconsistency with the titles of reference documents which created some confusion amongst Signatories. For example, the data survey references the industry Code of Practice for the Use of Stabilisers and the reference document is titled "Code of Practice for the Use of Lead and Cadmium in PVC Products in Australia."
- Adherence to Commitment 1.3 Minimum Standards for Environmental Management Systems continues to present a challenge for the smaller Signatories.
- Signatories were not assessed for their compliance against Commitment 4.2 Waste Management – Signatory Resource Efficiency because it was a voluntary commitment.
- There continues to be some confusion regarding the requirements of Commitments 4.4 Encouraging Consumer Responsible Care and 4.5 Life Cycle Thinking.
- 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.

The way forward

VCA has developed a sound process for collecting and reporting Signatory performance information against the commitments of the PSP. This public and transparent reporting against commitments is helping to raise the standard of environmental performance in the vinyl industry in Australia.

To continue to drive improvements in environmental performance and reporting amongst its Signatories, it is recommended that the VCA continues to:

- Seek feedback from Signatories regarding their experience using the data survey and their preferred method for reporting. Based on this feedback consider alternative methods for collecting data such as online tools. This may assist to achieve complete reporting. Ensure the language used throughout the data survey is consistent.
- VCA should finalise the criteria for determining commitment relevance and review the PSP commitments with each Signatory to determine and confirm relevant commitments. This will ensure consistent application of the revised relevance criteria and provide an opportunity to confirm Signatory understanding of their PSP reporting requirements. This may assist to achieve complete reporting.



- To support the update of commitment compliance criteria it is recommended that VCA communicates the refined criteria to all Signatories. To achieve greater compliance, VCA may consider engaging with each Signatory to discuss and clarify commitment requirements and explore pathways towards compliance. In particular, the VCA should focus on:
 - Codes of Practice, such as the Code of Practice for the Use of Stabilisers.
 - 1.3 Minimum Standards for Environmental Management Systems and embedding their EMS in Business Management Systems.
 - 4.3 Encouraging Consumer Responsible Care.
- VCA should finalise the compliance criteria for existing and new commitments such as the Energy Efficiency and Greenhouse Gas Emissions Charter ensuring the criteria is clearly defined and verifiable. The revised compliance criteria should be communicated to all Signatories. VCA may consider engaging with each Signatory to discuss and clarify commitment requirements and explore pathways towards compliance. In particular, the VCA should focus on:
 - 2.2 Open disclosure where the compliance and measurement criteria do not match the commitment description. The measure requirement of a record keeping system is not aligned with the intent of the commitment itself.
 - 4.2 Waste management – Signatory Resource Efficiency: Review and update criteria so that it is mandatory to improve waste management.
 - 4.4 Lifecycle Thinking: Commitment criteria could be further defined to require formal action and guidance.
- VCA should provide additional guidance regarding the verification process, including an outline of VCA's expectations of Signatories involved in the verification process. This will assist to streamline the verification process and reduce the resource burden on Signatories to complete the audit.
- Continue to document the organisational knowledge and refine the internal systems and to ensure the internal processes are robust, consistent and verifiable.
- Develop strong and measurable new commitments as current commitments are achieved. New commitments should reflect material issues within the industry, drive best practice and enable accurate progress reporting.

These have been outlined in a more detailed report presented to the VCA.

On behalf of the verification team
11 May 2012
Melbourne, Australia

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

Technical Steering Group

The Technical Steering Group met three times during 2011, reduced from the usual four meetings held in previous years. The December 2011 meeting was cancelled due to the earlier retirement of Barry Black, Product Stewardship Program Manager, and a delay in the start of the new recruit taking up this role.

Members of the Technical Steering Group in 2011 were:

Representative

Keith Falk
Peter Byron
Nigel Jones / Andrew Ferguson
Tom Elovaris
Alex Hruza
Mike O'Shea / Gary Peeters
Peter Marshall

Chris Low
Alan Whittle
Andrew Simmons
Nick Hayhurst
Kevin Doidge
Ian Lilja / Neil Stewart
Colin Bray
George Macovaz (chair)
Barry Black (secretary)
Sophi MacMillan
Matthew Hoyne / Stephen Dowling

Observers

Stephen Loffler
Shlomi Bonet



Organisation

Aperio Group (Australia) Pty Ltd
Armstrong World Industries Pty Ltd
Australian Vinyls Corporation Pty Ltd
Berry Plastics (Australia) Pty Ltd
Chemson Pacific Pty Ltd
CSIRO
Department of Sustainability Environment
Water Population & Community
Gerflor Australasia Pty Ltd
Iplex Pipelines Australia Pty Ltd
NSW Office of Environment and Heritage
Plastral Pty Ltd
Polyflor Australia Pty Ltd
Sun Ace Australia Pty Ltd
Tarkett Australia Pty Ltd
Vinidex Pty Ltd
Vinyl Council of Australia
Vinyl Council of Australia
Welvic Australia Pty Ltd

Organisation

Sustainability Victoria
Green Building Council of Australia

2011 Signatory List

Six Signatories joined the Program during 2011:

- > **Deceuninck Pty Ltd**
- > **Envorinex**
- > **Innova International Pty Ltd**
- > **Plustec Pty Ltd**
- > **Primaplas**
- > **Profine International Profile Group.**

Signatories joining after November were not required to report on 2011 activities.

Forbo Floorcoverings Pty Ltd was de-listed as a Signatory in 2011 for failure to meet the reporting requirements for 2009 and 2010. While de-listing a Signatory is regrettable, maintaining the integrity of the Program is paramount, and this depends on Signatories meeting obligations and enabling transparent public reporting.

At the end of 2011 the following companies were Product Stewardship Program Signatories:

Advance Cables Pty Ltd
Altro APAC Pty Ltd
Aperio Group [Australia] Pty Ltd **Foundation Signatory**
Armstrong World Industries Pty Ltd **Foundation Signatory**
Australian Plastic Profiles Pty Ltd
Australian Vinyls Corporation Pty Ltd **Foundation Signatory**
Berry Plastics [Australia] Pty Ltd **Foundation Signatory**
Chemson Pacific Pty Ltd **Foundation Signatory**
Dincel Construction Pty Ltd
Deceuninck Pty Ltd
Poly Marketing T/A Envorinex
Gerflor Australasia Pty Ltd
Innova International Pty Ltd
Iplex Pipelines Australia Pty Ltd **Foundation Signatory**
Kenbrock Flooring Pty Ltd
Pacific Plastics Qld Pty Ltd
Pegulan Floor Coverings Pty Ltd
Pipemakers Pty Ltd
Plaspak-Peteron Pty Ltd **Foundation Signatory**
Plastral Pty Ltd **Foundation Signatory**
Plustec Pty Ltd
Polyflor Australia Pty Ltd
Primaplas Pty Ltd
Profine International Profile Group
Rojo Pacific Pty Ltd
Signature Floorcoverings Pty Ltd
Specialty Polymers and Chemicals Pty Ltd
Sun Ace Australia Pty Ltd **Foundation Signatory**
Tarkett Australia Pty Ltd
TechPlas Extrusions Pty Ltd **Foundation Signatory**
Terminals Pty Ltd **Foundation Signatory**
Tyco Water **Foundation Signatory**
Ubique Polymers Pty Ltd
Vinidex Pty Ltd **Foundation Signatory**
Welvic Australia Pty Ltd **Foundation Signatory**

Glossary

APC	Australian Packaging Covenant
ARFA	Australian Resilient Flooring Association
BBP	Butylbenzyl phthalate
Converter	A manufacturer of PVC product from resin or compound.
DBP	Dibutyl phthalate
DEHP	Diethylhexyl phthalate
DIDP	Diisodecyl phthalate
DINP	Diisononyl phthalate
EMS	Environmental Management System
GHG emissions	Greenhouse gas emissions
MRF	Materials Recovery Facility
NICNAS	National Industrial Chemicals Notification and Assessment Scheme. The Australian Government regulator of industrial chemicals.
NGO	Non government organisation
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.
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
PIPES PHTHALATES PACKAGING
RIGID PROFILES WINDOW
PROFILES ADDITIVES RESIN
STABILISERS COMPOUND CABLE
FLEXIBLES PACKAGING RIGID
PIPES FLOORING RIGID PROFILES
WINDOW PROFILES ADDITIVES
RESIN STABILISERS COMPOUND
CABLE FLOORING FLEXIBLES
PACKAGING RIGID PIPES RIGID
PROFILES WINDOW PROFILES
ADDITIVES RESIN PHTHALATES
COMPOUND CABLE FLOORING
FLEXIBLES PACKAGING RIGID
PIPES RIGID PROFILES WINDOW



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