



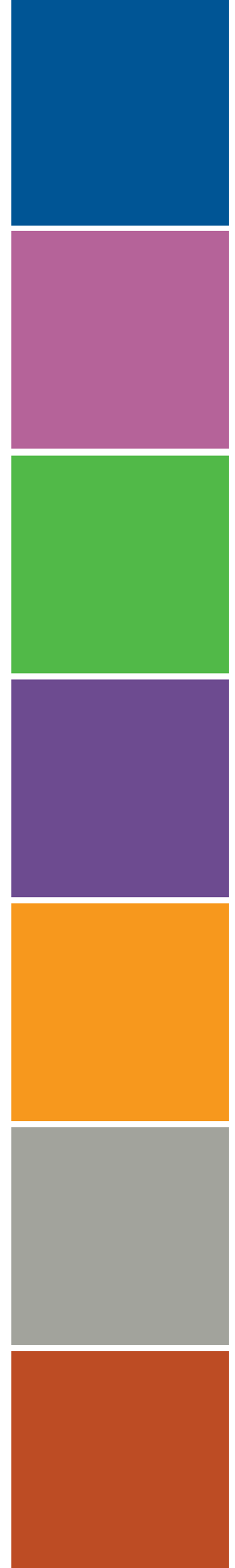
Vinyl 2010

Progress Report

2 0 0 5

Report on the activities of the year 2004





Vinyl2010

Progress Report

2 0 0 5



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EXECUTIVE SUMMARY

THE VOLUNTARY COMMITMENT AND VINYL 2010

Signed in 2000, the Voluntary Commitment is a ten-year plan to deliver continuous improvements in product stewardship across the lifecycle of PVC. Vinyl 2010 puts this into practice within the framework of Sustainable Development. It aims to minimise the environmental impact of PVC resin production, establish a comprehensive waste management strategy and ensure plasticisers and stabilisers can be used safely.

Vinyl 2010 emphasises clear numerical targets on recycling, significant investment on scientific and technical research, expanding technical expertise, practical experience, transparency and promoting social dialogue. Progress against targets is reported via independently audited annual reports.

DEVELOPMENTS IN 2004

2004 saw continued solid progress toward the intermediate targets set for 2005 with certain outstanding highlights and – as to be expected in any ‘learning by doing’ approach – new challenges and some setbacks.

RESIN MANUFACTURING

During 2004 the European Council of Vinyl Manufacturers (ECVM) continued to make progress with respect to its two Charters aimed at minimising further the environmental impact and improving the eco-efficiency of PVC resin production.

An ECVM Task Force initiated a comprehensive study on the compliance results of the Charter on S-PVC, Ethylene Dichloride (EDC) and Vinyl Chloride Monomer (VCM) and an upgrade of measurement methodologies. Meanwhile, verification of the E-PVC Charter has been conducted.

PLASTICISERS

In 2004, the European Council for Plasticisers and Intermediates (ECPI) contributed more than €630,000 to research on mechanisms of reproductive toxicity, epidemiology studies on asthma, human exposure and biomonitoring. A major study with human volunteers is now scheduled for 2005. EU Risk Assessments on plasticisers dibutyl phthalate (DBP), diisononyl phthalate (DINP) and diisodecyl phthalate (DIDP) moved forward to the final stages of completion. The risk assessments for di-(2-ethylhexyl) phthalate (DEHP) and butyl benzyl phthalate (BBP) are still under discussion by the EU Member States but are expected to be completed in 2005.

STABILISERS

The challenging target set for end 2005 on the reduction of lead stabiliser sales by 15% by members of the European Stabiliser Producers Association (ESPA) was reached ahead of schedule in 2004. However, the industry will have to maintain its vigorous and demanding efforts in 2005 and prepare actively for the next reduction targets. Vinyl 2010 will organise external verification of the 2005 figures.

WASTE MANAGEMENT PROJECTS

Overall progress was again strong in the EuPC – European Plastics Converters – sectoral projects. Collection schemes for end-of-life PVC products continued to develop, to learn from experience and benefit from synergies with each other.

Paradoxically, however, high demand, rising raw material prices and the intrinsic longevity of many PVC applications, appear to be exercising downward pressure on the availability of end-of-use PVC to collect and recycle.

Highlights of the waste management projects over the year were:

- Recycled post-consumer window waste from the projects operated by EPPA (the European PVC Window Profile and Related Building Products Association) rose to 5,429 tonnes. Recycled post-consumer related profiles waste reached 2,865 tonnes. New schemes began in Sweden, Norway, Italy and Ireland.
- TEPPFA (the European Plastic Pipes and Fittings Association) recycled 5,640 tonnes of PVC pipes and fittings. National schemes performed well in most countries. Strong demand for recyclates and greater professionalism in the sector were encouraging.
- ESWA (the European Single Ply Waterproofing Association) recycled 568 tonnes of PVC waste from roofing membranes – representing more than 25% of the total collectable available PVC waste for this application.
- The Edelweiss study project matured into the “ROOFCOLLECT Recycling System for Thermoplastic Membranes” with a geographical extension and an enlargement of scope. At national level, operations were consolidated and extended in Germany – the largest market – and began in Austria, Benelux and France. Preparations were also made to initiate systems in Italy and in the Nordic countries in 2005.
- Recovynyl analysed existing collection projects to evaluate availability and cost of collecting PVC waste, especially in Belgium and Germany. Recovynyl supports the Vinyl 2010 recycling targets via financial and other incentives to facilitate collection and dispatching.
- The flooring collection schemes of EPFLOOR (the European PVC Floor Manufacturers) were particularly successful achieving 972 tonnes - an increase of 68% over 2003. The association will continue to focus on the development of existing national collection schemes in 2005. EPFLOOR also deepened its understanding of options and financial viability through a series of important tests to evaluate a variety of recycling technologies.
- Concerning coated fabrics, EPCOAT (EuPC PVC Coated Fabrics Sector Group) feasibility studies continued. In particular, research by SFEC – the French calendaring and coating association – identified where and how to collect potentially recyclable homogeneous waste. A trial collection project started in Germany in cooperation with RWE, a major waste management operator. The German company Friedola also upgraded its existing recycling plant in preparation for further practical trials.

NEW RECYCLING TECHNOLOGIES AND TRIAL PLANTS

With financial support from the EU LIFE programme and from Vinyl 2010, the Danish company RGS-90 brought to near completion a full-scale industrial demonstration project for recycling of PVC waste into oil, salt and minerals. The plant has the capacity to recycle 50,000 tonnes of PVC waste per year. Start-up is projected for summer 2005.

The Redop project (REDuction of iron Ore in blast furnace plants by Plastics from municipal solid waste) is a feedstock recycling treatment for mixed plastics/cellulose fractions from municipal solid wastes (MSW). Approximately one tonne of Redop pellets was produced and successfully used in a blast furnace of the CORUS steel company. Redop is considering further industrial scale trials in 2005.

Since February 2002, Vinyloop has operated a full-scale demonstration plant at Ferrara, Italy, based on solvent technology. The first of its type in the world, the plant encountered technical difficulties caused principally by the quality and consistency of the cable-waste raw material. This necessitated further research and development. The Ferrara plant was also used to test new residue streams such as blisters, roofing and flooring.

Supported by Vinyl 2010, the Halosep-Watech process involves the treatment of flue gas residues arising from municipal solid waste incinerators to recover chlorides and heavy metals. The pilot plant will be operational in early 2005 with a testing programme until June.

OTHER PROJECTS

Certain building applications use light concrete for floors or walls where low weight and high thermal and sound insulation are required. A study in 2004 concluded that it is technically and economically feasible to use PVC waste from construction and demolition. Further studies are now underway.

The definition of recycling is important. In 2004, Vinyl 2010 commissioned a legal assessment in cooperation with German incinerator operator MVR Müllverwertung Rugenberger Damm GmbH & Co. KG. Preliminary analysis indicates that incineration should be considered as an energy recovery operation (and not as waste disposal). The second step (HCl recovery) can, under certain conditions, be classified as recycling.

MONITORING, ACCESS TO INFORMATION, AND STAKEHOLDER RELATIONS

GUIDANCE FROM THE MONITORING COMMITTEE

The Monitoring Committee guides Vinyl 2010 and furthers dialogue with stakeholders to help industry provide information that meets their needs and expectations. Under the chairmanship of Professor Alfons Buekens of the Free University of Brussels (VUB), the Committee held two meetings in 2004 with senior representatives from EU institutions and from trade unions.

FINANCE

Expenditure by Vinyl 2010, including EuPC and its members, on various waste management projects totalled €4.15 million in 2004.

INDEPENDENT AUDITS

Vinyl 2010 aims for maximum transparency and has engaged independent auditors and verifiers.

- The financial accounts were audited and approved by KPMG.
- KPMG also audited the statement of tonnages of products recycled.
- The 2005 Progress Report was reviewed by DNV Consulting and verified as giving a true and honest representation of Vinyl 2010's performance and achievements.

ENCOURAGING PUBLIC ACCESS TO INFORMATION

The industry provides wide and open access to information about Vinyl 2010's work. Throughout the year Vinyl 2010 maintained its programme of participation in meetings, presentations and presence at major conferences such as Green Week and the 9th European Roundtable on Sustainable Consumption and Production. A major endorsement was the decision by the United Nations Commission on Sustainable Development to register Vinyl 2010 as an official partner.

All annual Progress Reports, published since 2001, are available in the main EU languages on www.vinyl2010.org.

EU ENLARGEMENT & SOCIAL DIALOGUE

Vinyl 2010 continued its efforts to improve social dialogue and standards on health, safety and the environment in Central and Eastern Europe. Representatives from the 10 new EU Member States attended a seminar in April 2004 in Budapest, organised by Vinyl 2010.

2005 MIDTERM REVIEW

From the beginning, industry committed publicly to review its progress and objectives at midterm. As part of its learning-by-doing approach, Vinyl 2010 will examine and reappraise by the end of this year all basic assumptions – including its waste availability model – activities and targets, particularly in the context of EU enlargement and specific needs of new EU member states. The review will be conducted in close cooperation with the Monitoring Committee.

THIS IS VINYL 2010

Vinyl 2010 shows the commitment of the PVC industry to present and future generations and aims at ensuring high levels of economic dynamism, environmental protection and social welfare as part of Sustainable Development.

In practical terms Vinyl 2010 is the legal entity that provides the organisational structure and financial resources to implement the European PVC industry's Voluntary Commitment. This Commitment includes specific targets and initiatives on emission monitoring during PVC production, the usage of additives and, at end of life, waste management. It operates through projects covering technology, research, collection and recycling of post-consumer waste and communication to all stakeholders.

To our knowledge, it is the only Voluntary Commitment involving the entire upstream and downstream chain of a given material – from raw-material production to post-consumer waste – in a single industry in Europe or elsewhere.

THE FOUR FOUNDING ASSOCIATIONS ARE:



the European Council of Vinyl Manufacturers



the European Plastics Converters



the European Stabiliser Producers Association



the European Council for Plasticisers and Intermediates

FOREWORD

LEARNING FROM DOING

This is my first Progress Report as Chairman and I am delighted to see how our activities once again demonstrated innovation, determination and learning from technical and economic challenges.

Over the year we continued to achieve solid progress with some outstanding highlights. I am particularly pleased to report that the United Nations Commission on Sustainable Development registered Vinyl 2010 as an official partner, acknowledging the PVC industry's commitment and hard work.

I am delighted that our challenging target set for end 2005 on the reduction of lead used as a stabiliser has already been reached in 2004. However, our industry will have to maintain its vigorous efforts in 2005 and prepare actively for the next reduction targets.

At the core of our initiative, Vinyl 2010 waste collection and recycling projects covering major long-life applications cooperated well, shared experience and progressively built on their successes.

In this learning-by-doing approach, we experienced during 2004 the intensification of a paradoxical handicap: the apparent decreasing availability of PVC waste to recycle. The steep rise in oil prices and consequent increases in the cost of virgin PVC together with very high demand in Asia and Eastern Europe combined to make 'end-of-life' PVC applications increasingly valuable for direct reuse. At the same time, we believe that certain PVC products – such as pipes – could be lasting even longer in service than we expected. More durable and reused, our products are more valued and less waste is available for collection and recycling.

These factors may have profound implications in terms of reaching the numerical targets we have set and even more for the further expansion of our waste management schemes in Eastern European countries. We need to look carefully this year at all the parameters of our waste database to ensure that they match real conditions on the ground.

In the meantime, recycling operations have been characterised both by exciting developments and by some frustration. I am particularly pleased to note that the Stigsnaes feedstock recycling plant in Denmark neared completion recently. Funded by Vinyl 2010, the European Community and private investors, this brand new, state-of-the-art facility is the first of its kind in the world. On its own, it has the capacity to recycle at least 50,000 tonnes per year of waste material.



Similarly, the Redop project – exploring the use of PVC and other polymers as an alternative to coke in steel production – also moved ahead. Underlining, however, technical challenges in recycling, the Vinyloop plant in Italy encountered unexpected difficulties despite careful and thorough preparation in the trial phase. Such temporary setbacks are normal in breaking new ground.

Vinyl 2010 is concerned with fundamental Sustainable Development issues of protecting health and environment. EU Risk Assessments on phthalates plasticisers continued and, although progress was once again slow, we are confident that the end of the process is near.

Vinyl 2010's Monitoring Committee, which reviews and advises on our progress, met twice in 2004. The report of the Chairman follows below.

Industry reaffirmed its commitment to go ahead working toward the targets of the Voluntary Commitment despite the absence of the long awaited Communication from the European Commission.

The essence of Vinyl 2010 is partnership. As part of our communications activities we continued to attend major conferences and events dedicated to sustainability and are constantly reaching out to other stakeholders.

Through Vinyl 2010, the whole industry is working to build a sustainable future for PVC as part of a society attuned to economic dynamism, environmental protection and social welfare. These are goals of which we are rightly proud to be part.



Nicolas Paul Neu
Chairman Vinyl 2010

STATEMENT FROM THE CHAIRMAN of the Monitoring Committee

My task as Chairman of the Monitoring Committee and that of my colleagues is not just to oversee Vinyl 2010's activities. We are charged to understand in depth the many and varied projects of this ambitious undertaking and to feed back ideas, suggestions and possible concerns. This is why I am working hard to maintain and enlarge the variety of stakeholders represented in the Committee in order to provide a healthy balance of social, political, environmental and ethical views.

I am pleased again to report that industry members have provided information in a timely, thorough and transparent way across the many different aspects of the Voluntary Commitment. External independent verifiers have continued to audit quantitative targets such as recycling volumes and emissions.

I also consider it vital to gain practical knowledge from the field. In addition to receiving and reviewing information, we visit plant managers, recyclers, traders and others with hands-on experience. Such reality checks consume time but are part of our monitoring mission.

One of the most challenging aspects of the Voluntary Commitment involves the recycling of post-consumer waste because this assumes responsibility for material that has been produced many decades ago. This is not an easy undertaking and there are many practical hurdles.

How, for example, to convince workers or scrap dealers to retrieve PVC when demolishing buildings or scrapping equipment? How to sort PVC from rubble and how to promote the identification and separation of different plastics? It requires more than goodwill and R&D funding, yet it is part of the Voluntary Commitment. This requires educating and motivating workers and consumers in general. A broad change in current attitudes toward waste is critical to success.

This is particularly true in an enlarging European Union. Vinyl 2010 has continued to move forward with its efforts to help new EU countries improve their standards on health, safety and the environment. I was delighted to see more than 75 representatives from the 10 new EU Member States in April 2004 in Budapest, at a seminar organised by Vinyl 2010.

I was genuinely touched by the enthusiasm with which these new Member States have embraced the "old" Europe. A second such seminar for new member states is scheduled in Riga in May 2005.

Meanwhile in 2005 the Committee will work on the mid-term review of targets. Planned from the outset of the Voluntary Commitment, the review will be based on achievements to date and our assessment of the scope and opportunities of the next five years to 2010.

Vinyl 2010 is a serious commitment to Sustainable Development. I should especially like to thank the members of the Committee who left us this year for their time and hard work with Vinyl 2010. We have benefited significantly from their experience and insights.

Some stakeholders have been very critical of PVC, which they hold responsible for environmental and other problems. In private conversation, however, representatives of many environmental and other Non Governmental Organisations have expressed a positive assessment of what Vinyl 2010 is doing, but to date none of them has yet accepted to be part of the Monitoring Committee. I urge them to help us in our efforts to make a real contribution to Sustainable Development. They would be cordially welcome.



Alfons Buekens



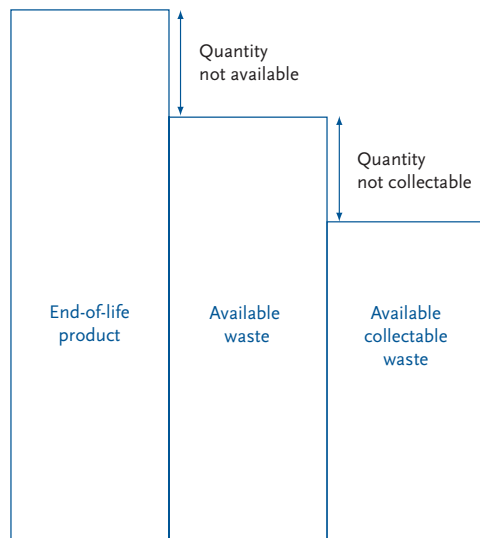
CONCEPTS OF WASTE

At the end of their useful life, all products become waste. As with all other products modern society requires a responsible management of PVC waste. This means promoting and implementing a wide range of eco-efficient options to minimise sending to landfill and boosting more sustainable solutions such as recycling and energy recovery.

In its Voluntary Commitment, the European PVC industry actively supports an integrated life cycle approach that uses raw materials as efficiently as possible and utilises the most sustainable end-of-life options. This support is both initiated and implemented by Vinyl 2010. The objective is to achieve a total of 200,000 tonnes of recycled post-consumer PVC waste per annum in Europe by the end of 2010, excluding waste streams already subject to other or more specific legislation (such as End-of-Life Vehicles and Waste Electric and Electronic Equipment).

A practical difficulty that will only be surmounted by sustained effort is to access PVC products, often sold long ago, at the time of their end-of-life, so that they can be made available for collection and recycling. Moreover, it is desirable to organise this process of retrieval so that unit loads (e.g. a container) can conveniently be constituted for shipping to the recycling centres. The variety, low weight and bulk of plastic products are sources of serious logistic challenges faced by Vinyl 2010 in its recycling targets.

WASTE - AVAILABLE AND COLLECTABLE WASTE



The definition of the concepts of collectable and available waste is illustrated by the graph here above.

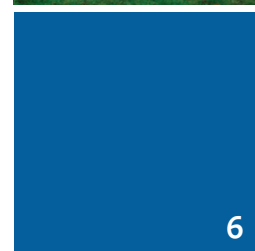
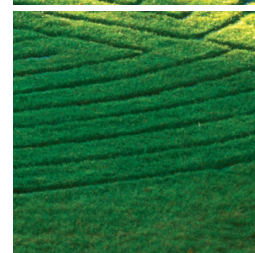
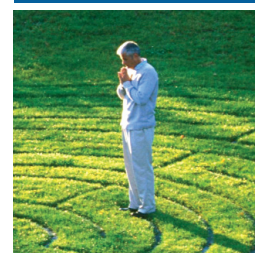
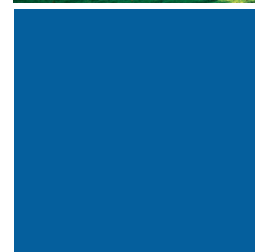
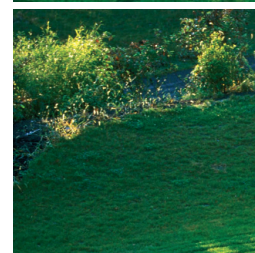
The notion of “available collectable waste” refers to the definition of our Voluntary Commitment. The amount of “available collectable waste” equals the total quantity of end-of-life product, minus the quantity of product not available for collection (e.g. pipes staying in the ground after their decommissioning), minus the quantity of product not collectable for economical or technical reasons (e.g. products made of many different materials such as electronic scrap).

This definition has also been included in the “Good practices guide on waste plastics recycling – A guide by and for local and regional authorities”, the manual produced in the framework of our collaborative project with the Association of Cities and Regions for Recycling (ACRR).

In its yearly report, Vinyl 2010 calculates the recycled and collected volumes for each application stream on the basis of studies, models, sales statistics and estimates gathered from member associations and experts. The volumes recycled are validated by the independent auditors KPMG.

The progress of scientific knowledge and the results of research in the field may therefore modify the previous forecasts. As an example, the ACRR study in Catalonia showed that the volumes of plastics wastes from demolition sites are lower than expected. New studies presented during the Plastic Pipes XII congress demonstrated that PVC pipes may last longer than expected, improving their sustainability but reducing the volume of waste available for entering a second lifetime.

For these reasons, Vinyl 2010 is committed to revise periodically its data to ensure they are complete, transparent and accurate.





Vinyl2010
2005

Working together

WORKING TOGETHER

The Monitoring Committee

Since 2003, Vinyl 2010 has established a Monitoring Committee with responsibility to monitor the PVC industry's progress on the Voluntary Commitment, involve all stakeholders more closely with Vinyl 2010 activities and guarantee maximum transparency.

Under the Chairmanship of Professor Alfons Buekens of the Free University of Brussels (VUB), the Monitoring Committee held two meetings in 2004 with senior representatives from European Union institutions and from Trade Unions. Mrs. Conceptio Ferrer and Mr. Bernd Lange, who both left the European Parliament in June 2004, will be replaced on the Committee in 2005.

During its meetings, the Monitoring Committee studied the practical aspects and implications of the various commitments, heard reports from all parties involved and monitored the progress made on various issues. These meetings contribute actively to Vinyl 2010's stakeholder dialogue and help the industry provide information that meets their needs and expectations.

Moreover, the Monitoring Committee has been involved in preparing and reviewing the progress report before approval.

On several occasions NGOs representing environmental and consumers' interests have been invited to join the Committee, but did not appoint any representatives.

The minutes of the Monitoring Committee can be found on the Vinyl 2010 website.

MEMBERS

Professor Alfons Buekens, VUB⁽¹⁾,

Chairman of the Monitoring Committee

Mrs. Conceptio Ferrer, Member of the European Parliament, Industry Committee⁽²⁾

Mr. Bernd Lange, Member of the European Parliament, Environment Committee⁽²⁾

Mr. Patrick Hennessy, Director, European Commission, Directorate General Enterprise

Mr. David-Grant Lawrence, Director, European Commission, Directorate General Environment⁽²⁾

Mr. Timo Mäkela, Director, European Commission Directorate General Environment⁽³⁾

Mr. David Thompson, Chairman of Vinyl 2010⁽⁴⁾

Mr. Nicolas Paul Neu, Chairman of Vinyl 2010⁽⁵⁾

Mr. Joachim Eckstein, Vice Chairman of Vinyl 2010

Mr. Alexandre Dangis, Managing Director of EuPC

Mr. Jean-Pierre De Grève, Secretary General of Vinyl 2010

Dr. Brigitte Dero, Secretary General of ESPA

Mr. Oraldo De Toni, Political Secretary of EMCEF⁽⁶⁾

Mr. Reinhart Reibsch, General Secretary of EMCEF

Notes: ⁽¹⁾ VUB: Free University of Brussels — ⁽²⁾ Member until June 2004 — ⁽³⁾ Member since November 2004 — ⁽⁴⁾ Chairman of Vinyl 2010 until December 2004 — ⁽⁵⁾ Chairman of Vinyl 2010 since December 2004 — ⁽⁶⁾ EMCEF: European Mine Chemical and Energy Workers Federation

Stakeholder Dialogue

Vinyl 2010 is constantly seeking dialogue with its stakeholders to promote and share best practice.

EUROPEAN UNION ENLARGEMENT

During 2004, Vinyl 2010 has been actively pursuing contacts in the Accession Countries, among others PVC resin manufacturers in Hungary, the Czech Republic, Poland and Slovakia and with plastic converters throughout the 10 new EU member states.

Vinyl 2010 organised a seminar on health, safety and the environment in Budapest in April 2004. More than 75 representatives from the 10 new EU member states attended with a view to furthering best practice throughout the entire EU region.

Another seminar is scheduled in Riga in May 2005.

UNITED NATIONS PARTNERSHIP



Since October 2004, the United Nations Commission on Sustainable Development has registered Vinyl 2010 as an official partner for sustainable development.

Vinyl 2010 submitted its candidature to the United Nations (Division for Sustainable Development, Department of Economic and Social Affairs) Partnership Team after participating in the International Forum on Partnerships for Sustainable Development in March. The forum was organised by the Italian Ministry of Environment in cooperation with the United Nations. For more information on this partnership, please visit:

<http://webappso1.un.org/dsd/partnerships/public/partnerships/1132.html>

CONFERENCES AND EXHIBITIONS

Throughout 2004, Vinyl 2010 continued to play an active role in the debate on sustainability all over Europe. Consumers, environmental NGOs, other industries and authorities have often been positively surprised by the number of challenging projects sponsored by the European PVC industry and the scale and scope of the recycling technologies involved. Vinyl 2010 was present at:

- The European Networks Conference on Sustainability in Practice held in Berlin, in April.
- The European Roundtable on Sustainable Consumption and Production organised in May, in Bilbao, by IHOBE (the Environmental Performance Agency of the Basque Government) in collaboration with UNEP, the World Business Council for Sustainable Development and other environmental NGOs, where Vinyl 2010 presented a paper.
- Green Week, organised by the European Commission, in Brussels in June, where Vinyl 2010 presented two speakers and an exhibition stand.
- The International Solid Waste Association congress, in October, in Rome, which was sponsored partially by Vinyl 2010. Vinyl 2010 attended with a stand and two speakers.
- The 25th International Seminar on Waste Management, held in Brussels in June.
- Ecomondo in November, in Rimini, where Vinyl 2010 attended with a stand, two presentations in the poster sessions and three speakers.



Vinyl 2010 Board Members and a Number of Project Managers



From left to right:

Mr. Roger Mottram – *Project Manager*

Mr. Arjen Sevenster – *Controller*

Dr. Michal Rosenthal – *Treasurer*

Mr. Alexandre Dangis – *Board Member*

Mr. Eric Criel – *Project Manager*

Mr. Joachim Eckstein – *Vice Chairman*

Dr. Brigitte Dero – *Board Member*

Mr. Nicolas Paul Neu – *Chairman*

Mr. Jean-Pierre De Grève – *Secretary General*

Mr. Geoffroy Tillieux – *Controller*

Dr. Helmuth Leitner – *Project Manager*

Mr. Tim Edgar – *Deputy Director of ECPI*

Mr. Martyn Griffiths – *Communications Manager*



Vinyl2010 2005

Milestones and Targets

MILESTONES AND TARGETS

Achievements and Results for 2004

QUARTER 1

- **EPCOAT:** initiation of test collection of PVC post-consumer waste in Germany – **Achieved**
- **ESPA:** publication of 2003 statistics on the tonnages of PVC stabilisers produced in the EU – **Achieved**

QUARTER 2

- **EPFLOOR:** evaluation of test with novel mechanical recycling partner in Spain – **Achieved**
- **ESWA:** geographic extension of the project in Benelux, France and Austria – **Achieved**
- **PVC in producing light concrete:** conclusion of feasibility study – **Achieved**
- **Redop:** decision on future steps by Steering Committee – **Scheduled in Q1 2005**
- **Vinyloop Dreux:** completion of feasibility study on the construction of a very large recycling unit – **Achieved**

QUARTER 3

- **Halosep-Watech:** start testing process (slurrying and dewatering) at pilot plant level – **Scheduled in Q1 2005**

QUARTER 4

- **EPCOAT:** signature of the commitment related to the achievement of project objectives in 2007 – **Scheduled in Q4 2005**
- **EPFLOOR:** initiation of recycling of PVC flooring in feedstock recycling plant RGS-S90/Stigsnaes – **Scheduled in Q2 2005**
- **EPFLOOR:** evaluation of pilot collection tests in France, Germany and UK – **Achieved**
- **RGS-90/Stigsnaes:** commissioning of a large-scale feedstock recycling plant – **Scheduled in Q2 2005**
- **UK Mixed PVC Recycling Project:** decision on investment and starting operation – **Achieved**

Targets for 2005

QUARTER 1

- **EPFLOOR:** completion of the first phase of the pilot collection project in France
- **ESWA:** initiation of collection of non-members roofing membranes
- **ESPA:** publication of 2004 statistics on the tonnages of PVC stabilisers
- **Halosep-Watech:** starting of testing process at pilot plant level
- **Redop:** completion of the report of Phase 2 and re-evaluation of economics; Steering Committee to decide future steps
- **UK Mixed PVC Recycling Project:** completion of the study
- **Vinyloop Ferrara:** installation of second generation process equipment

QUARTER 2

- **EPFLOOR:** initiation of recycling of PVC flooring in feedstock recycling plant RGS-S90/Stigsnaes
- **Halosep-Watech:** completion of testing (Phase 2)
- **RGS-90/Stigsnaes:** commissioning of a large-scale feedstock recycling plant and start-up of hydrolysis and pyrolysis

QUARTER 3

- **DEHP and BBP:** final industry input to EU Risk Assessments
- **EPFLOOR:** expansion of collection schemes in Sweden and Austria (around Vienna)
- **EPPA and TEPPFA:** initiation of a joint collection scheme in Spain

QUARTER 4

- **APPRICOD:** conclusions and dissemination of acquired know-how
- **EPCOAT:** signature of the commitment related to the achievement of project objectives in 2007
- **EPFLOOR:** first recycling campaign at RGS-90
- **EPPA, TEPPFA and ESWA:** 50% recycling of collectable, available PVC post-consumer waste from pipes, windows, fittings and roofing membranes
- **ESPA/EuPC:** achievement of the first lead reduction target



Vinyl2010 2005 Project Reports

PROJECT REPORTS

PVC RESIN MANUFACTURING

European resin manufacturers represented by ECVM^(*) are constantly looking at ways to reduce environmental impacts and improve eco-efficiency of their products through compliance with the Industry Charters for producing PVC by the suspension (S-PVC) and emulsion (E-PVC) processes. The ECVM Charters are submitted to external verification by Det Norske Veritas and are an integral part of Vinyl 2010 and hence subject to the scrutiny of the Monitoring Committee.

CHARTER ON S-PVC, ETHYLENE DICHLORIDE (EDC) AND VINYL CHLORIDE MONOMER (VCM)

Signed in 1995, the Charter compliance deadline was end 1998. The first verification of the actual emissions against the Charter requirements took place in 1999 followed by a second one in 2002 by Det Norske Veritas.

In the first quarter 2004, a dedicated ECVM Task Force initiated a comprehensive study based on the results (93% compliance) of this second verification and on an internal survey. Following detailed technical discussions, the Task Force agreed in 2004 on the need to upgrade the method employed to measure fugitive emissions. The upgrade was completed in October 2004. ECVM intends to publish a paper on the corresponding methodology in a specialist technical journal after peer review.

CHARTER ON E-PVC

The deadline for compliance with the ECVM Charter on emulsion PVC was end 2003. In March 2003, ECVM contracted Det Norske Veritas to conduct the first external

verification to assess compliance. As announced in last year's report, the actual achievements for the second half of 2004 were verified by DNV in early 2005.

The overall compliance of this first verification is 71% against the combined three criteria for VCM emissions to air, to water and in final product. While VCM emission to air has been awarded 86% compliance, the compliance for VCM in aqueous effluents is 71%. 57% of the plants achieve full compliance for residual VCM in final products against the single Charter limit of one gramme per tonne for all grades of PVC set by this Charter. However:

- ▶ Across all verified plants, approximately 95% of final E-PVC produced during the verification period complied with this criterion.
- ▶ In addition, all plants-complied with the residual VCM limits mentioned in the ECVM BAT guidelines, which are the same as in the S-PVC Charter, allowing up to 5 grammes per tonne depending on the applications.
- ▶ Some non-compliant companies have already agreed improvement plans. As already the case for VCM and suspension PVC, the full results plant by plant will be available on ECVM's Web site.

INHIBITORS



Following the draft conclusions from the risk assessment on bisphenol-A, conducted under the responsibility of the UK authorities, ECVM member companies voluntarily decided to stop using bisphenol-A as an inhibitor introduced in the polymerisation stage of PVC production from January 1, 2002. Moreover, they agreed to include a commitment about bisphenol-A phase-out in the future revision of the ECVM Charter to ensure proper compliance monitoring.

^(*) ECVM - The European Council of Vinyl Manufacturers

PLASTICISERS

Plasticisers are added to PVC resin to make compounds flexible, resilient and easier to handle for a wide range of final applications.

PLASTICISER RESEARCH

ECPI⁽⁴⁾ continued to invest in research to build up a scientific database and ensure that plasticisers can be used without risk to the environment or human and animal health. In 2004, ECPI contributed more than €630,000 to research on mechanisms of reproductive toxicity, epidemiology studies on asthma, human exposure and biomonitoring. The latter included preparation for a major study with human volunteers, which took longer than expected and is now scheduled for 2005.

RISK ASSESSMENTS

EU risk assessments of the commonly used phthalate plasticisers continued in 2004.

The risk assessments for dibutyl phthalate (DBP), diisononyl phthalate (DINP) and diisodecyl phthalate (DIDP) moved forward to the final stages of completion.

The European Chemicals Bureau has published the technical risk assessments reports on DBP, DINP and DIDP. The latter two show no risk to human health or the environment for any current use but an addendum on DBP concluded that there is a need for “occupational exposure limit values” to reduce risk for workers. Reports are available on www.phthalates.com/RAs. All three phthalates are subject to temporary restrictions on use in toys even though the risk assessment on DINP concluded that no risk measures had to be taken. A Dutch proposal for permanent measures relating to the use of phthalates in toys will undergo a second reading in the European Parliament in 2005.

The risk assessments for di-(2-ethylhexyl) phthalate (DEHP) and butyl benzyl phthalate (BBP) are still under discussion by the Member States. However, these are expected to be completed in 2005.

AVAILABILITY OF INFORMATION

ECPI remains committed to increasing understanding of the safe use of phthalates and invests accordingly:

- ECPI organised a second Global Scientific Workshop in Mello, France, in September 2004, which brought together industry, academic and governmental scientific experts to exchange information and evaluate findings from the latest research studies on the safe use of plasticisers.
- Moreover, several specialist Internet sites have been developed and can be visited at www.plasticisers.org, www.phthalates.com, www.dbp-facts.com, www.dehp-facts.com, www.dinp-facts.com and www.bbp-facts.com.



The screenshot shows the Phthalates Information Centre Europe website. It features a navigation menu on the left with links for Home, About us, Products, Regulations, and more. The main content area includes a 'Latest News' section with an article titled 'PVC flooring makes a fashionable come back' and another titled 'Health and Environmental Facts!'. There are also sections for 'Phthalates - commonly used plasticisers' and 'Other news'.

⁽⁴⁾ ECPI - The European Council for Plasticisers and Intermediates

STABILISERS

Stabilisers are added to PVC to allow it to be processed and to make it resistant to external forces including heat and sunlight (ultraviolet rays).

RISK ASSESSMENTS

Throughout 2004, ESPA^(*) continued its involvement in the risk assessments on cadmium, lead and tin.

As planned in the Voluntary Commitment, ESPA members have stopped the sale of all cadmium stabilisers in the EU 15 since 2001. However, a risk assessment continues within the “EU Existing Chemicals Programme” for an update and potential risk reduction measures. The revision of the “Restrictions on the Marketing and Use Directive 76/769” to ban all uses of cadmium stabilisers, but to include an authorisation to recycle material containing cadmium in building applications, has been delayed.

The publication of the outcome of the voluntary risk assessment of lead carried out by independent experts, which includes reports on effects and exposure to health and environment, due in 2004, has been delayed by three months. The preliminary conclusions of the risk assessment are: conclusion(i)^(**) for workers in the PVC processing industry, conclusion(ii) for the use in PVC and for the production of the stabilisers regarding environmental impact, and conclusion(iii) for worker exposure in stabiliser production. The assessment is now on track for submission to the Dutch rapporteur and is then expected to go, in September 2005, through the Existing Substances procedure for discussion by all EU Member States. This is the first example of such a voluntary procedure.

EUROPEAN PRODUCTION DATA

As committed to in the Vinyl 2010 Progress report 2004, year 2000 statistics were recollected to include all new ESPA members for the same 15 EU Member States before the enlargement of May 2004. The lead figures published in the 2004 Progress Report included Norway, Switzerland and sales by ESPA member companies to Turkey. The corresponding figures have therefore been deducted as part of the recollection process. The year 2004 statistics have also been collected for the same 15 EU countries only. The figures reported in the table below correspond to approximately 97% of the market. The 2001, 2002, 2003 figures provided in the Vinyl 2010 Progress Report 2004 have not been corrected and have therefore been excluded from the table below.

The table below shows that the usage of lead stabilisers has dropped by 16.7% in the five years to 2004.

| Tonnes of stabiliser systems | 2000 | 2004 | Reduction (%) |
|------------------------------------|---------|---------|---------------|
| Formulated* Lead Stabilisers | 127,156 | 105,940 | 16.7% |

*Formulated means that these systems are complete stabiliser/lubricant packages and may also include pigments or fillers as a service to the customer. Their major use is in pipe and profiles for construction and electrical cables.

^(*) ESPA - The European Stabiliser Producers Association

^(**) Note: According to the Technical Guidance Document on Risk Assessment – European Communities 2003 (Article 10 of Regulation 793/93 and as extracted from Annex V of Regulation 1488/94):

Possible results of the risk assessment for existing substances:

Conclusion (i): There is need for further information and/or testing.

Conclusion (ii): There is at present no need for further information and/or testing and no need for risk reduction measures beyond those which are being applied already.

Conclusion (iii): There is a need for limiting the risks; risk reduction measures which are already being applied shall be taken into account.

More information on EU risk assessment guidelines can be found on (page 15 and 16):

http://ecb.jrc.it/Documents/TECHNICAL_GUIDANCE_DOCUMENT/EDITION_2/tgdpart1_2ed.pdf

The table below shows sales of other stabilisers in the 15 EU countries plus Norway, Switzerland and Turkey. To comply with the Cefic statistical rules^(*) these figures have not been recollected.

| Tonnes of stabiliser systems | 2000 | 2001 | 2002 | 2003 | 2004 |
|---|--------|--------|--------|--------|--------|
| Formulated* calcium organic stabilisers e.g. Ca/Zn systems ⁽¹⁾ | 17,579 | 17,988 | 23,946 | 29,758 | 34,771 |
| Tin Stabilisers ⁽²⁾ | 14,666 | 15,614 | 14,756 | 14,180 | 15,207 |
| Liquid Stabilisers – Ba/Zn or Ca/Zn ⁽³⁾ | 16,709 | 13,351 | 13,975 | 13,441 | 14,025 |

*Formulated means that these systems are complete stabiliser/lubricant packages and may also include pigments or fillers as a service to the customer.

Notes on usage:

⁽¹⁾ Includes food-contact and medical applications, plus all lead replacement systems.

⁽²⁾ Used primarily in rigid applications including food-contact use.

⁽³⁾ Used in the wide range of flexible PVC applications, calendered sheet, flooring etc.

In conclusion, the percentage target for 2005 (reduction of lead stabiliser sales by 15% by end 2005) has already been achieved in 2004. This is the result of measures taken in different sectors, where substitution is progressing at varying rates and where significant challenges nevertheless remain. The reduction plan will continue to require efforts in partnership with downstream customer sectors to make sure that the 15% target is again achieved in 2005 and to meet those agreed for 2010 and 2015. External verifiers will audit the Cefic statistics collection process and individual ESPA member figures for lead stabilisers for 2005.

Consumption of calcium organic stabilisers doubled between 2000 and 2004. This is in line with:

- The increase of PVC consumption between 2000 and 2004.
- The fact that less calcium organic stabilisers are needed than lead stabilisers for the same objective. The reduction in dosages can be between 5 and 30% depending on the application.

(*) Under the rules of Cefic – the European Chemical Industry Council – statistics cannot be published if fewer than three companies are reporting. This is to avoid disclosure of individual information.



PVC WASTE MANAGEMENT: SECTORAL PROJECTS

WINDOW PROFILES



The window profile sector represented by EPPA^(*) managed 10 different projects across Europe in 2004 and continued developing synergy projects with other PVC construction products sectors. Recycled post-consumer PVC window waste rose to 5,429 tonnes in 2004 from 4,817 the previous year. The next significant quantified target is to recycle 50% of the total available, collectable volume of post-consumer PVC window frames by end 2005. In addition, recycled post-consumer related profiles waste reached 2,865 tonnes.

EPPA will also need to update its mathematical waste prediction model to take into account the somewhat unforeseen activity involving reused PVC windows and exports for recycling. The reuse of PVC window frames in Europe is increasing and may be substantial. Vinyl 2010 will, in 2005, evaluate these in terms of tonnage for the EU.

National Developments

In the UK, EPPA, through the British Plastics Federation (BPF), works closely with the UK Building Research Establishment (BRE), the National Federation of Demolition Contractors, PVC recyclers and waste management companies to find the most appropriate 'best practice' solutions to collect and manage PVC waste from the construction and demolition sector. Please visit www.wrap.org.uk for more information.

Further expertise was gained, in 2004, in the dismantling, collection and sorting of post-consumer windows via the Oldham refurbishment project, where 950 window units were collected, the Warrington refurbishment project, where 300 units were collected, and the Weaver Vale Housing Trust Project, where 50,000 single-glazed PVC window units are to be replaced with modern double-glazed PVC units.

Throughout 2004, BPF continued its participation in a consultancy project to enlarge glass recycling from windows and examined the feasibility of increasing recovery of PVC alongside glass.

In France, the synergy pilot project with post-consumer window profiles and pipes continued throughout 2004.

Thanks to several contracts with private and municipal construction waste centres, the network of collection points has been enlarged from 45 to 84 and will hopefully reach 90 points in 2005.

Due to a lack of local window shredding capacity for recycling, which results in high transport cost, France still has difficulties in reducing the collection costs to an acceptable level.

In Germany, the joint collection system initiated in 2003 with Rewindo (the largest German clearing house for post-consumer PVC window recycling), the PVC pipe manufacturers (TEPPFA), the roofing membranes manufacturers (ESWA) and the flooring industry (EPFLOOR), has been extended as it facilitates cooperation with the demolition industry and the German Chambers of Commerce. Rewindo increased the amount of post-consumer PVC windows waste recycled by nearly 400 tonnes to 3,709 tonnes. (For more details, please visit www.rewindo.de).

In Denmark, under the WUPPI A/S recycling venture, EPPA and TEPPFA extended their joint collection of rigid PVC building products to new building related products (for more information please visit www.wuppi.dk). Moreover, they intensified their network of municipal collection parks.

^(*) EPPA - The European PVC Window Profile and Related Building Products Association, an EuPC sector group (www.eppa-profiles.org)

In **Austria**, EPPA is planning to develop further a collection and recycling scheme. A study of post-consumer waste availability showed an increase of reuse, which has to be taken into account.

In **Sweden, Norway, Italy and Ireland**, small scale projects were initiated in 2004. In Belgium, the collection and recycling system will have to be reorganised following the new ownership of the local recycler, Rulo, and the setting-up of Recovynyl. Finally, in Spain, EPPA is preparing a joint collection project with TEPPFA to be started in 2005.

PIPES AND FITTINGS



TEPPFA^(*) continued collection and recycling synergy projects with EPPA in **France, Denmark and Germany**, thus facilitating cooperation with municipal waste operators. In 2004 TEPPFA recycled 5,640 tonnes of PVC pipes and fittings. Overall, however, the proportion of profiles waste collected via these synergy projects is larger than the proportion of pipes and fittings. TEPPFA manages collection and recycling projects in **13 European countries**. Apart from PVC, 4,600 tonnes of other plastic pipe waste were also collected and recycled.

TEPPFA hopes to increase collection volumes in the coming years thanks to the Recovynyl project (see below). Nevertheless, an element of uncertainty is that the tonnage predictions were made on the assumption that pipes and fittings have an average life expectancy of approximately 40 years, whereas it now emerges that this could be higher for many types of PVC pipes as for other applications.

The most encouraging lesson to date from the TEPPFA programme is that demand for recyclates is high and that the recycling sector is becoming more and more professional.

National Developments

The excellent collaboration with EPPA continued in **Denmark** where the WUPPI scheme led to increased collection volumes and in **France and Germany**, where TEPPFA works closely with municipal waste collection authorities. In **Germany** the collection and recycling system is being reorganised to meet the regulators' cartel concerns. In **Belgium**, the local recycler, Rulo, was taken over and the new management is reorganising the business. Increased collection volumes in other countries compensated for the volume lost in **Belgium**. In **Italy**, TEPPFA has made significant progress and in **Spain and Portugal**, while project launches have proved more difficult, much enthusiasm remains. Finally, in the **UK and Ireland**, TEPPFA continues its collaboration in a collection and recycling scheme in cooperation with other rigid PVC product representatives to identify 'best practice' for collection of demolition waste.



^(*) TEPPFA - The European Plastic Pipes and Fittings Association, an EuPC sectoral association



ROOFING MEMBRANES



In 2004, ESWA^(*) recycled 568 tonnes of post-consumer PVC waste from roofing membranes. The 568 tonnes represents more than 25% of the total collectable available PVC waste from roofing membranes estimated at 2,232 tonnes in 2004. The next objective is to recycle 50% in 2005.

Collection Schemes – ROOFCOLLECT System



In 2004, The Edelweiss study project matured into the “ROOFCOLLECT Recycling System for Thermoplastic Membranes” with a geographical extension and an enlargement of scope. This scope is expected to expand further at the beginning of 2005 with the collection of ESWA non-members’ roofing membranes and even of non-roofing membranes such as civil engineering and swimming pools manufactured by ESWA members.

ESWA and DUD (Industrieverband für Kunststoff Dach- und Dichtungsbahnen e.V.), the German Association for Thermoplastic Roofing and Waterproofing Membranes, set up ROOFCOLLECT to manage the multiple European collection regions and recycling units. For more information, please visit www.roofcollect.com.

Collection Schemes – National Developments

Germany remains by far the largest market for PVC roofing. Success in Germany is therefore crucial to meeting ESWA’s targets. The future of the project will largely depend on the implementation of the landfill ban to come into effect on 1 July 2005.

The partnership with the waste management company Interseroh (www.interseroh.de), which started in June 2003 to boost collection in Germany, was further consolidated in 2004. The scheme makes collection as easy as possible by using big bags to collect PVC waste. It has been extended in 2004 by offering container solutions whenever feasible (mainly for larger projects). These containers allow reduced transport costs and handling on site.

Throughout 2004, DUD continued to offer a strong administrative and communications support and the successful roofers’ incentive bonus scheme was carried on.

In 2004, geographical extension started, with Interseroh as the preferred waste management partner, in Austria, in the Benelux region, with a first roof renovation project of 7,000m² with big bags and in France, with a media launch and a 9,000m² roof renovation at Orly Airport near Paris. Moreover, preparations were made for collection systems to become operational in 2005 in Italy and the Nordic countries.

The Recycling Process: From AfDR to Alternative Solutions

AfDR (Arbeitsgemeinschaft für PVC-Dachbahnen-Recycling), the German cryogenic shredder unit owned and operated by several ESWA members, was closed down at the end of 2004. Until this point, the plant recycled most of the PVC roofing membranes collected by ESWA (506 tonnes in 2004) although ESWA had been looking since 2003 for alternatives due to insufficient capacity of the plant. A number of technical trials was conducted in 2004 and decisions were taken to manage the new situation.

Vinyloop®, a process developed and operated by Solvay, has been selected as a prime long-term solution to deliver tailor-made recyclates. In 2004, large-scale technical trials at the Vinyloop cable recycling facility in Ferrara, Italy, were successful and subsequently processing tests took place at ESWA members’ facilities. Deliveries of collected post-consumer PVC roofing membranes are expected to start in early 2005 at an RWE-owned shredding unit located at Castrop-Rauxel in Germany. Full truckloads of shredded materials will then be transported to Ferrara, Italy, to save on transport costs.

Alternative recycling routes to Vinyloop are being investigated such as the RGS-90/Stigsnaes unit in Denmark, which started accepting mixed PVC waste by end 2004. It presents the advantage of accepting a larger range of roofing materials and requires no pre-sorting or treatment. However, the gate fee and transport costs are higher than for Vinyloop.

For more information, please visit www.eswa.be.

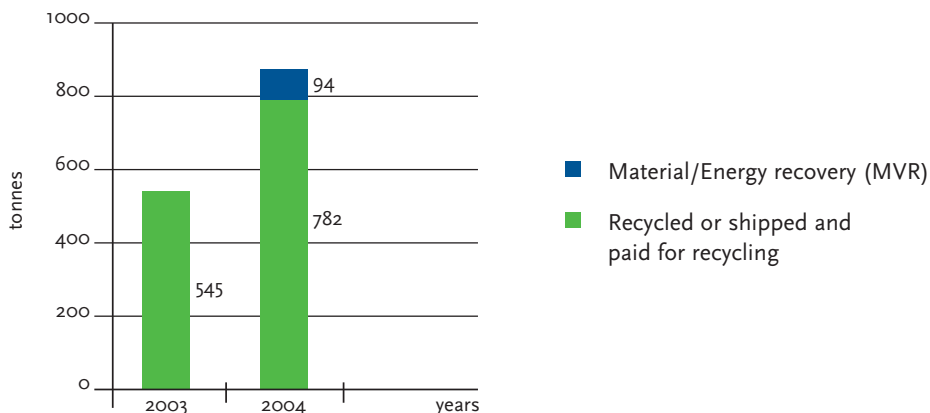
^(*) ESWA - European Single Ply Waterproofing Association, an EuPC sectoral association

FLOORING

EPFloor
European PVC Floor Manufacturers
A Sector Group Of EuPC

In 2004, the collection schemes were successful with an increase of 68% of the quantities collected compared with 2003. European PVC Floor Manufacturers – EPFLOOR^(*) – collected a total of 972 tonnes of PVC flooring, of which 477 tonnes were recycled and 305 tonnes sent for recycling and the corresponding gate fees paid. Following delays at the recycling plants, the latter tonnage is only due to be recycled in 2005. In addition, 94 tonnes were sent to MVR Hamburg for energy/material recovery. The remaining waste collected is stored at AgPR awaiting recycling or dispatching.

Recycling and recovery in 2004 in the EU 15 and Switzerland



Note: The total of 782 tonnes includes 305 tonnes paid and sent to be recycled but awaiting treatment.

R&D: Development of Recyclate from Flooring Waste

In 2004, EPFLOOR, in cooperation with the R&D departments of its members, concluded large-scale tests further to develop Recinyl[®], a PVC recyclate compound obtained from flooring via the solvent based Vinyloop[®] technology. These tests have proven the feasibility of recycling in higher value applications such as calendered and coated interlayer applications as well as in special compounds for foamed applications.

EPFLOOR also conducted tests on recyclate obtained from melt filtration, which revealed that, although the technology is feasible, it is in practice too expensive and requires considerable pre-treatment. Consequently, EPFLOOR decided to discard this option.

Meanwhile, EPFLOOR conducted several tests to evaluate alternative mechanical recycling companies and has selected, among others, Hoser in Germany. Hoser has been in operation for many years in recycling and in the production of drainage sheets. EPFLOOR has also sent almost 100 tonnes of PVC flooring waste to the energy and HCl recovery MVR plant, in Hamburg, to compare the collected waste with the plant specifications (conditioning, quality, content etc.) and for logistical tests.



^(*) EPFLOOR - European PVC Floor Manufacturers, an EuPC sector group



Collection Schemes

In 2004, the collection scheme in **Germany** was expanded thanks to synergy projects with PVC pipes, windows and roofing membranes. These resulted in an increase of the number of collection points and contacts.

In parts of **Austria** and **Switzerland** collection networks are now well established.

In **Belgium**, flooring manufacturers and the Flemish regional government agreed on the principle that manufacturers would present the region with a voluntary collection and recycling plan by the end of 2005. As a result of the agreement, flooring waste is no longer subject to the take-back obligation under the Flemish waste-management law adopted in 2003.

In **France**, the pilot collection project in cooperation with flooring installers and demolition sites as well as public and private waste platforms continued. It has revealed that the most substantial sector generating PVC flooring waste is renovation of social housing (HLM). The first phase of the pilot project is expected to be completed by the end of the first quarter of 2005.

Recycling and Recovery Schemes

PVC flooring recycling took place principally at the AgPR cryogenic recycler in Troisdorf but 33 tonnes were recycled by other recyclers. Moreover, 101 tonnes of PVC flooring waste were sent to Vinyloop Ferrara for industrial scale testing, 94 tonnes to the MVR plant in Hamburg for energy and HCl recovery tests and 305 tonnes to RGS-90/Stigsnaes, the Danish feedstock recycling plant. Collected waste, sent to the latter, has been stored on the site awaiting start-up of the plant.

COATED FABRICS

epcoat EPCOAT^(*) operates within EuPC as the European coordinator for Vinyl 2010 on the recovery and recycling of PVC coated fabric products (such as tarpaulins, tents, marquees etc).

In 2002, EPCOAT initiated a study into the feasibility of contributing to the recycling targets of Vinyl 2010 with the collection of data and planned test projects. This work continued in 2004 with the Vinyl 2010 studies, collection schemes and recycling projects involving coated fabrics as detailed below. A dedicated web site was launched in 2004 to provide detailed information on these projects and can be visited at www.eupc.org/epcoat.

Studies

SFEC Artificial Leather

Artificial leather is a major potential source of recyclable post-consumer waste: It is estimated that 65,000 tonnes a year of PVC artificial leather are consumed annually (excluding automotive applications which are covered separately by the EU's End-of-Life Vehicles Directive). A study conducted by SFEC (Syndicat Français des Enducteurs, Calandriers, et Fabricants de Revêtements de Sols et Murs), the French calendering and coating association, identified where and how to collect potentially recyclable homogeneous waste. The most promising collection targets appear to be the prefabricators – who have a source of collectable, clean waste – and end-of-life furniture.

British Plastics Federation Project

It was decided to integrate the BPF (British Plastics Federation) Mixed PVC Recycling Project and the BPF PVC Clearing House Proposal into a Recovinyl project (see UK Mixed PVC Recycling Project below).

^(*) EPCOAT - EuPC PVC Coated Fabrics Sector Group

Collection Schemes

Industrieverband Kunststoffbahnen (IVK)

The IVK (Plastics Foils Association), in cooperation with RWE (www.rwe.com), a major waste management company, started a trial collection project involving 30 prefabricator sites and four coated fabric producers in Germany. RWE is in charge of collection on site, transport, storing and shredding (when necessary), and finally transport to the recovery or recycling units.

During 2004, 22.5 tonnes of mainly post-consumer waste were collected and recycled. The initial customer interest and participation proved to be low but it is hoped that the German landfill ban coming into effect in mid-2005 will boost the project. IVK plans to carry out a market survey on customer motivation and to trace waste streams in 2005.

Recycling

Friedola

Friedola, a German firm which produces coated fabrics, decided in 2003 to renovate and expand an existing plant (dating from 1973) to treat the waste from the IVK project. The technology involves the mechanical shredding, partial separation of polyester fibres and compacting (or agglomeration) of post-consumer waste fabrics. The recyclate can then be reused in tarpaulins, automotives and other new PVC products.

The first phase of the project was executed in 2004 with the upgrade of existing machinery, control systems and environmental measures. The company plans to extend its capacity as soon as collected volumes justify the investment. The unit is now operational and several tests have been performed with tarpaulin post-consumer waste. Product developments are still required to find new outlets for the recycled compounds.

Texyloop

No progress has been made regarding the Texyloop project in 2004. Several options are under consideration regarding a potential 2,000-tonne-per-year pilot plant. This should be clarified in 2005.





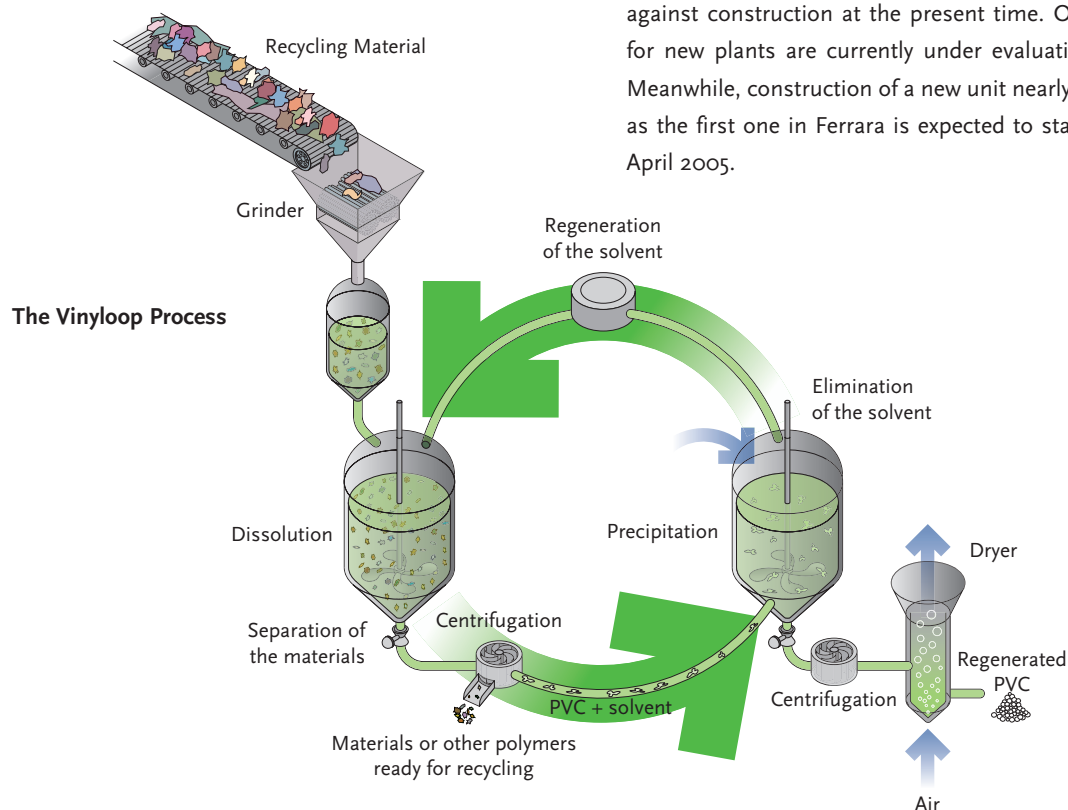
PVC WASTE MANAGEMENT: RECYCLING TECHNOLOGIES AND PLANTS

OVERVIEW OF RECYCLING PROJECTS AND THE TECHNOLOGY THEY USE

| PROJECT | TECHNOLOGY |
|------------------|-------------------------------|
| VINYLOOP | Mechanical recycling |
| REDOP | Mixed plastics dechlorination |
| DOW/BSL | Rotary kiln |
| RGS-90/STIGSNAES | Hydrolysis + pyrolysis |
| LIGHT CONCRETE | Mechanical recycling |

VINYLOOP

The Vinyloop® mechanical recycling technology is based on the use of solvents for the treatment of PVC wastes using dissolution, filtration and precipitation to produce a PVC compound containing most of the expensive original additives.



Since February 2002, Vinyloop has operated a full-scale demonstration plant at Ferrara, Italy.

As the first plant of this type in the world, Vinyloop Ferrara has encountered some technical difficulties. These were principally due to the frequently low content of PVC and high content of rubber in the cable waste. This led to further research-and-development efforts to find new solutions and processes. The Ferrara plant was also used to test new residue streams such as blisters, roofing and flooring residues. Further tests are expected in 2005 focusing on coated fabrics and rigid profiles.

Next steps will include a better selection of raw materials, the pre-treatment of wastes, and the installation of a second generation process in the first quarter of 2005 and a second stripper.

In 2004, the plant showed that it was nearly able to attain full capacity which is expected to be reached in 2005 with a potential of 10,000 tonnes per year.

The 2004 feasibility study for the building of a new facility in Dreux, France, using Vinyloop technology concluded against construction at the present time. Other locations for new plants are currently under evaluation in Europe. Meanwhile, construction of a new unit nearly twice as large as the first one in Ferrara is expected to start in Japan, in April 2005.

REDOP

The Redop project (REDuction of iron Ore in blast furnace plants by Plastics from municipal solid waste) is a feedstock recycling treatment for mixed plastics/cellulose fractions from municipal solid wastes (MSW). The scope is to obtain a product containing less than 0.15% of weight in chlorine, with high heat value and low content of impurities for use in steel production as a substitute for coke as a reduction agent and as fuel in the production of pig iron.

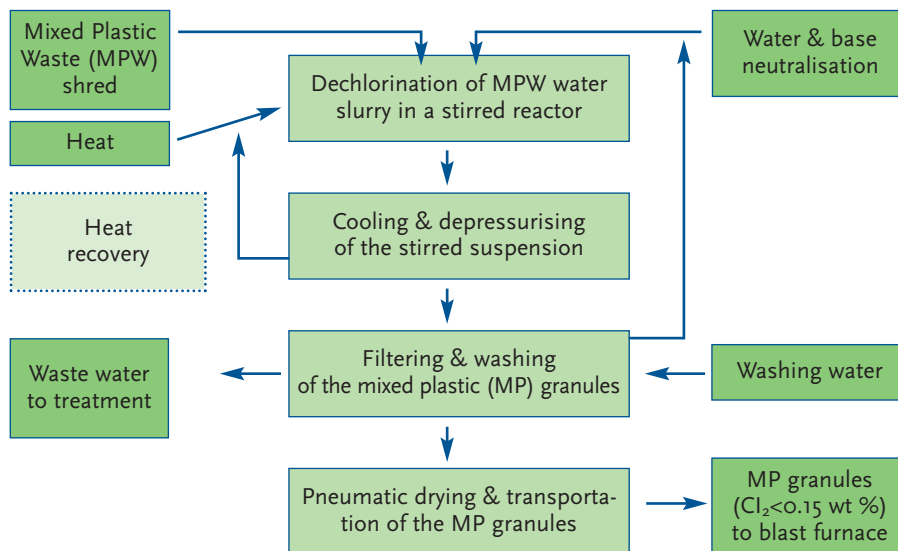
In the Redop process a mixed plastics/cellulose fraction from MSW is separated by conventional technology into two sub-fractions, one containing mainly mixed plastics and a second cellulose sub-fraction. A slurry of the mixed plastics fraction is heated in a stirred reactor at 230-300°C. The cellulose paper waste still present is degraded into tensio-active molecules that create a stable suspension. PVC is dechlorinated and the other plastics melt.

The resulting fuel pellets can be injected into a blast furnace to transform iron ore into pig iron or hot metal for direct conversion into steel products by lamination or extrusion. In the process, the Redop pellets primarily act as a reduction agent, where the carbon atoms react with the oxygen in the iron ore to produce iron. The granules are intended to replace coal, coke and mineral oil used in blast furnaces.

The feasibility study was completed in 2000 and bench-scale results in 2001 were very promising. Trials continued over 2002 and 2003 and finally over the summer of 2004 about one tonne of Redop pellets were produced in a pilot stirred reactor. On 22 November 2004, the one tonne of Redop pellets were successfully used in one of the blast furnaces of the company CORUS in Ijmuiden, the Netherlands.

Redop is considering further industrial scale trials in 2005. The report of phase 2 and re-evaluation of economics are expected by the end of the first quarter of 2005. The Redop Steering Committee will then decide on future steps.

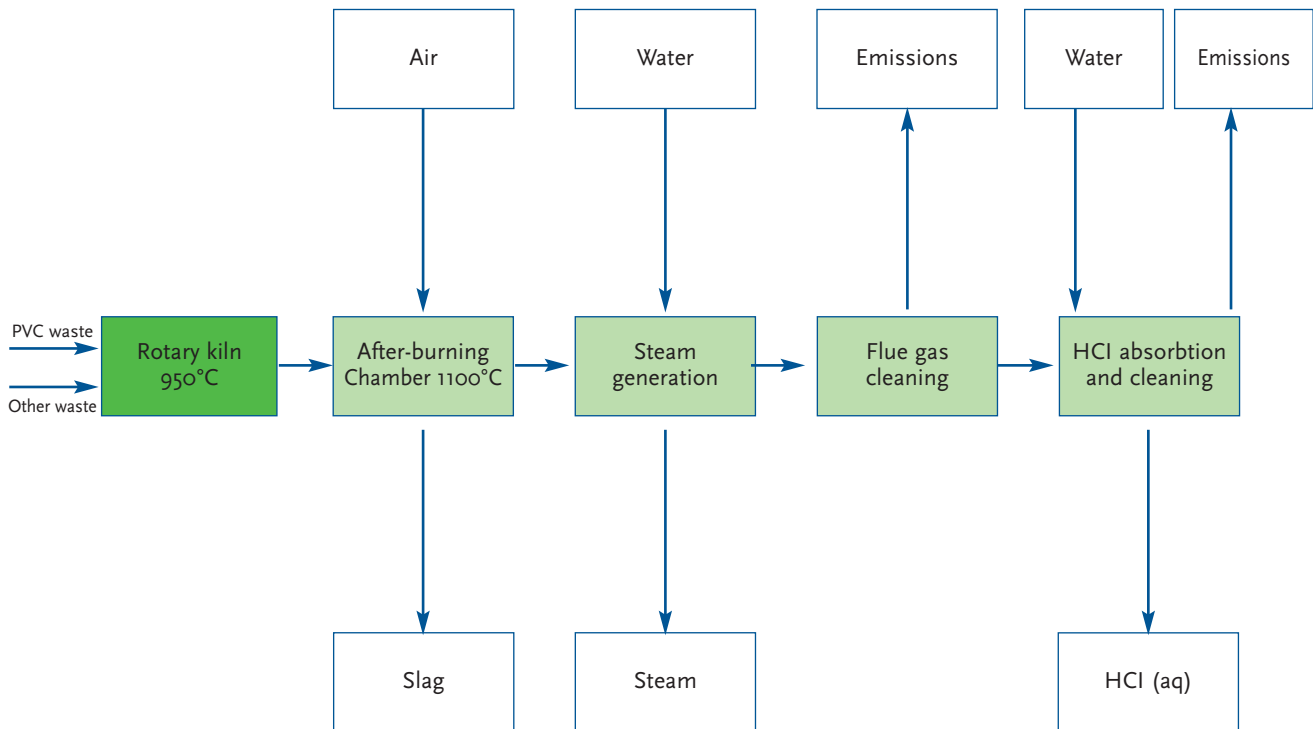
The Redop process





DOW/BSL

Dow/BSL operates a feedstock recycling plant near Leipzig based on a rotary kiln technology and able to treat rigid and flexible PVC wastes, recover HCl and produce energy. The plant is available to Vinyl 2010 as one of a range of options for PVC recycling.



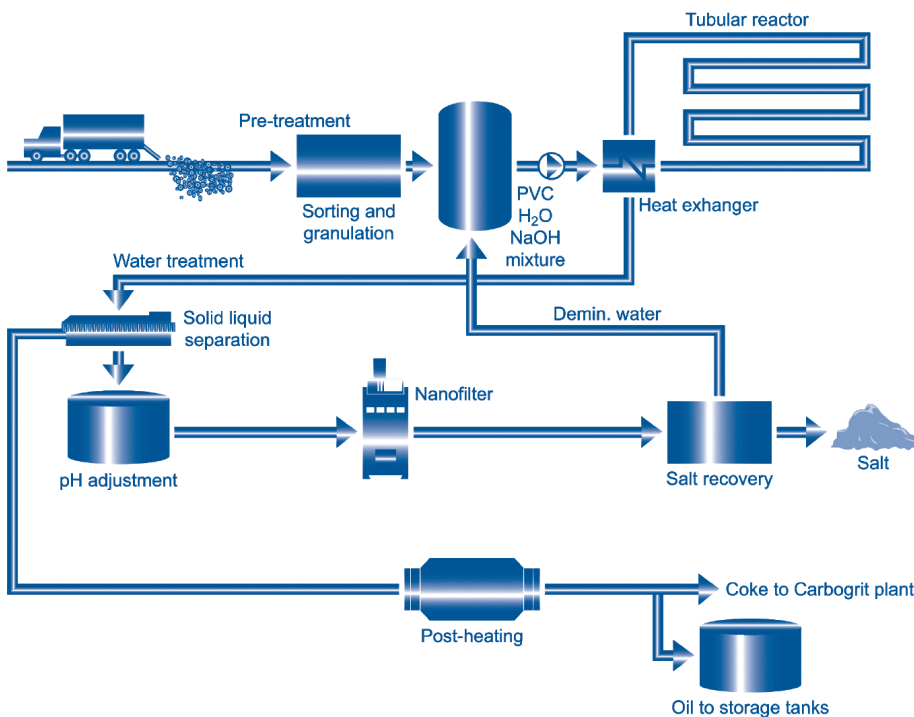
RGS-90/STIGSNAES

Since 1998, the Danish company RGS-90 has made great efforts to develop a sustainable method for feedstock recycling of PVC waste. RGS-90 obtained financial support from the European Union's LIFE-programme and from Vinyl 2010. This has made it possible to carry out successful preliminary pilot tests and develop a full-scale industrial demonstration project for recycling of PVC waste into oil, salt and minerals.

The RGS-90 process is based on the combination of two steps: the dechlorination of PVC by hydrolysis and the successive, low-temperature pyrolysis of the dechlorinated solid fraction. Large-scale trials have already demonstrated the process is capable of creating a liquid product with low chlorine content and 100% utilisation of the PVC waste. The process showed ability to treat all types of PVC waste in full-scale tests.

In 2004 RGS-90 constructed a full-scale plant near the Danish city of Skælskør, with a capacity to recycle at least 50,000 tonnes of PVC waste per year. With the industrial size plant in operation, further tests will be performed to evaluate the PVC waste pre-treatment, reactor performance and product refining processes. The next step planned is the start-up of hydrolysis and pyrolysis. The plant is expected to run in short phases until summer 2005, then continuously.

The RGS-90 Process



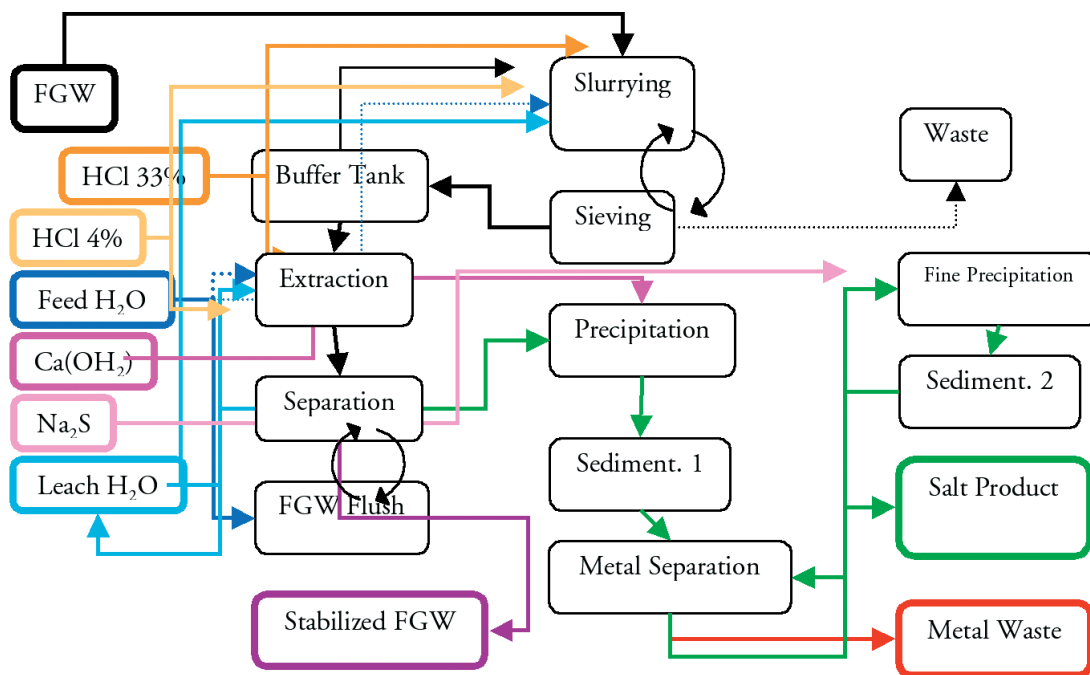
HALOSEP-WATECH

Supported by Vinyl 2010, the Halosep-Watech process is aimed at investigating the treatment of flue gas residues arising from municipal solid waste incinerators. The objective of the trials is the recovery and recycling of chlorides and heavy metals contained in the solid fraction derived from the neutralisation of gaseous effluents. Preliminary tests (slurrying treatment and dewatering) were performed in spring 2004 on a mobile pilot plant. In autumn 2004, RGS-90, owner of Watech, closed down the former Watech laboratory at Broendby and decided to move the test rig to RGS-90's main offices in Copenhagen. The pilot will be operational in early 2005 and further tests will be completed by June 2005.

The trials will investigate:

- Potential reuse of salts.
- Salt concentration and composition obtainable.
- Heavy metal content in brines and removal hereof.
- Feasibility of salt separation (Salts=NaCl, KCl and CaCl₂).
- Leaching properties of treated residues.
- Potential use of KCl as fertiliser.
- Potential use of NaCl and CaCl₂ as road de-icing salts.

Halosep® Pilot Plant: Flow Chart



Legend: FGW = flue gas waste, HCl = hydrochloric acid, Ca(OH₂) = slaked lime, calcium hydroxide, Na₂S = sodium sulphide.

PVC WASTE MANAGEMENT: OTHER PROJECTS

LIGHT CONCRETE

The recovery and recycling of PVC, and of plastics in general, is often very difficult in building and construction because the polymers are inserted inside mortar, cement, cement plastering, glue, sealing etc.

With the support of Vinyl 2010, the Centro di Informazione sul PVC (the Italian PVC Forum) and CORISE (the Roman Consortium for the Recycling of Wastes from Buildings) explored a possible solution for the recycling of this 'impure' PVC. In particular it was investigated if such PVC wastes from buildings can be employed for the production of light concrete. Light concrete is utilised in certain building applications where low weight and high thermal and sound insulation characteristics are required, such as for floors or walls. A feasibility study, carried out in 2004 investigated the technical characteristics and possible applications of PVC light concrete as well as the economics for the production and sale of light concrete containing PVC waste.

Evaluating the information collected, the technical data and the economics, the feasibility study concluded that: "It is technically and economically possible to use PVC waste coming from Construction & Demolition, or from other sources, to produce light concrete that can be sold".

In detail the conclusions of this feasibility study are the following:

- In terms of performance, the PVC waste light concrete can compete in some applications with the existing light concrete in the range of mass/volume ratio of 1,200 to 1,500 kg/m³.
- Rigid, flexible or mixed PVC waste can all be used in light concrete.
- Additional research is needed for optimising the blending, completing the tests and establishing collection schemes.

MVR HAMBURG

MVR Müllverwertung Rugenberger Damm GmbH & Co. KG is a modern incineration plant that turns waste into energy and materials for industrial reuse.

MVR received at the beginning of 2004 the classification "products" for HCl and other by-products obtained (e.g. gypsum) from the competent authorities.

After discussion between Vinyl 2010 and MVR, a legal assessment was commissioned to evaluate if such a classification implies recognition as a true recycling process.

Preliminary analysis indicates that the first step (the incineration) should be considered as an energy recovery operation (and not as waste disposal). This is the case of MVR, as it contractually delivers energy to external customers, saving fossil fuel. The second step (HCl recovery) can be classified as recycling, as long as the product quality corresponds to industrial specifications (which is the case for MVR).

RECOVINYL

Recovinyl is an organisation that facilitates the collection, dispatching and recycling of PVC post-consumer waste from the construction and demolition sector. It involves all stakeholders from consumers, industries and municipalities to waste management companies and recyclers. Its aim is to ensure a steady supply of PVC waste for recycling and consequently support the Vinyl 2010 sectoral targets.

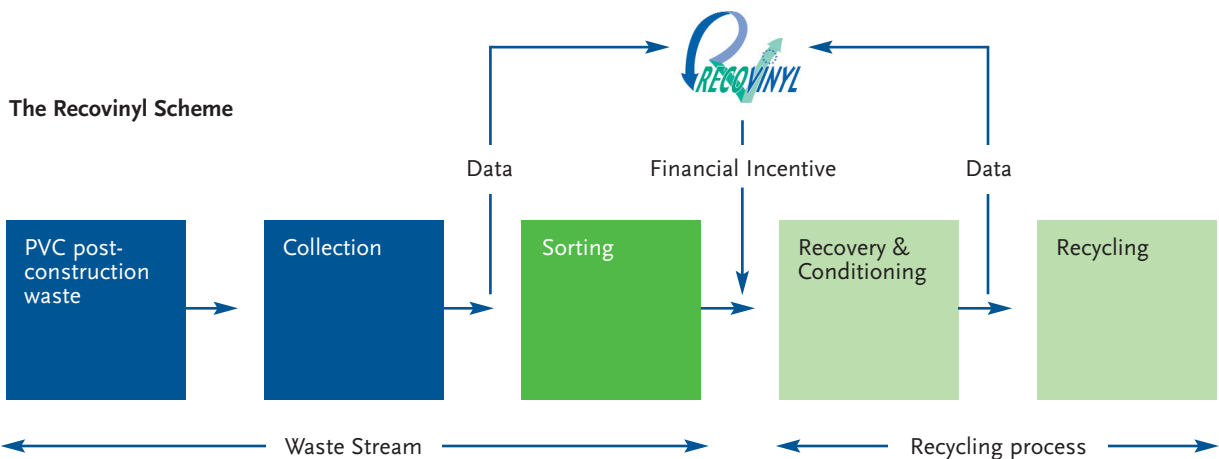
Recovinyl is designing, testing and implementing a collection system offering financial incentives to collectors that sort and bring PVC waste to accredited recyclers. This system should ensure the collection of 40,000 tonnes of PVC post-consumer waste by 2010. Recovinyl is working in synergy with the sectoral associations of Vinyl 2010 to expand the collection schemes and make them self-supporting.

In 2004, Recovinyl started analysing existing projects and collecting PVC waste to evaluate available quantities and costs. Efforts were concentrated in Germany and in Belgium.

In Germany, Recovinyl established two projects at a landfill park near Hanover to analyse the incoming streams of PVC wastes. The projects were a public collection point and the observation of waste types and quantities supplied.

In Belgium, Recovinyl started a collection project in 25 locations where people can bring post-consumer PVC waste from construction. The first results are expected in the second quarter of 2005. Moreover, Recovinyl initiated tests to analyse incoming PVC waste streams at three transfer stations of general waste collection.

In 2005, Recovinyl plans to concentrate its activities in the Benelux, France, the UK and Germany with the setting-up of a network of collection points composed of affiliated collectors and accredited recyclers. The activity will mainly consist of negotiating with local governments, developing contacts, identifying recipients for collection, setting a database, developing guidelines and organising trainings for collection centres. A website is planned for 2005.



CIFRA

In 2004, Vinyl 2010 funded a project by the French company CIFRA for the recycling of rigid PVC film used in the cooling towers of electrical power plants. A total of 183 tonnes have been recycled. The next step is the start-up of an in-house recycling plant at CIFRA. We expect the company to begin full-scale recycling and production in 2005.

APPRICOD - ACRR

The associations represented in Vinyl 2010, plastics resin producers (*PlasticsEurope*) and recyclers (EuPR) signed a partnership agreement with the Association of Cities and Regions for Recycling (ACRR) in September 2001. The objective was to improve the recycling of plastic waste collected by local authorities.

The first phase of the initiative ended in 2004 with the presentation of the results of the two pilot projects carried out in Catalonia and in the Region of Porto (see previous Progress Reports). In February 2004, a manual for regional and local authorities called “Good Practices Guide on Waste Plastic Recycling, a Guide by and for Local and Regional Authorities” was published. The guide is available at the address: www.ecvm.org/code/page.cfm?id_page=191&id_presse=53

The outcome of the partnership with ACRR was most encouraging and demonstrated that such cooperation could help improve plastics recycling. For this reason it was decided to continue.

Vinyl 2010, the plastics industry, recyclers, various ACRR members in Italy, Spain, Portugal and Belgium and the European construction and demolition industries have presented to the European Commission a follow-up project called “APPRICOD” further to research and promote further the collection and recycling of plastic waste from buildings. The Commission has granted funding under its LIFE programme. The project formally started in December 2003 and will run until mid-2006. Current planning includes:

- Evaluation of the current situation. Vinyl 2010 and *PlasticsEurope* will provide the necessary information.
- Design and execution of at least five pilot trials in each of the Ancona, Barcelona, Brussels and Porto regions, covering the full spectrum of activities (construction, renovation and demolition).
- Trials to run from April to December 2005.
- Acquired know-how and conclusions will be disseminated in 2006.

More information on APPRICOD can be found on www.acrr.org/projects/appricod.htm



UK MIXED PVC RECYCLING PROJECT

The objective of this project was to maximise the UK's contribution toward meeting the Vinyl 2010 recycling targets by:

- Identifying and exploiting synergies across various PVC application sectors.
- Identifying political, logistic and economic circumstances in the UK that could help to meet this objective.

A study has been carried out in collaboration with WRAP – Waste Resource Action Programme. Established by the UK Government, WRAP aims to encourage recovery and recycling.

The timescale of the project was 12 months, with a financing effort of approximately €750,000, including in-kind contributions from industry. The work was completed at the end of March 2004, and a report was released in September 2004. For further information please visit: www.wrap.org.uk/templates/temp_publication.rm?id=698&publication=402

The conclusions of the WRAP study can be summarised as follow:

- Approximately 55,000 tonnes of PVC are currently recycled in the UK (mainly pre-use waste, but some 10,000 tonnes of post-use waste – as defined in the WRAP report).
- Landfill costs in the UK are still low compared to most other European countries (approximately €60 per tonne including tax), which discourages recycling.
- Post-use window, pipe and flooring waste streams are significant.
- Improved waste collection and sorting is the key to increasing post-use PVC waste recycling in the UK.
- Development of existing mechanical recycling methods in the UK can produce high-grade recyclate from post-use window and pipe waste.
- Markets for low-grade recyclate have been identified and can be developed further.
- Public sector support for developing a specification of recycled PVC is needed.

A new waste collection pilot scheme is currently underway. The target is to collect over 100 tonnes of post-consumer PVC waste in six months. The results will be extrapolated to estimate the amounts that could be collected (and at what

cost) when best practice is applied over larger regions. The collection study is being conducted in the Thames Valley area (west of London) and completion is expected in March 2005.

LIFE CYCLE ANALYSIS REVIEW OF PVC AND COMPETING MATERIALS

The life cycle analysis (LCA) review does not form part of the industry's Voluntary Commitment but was mentioned in the European Parliament resolution on the Commission's "Green Paper on environmental issues of PVC" (2001) as regrettably missing. Indeed, the LCA-methodology allows applying sound bookkeeping methods to establish a balance of pros and cons, including aspects of materials consumption, environmental aspects and end-of-life considerations.

The European Commission in 2002 therefore commissioned a consortium led by PE Europe (Stuttgart), an independent consultant, to conduct a review of existing LCA studies on PVC for many applications including flooring, toys, window profiles, coatings and medical devices. ECVI, ESPA and ECPI collaborated actively to the LCA review by providing existing LCA studies and comments. The last version of the report was signed off in March 2004.

The review investigated more than 100 life cycle documents and reviewed in depth 30 LCA studies. Vinyl 2010 considers that the conclusions of the review are well balanced: It confirms that PVC is a material like any other, with both stronger and weaker points, depending on the application and on its use, and that there is no reason to treat PVC differently from any other material. The study is available on the website of DG Enterprise of the European Commission: europa.eu.int/comm/enterprise/chemicals/sustdev/pvc.htm.

These results also appear to be consistent with the findings of a draft report issued in December 2004 by the US Green Building Council's PVC Task Group. This two-year study concludes that the environmental and health impacts of PVC used in building applications are comparable to those of competing materials. The report is available for review on: www.usgbc.org/News/usgbcnews_details.asp?ID=1224.

FINANCIAL REPORT

Expenditure by Vinyl 2010, including EuPC and its members, amounted to €4.15 million in 2004, down from €4.39 million the year before.

The decline is due to an unexpected delay in the industrial start-up of the RGS-90 recycling facility in Stigsnaes, Denmark. Vinyl 2010 had earmarked a €3 million contribution conditioned upon start-up of RGS-90 during the fourth quarter of 2004. This payment was not made as start-up was delayed to mid-2005 for technical reasons.

As RGS-90 is now scheduled to go on stream during the current year, this is expected to result in a sharp year-on-year increase in Vinyl 2010's expenditure for 2005.

The figures below have been audited by KPMG.

| VINYL 2010 – WASTE MANAGEMENT PROJECTS Figures in 1,000s of Euros | Total expenditure including EuPC and its members | |
|--|--|--------------|
| | 2004 | 2003 |
| ACRR | 52 | 0 |
| Dow/BSL: ASCON | 0 | 109 |
| Eco-efficiency study/LCA | 0 | 53 |
| Enlargement project | 51 | 0 |
| Enlargement seminar | 23 | 0 |
| EPCOAT collection | 240 | 122 |
| EPCOAT recycling Friedola | 100 | 0 |
| EPFLOOR | 726 | 524 |
| EPPA | 753 | 724 |
| ERPA/CIFRA | 250 | 0 |
| ESWA-ROOFCOLLECT | 500 | 846 |
| EuPR | 0 | 100 |
| Ferrari Taxyloop | 0 | 0 |
| Light concrete Italy | 6 | 24 |
| NKT Halosep | 153 | 8 |
| Recovinyl SA | 288 | 100 |
| REDOP | 0 | 0 |
| RGS-90/Stigsnaes | 1 | 1,001 |
| TEPPFA | 923 | 669 |
| UK mixed PVC waste project | 85 | 106 |
| Vinyloop Ferrara | 0 | 0 |
| Total | 4,151 | 4,386 |

VERIFICATION STATEMENTS

KPMG CERTIFICATIONS

KPMG CERTIFICATION OF EXPENDITURE

Cvba Klynveld Peat Marwick Goerdeler Bedrijfsrevisoren - Reviseurs d'Entreprises Scrl

Report of the Auditor on the statement of supported charges for Project Vinyl 2010 during the period between 1st January 2004 and 31st of December 2004.

We are reporting to you on the completion of the mission, which you have entrusted to us. We have performed a verification of the table presenting the supported charges for the different projects of Vinyl 2010, as included in the Vinyl 2010 Progress Report related to the activities of the year 2004.

Total of supported charges related to the different projects of Vinyl 2010 amounts to €4,151,301.94.

The persons responsible for establishing the table presenting the supported charges for the different projects of Vinyl 2010 have provided us with all explanations and information which we required for our audit. We examined evidence supporting the amounts in the statement. We believe that our audit provides a reasonable basis for our opinion.

In our opinion, the statement as per 31st December 2004 presents fairly the position of supported charges for the different projects of Vinyl 2010 during the period between 1st January and 31st of December 2004.

Klynveld Peat Marwick Goerdeler Bedrijfsrevisoren - Reviseurs d'Entreprises Scrl, represented by



Dominic Rousselle, Partner

Louvain-la-Neuve, February 25, 2005

KPMG CERTIFICATION OF TONNAGES AND FULFILMENT OF SECTORAL VOLUNTARY TARGETS

Cvba Klynveld Peat Marwick Goerdeler Advisory Scrl

Report of the independent expert concerning the audit of the tonnages of post-consumer PVC waste collected and recycled in 2004 by the sector groups EPPA & EPFLOOR of the EuPC, by the sector associations ESWA & TEPPFA of the EuPC and by the subsidized recycling plants Vinyloop Ferrara and CIFRA during the period between 1st January 2004 and 31st of December 2004.

In accordance with the assignment, which was entrusted to us by Vinyl 2010, we give an account of our audit of the following tonnages for the different projects of Vinyl 2010 mentioned in the Vinyl 2010 Progress Report related to the activities of the year 2004.

The conclusions of this audit are summarised in the table here below:

| Project | Type of PVC post consumer waste | Tonnage recycled in 2004 | Tonnage recycled and paid to be recycled 2004 | % increase | Tonnage recycled in 2003 |
|--------------|---------------------------------|--------------------------|---|--------------|--------------------------|
| EPPA | Windows | 5,429 | 5,429 | 12.71 | 4,817 |
| | Related Profiles | 2,865(a) | 2,865 | NA | NA |
| EPFLOOR | Flooring | 477(b) | 782 | 43.49 | 545 |
| ESWA | Roofing membranes | 568 | 574 | 5.51 | 544 |
| TEPPFA | Pipes & fittings | 5,640(c) | 5,640 | -8.29 | 6,150 |
| CIFRA | Rigid PVC film | 183 | 183 | NA | 0 |
| Vinyloop | Mainly cables | 2,915(d) | 2,915 | 32.56 | 2,199 |
| Total | | 18,077 | 18,388 | 28.99 | 14,255 |

(a) Based principally on audited certificates and on a study by Consultic.

(b) Amount calculated for pre-enlargement EU 15 countries and Switzerland.

(c) The decrease in the audited recycling tonnage for pipes and fittings is due to one recycler in the TEPPFA network stopping its activity in post-consumer waste recycling in 2004. Collection schemes have to be organised and new recyclers properly audited before their tonnages are taken into account into this reporting.

(d) Tonnages already reported in other rows have been deduced from this total.

The persons responsible for establishing the table presenting the supported tonnages for the different projects of Vinyl 2010 have provided us with all explanations and information which we required for our audit. Based on our review of the information provided, we believe that all waste that was taken into account was Non regulated post-consumer PVC waste, according to the Vinyl 2010 definition of Non regulated post-consumer PVC waste and that we have not recognized any elements which are of nature to influence significantly the presented information.

Klynveld Peat Marwick Goerdeler Advisory

represented by

Ludo Ruysen, Partner





DNV VERIFICATION STATEMENT

DNV Consulting was for the fourth time commissioned by Vinyl 2010 to provide an independent verification of the 2005 Progress Report. The 2005 Progress Report presents the achievements made by the Vinyl 2010 project in 2004 related to the 10-year programme.

The objective of the verification was to validate statements made in the report. This verification statement represents our independent opinion. DNV Consulting was not involved in the preparation of any part of this report or the collation of information on which it is based.

Verification Process

The verification consisted in checking whether the statements in the report give an honest and true representation of Vinyl 2010's performance and achievements. This included a critical review of the scope, balance and interpretation of presented statements.

The verification process included the following activities:

- Desk-top review of project related material and documentation made available to us, such as plans, agreements, minutes of meetings, presentations and more;
- Communication with Vinyl 2010 personnel responsible for collating and writing various parts of the report, in order to discuss and substantiate selected statements.

The verification did not cover the following:

- The underlying data and information on which the desk-top review documentation is based;
- The presented tonnages of stabiliser systems used in 2004;
- The presented recycled tonnages within various sectors (verified by KPMG);
- The Financial Report (verified by KPMG).

Verification Results

It is our opinion that the 2005 Progress Report is a valid representation of Vinyl 2010's performance and achievements in 2004.

The report reflects Vinyl 2010's dedication towards sustainability performance and demonstrates an increased openness in their coverage of both achievements and challenges within the 10-year programme.

We commend Vinyl 2010's early achievement of the target set for reduction in use of lead stabilisers in the PVC industry. In addition, we acknowledge the recent registration of Vinyl 2010 as partners of the United Nations Commission on Sustainable Development as recognition of the project's efforts towards fulfilling their commitments.

The current year, 2005, represents a halfway milestone for Vinyl 2010. Several ambitious targets are to be met and the objectives of the Voluntary Commitment are to be reviewed. We encourage Vinyl 2010 to maintain their noteworthy ambitions whilst adapting to the new realities of the PVC waste industry.


Birgit Hammerseng


Christen M. Heiberg

PVC'S CONTRIBUTION TO SOCIETY

Polyvinyl chloride or 'PVC' is a modern synthetic material and an important member of the extensive polymers 'family'. Formed from salt (57 per cent) and oil (43 per cent), PVC is less oil dependent than all other major thermoplastics. It was one of the earliest plastics to be developed commercially and is now among the most widely used.

PVC is helping society to become more sustainable by its excellent performance and vital qualities in many thousands of applications and because it is so long-lasting.

Today, PVC products continue to make life safer and more comfortable in areas as diverse as construction, automotive, cabling, luxury goods and medical devices, to name just a few. It is widely used to satisfy daily needs for people. For example, PVC pipes bring clean water and cut down losses through leaks. PVC windows help insulate thermally offices and homes while letting in maximum light. In transport, lightweight and insulating PVC products help save fuel and energy.

PVC is extremely durable and makes good use of raw materials, thus conserving natural resources. Moreover, at the end of its useful life, PVC can be recycled to make new products.

Finally, in Europe, the industry provides some 530,000 jobs and includes more than 23,000 firms of which many are Small and Medium Sized Enterprises.

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