

Message from M. Hirler and G. Schwarz :

Stellungnahme der Unternehmensgruppe Hirler GmbH und Hirler Export GmbH zum „Grünbuch“ zur Umweltproblematik von PVC.

An die EU-Kommission

Die Unternehmensgruppe Hirler, gegründet vor 30 Jahren, besteht aus zwei aktiven, dynamischen Geschäftsbereichen, dem Spezialbauunternehmen und der Produktion von Kunststoffbahnen.

Ziel des Spezialbauunternehmens ist das Planen, Bauen und Instandhalten, sowie die Verarbeitung neuzeitlicher Bau- und Kunststoffe umweltschonend, qualitätsbewusst und termingerecht auf den Grundlagen des Handwerks und den anerkannten Regeln der Technik.

Die Kunststoffproduktion verwendet VAE/VC Pflropfpolymer-Rohstoffe und stellt eine Dach- und Dichtungsbahn her, die seit über 30 Jahren ohne grössere erkennbare Qualitätsverluste Abdichtungsaufgaben erfüllt. Dieses Pflropfpolymer ist eine hervorragende und positive Entwicklung für die VC-Technologie, da es ohne Zusatz von flüchtigen Weichmachern natürlich weich ist und bleibt.

Der Einsatz von PVC-Stoffen, im Bereich der Fassadensanierung und Instandhaltung von Bauwerken führt zu der anerkannten Qualität, für die unser Unternehmen bekannt ist.

Nach Aussagen unserer Projektleiter, Bauleiter und die für uns tätigen Handwerker sind die Materialien aus PVC, die zum Stabilisieren von Wärmedämmverbundfassaden als Zubehör bei der Verarbeitung neuzeitlicher Spritzbeton-, Zementmörtel- und Flüssigkunststoffe verwendet werden als dauerhafte, gutverarbeitende PVC-Produkte seit langem geschätzt. Dies betrifft auch die Langzeitbeständigkeit, denn unsere Auftraggeber legen sowohl auf hohe Wertigkeit wie auf gute Verarbeitung ohne Gesundheitsrisiko grossen Wert.

Wir sehen einem Verbot von PVC oder einer Einschränkung im Gebrauch einen schwerwiegenden Eingriff. Denn diese Materialien müssten dann durch Aluminium oder andere im Baubereich üblichen Metalle ersetzt werden, was unseres Erachtens nicht akzeptiert werden kann, da die Herstellung dieser Materialien von der Risikobewertung deutlich kritischer zu betrachten sind.

Das Thema Entsorgung kann in der PVC-Diskussion kein spezifisches Thema sein, und greift viel zu kurz. Die Entsorgung ist innerhalb der Produkte, Verpackungen, Elektro- oder Bauabfälle innerhalb von Deponierichtlinien insgesamt zu sehen.

Zu den von der Kommission gestellten Fragen verweisen wir auf die umfangreiche, gemeinsame Stellungnahme des VCI, des VKE und der AG-PU, die wir inhaltlich voll unterstützen.

M. Hirler  
Geschäftsführung

G. Schwartz  
Mitarbeitervertretung

## Hydro Polymers AS' response to the Green Paper

On behalf of all our employees, the Working Environment Committee/Works Council at Hydro Polymers AS in Norway would like to present a response to the Green Paper published by the Commission. We would also like to take this opportunity to present some background information on our sites in Grenland, Norway.

Firstly, it must be pointed out that we support the view that industry should be subjected to stricter guidelines and must improve its degree of compliance with regulations, in order that industry is motivated to develop sustainable processes and products. We look positively upon the fact that PVC as a product is being examined from all angles, that is to say its entire lifecycle, from its conception until the end of its user life. We feel that this is a definite advantage for PVC products as compared to other products.

We are however, disappointed that the Commission has not seen fit to include the conclusions stemming from the industry's "Voluntary Commitment". We are also disappointed by the fact that only the negative aspects of PVC have been highlighted. We feel that certain sections of the Green Paper, such as the section dealing with waste management, should be discussed over a broader spectre since this aspect applies not only to PVC but also to other material groups.

In our evaluation of PVC, we have hired environmental consultants The Natural Step (TNS). TNS does not use the term "from conception until the end of product life", but prefers to use the term "from product conception to product conception". TNS looks upon PVC as a product that also belongs to the future, provided solutions are found for the challenges faced in terms of PVC additives and developing towards a carbon neutral industry.

We look forward to other products undergoing similar scrutiny, so that answers will soon be available in terms of how other materials such as glass, paper, metals and other plastics are assessed in terms of their life cycle as compared with PVC. We urge the Commission to commence this work as it has to be completed before we know which products have a sustainable development in the future.

Yours sincerely,

The Working Environment Committee/ Works Council at Hydro Polymers AS

For corporate management:

Leif Hellebø  
*President, Hydro Polymers AS*

Kjetil Nakken,  
*Production Manager  
Chlorine/ VCM plant  
(WEC/WC chairman)*

Oddvar Kaland  
*Vice president, Production Manager  
Ethylene plant*

(cont.)

*(Working Environment Committee/ Works Council signatures continued)*

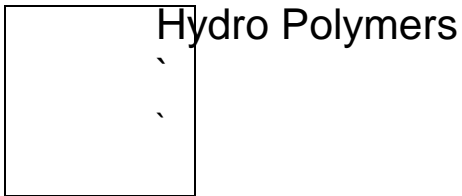
Kurt Ekornåsvåg  
*Vice President, production manager  
PVC plant*

Eirik Stamland  
*Health, Environment, Safety Manager*

Marit Nes  
*Communications Manager*

Eyvind This-Evensen,  
*MD, Manager of Health Services*

Rolf Solvold  
*Human Resources Manager*



# Hydro Polymers

**Harald Jacobsen**  
*Senior Manager*  
*Technical Centre PVC*

**Marius Natvig**  
*Financial manager*

*For union representatives:*

**Sigbjørn Jenssen**  
*NOPEF*

**Geir Ødefjeld**  
*NOPEF*

**Stein Morten Eriksen**  
*NOPEF*  
*Chief Safety Delegate*

**Geir Ødefjeld**  
*NOPEF*

**Jan Arvesen**  
*NOPEF*

**Tor Eivind Sandnes**  
*NOPEF*

**Morten Seland**  
*NOPEF*

**Svein Stabell**  
*Lederne*

**Gunnar Kårbø**  
*NITO*

**Olav Langeland**  
*NIF*  
*(WEC/WC secretary)*

**Egil Østerhus**  
*NMF*

**John Øivind Selmer,**  
*NKIF*

**Trond Kristiansen**  
*FLT*

**Torunn Aakermann**  
*NIF*

<b>NOPEF</b>	Norwegian Association of Oil og Petrochemicals Unions
<b>Lederne</b>	Norwegian Association of Supervisors, Technicians and other managers
<b>NIF</b>	Norwegian Association of Chartered Engineers
<b>NITO</b>	Norwegian Society of Engineers and Technicians
<b>NKIF</b>	Norwegian Association of Chemical Workers
<b>FLT</b>	Norwegian Association of Supervisors, Technicians and other managers
<b>NMF</b>	Norwegian Society of Commercial Employees

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### 1. About Hydro Polymers AS

#### In general

Hydro Polymers AS is part of the Petrochemicals Division belonging to Norsk Hydro, which is Norway's largest industrial enterprise. The Petrochemicals Division employs 1,600 and its three subsidiaries Hydro Polymers Ltd, in Great Britain, Hydro Polymers AB in Sweden and Hydro Polymers AS in Norway make up an integrated PVC production system. The Norwegian trademarks are Norvinyl and Pevikon. Hydro Polymers AS has 630 employees including its employees at the head office in Oslo. Hydro Polymers' industrial sites are located in Grenland which is in the southern part of Norway. These sites produce ethylene, propylene, chlorine, caustic soda and VCM in addition to E-PVC and S-PVC. Monomer production is carried out at Rafnes while the PVC plant is located at Herøya in Norsk Hydro's industrial park - which is Norway's largest industrial work place. Until the year 2001 Hydro Polymers also has the responsibility of operating and running Noretyl's ethylene plant that produces ethylene and propylene.

Norsk Hydro has produced PVC at Herøya since 1950 and the Chlorine/ VCM plants started up in 1978. Both plants have undergone numerous expansions and renovations and over the past few years, more than EUR 13 million has been spent every year on the environment, the working environment and plant safety.

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All employees are highly skilled and there is ongoing work within the areas of expertise and environmental aspects. In 1996, all employees attended a course entitled "PVC and the Environment". We also offer a training programme in connection with the ISO 14001 certification.

## Health, Environment and Safety (HES)

Hydro Polymers AS strives continuously towards improvement and our monomer production lies well under Best Available Technology (BAT) requirements. The business plan for 2000-2003 includes measures to meet EVCM requirements with respect to the E-PVC charter and BAT.

Intense focus is placed on the working environment and a threshold limit value (TLV) for VCM is set at 1 ppm at both the VCM and PVC installations.

When the correlation between VCM and health risks became known in the 1970s, PVC production was stopped and the plant renovated. We have carried out several comprehensive health surveys among our employees. Continual focus is directed at and follow-ups are made of the work environment and employee health at our sites.

Over the past years, sick leave has been on the rise and in 1998 measures were instigated to reduce these figures. The aim of the programme entitled "Frisk 2000"<sup>1</sup> is to encourage everyone to participate in some form of physical activity. The company has provided every employee with a fitness calendar so that he/she can chart their physical activities. The company also covers the costs of health studio memberships for its employees.

Hydro Polymers AS is focused on close co-operation with its surroundings and is intent on ensuring open and good communication. We provide neighbours and business relations with health, environmental and safety reports and co-operate with several environmental organisations.

## Facts and Figures

- Annual production capacities: 450,000 tons VCM, 130,000 tons chlorine, 140,000 tons caustic soda, 90 tons S-PVC, 21,000 tons E-PVC
- Chlorine/VCM plant: started up in 1978, expanded in 1985
- PVC production: started up in 1950, today's plant renovated in 1974 and expanded in 1997
- Turnover: EUR 310 million
- 70% of the production is exported
- Number of employees: 630, incl. Ethylene plant

## Accreditations

- Satisfies the requirements made by the EVCM charter
- ISO 9002 certification, Chlorine/VCM plant, 1990
- BS7750 environmental certification PVC plant, 1993
- ISO 14001 certification PVC plant, 1998

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<sup>1</sup> "Fitness programme 2000"

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- ISO 14001 certification Chlorine/VCM plant, 2000
  - Accredited to EMAS, PVC plant, 2000
- The aim is that the Chlorine/VCM plant will be accredited to EMAS, 2001

## Distinctions and awards

- Norwegian National Award for quality, 1984
- Norwegian National Award for quality, 1996
- Petrochemical Division's Safety Award issued to the Chlorine plant, 1997
- Petrochemical Division's Safety Award issued to the PVC plant, 1999
- Norwegian National Award for quality, 1999

## **2. Green Paper response**

We feel that it is indeed positive that PVC as a product is now being examined in terms of the material's full lifecycle, ie, from "conception to the end of the product's life" and that the EC has taken on the debate surrounding PVC in a constructive fashion. We are however, somewhat disappointed because only the negative aspects of PVC have been focused on. We would like to highlight the possibility to reclaim the chlorine contained in the PVC.

We would also like to emphasise the fact that PVC products are beneficial for today's society, especially since PVC in many instances replaces natural materials. In addition, PVC products boast a long lifecycle as for example, piping and window profiles. We would like to request that alternative materials within these product spectres also be examined from their concept phase to the end of their lifecycle in order to form a comparison in terms of energy consumption, environmental effects, etc.

We must also emphasize that all recirculation must be based on what is feasible; technically, economically and environmentally.

Here follow our specific comments to the eight "Issues for Consideration" contained within the Green Paper.

### **2.1 Additives**

#### **I Stabilisers**

##### Cadmium

As a stabiliser and pigment in the plastics industry, cadmium was phased out in Scandinavia over 15 years ago. The PVC industry's voluntary environmental commitment will phase out the use of cadmium as a stabiliser in 2001. Based on the consumption pattern applying to cadmium in Europe, this will most likely occur during the first six months of 2001.

##### Lead

More than 90% of the use of lead stabilisers in Norway will be replaced with other stabilisers consisting of non-heavy metals by the end of 2002. In Norway, less than 1 percent of the total lead consumption was used as stabilisers in PVC applications. It is the wish of Danish, Swedish and

## Hydro Polymers

Norwegian authorities alike to reduce the use of lead, and the PVC industry has cooperated actively to ensure that this goal be met.

### **II – Plasticisers/phthalates**

Phthalates are used as additives to make the PVC more malleable. Phthalates are a group of chemicals that can and should not be treated as a group, but rather as individual, single chemicals. PVC is only one source of many for the spreading of phthalates. Phthalates are found in cosmetics, paint and wood treatment products. Some phthalates occur naturally.

American studies of phthalate recordings in *inter alia*, human urine show that phthalates used in PVC make up less than 5% of the amounts recorded (National Centre for Environmental Health). This appears to indicate that phthalate sources other than PVC should also be investigated.

The EC is carrying out a risk analysis of the most common phthalates. This study will be available during the first quarter of 2001. Any possible limitations pertaining to the use of phthalates will be decided once the report has been completed. In addition the recommendations from the commission we would like to examine the results of the risk analysis and then consider methods to reduce the detrimental effects of phthalates.

### Toys

Hydro Polymers AS does not support the use of flexible PVC in articles intended to be sucked and chewed by infants. We refer to and concur with the reply from our colleagues in Hydro Polymers Ltd, UK.

## **2.2 Waste Management**

### **III – Mechanical recycling**

The PVC material in post-use products is simply too good not to be recycled through energy, chemical or material recycling processes. Norway is a long, narrow country and this provides great challenges in terms of material recycling, since the resources needed to collect the materials for recycling are in many cases more expensive than the actual profits obtained through recycling itself.

The voluntary environmental commitment is a good start for the establishment of mechanical recycling and the industry has increased its degree of recycling from 50 to 80% under this agreement.

PVC is a plastic that is well suited to recycling. Our research department has shown that PVC used in electric cable and wire insulation may be recycled eight times without any deterioration in the product quality.

### **IV - Recycling of PVC containing heavy metals**

PVC containing heavy metals, as is the case for many other plastics, should be recycled to form new products with a long life span. Scientific risk evaluations have shown that recycling these materials has no detrimental effects to health or the environment. It is important that the products made from this recycled material be produced in adherence with the same strict regulations applying to additives for the virgin PVC products.

As virgin PVC without heavy metal content emerges, it may be necessary to develop other solutions than resirculation for these materials.

## **V - Chemical recycling**

Chemical recycling of PVC involves breaking down the PVC waste, extracting the chemical building stones within the plastic and using them in new processes.

Through our branch organisation EVCN, the European PVC industry has worked on various chemical-recycling processes over the past five years. In France, Germany, Denmark and Norway, we are involved in chemical recycling on an industrial scale.

In Norway, PVC from the cable industry is being chemically recycled. Norsk Hydro is supporting a project in Kjøpsvik in the North where PVC waste from cables is both an important energy source and a neutralisation agent in cement production.

We are of the opinion that EC should act as a motivator for voluntary agreements as well as monitor results of these.

## **VI – Incineration**

Energy recycling of PVC waste in incineration plants or specially selected industrial waste treatment plants is expensive because the hydrochloric acid that is formed when PVC burns has to be neutralised. Studies from TNO in The Netherlands and Berlin show that the costs of incinerating PVC are lower than for other plastics, yet higher than for average waste products.

Earlier, it was believed that the formation of dioxins in incineration plants was related to what was being incinerated and products containing chlorine such as PVC were often accused of being the sources of these dioxins.

Modern science has shown that the formation of dioxins is dependent on incineration parameters such as temperature profiles and oxygen supply.

Incineration of PVC in modern incineration processes that include the recovery of chlorine can open for a large degree of material and energy reclamation. Such a technical development may contribute to making PVC a more sustainable plastic material than today and it will be a better alternative than landfill.

## **VII – Landfills**

PVC is much too good a resource to be placed in landfills. It should be recycled chemically, mechanically or through energy recycling. We will support recycling initiatives. Waste disposal may be environmentally acceptable but only when incineration plants are inadequate.

Studies of PVC products in landfills have shown that these products have no effect on the landfill itself. As a plastic material, PVC is considered an inert material in the landfill and any plasticiser that may leak out of the product will be consumed by the micro organisms present in the landfill.

One of the five horizontal studies carried out by the EC treated the waste disposal of PVC products. Both the EC and Prognis, who carried out the study have admitted that the study itself was erroneously carried out. In October 2000, a meeting was held involving research specialists in the field of landfills where together with the EC, available knowledge was tabulated on this subject corresponding to the paragraph above.



## **VIII – Other horizontal aspects on PVC**

We as an industry are dependent on this type of horizontal initiative where the product's whole lifecycle is scrutinised, from its conception and recycling to the end of its use. The horizontal PVC study lacks many important parts of PVC's product lifecycle and should be expanded to include that what is missing.

We feel that similar horizontal studies should be carried out on other materials and products so that the use of a lifecycle analysis of these materials will provide a valuable tool towards the improvement of the environment. It is important that these studies be based on updated scientific knowledge.

### Conclusion

We are pleased that the EC has carried out a risk analysis of PVC and consider this to be positive, yet we would like to point out that this same type of analysis needs to be carried out on other materials as well. Potential restrictions applying to the use of PVC shall be based on scientific risk analyses in addition to a product lifecycle analysis of current PVC products compared to alternative products.

### **3. Enclosures**

Health, Environmental and Safety Reports 1999

Brochure: "Hydro Petrochemicals in the Grenland region"

# ICLEI's European Eco-Procurement Programme:

## Statement On PVC Green Paper

As the International Environmental Agency for Local Governments, ICLEI welcomes the European Commission's will to tackle the "Environmental issues of PVC", as documented in the respective Green Paper. ICLEI has the mandate of some 180 European local authorities located in 30 European states to serve as advocates for local governments towards national and international governments, agencies and organisations to increase their understanding and support of local environmental protection and sustainable development aspects.

In this context and regarding the European Unions self-commitment to sustainable development, ICLEI's European Eco-Procurement Programme would like to stress the necessity of a clear phase-out strategy for the production of PVC. The hazardous composition and subsequent risks of disposal which have been scientifically acknowledged in the Commission's Green Paper, make PVC incompatible with the notion of a sustainable economy. This holds true all the more considering the fact, that more environmentally friendly substitutes are available.

From the point of view of local authorities the treatment of PVC is an important topic when opting for the greening of public purchasing. Numerous municipalities all over Europe have adopted voluntary self-commitment strategies on phasing down PVC in publicly procured products. They are now under pressure from the PVC industry. The reference to the inner market principles and free competition, however, cannot disregard the EU state of environmental regulation: With the establishment of sustainable development and environmental policy integration in Art. 2 and 6 of the Treaty of Amsterdam, the environment became one of the Communities prime policy areas. It is a necessary condition for the further establishment of environmental policy as a cross-sectoral topic, but also of the integration of the Community itself, that the right of free trade and competition regulation are reinterpreted in this light. Municipalities should soon be enabled to take into account environmental criteria in their purchasing activities. Only the emphatic greening of its politics will render Europe sustainable. Against this background a phase out of PVC will not only be a relief of the environment but it also strengthen the EU's competitiveness by exhausting first mover advantages.

ICLEI's European Eco-Procurement Programme therefore pleads for the short term phase out of short-lived PVC uses such as inter alia packaging and toys, of PVC medical devices for which alternatives are available, and of hazardous stabilisers and softeners. We consider necessary a ban on incineration and landfilling of PVC wastes and on the recycling of PCV containing hazardous additives. Producer responsibility should be established for the separation of PVC from the general waste stream and for temporary storage until a final disposal solution has been found and implemented by the producers. In a mid-term perspective we call for the drafting and implementation of a phase out programme of the entire European PVC production. This phase-out programme should entail the legal requirement for public purchasers to consider PVC-free alternatives in their operations, as this would give public purchasers the necessary legal position to make environmentally friendly decisions.

We also call on the French Presidency of the European Union to follow the path of the French government to greening government actions and public procurement. The PVC case could become a crystallisation point to enhancing the European framework and enforcing action for greening government operations, an intention the French Environmental Ministry has confirmed only recently by supporting the Lyon Declaration.<sup>1</sup>

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<sup>1</sup> The Lyon Declaration was adopted by the participants of the EcoProcura® Lyon conference the 17-18<sup>th</sup> October 2000, which is part of the series of EcoProcura® conferences organised by ICLEI.



Excmo. Sr. D. Ludwig Krämer  
Jefe de la Unidad de Gestión de Residuos  
DG Medio Ambiente  
Comisión Europea  
Rue de la Loi, 200  
B-1049 Bruselas

San Sebastián, 29 de Noviembre 2000

Excmo. Señor:

Nos dirigimos a usted en nombre de la Fundación INASMET, con el objeto de dar respuesta a las cuestiones planteadas en el “Green Paper” de la Comisión Europea, presentado a consulta pública el pasado 26 de julio.

A continuación, expondremos nuestras observaciones respecto a las ocho preguntas planteadas en el “Green Paper”, basándonos en la evidencia técnica y científica.

**1. *¿Qué serie de medidas deberían aplicarse para resolver el asunto del uso del plomo y del cadmio en el nuevo PVC? ¿Según qué calendario?***

Plomo

Antes de tomar ninguna decisión sobre posibles medidas legislativas relacionadas con el uso del plomo como estabilizante en los productos de PVC sería necesario llevar a cabo una evaluación científica de los riesgos derivados de dicho uso. Mientras tanto habría que tomar en consideración los resultados de los trabajos que distintos organismos están realizando sobre los riesgos derivados del empleo de plomo en general..

Cadmio

El sector del PVC ya ha tomado medidas en relación a este tema comprometiéndose los productores europeos de estabilizante (ESPA) a poner fin a la comercialización de

estabilizantes de cadmio en Europa en un año y recomendando a los transformadores que dejen de utilizar estabilizantes de cadmio a partir del 2001.

**2. *¿Deberían adoptarse medidas específicas para el uso de los ftalatos como plastificantes en el PVC? En caso afirmativo, ¿cuándo y mediante qué instrumentos?***

- Antes de tomar ninguna decisión sobre medidas específicas para el uso de los ftalatos como plastificantes en el PVC sería necesario estudiar las evaluaciones de riesgo actualmente en curso que se prevé estén disponibles a finales del año 2000.

**3. *¿Qué serie de medidas serían las más eficaces para alcanzar el objetivo de aumentar el reciclaje de PVC?***

Según el foro de ibérico de PVC:

- El reciclado de PVC no conlleva unas dificultades distintas a la del resto de los plásticos, tal como constató la antes citada Comisión de Expertos en PVC designada por el Ministerio de Medio Ambiente español, que llegó a las siguientes conclusiones:
  - *“El PVC es un material termoplástico que es fácilmente reciclable mecánicamente y una vez reciclado tiene gran variedad de aplicaciones”*
  - *“El reciclaje mecánico del PVC no presenta, en las distintas etapas del proceso, problemática diferente a la de cualquier otro material termoplástico, ni para la salud humana ni el medio ambiente”*
- El PVC es el segundo plástico más reciclado en España, tal como consta en el Plan Nacional de Residuos Urbanos, aprobado en Consejo de Ministros el pasado 7 de enero. Además, se ha fijado para el PVC una cuota de reciclaje que dobla a la de los demás plásticos, para lo cual se podrán suscribir acuerdos voluntarios o convenios de colaboración con los agentes implicados, tal como consta en el citado Plan (publicado en el BOE. núm 28 del 2/2/99).
- La forma más eficaz de alcanzar el objetivo de incremento del reciclaje del PVC es que la UE y sus Estados Miembro apoyen el Compromiso Voluntario de la Industria del PVC.
- Ya se han alcanzado compromisos voluntarios para los marcos de ventanas y tuberías de PVC. Dichos compromisos recogen objetivos intermedios y finales cuantificados y calendarios específicos (en ambos casos se ha fijado un objetivo de reciclaje del 25% para el 2003 y del 50% para el 2005).

- ❑ Para otras aplicaciones potenciales como cables de PVC o revestimientos de suelos, es necesario desarrollar una logística apropiada, así como tecnologías y aplicaciones de reutilización. La industria del PVC se ha comprometido a apoyar el desarrollo de estos avances para lograr objetivos más elevados de reciclaje mecánico lo antes posible.
- ❑ La industria también ha establecido programas de devolución en los últimos años para reciclar los residuos de PVC provenientes de los talleres de procesado e instalación. Para finales del año 2002, se habrán identificado la generación y fuentes de este tipo de residuos para establecer objetivos de mejora significativos.
- ❑ Por otra parte, es necesario examinar las distintas aplicaciones susceptibles de ser recicladas de acuerdo a ciertos criterios para garantizar que el reciclaje mecánico siga siendo sostenible (fácil de identificar, fácil de recoger, fácil de clasificar, en cantidades suficientes, existencia de un mercado de material reciclado en condiciones económicas competitivas). La industria del PVC procederá a este análisis.
- ❑ Deben respetarse las particularidades de cada país, teniendo en cuenta las tendencias de las aplicaciones locales (por ejemplo, los marcos de ventanas de PVC no se utilizan de igual forma en toda Europa).
- ❑ La adopción de normas sobre productos reciclados una medida válida, siempre y cuando estén redactadas de tal modo que los materiales reciclados puedan ser absorbidos sin afectar a las prestaciones del producto final.
- ❑ Para alcanzar objetivos altos de reciclaje, hay que considerar todas las opciones de reciclaje de materia (p. ej. reciclaje mecánico, reciclaje químico y cualquier otra nueva tecnología).
- ❑ Es necesario el apoyo de las autoridades públicas para crear y organizar programas apropiados de recogida de residuos. La industria del PVC trabajará con todas las partes interesadas para desarrollar estos programas.
- ❑ No es adecuada la adopción de objetivos de reciclaje específicos para un material. Estos deben afectar a todo el sector, como ocurre en el caso de los envases, Vehículos Fuera de Uso, Residuos de Equipos Eléctricos y Electrónicos, etc. El PVC, como cualquier otro material, tiene que contribuir adecuadamente a la consecución de los objetivos acordados. Esta es la forma más rentable para la sociedad de organizar la recogida y clasificación.
- ❑ El marcaje de los materiales individuales no constituye una forma rentable de separación, ya que seguirá habiendo muchos productos compuestos que requerirán más de un código.

- La industria del PVC propone una contribución financiera compartida por todas las partes interesadas a lo largo de todo el proceso de los costes de recogida y clasificación.
- Hay que tener en cuenta que en la actualidad, sólo existe normativa de objetivos de reciclaje para los materiales de envasado (todavía no se ha implantado Vehículos Fuera de Uso, y Residuos de Equipos Eléctricos y Electrónicos aún se encuentra en fase de borrador). Por este motivo, los materiales de envasado presentan mayores volúmenes de reciclaje. Dado que el PVC tiene una importancia menor dentro los materiales plásticos de envasado, es lógico que el PVC presente cifras generales de reciclaje más bajas.

**4. *¿Deberían asociarse medidas específicas al reciclaje mecánico de los residuos de PVC que contienen plomo y cadmio? En caso afirmativo ¿cuáles?***

- Teniendo en cuenta que los metales pesados no se liveran directamente al medio ambiente durante el proceso de reciclado, se considera que sería suficiente aplicar medidas orientadas a priorizar el sistema de ciclo cerrado.

**5. *¿Qué serie de medidas serían las más adecuadas para el reciclaje químico de los residuos de PVC?***

Según el foro de ibérico de PVC:

- Las iniciativas voluntarias son la forma más adecuada de avanzar en el desarrollo tecnológico del reciclaje químico. Es necesario disponer de una explotación a escala industrial para poder evaluar los aspectos tecnológicos y económicos.
- Los productores de PVC se han comprometido a invertir 3 millones de euros en 2001 en una planta piloto de reciclaje químico, con el objeto de identificar de aquí al año 2002, la tecnología más adecuada para llevarla a escala industrial. Paralelamente, la industria del PVC investigará otros procesos potenciales de reciclaje químico.
- El reciclaje químico es complementario del reciclaje mecánico, porque ofrece la posibilidad de tratar residuos de PVC no clasificables y/o contaminados con otros materiales.

**6. *¿Qué serie de medidas sería más eficaz para resolver las cuestiones relativas a la incineración de residuos de PVC?***

- Un concepto de gestión de residuos sostenible para los plásticos debe incluir la opción de incineración para utilizar (aprovechar) el poder calorífico de estos

materiales cuando el reciclaje mecánico, químico o de nueva tecnología no sea posible.

- Se considera necesario aún así avanzar en el desarrollo tecnológico para minimizar las cantidades de residuos de sales producidas, así como desarrollar tecnologías de purificación con el objetivo de recuperar sales que se reutilizarán en procesos químicos, y de minimizar los residuos finales que deben ser eliminados. Existen innovaciones tecnológicas potenciales (p.e. la recuperación de HCl, Neutrec, ...) que permiten minimizar y/o reciclar los residuos de neutralización.

**7. *¿Son necesarias medidas específicas relativas al depósito en vertederos de los residuos de PVC? En caso afirmativo, ¿cuáles?***

- El depósito en vertederos debe ser la última opción para la gestión de residuos, tanto de PVC como de otros de materiales, dando prioridad al reciclaje y a la revalorización energética b de cualquier modo es imprescindible seguir investigando para estudiar la degradación potencial del PVC, del desprendimiento de estabilizantes y plasificantes así como la contribución medioambiental de los ftalatos a los lixiviados y emisiones gaseosas de los vertederos, dado que existen numeros informes contradictorios al respecto.

**8. *¿Cuáles son los instrumentos adecuados para desarrollar una estrategia horizontal en materia de PVC? ¿Deberá preverse una política de sustitución del PVC para algunas aplicaciones concretas? En caso afirmativo, ¿cómo?***

- Antes de plantear la sustitución del PVC en cualquier aplicación debería someterse al mismo proceso de exhaustiva revisión a los materiales alternativos. La comparación debería hacerse teniendo en cuenta el ciclo de vida de cada aplicación
- La Comisión de Expertos en PVC designada por el Ministerio de Medio Ambiente español también se manifestó a este respecto para el caso de los envases, y llegó a las siguientes conclusiones:
  - *"Por lo que se refiere a los envases de un solo uso, no se ve una clara prioridad de ninguno de los materiales revisados desde el punto de vista medioambiental, estando el PVC bien situado entre todos ellos"*



- *“A la vista de todo lo anteriormente expuesto, no hay razones para dar al PVC un tratamiento discriminatorio con respecto al de otros materiales de envase al considerar el análisis del ciclo de vida de las materias primas y de los productos de envase elaborados”*
- El Compromiso Voluntario es la mejor forma de avanzar hacia la sostenibilidad y una buena tutela de producto, mediante
  - La optimización continua de los procesos de fabricación
  - La consideración de los aspectos relacionados con los aditivos
  - El incremento del reciclaje
  - La puesta en marcha de un esquema financiero para alcanzar los objetivos.

En el convencimiento de que nuestras observaciones serán tenidas en consideración, le saluda atentamente,

***Sr. Gregorio Ortiz de Urbina***  
**Director División Medio Ambiente**

Message from Inter-Environnement Wallonie:

Mr. Schulte-Braucks  
Head of the Chemicals Unit  
D.G. Entreprises  
Commission Européenne  
200 rue de la Loi  
B-1049 Bruxelles

Namur, 28<sup>th</sup> of November, 2000

Ref: TS/SC/001128/1

**Object: Green Paper on "Environmental issues of PVC".**

Dear Mister Krämer,

Inter-Environnement Wallonie is the Federation of Environmental Citizens Organisations of the Walloon Region. More than 130 organisations are members of our Federation and we are their official representative towards the Walloon Government.

We participated to the public hearing on the 23th of October, organised by the Commission, and we read the conclusions of the Green Paper on PVC. This topic is very important for us, especially because there is, in the Walloon Region, an important PVC producer (Solvay) but also because most of our incinerators do not meet European emission standards and that milk has been contaminated by dioxines around some of them. The Walloon population is therefore much concerned by the problems that are related to PVC production and it is to defend their interests that we would like to insist on the importance that the European Commission adopt a comprehensive strategy on PVC.

You will find herewith our recent article where we explain our position and where we regret Solvay's attitude. Indeed, it is unfair and too easy to use the "chantage à l'emploi" to put pressure on employees. PVC producers could also "recycle" themselves, as safer alternatives exist, and the substitution of PVC with these alternatives would have a positive effect on employment as has been shown by studies in Germany and Canada.

The scientific studies that support the Green Paper have highlighted a number of key hazards related to PVC, in particular during disposal. Landfilling is a ticking time bomb due to the release of hazardous PVC additives and the potential for dioxin formation during landfill fires. Incineration of PVC makes the problem even worse, as apart from the risk of dioxin formation, the hazardous residues resulting from PVC incineration may even exceed the quantities of PVC put into incineration. Recycling cannot solve the problem, as potential recycling rates under ecological criteria are projected to reach only 5% in 2020. And the problem is set to get worse, as waste quantities will increase significantly over the next decades.

The hazards of PVC throughout each step of its lifecycle always go back to the same two causes that are *specific* for PVC: it is made out of chlorine, and it requires large amounts of additives to be functional. These specific characteristics do not only create major hazards during production and use, but also leave no safe waste treatment option.

The problem of PVC can only be solved when both causes are addressed. A phase out of hazardous additives alone would only solve part of the problem. As PVC cannot be produced without chlorine, the only way to stop this hazard from growing further is to phase out the entire PVC production as soon as possible. Safer alternatives are widely available, and the substitution of PVC with these alternatives would have a positive effect on employment as has been shown by studies in Germany and Canada.

As far as the disposal of the PVC products already on the market is concerned, it needs to be ensured that the existing problem is not made worse by unsafe disposal methods. As standard waste disposal operations have been shown to be unsafe by the EU studies, it has to be ensured that PVC is kept separate from the general waste stream to avoid its landfilling or incineration.

In conclusion, I therefore urge you to adopt a clear phase-out strategy for the entire production of PVC and to make producers responsible for separate collection and disposal of all PVC waste.

Yours faithfully,

Thérèse Snoy  
General Secretary

Annexe: Article to be published in our magazine (Revue "ENVIRONNEMENT", n°55, December 2000)

Message from Jacques de Gerlache :

A l'attention de :

Mr Krämer, Head of the Waste Management Unit (DG Environment)

Mr Schulte-Braucks, Head of the Chemicals Unit (DG Enterprise)

200 rue de la Loi - B-1049 Brussels, Belgium

Messieurs,

Comme toxicologue, j'ai toujours suivi avec beaucoup d'attention l'ensemble des études relatives au PVC "du berceau à la tombe".

J'avoue ne pas bien comprendre cependant l'acharnement dont il fait l'objet. Étudié plus qu'aucun autre produit industriel, soumis à l'examen de multiples Commissions indépendantes et au dessus de tout soupçon dans de multiples pays, aucune n'a jamais conclu à la nécessité de mesures significatives de restrictions ou d'interdiction à son égard.

Comme l'ensemble des activités industrielles, sa fabrication a bénéficié des progrès technologiques et s'est améliorée d'année en année. La Commission OSPARCOM, qui peut difficilement être taxée de laxisme, a entériné l'an dernier à l'unanimité de ses 25 pays membres la fabrication de PVC en suspension (>85% de la production) selon les meilleures pratiques disponibles (BAT) ce qui ne présente pas de risque inacceptable pour l'environnement et le milieu marin en particulier.

L'industrie du PVC européenne toute entière vient de signer un Engagement Volontaire formel et jusqu'ici doute unique en son genre, qui définit des objectifs vérifiables de progrès, notamment en matière de recyclage. Mais dans ce domaine particulier pourquoi vouloir faire porter par le seul PVC le poids d'une problématique dont l'enjeu principal est la mise en place de filières de collectes et de tri concernant tous les matériaux. En ce qui concerne le recyclage, existe-t-il d'autres secteurs plus actifs que celui du PVC en matière de développement et de mise en place d'une stratégie couvrant les 3 options fondamentales : recyclage mécanique, chimique et énergétique. Le "surcoût" de l'incinération du PVC (0,65 % des déchets !!) si souvent évoqué mais jamais comparé à tous les autres justifie-t-il une telle débauche d'efforts alors qu'il y a tellement d'autres priorités, notamment sur le plan de la sécurité "biologique".

De ce point de vue n'est-il pas aussi dérisoire de se focaliser excessivement sur le recyclage non énergétique du PVC lorsque l'on sait pertinemment que l'énergie des déchets PVC correspondant sans doute à moins de 1% de celle du pétrole dépensé chaque année. Au moins le contenu énergétique du PVC (et des autres polymères) a-t-il été utilisé plusieurs fois avant d'être utilisé sous forme d'électricité ou de chaleur.

Les études horizontales en effet, pas plus que les Commissions d'enquête nationales antérieures ne soulèvent de problème spécifique quant à un impact sanitaire lié au cycle de vie du PVC. Si j'ai bien compris, les mesures frappant les jouets en PVC sont uniquement justifiées par l'absence actuelle d'une méthode capable de vérifier pour le secteur concerné le respect des normes recommandées par le CSTEE.

En ce qui concerne les pressions extérieures et notamment émotionnelles et démagogiques dont le PVC est l'objet notamment à propos des plastifiants, j'ajouterai qu'en tant que toxicologue, je suis particulièrement choqué par les tentatives démagogiques de manipulation de personnes ou groupes de personnes que l'on amène à témoigner de leur cas personnel et en particulier de situations familiales ou médicales souvent graves et qui méritent le plus grand respect. Ces témoignages individuels dans un contexte inapproprié relève plus de la presse à sensation que d'un forum médical scientifique. En effet, aucun élément sérieux et avéré ne permet de lier directement ces cas particuliers à une quelconque cause avérée.

Abuser de l'ignorance bien naturelle de l'homme de la rue des aspects complexes et techniques des dossiers relatifs à la santé et à l'environnement pour susciter chez eux des réflexes de peur et d'angoisse n'honore pas ceux qui recourent à ces moyens en prétendant les défendre.

Je pense personnellement qu'inciter les autorités responsables à prendre des décisions partisans et discriminatoires non basées sur des faits ou des présomptions suffisantes représente en réalité un risque énorme du point de vue de la crédibilité et de l'efficacité de nos institutions sanitaires et environnementales. En effet, l'adoption de mesures justifiées par calcul politique envers des boucs émissaires symboliques ne peut qu'ouvrir la porte à tous les abus de pouvoir démagogique et empêcher à l'avenir les autorités en charge de la protection sanitaire et environnementale de prendre les mesures appropriées quand elles sont vraiment indispensables.

Nous ne vivons pas dans un monde parfait et ce ne sera jamais le cas. Tout au plus pouvons nous oeuvrer à le rendre plus durable et plus digne pour l'ensemble de la communauté humaine et de l'environnement naturel dont elle est une part indissociable.

J'ai à cet égard la conviction d'y contribuer positivement et en toute objectivité en exerçant mes qualités de toxicologue au sein d'une industrie qui, tout en contribuant chaque jour à subvenir à des besoins aussi fondamentaux que la santé, l'habitat, la qualité de l'eau potable et de l'alimentation, progresse significativement en matière de santé, de sécurité et d'environnement. Je ne ferais pas ici de comparaisons de chiffres qui seraient pourtant bien éclairantes.

Enfin, j'ai la conviction que ma crédibilité et celle de mes collègues scientifiques oeuvrant dans l'industrie, quoique systématiquement mise en cause, est aussi grande que celle de ceux qui l'exercent dans d'autres contextes : nous n'avons en effet pas plus que d'autres le droit à l'erreur étant donné les conséquences importantes de nos avis et de nos expertises.

J'ai pleinement confiance dans le fait que les représentants des citoyens élus au sein des institutions européennes et les fonctionnaires qui les assistent dans l'exercice de leurs responsabilités continueront dans le futur à mesurer toute l'importance de décisions mûrement réfléchies dans la pleine mesure des intérêts de chacun qui sont à la fois et indissolublement économique, sociale et environnementale.

Jacques de Gerlache  
Pharmacien, Dr Sc. Pharmaceutiques  
Toxicologue

Message from James Franklin :

Dear Mr. Krämer,

Following the publication of your "Green Paper on Environmental Issues of PVC", please find below some comments which I, as an industrial research scientist, feel should be taken into consideration :

- \* In-depth analyses of all aspects of the production, use and disposal of PVC have been performed over the 50-year industrial history of this polymer;
- \* For certain alternative materials, such detailed knowledge is not available. It may be tempting to give them the "benefit of the doubt", but, before replacing PVC in any application, the life-cycle of the potential substitute should be subjected to the same intense scrutiny as for PVC;
- \* Although chemists have demonstrated their ingenuity by synthesising vast numbers of new compounds, one can imagine few polymers with structures as simple as PVC. On account of this simplicity, PVC is an inexpensive material which is all the more valuable in that it contains 57 % chlorine - meaning that over half of the raw material content is independent of the supply of petroleum;
- \* It is true that a number of problems associated with the production, use and disposal of PVC have come to light over the last 30 years or so : carcinogenicity of the monomer, formation of dioxins during the oxychlorination of ethylene, leaching of stabilisers or plasticisers, etc. But technical solutions exist for all of these problems. Risks can be managed with available technology;
- \* Over-regulation of PVC is not in Society's interest. On the contrary it would deprive us of a valuable resource;
- \* What must be ensured is the production, use and disposal of PVC under conditions complying with adequate environmental and health standards. The expertise and technology for doing so exist in Europe. All stakeholders must work together so that they are applied rationally.

Thank you for the opportunity to contribute to this debate.

Yours sincerely,

Dr. James Franklin

Message from Jean Bidoul:

Message a l'attention de

Mr Kramer, Head of the Waste Management Unit (DG Environment)

Mr Schulte-Braucks, Head of the Chemicals Unit (DG Enterprise)

Messieurs,

Au moment ou la conference de La Haye se termine, il me parait necessaire de participer a l'enquete publique sur le " Livre Vert" concernant le PVC.

Les economies d'energie et le respect des forets sensibilisent de plus en plus de responsables et chacun d'entre nous.

J'ai donc relu des articles comparant les avantages/inconvenients, sous tous les aspects de nombreux materiaux dont le PVC. Dans des domaines tels que la construction et certains biens d'equipement, il parait evident que le PVC, materiau inerte et durable, contribue a la sauvegarde des forets et a la reduction de l'effet de serre, tout en resitant bien au feu et en economisant, beaucoup plus que d'autres plastiques, cette matiere premiere precieuse non renouvelable qu'est le petrole.

Les feuilles souples en PVC permettent de realiser des emballages legers et performants, ainsi que des objets tres largement utilises par le monde medical:

Bien sur, les etudes le montrent, il reste pas mal de progres a faire, notamment en matiere de recyclage, mais le PVC ne represente qu'une partie infime de nos dechets; il semble que le probleme soit regle pour autant que l'on ai un incinerateur qui fonctionne convenablement, ce qui ne me semble pas un exploit !

Je vous prie d'accepter, Messieurs, l'expression de ma meilleure consideration.

Jean Bidoul



Sartrouville le 29.11.00

**OBJET : LIVRE VERT SUR LE PVC**

Monsieur,

J'ai pris connaissance du livre vert sur le PVC qui a été récemment publié sur Internet par la commission européenne et par la présente je souhaiterais vous faire des commentaires d'un citoyen français, ingénieur de profession et ayant 30 années d'expérience dans le domaine des polymères techniques.

Tout d'abord , je suis personnellement choqué par **le caractère discriminatoire d'une telle étude** qui focalise l'attention sur un matériau, provoquant par voie de conséquence une suspicion favorisant des matériaux pour lesquels le niveau d'informations scientifiques disponibles en matière d'impact sur l'environnement et la santé est de loin inférieur à celui dont on dispose aujourd'hui sur le PVC. Dans un souci d'équité il aurait été souhaitable qu'une telle étude soit également réalisée sur d'autres matériaux de grande consommation.

**1. IMPACT DU PVC SUR LES RESSOURCES NON RENOUVELABLES**

A ma connaissance le PVC est une des rares matières plastiques qui utilise pour sa production le moins de ressources fossiles puisque les éléments rentrant dans sa composition sont du chlore (à 57% en poids) provenant du sel de mer et de l'éthylène.

**⇒ De ce point de vue et à l'inverse d'autres matières plastiques, il apparaît clairement que le PVC préserve les ressources non renouvelables de notre planète.**

**2. IMPACT DU PVC SUR L'ENVIRONNEMENT ET LA SANTE**

Le PVC dans sa forme rigide est principalement utilisé dans le bâtiment et dans les travaux publics pour des applications dont la durée de vie varie de 15 à 100 ans. Pour ces applications le PVC présente des propriétés d'usage extrêmement appréciables, à savoir :

- à l'inverse d'autres matériaux tels que l'acier ou le bois, **le PVC ne nécessite aucun entretien après son installation**. Dans le cas des fenêtres, volets, lambris, barrières exposées aux intempéries (pluie, rayonnement solaire, oxygène de l'air, air marin, etc.), il est nécessaire d'effectuer régulièrement des travaux de rénovation afin de protéger les produits finis et de prolonger leur durée de vie. C'est ainsi qu'il faut poncer et appliquer sur le bois ou l'acier des peintures de protection qui contiennent dans la plupart des cas des solvants ou co-solvants organiques (propylène glycol), des anti-rouille, des insecticides, des fongicides, etc. En considérant que la durée de vie d'un produit PVC soit de 20 ans, durant ce laps de temps **il faudra effectuer au minimum 4 à 5 opérations de**

**rénovation sur du bois ou de l'acier, et rien sur du PVC.** Pour être complet dans cette comparaison il faudrait d'ailleurs considérer les dépenses d'énergie engendrées à la fois par la production et le transport des peintures utilisées pour la rénovation de ces matériaux dits naturels.

⇒ ***Sur ce plan, le PVC présente un intérêt indiscutable en matière de protection de l'environnement et de la santé.***

Un autre exemple intéressant est celui des tubes et raccords utilisés pour le transport des eaux usées ou de l'eau potable.

En raison de leur insensibilité à la corrosion et de leur résistance à l'entartrage, **la durée de vie des tubes PVC est très supérieure à celle des tubes métalliques** (acier, fonte, béton, cuivre ). Posez la question à des plombiers ou à des responsables d'entretien, ils vous confirmeront que l'on remplace bien plus souvent les canalisations réalisées dans ces matériaux alors que cela est très rare avec le PVC.

Dans le domaine des installations d'eau chaude et froide sanitaire, le PVC est un matériau extrêmement intéressant. En effet il présente une résistance naturelle aux produits de désinfection et en particuliers au chlore. **Cette propriété fait du PVC un des rares matériaux capables de résister aux traitements de lutte contre la légionella** qui imposent une injection régulière de chlore (voir des chocs chlorés en cas de situation critique). Or, la plupart des métaux voir même des plastiques d'utilisation courante subissent une corrosion lorsqu'ils sont en contact du chlore. Cette corrosion entraîne une augmentation des risques de fuites et une réduction significative de leur durée de vie. En conséquence, les installations doivent être remplacées plus fréquemment lorsqu'elles ne sont pas en PVC, d'où des coûts et des consommations d'énergie.

⇒ ***Sur ce plan encore une fois, le PVC présente un intérêt indiscutable en matière de protection de l'environnement et de la santé.***

### **3. IMPACT DU PVC SUR L'ENVIRONNEMENT ET LA SECURITE**

La présence de chlore dans le PVC confère à ce polymère des propriétés naturelles de résistance au feu qui ne peuvent pas être égalées par la grande majorité des polymères actuellement disponibles sur le marché. En effet, à l'inverse du PVC, la plupart des autres matériaux plastiques se comportent comme du pétrole solide. Ils sont naturellement combustibles. Dans la plupart des cas, des retardateurs de flamme ou ignifugeants doivent être mélangés à ces matériaux pour améliorer leur résistance à la propagation de la flamme. Ces ignifugeants sont des produits chimiques dont la décomposition peut entraîner la formation de molécules complexes dont certaines ne sont probablement pas sans danger pour la santé.

Posez la question aux centres techniques spécialisés dans les essais feu des produits du bâtiment. Ils vous confirmeront que le PVC est difficile à enflammer et qu'il présente un comportement au feu bien supérieur aux autres matériaux proposés comme alternatives.

**⇒ Sans nul doute, le remplacement du PVC dans le secteur du bâtiment serait la cause du développement d'incendies causant la mort de plusieurs personnes chaque année.**

#### **4. LA QUESTION DES STABILISANTS**

Concernant les stabilisants thermiques du PVC, je tiens à attirer votre attention sur le fait que le cadmium n'est plus utilisé depuis plusieurs années en Europe en tant que système de stabilisation du PVC. Le plomb est encore utilisé à des taux inférieurs à 1% car cet élément s'avère très efficace. Cependant, dans plusieurs pays européens, son utilisation est limitée aux produits ne transportant pas d'eau potable. Dans ces pays, l'étain sous forme d'organo-étain (très différents sur le plan chimique du TBT utilisé comme anti-fouling sur les coques de bateaux) est employé à la place du plomb. A ce sujet, il apparaît clairement dans la stratégie de certains mouvements soit disant écologistes de créer un amalgame entre les organo-étains et le TBT dans le but de jouer un doute sur ces composés et jouer sur l'émotion. Depuis maintenant neuf ans, nous menons des recherches sur la substitution du plomb. Des progrès doivent être encore réalisés pour envisager un remplacement du plomb dans toutes les applications. En outre, il faut être prudent car nous manquons de recul quant aux performances de durabilité à long terme de PVC non stabilisé au plomb. Or, la durabilité est une propriété extrêmement importante en regard de son impact sur l'environnement. Pour être complet, j'ajouterais qu'à ce jour toutes les études de migration réalisées par des scientifiques ont montré l'absence de relargage du plomb dans le sol, lors de sa mise en décharge.

#### **5. IMPACT DU PVC SUR L'ENVIRONNEMENT EN FIN DE VIE**

Le PVC comme tous les polymères thermoplastiques peut être recyclé dans de nouveaux produits . Etant directeur de la recherche et de l'environnement d'un groupe international , je peux vous garantir que depuis dix ans nous avons développé de façon volontaire une politique de recyclage non seulement des déchets internes mais également des déchets plastiques provenant de sources externes. Nous développons aujourd'hui des nouveaux produits pour les travaux publics à partir de matériaux plastiques recyclés. Cet effort sera poursuivi dans les années à venir avec la mise en place de filières de collecte bien organisées qui permettront aux industriels d'utiliser plus largement ces gisements et de participer encore plus activement à l'effort d'amélioration de notre environnement.

Pour les déchets PVC qui ne pourront pas être recyclés , ils pourront être incinérés . La combustion du PVC dégage principalement de l'acide chlorhydrique et de l'énergie. Il s'agit d'une molécule simple aisément neutralisable par la chaux pour former des composés tels que le chlorure de calcium que l'on trouve dans la nature.

**⇒ Le développement du recyclage du PVC ainsi que celui des autres matériaux permettra dans les années à venir de réduire considérablement les mises en décharge et l'incinération. En outre , cette opération permettra d'économiser des matières premières non renouvelables.**

En conclusion, le procès dont est victime aujourd'hui le PVC me semble non fondé. Il est le fait principalement de mouvements intégristes qui n'ont aucune conscience des conséquences globales d'un remplacement de ce matériau sur l'environnement et sur l'économie. Dans un souci d'objectivité , de rigueur scientifique et d'équité, je souhaiterais que soient réalisées des analyses de cycle de vie multicritères afin

d'avoir vraiment une mesure précise et représentative de l'impact du PVC sur l'environnement.

Vous remerciant de l'attention que vous voudrez bien porter à ces réflexions , je vous prie d'agréer , Monsieur , l'expression de mes salutations distinguées.

Jean CARMIER  
Directeur de la recherche et de l'environnement  
ETEX Plastiques

Message from Jean-Jacques Ruelle :

Messieurs,

Permettez-moi ici d'exprimer ma conviction profonde dans les qualités intrinsèques du PVC, un polymère particulièrement respectueux de l'environnement car consommant sensiblement moins de ressources fossiles et d'énergie que les autres plastiques tant lors de sa fabrication que lors de sa mise en oeuvre et qui permet dans bien des applications (fenêtres, volets, barrières), en se substituant au bois, d'épargner les arbres des forêts et donc d'atténuer le problème des dégagements de gaz à effet de serre.

Très sincèrement,

Jean-Jacques Ruelle

Message from Jean-Marc Chamberland :

Dear Sir,

In response to your Green Book, please find a responsible citizen opinion on PVC.

As a Project Manager, I have been closely involved during the last ten years in the design, construction and operation of PVC Plant in various places in the world, bringing state of the art technology into the Plants for example for enhancing waste water recovery and reduction of any kind of emission.

Progress accomplished during the last ten years is fantastic and is a continuous on-going process, confirming the commitment of my Company for a responsible approach.

Continuous improvement of safe manufacturing process has allowed PVC to remain by far the cheapest of the product available on the market for essential applications such as gravity piping systems, giving the possibility of developing countries to create infrastructure for waste water collection at the lowest possible price, contributing the improvement of the welfare of populations.

Other fundamental issue is that PVC is requiring Salt for a large part reducing the use of oil, our valuable natural resource.

As millions of people do, I am convinced that PVC is a very good product, essential into the daily live and cheap. Recycling will continue to be improved by the numerous engineers involved into the development of better technologies so that impact on environment can be minimized and a large percentage of PVC can be reused at the end of product lifetime.

Best Regards

Jean-Marc Chamberland  
Engineering & Construction Manager - SOLVAY SA

Message from John M. Batt :

November 29, 2000

PVC - The Green Paper

Dear Mr. Schulte-Braucks,

As an employee of ATOFINA Chemicals, Inc., located in the United States, and active in the PVC stabilizer and additives industry, I am very much concerned about The Green Paper of the Commission. I have reviewed the pros and cons of this Green Paper and also of the Voluntary Commitment made by the European PVC Industry. I would like to make a few comments:

PVC is one of the most important modern synthetic materials. PVC offers great added value to society, especially in many applications ranging from medical devices, pharmaceutical packaging, floor covering for homes and hospitals, maintenance free windows, with low energy loss, water pipes with an expected lifetime of 100 years and many other applications.

Our company manufactures plastic additives and other chemicals which are designed to enhance the performance of plastic products used by consumers and industry. These products can be used safely and are well proven in their respective applications.

I know that plastics other than PVC, more traditional materials, are used in other applications but are often less efficient in ecological and economic terms compared to PVC solutions in applications like those I mentioned above.

After their useful life, all products regardless of the material they are made of, finally become waste. PVC recycling is now increasing and new improved recycling technology is under development. This will ensure that in the coming decades all PVC based products find the best ecological and economic end-of-life treatment.

The many issues raised in The Green Paper apply to many materials, not only to PVC. Therefore I cannot understand why the European Commission focuses on PVC in particular.

The products we produce for the PVC industry are significant in our local region, as we produce stabilizers, flow and impact modifiers, and other chemicals.

The importance of the PVC industry, including many small and medium sized companies producing PVC based products, is considerable.

I fully support the voluntary approach and the Voluntary Commitment made by the PVC industry.

Therefore, I strongly recommend that the EU Commission accepts the industry's Voluntary Commitment. It offers the most effective approach for further improving PVC and its long term viability on ecological and economic grounds.

Please make sure PVC is treated the same as any other material.

Sincerely,

John M. Batt



Message from Jorge Costa :

Cher Messieurs,

Je suis pour les plastiques en general, car je suis aussi pour la protection de l'environnement. Quand on parle de solutions en plastique, on parle chaque fois plus des solutions du present et du futur.

Je suis pour le PVC, lorsque le produit est recyclable et il nous permet de Faire, par exemple, des conduits etanches qui sauve leau du planet qui est chaque fois plus un tresor.

Dans des Groupes, comme PIPELIFE, la fabrication des tubes avec des recycles de PVC est deja une realite. La fabrication des conduites avec tubes PVC est une solution economique, des que le produit est plus leger et la main d'oeuvre est moins chere si on compare avec des autres produits traditionnelles.

P - Pour  
V - Vivre  
C - Calmement

Salutations Distinguees

Jorge Costa

## JPM RESOURCES [UK] LIMITED



### HEAD OFFICE

Crosses Farm

Shaw Brow

Whittle-le-Woods

Chorley, Lancashire

PR6 7HG, England

Tel: 00 44 (0) 1257 239 600

Fax: 00 44 (0) 1257 239 619

Email: @jpmresources.co.uk

Mr E Liikanen  
Commissioner for Enterprise  
and the Information Society  
European Commission  
Rue de la Loi, 200  
1049 Brussels  
BELGIUM

30 November, 2000

Dear Mr Liikanen,

### **The Green Paper on PVC - COMM (2000)469**

JPM Resources is an international company involved in the design and manufacture of Sports accessories. We currently directly employ 35 people. Indirectly however, through our production and distribution networks, the numbers of employees total over 2500 people. Our client base includes large sporting brands such as NIKE and we presently manufacture products for most European countries.

Our sales value is approximately £30m and we are a large source of employment throughout Britain and Europe.

We have looked at the Green paper released by the European Commission on PVC and are aware that a strategy regarding its manufacture and waste management is likely to be published in 2001.

We feel that the Green Paper does not fully recognise the value of PVC. PVC is a material that has been tried and tested for more than 50 years. It has many useful properties and it is because of these that it is used in many applications essential to everyday use, from construction materials to safely

delivering a clean water supply, to life-saving medical products such as blood bags.

Section 3 of the green paper, discusses the use of additives in PVC. We would like to comment as follows:-

- We believe that there is sufficient legislation already in place that restricts the use of cadmium and lead in various situations.
- Along with our suppliers, we have worked towards reducing the use of stabilisers within our products. For example our products conform to the legislation of low cadmium, low formaldehyde. In addition we use a backing which is low toxic, thus voluntarily reducing any perceived risks.
- Studies to date show phthalates are safe and there is no real alternative to phthalates.
- Phthalates are currently subject to Risk Assessment under the EC Directive on Existing Substances. It is important that we await the results of further scientific research before legislating against phthalates.

Within section 5 of the Green paper, there is a discussion on a possible horizontal strategy on PVC. We would like to comment as follows:-

- Legislation regarding one material is improper without having investigated its alternatives to the same degree. Currently in the manufacturing of our products there is no suitable and readily available alternative to PVC.
- We have looked into what other interest groups perceive the alternatives to PVC are. As a business we are aware of the main alternative suggested, PU. We currently use PU backed fabrics, however from experience we know that they are only suitable for a limited number of products.
- PVC has been used in our industry for many years and is a tried and tested application. It is used mainly due to it possessing the following useful characteristics.
  - Waterproof
  - Versatility - it can be flexible, transparent, opaque, coloured
  - Ease of processing and availability
  - Cost effectiveness
  - Lightweight
  - Design freedom
  - Strength and durability

We consider that there is no case for legislating against PVC, and that the best approach to a European strategy is through the fulfilment and

development of voluntary initiatives.

If the Commission decides to legislate against PVC, then time is needed by all groups to implement these changes. Further investigations into the alternatives to PVC need to be undertaken before any decisions affecting its use are taken, as often the proposed solution to a problem is not always the perfect cure.

Yours sincerely

John Marshall  
Managing director  
JPM Resources

## **Comments on COM(2000) 469 final; Green Paper on Environmental issues of PVC**

Prepared by: Julian Morris

Note: The author is Director of the Environment and Technology Programme at the Institute of Economic Affairs, 2 Lord North Street, London SW1P 3LB. However, his comments are made in a personal capacity and not on behalf of the Institute (which has no corporate view), its Directors, Advisors, or Trustees

### **GENERAL COMMENTS**

1. The Green Paper has been prepared in advance of the publication of assessments of the economic and environmental implications of imposing restrictions on the use of PVC. As such it is premature and in that context many of the questions to which it seeks answers are absurd.
2. It is perhaps worth speculating as to why the Green Paper has appeared at this time. It seems likely that DG Environment is being manipulated by a combination of environmental and industry groups, who fear that the results of a balanced assessment of PVC's role would not support the restrictions they seek. Various environmental groups have for some time sought to eliminate PVC from society. Their reasons for this are probably mixed, but include a long-standing antipathy to chlorine in practically every form, regardless of the environmental and health impacts (let alone the economic consequences). In this context a group of environmental organisations is seeking a global ban on the production and distribution of DDT, an organochlorine compound which is currently the most cost-effective means of preventing malaria. Such a ban would endanger the lives of millions of children in developing countries.<sup>1</sup> Certain industries that produce commodities which compete with PVC would clearly benefit if the use were to be restricted. The manufacturers of wood and aluminium window frames seem obvious candidates, as do the manufacturers of other plastics. In addition, it is possible that the PVC industry itself (and especially those manufacturers that also produce other plastics) may be supportive of restrictions that increase the costs of production, as these may act as a barrier to entry, creating oligopolistic profits for the incumbent firms.<sup>2</sup>
3. It seems unwise at this stage to elaborate any legislation that specifically targets PVC. Before this is done it will be necessary to carry out more detailed assessments of the costs and benefits of any such legislation, evaluating in particular the opportunity costs – that is the foregone benefits – that might result from such restrictions. For example, the Green Paper mentions the impact of incinerating PVC and focuses the reader's attention on the possibility that dioxins might enter the environment as a result. However, no mention is made of the impact of incinerating wood – a competitor to PVC – which might also result in the emission of dioxin to the environment. If restrictions are imposed on PVC use, in the form of mandatory separation of

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<sup>1</sup> See [www.fightingmalaria.org](http://www.fightingmalaria.org) and references available from that site.

<sup>2</sup> See Morris, J. (1995): "The Impact of Part II the Environmental Protection Act 1990 on the Waste Management Industry," Cambridge University Department of Land Economics, MPhil Thesis, and references therein.

waste for example, it seems likely that there will be an increase in the amount of wood used for the manufacture of window frames. As a result of this, when these window frames come to be replaced, there may be an increase in emissions of dioxins, furans, and other polyaromatic hydrocarbons into the environment. To be consistent, this would mean imposing restrictions on the burning of wood in fires in Alpine huts. Is the Commission considering this course of action? The point of course is that it is ridiculous merely to assert the possibility of a risk of harm as a justification for taking regulatory action. Failure to consider the actual harm that may result from this risk, to evaluate the expected cost that would result from the estimated harm and to factor in the opportunity costs of regulation taken to prevent, limit or mitigate the harm would lead to disastrous policymaking. Consider merely the following list of potential human carcinogens: hydroquinone, furfural, catechol, and caffeic acid. All these compounds (which are known rodent carcinogens) are present in coffee.<sup>3</sup> Has the Commission launched an investigation into the sale of coffee? No, because coffee clearly provides benefits to consumers and there would be a public outcry of it were to be banned. But by regulating the use of PVC the commission is nevertheless threatening to increase the cost of coffee, milk, meat and other foodstuffs by raising the cost of their distribution and storage.

#### SPECIFIC COMMENTS

1. The introduction suggests (or strongly implies) that a horizontal Directive on PVC may be justified by the variety of different national regulations targeting PVC, which 'may have consequences for the internal market'. The implication being that these national restrictions are a restraint on trade. That may be so but the question the Commission must ask itself is whether a Community-wide Directive would be beneficial to trade, or whether measures requiring separation of PVC waste, for example, might actually inhibit trade not only in PVC but in the products in which PVC is stored.
2. The subsequent suggestion that a life cycle analysis of PVC is the appropriate tool for evaluating the way in which PVC should be regulated in order to ensure a high level of protection of human health and the environment as well as maintaining the internal market also misses the point that merely assessing the risks of PVC may lead to a failure to consider relevant opportunity costs associated with the regulation of PVC use. A truly integrated approach would consider PVC and all relevant alternatives; it would, further, include a full cost-benefit analysis of the use of these technologies and the implications of imposing restrictions upon them. Of course, such an approach is immensely complicated and would take years, possibly decades. So, in the mean time, perhaps a better approach would be to consider the regulation of the activities that are purported to cause harm, such as the disposal of waste. In that case, maybe a better use of the Commission's valuable time would be to establish clear rules restricting any harms that might result from the manufacture, use and disposal of PVC and all other substances. Focussing on these identifiable harms and establishing chains of responsibility associated with them seems a

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<sup>3</sup> Ames, B. and L. Gold (1999): "Pollution, Pesticides and Cancer Misconceptions," in Morris and Bate (eds), *Fearing Food*, Butterworth-Heinemann.

much more logical means of dealing with the problem: it would internalise better the external costs associated with waste disposal; it would thereby create incentives on the part of those responsible to manage the waste in the most environmentally desirable way; it would even create incentives on purchasers to adjust their consumption decisions in light of the possible costs that might be associated with waste management. Of course the effect on purchasers may be only marginal, but so long as the external effects associated with the product are internalised, what is the problem?

3. This comment of course cuts to the heart of the Commission's waste hierarchy, which is based on a dogmatic view of how waste should be managed. This view belongs in the 1970s, from whence it came: it rests on a number of salt pillars, including the facile notion that recycling saves resources (in fact in many cases this is not true since resources must be used in the process of recycling), and the demonstrably false assertion that resources will run out. In respect of the latter point, the reality is that resources are the product of the human mind; absent man and there would be no resources in the sense in which we conceptualise them. Take oil: Oil is of no value unless there are uses for it and those uses are created by man's ingenuity. Oil does not 'run out' because oil companies are constantly searching for new sources; we have only 30 years or so of 'proven reserves' because 30 years is approximately the payback period for investments in oil exploration. When oil prices rise, entrepreneurial oil companies invest more in discovery in order to take advantage of the increased return on investment. And as a result of that, oil availability increases and prices fall again. Of course, there may eventually be some limit to availability (though this is likely to be a long time off), but if that happens, the price will rise gradually and entrepreneurs will invest in alternative technologies. Oil will not be exhausted because cheaper alternatives will be found. Economists have known this for decades. It's about time the Commission took note. Of course there are other ways to deal with the scarcity problem. Consumers prefer more fuel-efficient cars and lighter materials because they are cheaper (as long as they are equally good). Other alternatives to increased resource consumption are constantly being invented but not because of government intervention: even with very low tax, US residents buy fuel-efficient cars (even sports utility vehicles are far more efficient than older cars and they are not subject to the Federal Corporate Average Fuel Economy standards). Necessity may be the mother of invention, but desire is the father and mandate is merely an evil stepmother.

The argument with regard to oil clearly applies equally to waste management options: if landfills or incinerators become scarce then there will be incentives to manage waste in other ways, but there is no economic or environmental justification in forcing early adoption of these alternative technologies.

4. If PVC is responsible for only 35% of the chlorine produced by chloralkali electrolysis, what is the Commission doing about the other 65%? If it is contemplating more strict regulation, would there not be a conflict with the proposed horizontal PVC directive (leading effectively to double counting of putative effects)? If it is not contemplating more strict regulation, it is presumably happy with the current emissions and other environmental effects of the chloralkali industry, in which case why is it including this as a component of the proposed horizontal Directive on PVC?

5. The fact that the Association of European PVC Producers (ECVM) has entered into a voluntary agreement with the Commission to restrict emissions of certain chemicals (and various other matters) might be interpreted as a desperate measure on the part of the PVC industry to placate the Commission. Alternatively, it might be seen as a ploy on the part of the industry to obtain regulations that it finds acceptable (the fact that 12% of those firms audited were not complying with the voluntary agreement to restrict emissions suggests that free riding is a problem and from the industry's perspective a regulation might provide benefits by eliminating these free riders – assuming perfect enforcement). As mentioned above there is some evidence that industries use regulation as a barrier to entry. This is not to say that a regulation that causes evident harm to the industry would be preferable. Rather it is merely to say that the motives and behaviour of both the Commission and the industry might be called into question.
6. There is much discussion throughout the text of evidence pertaining to potential harmful effects of PVC and various related chemicals (phthalates, lead, cadmium, etc.), yet this discussion often appears without reference to any estimates of the actual harm that might result from these chemicals in the context in which they are employed (either as a result of emissions during production, leakage during use, or emissions/leaching during disposal). This leads to the impression that these chemicals are harmful even though as is stated at various places in the text studies assessing the actual impacts are still ongoing.
7. An example is found under section 3.2: “most lead compounds including those used in PVC are classified as toxic to reproduction, harmful, dangerous for the environment (ecotoxic) and presenting a danger of cumulative effects. Lead is persistent and certain lead compounds accumulate in certain organisms.” This is all very interesting but it tells us precisely nothing about the effects of lead as used in PVC (it is also noteworthy that the abovementioned sentences contain no references to studies supporting the assertions made). What it does is provide ammunition for the Commission to cite as evidence of the potential harmful effects of lead and thus justify, presumably on ‘precautionary’ grounds, just about any restriction it wants. Yet this would be a pity because two paragraphs later it is pointed out quite correctly that: “A distinction has to be made between the hazards and risks from chemical substances. At present, no comprehensive risk assessments have been completed on the use of cadmium and lead compounds as stabilisers in PVC products.” It is further pointed out that a study is ongoing into these effects. The question therefore arises (as alluded before): why has this Green Paper been issued in advance of the conclusion of these studies? Is there some urgency to the imposition of a Horizontal Directive? Given that the timescales discussed in the document are of the order of decades and that PVC has been used already for decades, it seems rash to rush into the imposition of such a regulation in this way. As it is also pointed out that other sources “contribute significantly more to the dispersion of these heavy metals in the environment”, why are these other sources not also being investigated and an assessment carried out to discover which source can be reduced (if reduction is even desirable) at the least cost. Is it presumed that even though PVC is only a minor contributor to the presence of these metals in the environment, it will somehow be cheaper to reduce



dispersion from PVC than from other sources? If so, on what basis is this presumption made?<sup>4</sup> Later on some confusing statements are made with regard to the effects of these stabilisers, namely: “it is questionable whether a general substitution of these stabilisers would have a major effect on the overall emissions of lead or cadmium to the environment. On the other hand, according to some analyses, the long-term use of lead stabilisers would contribute to an increase in lead concentrations in the environment through the waste management phase.” The problem here is that on the one hand the Commission is forced to accept that there is no major effect and so there is no reason for taking action, and on the other it is desperately clutching at reasons why it might take action nevertheless. Again, the author is forced to conclude that something fishy is going on (and it has nothing to do with the smell of the harbour outside his hotel room).

8. The Commission states that “the uses of cadmium should be limited to cases where suitable alternatives do not exist.” So, in other words, the uses of cadmium are to be limited to the uses of cadmium, since no metal can perfectly substitute for cadmium and so there can be no suitable alternatives. Alternatively, cadmium can never be used because imperfect substitutes can be found for all uses. This appears to be a mechanism for justifying arbitrary restrictions on the use of cadmium based on some official’s decision as to what is a suitable alternative. Perhaps the main effect is to prevent new uses of cadmium being developed (since developers will not want to be barred from using their new technology merely because a bureaucrat decides they think that a suitable alternative can be found). One might wonder at the marvellous technologies that mankind is being denied.
9. Why an ‘isolated result’ that has no bearing on the impact of PVC in landfills is mentioned is unclear

#### Responses to Questions

1. It seems unwise at this stage to propose any measures to ‘address the issue of the use of lead and cadmium in new PVC’. Why is this question being posed in advance of the risk assessment on cadmium and the scientific evaluation of lead by the CSTEE? Surely we should wait at least until those assessments have been completed.
2. The question of toxicity of phthalates was addressed by the CSTEE last year and it was concluded that there was little evidence of effects on health or the environment. The Commission banned DEHP and DINP in their applications in baby toys based on the flimsiest of evidence based on high dose experiments, which were found to have some endocrine modulating effect. But if substances are to be regulated to control for their endocrine modulating effects, why has the Commission not yet banned the birth control pill, or for

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<sup>4</sup> The author recognises that the Commission is seeking also to eliminate lead and cadmium from other sources, especially batteries and accumulators; again, perhaps the Commission should await the results of evidence pertaining to the merits of such action before it is taken. For all its attempts the Commission will not achieve a world without risk; indeed, in its attempt to do so it may achieve the very opposite, creating a wake of uncertainty in its path and undermining so many actions that individuals take in their endeavours to reduce the risks that they face.

that matter soy, both of which are far more powerful endocrine modulators than are phthalates?<sup>5</sup>

3. This question is incorrect. The correct question is: how can we make Europe's waste management systems more efficient and less environmentally damaging? The answer to that question is beyond the scope of these comments, but it almost certainly does not lie in the implementation of the waste hierarchy or a horizontal directive on PVC. It should be stressed that recycling is not an end in itself. As the Commission does favour reduction over recycling, however, it is worth pointing out the potential trade-off between increased recycling rates and reduced use of resources: laminated packaging uses less material and enables very long-term storage without refrigeration, whereas standard PVC packaging may require refrigeration. However, laminates are more difficult to recycle than are pure PVC. Consider also the trade-offs associated with window frames: wood windows probably cannot be recycled, but they can be burnt; aluminium window frames probably can be recycled, but cannot be burnt; PVC window frames can be recycled or burnt. Mandating that a certain percentage of PVC should be recycled (or equivalently requiring some 'voluntary' commitment) and imposing the cost of recovery and recycling on the PVC industry will drive up the cost of using PVC window frames, which will force an increase in the use of substitutes, which may produce more waste, the environmental impact of which is unknown.

A more general point is that as waste management systems are more and more fitted into the straightjacket of the Commission's central plans, they will become less and less subject to the innovations that occur in dynamic market economies and will become stultified. Would it not be a tragedy if as a result of the actions of the Commission to attempt to increase recycling rates material by material and product by product, European waste management were to become less and less efficient, resulting in higher costs for taxpayers and companies as well as resulting in very high material throughput as more basic materials were used, and an increase in energy consumption as more and more focus is placed on separation, collection and recycling and less on efficient forms of waste management.

4. Given the above comments on cadmium etc. the answer to this must be 3: no specific conditions.
5. Again the set of options is limited to actions that are all undesirable at this time. Why such a perversely restrictive set of options has been given is unclear and would perhaps be worth investigating.
6. 5.
7. No specific measures concerning the landfilling of PVC seems necessary.
8. The appropriate instruments are no instruments: a horizontal Directive is totally unjustified by the available scientific evidence and by a parsimonious analysis of the economic costs and benefits of imposing such a Directive.

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<sup>5</sup> Durodie, B. (1999) "Poisonous Dummies" Cambridge: European Science and Environment Forum.

Message from Julius-Heywinkel GmbH :

Stellungnahme zum PVC- Grünbuch

Sehr geehrte Damen und Herren,

wir beurteilen die Arbeit Ihres Gremiums als wichtigen Beitrag zur Versachlichung der Evaluation des Werkstoffes Weich- PVC und möchten aus diesem Grund die uns gebotene Gelegenheit zur Teilnahme an der Diskussion wahrnehmen.

In diesem Rahmen möchten wir unsere Sichtweise, d.h. die Sichtweise des verarbeitenden Betriebes darstellen.

Die Julius Heywinkel GmbH, Textil- und Kunststoffwerk, stellt unter anderem technische Textilien her. Diese Textilien werden in unserem Haus mit Polyurethan, Silikon und insbesondere mit plastifiziertem PVC (PVC- P) beschichtet und von unseren Kunden konfektioniert.

Anwendungsgebiete reichen von höchsten Ansprüchen genügenden Schlauchboot über LKW- Planen, Werbeplanen, chemiekalienbeständigen Industriefaltenbälgen und Ölsperren, schwerentflammaren Zelten bis hin zu Krankentragen und Sprungrettungskissen.

Für diese Produkte bietet PVC- Weich ein weites Spektrum an Eigenschaften und eine sehr gute Einstellbarkeit hinsichtlich verschiedenster Anforderungen.

Bei der Beschichtung mit Weich- PVC blicken wir auf eine annähernd 40- jährige Erfahrung zurück. In dieser Zeit ist es zu keinem Fall gekommen, bei dem direkte Schäden oder Spätfolgen eines Mitarbeiters zu beklagen waren, die im Zusammenhang mit der Verarbeitung der für die Herstellung und Verarbeitung von PVC- P nötigen Chemiekalien stehen.

Zu den im Grünbuch diskutierten Stabilisatoren läßt sich sagen, daß weder Cadmium noch Blei als Stabilisatoren eingesetzt werden und wir bereits seit Jahren die als Alternativen gehandelten Barium- Calcium- und Zinkverbindungen mit aus technischer Sicht sehr guten Ergebnissen einsetzen.

Bei den Phthalatestern setzen wir die in einer Reihe von Studien bereits als problematisch beschriebenen Phthalate DOP und DEHP nicht ein sondern sind seit langem zu den höherwertigen Phthalaten DINP, DIDP, P911 gewechselt. Daneben testen wir Alternativen zu den Phthalaten, sind mit dem Einsatz dieser alternativen Weichmacher jedoch sehr vorsichtig, da die Substituenten nur wenig erforscht sind und es sich oftmals nicht um Naturprodukte sondern um Modifikationen handelt., deren Einfluß auf den Organismus noch unerforscht ist. Die Phthalate dagegen gehören zu den am besten erforschten Weichmachern mit dem am besten einzuschätzenden Risiko, sofern von Risiko gesprochen werden kann.

Beim Recycling werden Produktionsabfälle soweit z.Z. möglich wieder zur Herstellung von Planenstoffen genutzt, ferner zwingt uns der Gesetzgeber durch die Rücknahmeverpflichtung und das kommende Verbot der Deponierung zu weiterem Handeln. Dabei muß aber gewährleistet sein, daß jede Art des Recyclings in Betracht gezogen werden kann, sei es durch Aufbereitung und Trennung, durch chemische Aufbereitung in die Monomerfraktionen, durch Verbrennung mit energetischer Nutzung oder durch sinnvolle Kombination der Verfahren. Ein Ausschluß einzelner Verfahren wäre für unseren Betrieb eine starke Einschränkung mit der Gefahr, auch Ökologisch nur die zweitbeste Lösung erarbeiten zu können. Wie effektiv die technische Entwicklung sein kann zeigt unserer Meinung nach die Verbrennung, bei der inzwischen weniger Dioxine entstehen, als bei der Verhüttung von Stahl.

Das Beispiel der in der Einleitung erwähnten Ölsperre zeigt auch die Notwendigkeit der Betrachtung aller Faktoren: So muß das Material unter anderem bei tiefen Temperaturen einsetzbar sein und seine Flexibilität behalten, es muß leicht sein, es muß eine hohe Reißfestigkeit haben um auf fließenden Gewässern dem Wasserdruck standhalten zu können und es muß chemikalienbeständig und auch lichtbeständig sein. Bis zu diesem Punkt ist auch der Einsatz von Elastomeren denkbar, beim Recycling ist das Elastomer aufgrund seiner chemischen Vernetzung nur noch als Füllstoff einzusetzen oder zu verbrennen, ein intelligentes werkstoffliches Recycling wäre ausgeschlossen.

Selbstverständlich sind wir auch bemüht, entsprechende Alternativen zu PVC- P zu erforschen, die Anwendbarkeit sicherzustellen und wo sinnvoll oder vom Kunden gewünscht auch einzusetzen. In diesem Bereich gibt es eine Reihe von Forschungsprojekten, z.B. im Bereich Automobil.

Zusammenfassend soll dieses kurze Statement verdeutlichen., daß jedes pauschale Einschränken oder gar voreilige Verbot für unseren Betrieb eine unzumutbare Härte und den Verlust vieler Arbeitsplätze bedeuten würde, obwohl wir bei der Auswahl der Rezepturbestandteile bereits sehr überlegt handeln und jederzeit bereit sind, den Einsatz von PVC- P im jeweiligen Anwendungsfall kritisch zu betrachten und an Alternativen zu arbeiten. Da mit einem Verbot nicht automatisch auch der Bedarf an wirtschaftlichen Kunststoffartikeln erlischt ist vielmehr damit zu rechnen, daß Waren aus Nicht- EU- Staaten importiert würden um den Bedarf zu decken. Bei den dann in unseren Wirtschaftsraum gelangenden Waren wäre eine Kontrolle nahezu unmöglich. Die Zusammenarbeit mit der PVC- Industrie im Rahmen der Erklärung der freiwilligen Selbstkontrolle bietet dagegen die Möglichkeit, im Dialog problematische oder gar gefährliche Stoffe zu identifizieren und durch unbedenkliche Substanzen zu ersetzen.

Europa ohne die Herstellung und Verarbeitung von Weich- PVC ist für uns nicht vorstellbar.

Hochachtungsvoll

Thorsten Frohwerk      Carsten Strubbe  
(Leitung Produktion)    (Leitung Entwicklung)

Message from Kimberly C. Kelly:

European Commission  
Attn. Mr. Krämer  
Head of the Waste Management Unit (DG ENV)  
B-1049 Bruxelles  
Belgium

November 29, 2000

Dear Mr. Krämer:

I am writing this letter on behalf of the estimated 89 million girls and women worldwide who live with endometriosis, an incurable immunological and hormonal disease. It is a painful and debilitating condition triggered by exposure to environmental toxins such as dioxin, PCBs, and other endocrine disruptors. The Endometriosis Association has numerous concerns regarding the continued manufacturing of polyvinyl chloride (PVC) plastic. Of particular concern are the serious health effects associated with women and girls' exposure to the toxic phthalates used in the making of PVC products and with their exposure to dioxin generated during the incineration of PVC waste.

The studies commissioned by the European Commission on PVC show multiple significant environmental and/or economic problems for each of the PVC waste disposal options. They show that neither incineration nor landfilling is safe, and that recycling cannot solve the problem.

It is irresponsible to keep manufacturing such a material. Its manufacture and use needs to be phased out as soon as possible, starting with short-lived applications such as packaging. Existing wastes need to be fully separated from the general waste stream and safely stored separately until an environmentally safe destruction technology has been established. The costs should be borne by the producer.

The Endometriosis Association calls for the following actions to be taken:

- Phasing out short-lived PVC uses such as packaging and toys.
- Phasing out PVC medical devices, for which alternatives are available.
- Phasing out the use of hazardous stabilizers and softeners.
- Banning incineration and landfilling PVC wastes.
- Banning the recycling of PVC containing hazardous additives.
- Making producers of PVC responsible for the separation of PVC from the general waste stream and temporary storage until a waste solution has been found and implemented by the producer.
- Developing and implementing a phase-out program for all PVC production.

Thank you for your prompt attention in addressing this matter.

Sincerely,  
Kimberly C. Kelly  
Environmental Coordinator  
Endometriosis Association



**Laerdal**  
helping save lives

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Commission of the European Communities  
Mr Krämer, Head of the waste management unit and  
Mr Schulte Braucks, Head of the chemicals unit  
env-pvc@cec.eu.int

Stavanger, 29 November 2000

**Green Paper on Environmental Issues of PVC.  
COM 2000/469**

- Laerdal Medical is a consumer and producer of soft PVC, which we use in our lifesaving products for training and therapeutics.

We want to thank the commission for the initiative to focus on human health and the environment and for the invitation to all interested parties to discuss and comment.

We ask the commission to base its decisions on scientific research and that possible replacement materials should be examined as rigorously as PVC.

Attached are our answers to your 9 questions in the Green Paper draft, and some information about our company.

Yours sincerely,  
Wenche Eriksen and  
Turid Ersdal

## **Our answers to your questions:**

### ***Question 1: Cadmium and Lead***

We agree with the PVC industry to stop the use of Cadmium stabilisers within 2001, and to do further investigation on the environmental issues for lead. Laerdal Medical has introduced a ban of cadmium and lead in its PVC products.

### ***Question 2: Phthalater***

It is important with a thorough risk evaluation, and to wait for these results before any decision of legal restrictions are made. The thermal stability of the recipe is important to avoid leakage of plasticiser, and an international standard for a stability test is required.

### ***Question 3: Mechanical recycling***

We agree with the PVC industry on voluntary based agreement. All PVC products ought to be labelled with their contents, also regarding heavy metals and phthalates, for the sake of recycling.

Laerdal Medical has in vain tried to find a recipient in Norway for PVC waste.

### ***Question 4: Recycling of PVC containing heavy metals***

It is important to separate PVC containing heavy metals from other PVC compounds, and to recycle them individually. The ease of separation will depend upon the labelling of the products. The buyer of low-priced recycled PVC must know that the material is free from heavy metals.

### ***Question 5: Chemical recycling***

We want further voluntary initiative, as more investigation is needed before any legal restrictions are made.

### ***Question 6: Incineration***

N/A

### ***Question 7: Landfill***

We want to emphasise the importance of scientific research before any decisions on legal restrictions.

### ***Question 8: Conclusion***

N/A

## Some information about Laerdal Medical

### ***The History of Laerdal Medical:***

Our company started as a small publishing house in 1940, specialising in greeting cards and children's books. Pioneering in soft plastics in the early 50's, Laerdal made millions of realistic dolls and "furniture friendly" toy cars. Realistic wound simulations and life-size, life-like Resusci Anne, a training manikin for mouth-to-mouth resuscitation, set a new course. First aid and emergency medicine became our field of activity, with an emphasis on training.

In the 60's pre-hospital emergency medicine began to be seen as an extension of advanced hospital treatment. To increase the practical usefulness of these ideas Laerdal Medical developed easily portable equipment for ventilation and airway control, and began a tradition of offering equipment along with complementary training aids.

In the 80's early defibrillation was shown to decisively increase the survival rate of pre-hospital cardiac arrest. This triggered the development of our Heartstart semi-automatic defibrillator, enabling ambulance personnel without long medical training to provide this life saving treatment.

### ***The products of Laerdal Medical:***

- a) Training products: Manikins for training basic and advanced life support and trauma, and anatomical models
- b) Therapeutic products: Defibrillators, Ventilation, Suction and spinal motion restriction

PVC is mainly used in the training manikins as skin imitation. Soft PVC in skin colour is used for face, chest, arms and legs.

Laerdal Medical formulates the soft PVC (plasticols) by mixing the required PVC, plasticisers and additives. Expected lifetime for our PVC products is 10 years, but many of our customers have training manikins, which are 20-30 years old.

### ***Quality and environmental program of Laerdal Medical:***

Among the most central we can mention:

21 CFR Part 820 "Medical Devices"

Current Good Manufacturing Practice (CGMP)

Final Rule (Quality System Regulation)

NS-EN-ISO 9001

NS-EN 46001

This year there has been prepared an environmental report concerning emission from the plant.

### ***Heavy metal stabilisers and phthalate plasticisers:***

Laerdal Medical does not use any lead or cadmium stabilisers in its products. We do use phthalate plasticisers to soften our PVC.



Noyal-Pontivy, le 27 Novembre 2000

**Mr SCHULTE-BRAUCKS**

Directeur du département chimie (DG  
Entreprises)  
200 rue de la loi  
B-1049 Bruxelles  
BELGIQUE

Nos réf : JPLB/KP/00.94

**Réf : PVC un matériau d'avenir**

Messieurs,

Ayant été informé de la consultation européenne sur la discussion ouverte pour le devenir du PVC (livre vert), vous trouverez ci-dessous les raisons pour lesquelles nous estimons que ce produit est excellent à la fois au niveau économique mais également au niveau environnemental.

La fabrication du PVC date aujourd'hui depuis 1930 et son utilisation est de plus en plus vaste dans les domaines de notre vie quotidienne tels que, l'automobile, le bâtiment, la médecine et l'emballage.

Dans le domaine particulier de l'emballage alimentaire où la Société LINPAC PLASTICS PONTIVY joue un tout premier rôle, et qui fait vivre plus de 1000 personnes, le devenir du PVC est une question majeure dans notre région.

Vous trouverez ci-dessous les quelques raisons fortes pour lesquelles nous sommes convaincus que le film PVC pour l'emballage des produits alimentaires fait partie de cette famille de produits les mieux adaptés pour leurs usages (protection hygiénique des aliments), et qui représente une valeur sûre pour l'avenir (préservation de nos ressources énergétiques).

**Contribution à la sécurité alimentaire :** protection et respect de l'Hygiène alimentaire

Le film PVC permet de protéger les aliments (viandes, fromages ou légumes) du développement de micro-organismes altérant à grande vitesse la nourriture si celle-ci n'est pas correctement emballée.

**Versatilité du film PVC :** Conserve toutes les qualités du produit emballé (goût, arôme, aspect...)

- Adapté aux différents modes de distributions des produits agro-alimentaires et aux conditionnements à haute cadence des produits de grande consommation.
- Résiste aux grands écarts de température (congélation ou micro-ondes).
- Possède des aspects techniques intrinsèques tels que légèreté, perméabilité à l'oxygène et à la vapeur d'eau adaptée, transparent, étirabilité, auto-adhérent, etc...

## **Valeur sûre pour l'avenir :**

### En minimisant la consommation du pétrole

- en effet par sa composition (plus de 50% de composés d'origines minérales (sels), le PVC minimise l'utilisation des ressources d'origine pétrolière

### En contribuant à la préservation de l'environnement

- Lorsque l'on fait l'écobilan du PVC c'est-à-dire l'évaluation de l'impact écologique du PVC aux différents stades de sa production, de son utilisation et de son devenir après utilisation, il est clairement montré que le PVC est l'un des matériaux les plus performants vis-à-vis de l'environnement. Par exemple, une fabrication propre et économique en énergie (il faut 7 fois plus d'énergie pour fabriquer un tuyau en fonte par rapport au PVC).
- Le contenu énergétique par rapport aux autres matériaux est sans conteste à l'avantage des matières plastiques et du PVC.
- Le déchet PVC : une nouvelle vie
  - soit par recyclage Matière. Les déchets PVC sont recyclables, de nombreuses études l'ont démontré, dans la mesure où la collecte, le tri sont réalisables,
  - soit par recyclage énergétique.
- La combustion des déchets ménagers est valorisée par la récupération d'énergie. Le PVC grâce à son pouvoir calorifique (égal à celui du bois ou du papier), contribue au chauffage urbain et à la production de vapeur à usage industriel.
- La présence de PVC dans les ordures ménagères n'a aucun lien direct avec la présence de dioxines dans les fumées (réf. étude de Professeur Rappe Université de Suède ou la récente étude BPF sur l'incinérateur de Londres).
- La présence d'acide chlorhydrique dans les fumées liée au PVC, représente 0.2% des pluies acides (rejets SO<sub>2</sub>, NOX, Hcl) de la pollution acide de l'atmosphère.
- De plus les normes très strictes au niveau des traitements des fumées des incinérateurs sont en vigueur pour éliminer les différents polluants.

La recherche et l'évolution technologique (matières premières de meilleure qualité et process de plus en plus performant) nous ont permis de réduire les épaisseurs de plus de 30% des qualités de nos films PVC étirables.

N'est ce pas là un facteur essentiel au concept de développement durable faisant du PVC un matériau d'avenir.

J.P LE BRETON  
Responsable Qualité  
LIMPAC PLASTICS PONTIVY

B.P BAUCHER  
Président Directeur Général  
LIMPAC PLASTICS PONTIVY

Message from Lody R. Berkenbosch :

Dear Mr. Kraemer and Mr. Schulte-Braucks,

Thank you very much for giving me the opportunity to take notice of the Green Paper and to give my comments.

The idea to anticipate possible future environmental problems and to work out worst case scenario's does appeal to me.

However, I happen to be familiar with the history of the environmental issues of PVC and how they got into the world and I do think that we are looking at a tremendous overkill in manhours and money:

In your Green Paper you mention a number of adverse effects caused by PVC or its additives (pseudo-oestrogenic effects, kidney and liver carcinogenicity, etc.). In fact, much of the idea, that PVC is a possible danger to health and to the environment, thence a specific policy would be needed, is based upon these mentioned adverse effects. Most of these effects have been derived from a.o. a publication by Sharpe et al..

The author, however, recently felt it necessary to write an open letter, stating that he had to draw these conclusions but could not repeat the studies with the same results. Neither could his peers. Today we think that an artefact was introduced and the ill effects (pseudo-oestrogenic, fertility threatening gonadal effects) were in fact caused by an additive (bisphenol A) to some of the substances studied, that we now know to have these effects.

Furthermore, he found this with a number of substances. For phthalates he found these effects with BBP and DINP (containing bisphenol A?) only. Others extrapolated these effects to ALL phthalates, although they were never found with DEHP, by far the most frequently used phthalate.

**What if** this has truly been the case, that an artefact was introduced.

**What if** certain people purposely keep on emphasizing these "facts" for their hidden agenda - the goal justifies the means - ??

Of course it is better to either avoid or reduce waste and, where possible, reuse the materials. But it seems to me, that a lot of energy will be wasted on a wild goose chase for possibly ill effects of what is now by far the best investigated chemical entity in the universe.

As manpower and money are still limited resources, I am of the opinion that "those who cry wolf" had better think twice and let the community look for the real "wolves" that threaten our existence.

Yours truly,

Lody R. Berkenbosch, pharmacist