Letter

(Austrian) Federal Ministry
for Economic Affairs and Labour

To: Mr Schulte-Braucks
European Commission

Green Paper on the environmental issues raised by PVC

Opinion

Please find enclosed the opinion of the Federal Ministry for Economic Affairs and Labour regarding the Green Paper on the environmental issues raised by PVC for your kind attention.

1 enclosure

Vienna, 23 November 2000
pp the Federal Minister:
Dr Benda

Checked for accuracy:

Opinion of the Federal Ministry for Economic Affairs and Labour

regarding the Green Paper on the environmental issues raised by PVC

I. RE QUESTION NUMBER 1:

WHAT FORMS OF ACTION NEED TO BE TAKEN IN ORDER TO TACKLE THE PROBLEM OF LEAD AND CADMIUM USE IN NEW PVC?

A basic aspect of additive assessment is the risk assessment of chemical substances. Only at one point in the Green Paper is any reference made to the necessarily nuanced views to be taken of the differences between the dangers and risks posed by chemical substances (Figure 9). At no point in the Paper is there any discussion of the Commission communication of 02.02.2000 on the applicability of the precautionary principle. There an arrangement concerning scientific risk assessment is called for. Unfortunately there is almost no discussion whatsoever in the Green Paper of that EU Commission formulation in connection with PVC additives.

Cadmium stabilisers

Cadmium has been banned in Austria since 1994.

Directive 338/EC closely restricts its use within the EC. The PVC industry has announced a voluntary offer no longer to use Cd stabilisers within one year (up to 2001). In view of the high level of representation of this industry it seems possible to implement such a procedure more quickly and consistently than it would as part of a discussion on regulatory policy. In this way it would be possible to refrain from restabilising PVC products with cadmium.

Lead stabilisers

Since the PVC industry has put a comprehensive risk assessment of lead in prospect the Committee of Scientific Experts (CSTEE) has prepared a scientific assessment of lead, and the EU Commission itself is calling for action to be taken on a comprehensive, scientific assessment in accordance with the precautionary principle, further short-term action on lead stabilisers would not be suitable. Precisely the CSTEE's assessment

submitted in recent weeks on a proposed ban on lead in Denmark shows that the demand for such a ban does not meet scientific criteria. Any application of that view by the EU Commission should also contain a rejection of any regulations on lead by individual States until the scientific risk assessment has been concluded. In addition the PVC industry is actively conducting wide-ranging investigations that are aimed at developing innovative new stabiliser systems, testing these and supplying them on the market.

Answer to question 1:

The PVC industry's voluntary commitment as regards cadmium would seem to be the most suitable and quickest form of action to be taken. Its form and application and possible subsequent transposition into an EU regulatory law should be discussed more closely with the PVC industry.

In view of the current criteria applied by the EU Commission and the action offered by the PVC industry action on lead would seem not to be justified. The risk assessment of lead is being intensively pursued. The development and marketing of alternative stabiliser systems should be discussed with the PVC industry.

II. RE QUESTION NUMBER 2:

SHOULD SPECIAL ACTION BE TAKEN ON THE USE OF PHTHALATES AS PLASTICISERS IN PVC? IF YES, WHEN AND WITH WHAT INSTRUMENTS?

The Green Paper correctly establishes, with regard to the use of various plasticisers, that the information on the effects of alternative plasticisers (as phthalate substitutes) on the environment and human health are limited, and that further data would first have to be obtained before any proper assessment could take place. These points should also be critically analysed in the light of the Commission communication on the applicability of the precautionary principle. There is a danger that a risk of problem displacement, if not of problem aggravation, can be added to this as a result of (over-) quick action.

Likewise, within the meaning of the abovementioned Commission communication, it can be seen that the most important phthalates in accordance with EU Directive 793/93 are subjected to a comprehensive risk assessment. In this connection there have been

numerous specialist discussions among experts at European level, scientific studies have been carried out and assessed and a possible need to act at toxicological/ecotoxicological level has been deduced. The methods of procedure for and the principles of that risk assessment are laid down in the EU's technical guidance document on waste use. A method of procedure such as this does not conflict with the precautionary principle, but is a necessary prerequisite for the application of this. This process has so far been supported by all social groups in the EU and is at the point of conclusion in the case of phthalates. Unfortunately this process is only examined very incompletely in the Green Paper. Instead of this opinions and contributions to discussions have been given prominence, although these have so far in no way been accepted (for example the contribution made by the German Federal Environment Agency on the persistence of soft PVC. This had already been extensively commented on and criticised by the PVC industry well before the EU's horizontal initiative. The German plastics industry has already expressed an opinion on this matter).

Answer to question 2:

In view of EU Directive 793/93 and the Commission's communication of 02.02.2000, the results of the risk assessments relating to phthalates are to be awaited, and the appropriate final conclusions then reached. The level of knowledge of the alternatives is to be expanded in order to avoid any risk of problem displacement or aggravation. The European PVC industry's offer to clarify the situation should be taken up.

III. RE QUESTION NUMBER 3:

WHAT RANGE OF INSTRUMENTS WOULD BE NEEDED TO ENABLE THE AIM OF GREATER USE OF PVC RECYCLING TO BE ACHIEVED IN THE MOST EFFECTIVE MANNER?

The following general pointers concerning this part are important.

a) The authors of the Green Paper are too pessimistic as regards the scope for reprocessing PVC. It would be necessary to examine that scope for reprocessing in comparison with the alternative materials. For example, a look at flooring materials would yield the following:

	mechanical	chemical	incineration	landfill
Ceramics, stone	-		-	+
Wood, laminates	-		+	
Carpet	-			
Rubber	-			
Linoleum	-			
Cork	-		+	
PVC	+		+	

(Key to table: In [current] terms the best method of reprocessing the individual materials is marked with a +, - means that this reprocessing method does not exist. An empty box means that the reprocessing option is somewhat environmentally unfriendly, has other drawbacks, or is not customary).

Similar comparative tables can be provided for other products (windows, piping ...). Only then will it become clear that several possible means of reprocessing PVC exist with a view to the most environmentally friendly variant, and that the quantities of alternative materials reprocessed hitherto are somewhat lower than those of PVC.

The statement that mechanical PVC recycling cannot over the coming years make any significant contribution to managing the post-consumer amounts of PVC waste cannot be accepted. In a study submitted by the Darmstadt Ecological Institute to the order of the European Environmental Bureau (EEB) the authors reach the conclusion that high-value mechanical recycling of post-consumer plastic waste makes ecological and economic sense with proportions of more than 15%.

Therefore, if a rate of 18% recycling of post-consumer wastes, as applying to PVC were to be achieved - as forecast in the EU studies - the relevant threshold would even have been exceeded. If one makes a direct comparison with the recycling rates for other materials then it is possible to pinpoint a positive development for PVC recycling in the same way as, for example, glass and paper recycling. Here, too, differing product groups diverge very widely in terms of recycling rates. According to information received from the German paper manufacturers association the waste recycling rates for printing and press papers is only 37%. Conversely up to

96% of packaging papers are recycled. According to an investigation by the Federal Environment agency the reprocessing rate for flat glass is a relatively low 36% for 1995 as compared with the high recycling rates for receptacle glass (79% in 1997).

The view that PVC can have an adverse effect on the recycling of other plastics in mixed-plastic waste reduces the problem of mixed wastes to the PVC issue. One component can disrupt any other when <u>all</u> mixed waste is recycled. Thus, for example PP is a disruptive factor in PE, or Cu in steel scrap. Consequently the question concerning action against PP or Cu or PVC should not be raised but rather the question as to how one can separate unacceptable mixtures or find a recycling process whereby the mixture can be directly recycled.

Answer to Question 3:

Re 1. Mandatory collection and recycling targets solely for PVC restrict competition and do not improve the ecological situation. Example: PVC would be made more expensive in the flooring sector by mandatory collection systems. Its competitor linoleum would not be made more expensive and would, moreover, continue to be disposed of via landfill or incineration.

Re 2. There are already voluntary collection systems in some Member States.

Re 3. Not just two classes of demolition waste (PVC and other demolition waste) but - if at all - waste classes that are material specific (iron, wood, copper, PVC, EPS ..) should be introduced. PVC is one material among many and each material must be sorted separately if it is to be recycled in an optimum manner.

Re 4. Standards should only contain property categories. It is of no importance to users whether these can be complied with by either new or old products. Moreover here again it is the case that this matter is not specific to PVC, but applies to all materials (steel, Cu ...).

Re 5: The most important PVC products - in the building sector - have long been legibly marked: e.g. piping and windows. In addition there has long been a regulation in Austria requiring the marking of plastic packaging. Although the regulation also requires plastic packaging to be collected and recycled, it has not been possible to achieve any particular successes in this area.

Re 6: Innovative PVC recycling processes are being developed.

It can be said, in summary, that no particular action is needed for PVC alone in order to increase recycling.

If one wishes to minimise the ecological economic outlay on disposal, help will only be provided by comparing and optimising the recycling approaches to the potential material alternatives.

IV. RE QUESTION NUMBER 4:

SHOULD THE MECHANICAL RECYCLING OF PVC WASTE CONTAINING LEAD AND CADMIUM HAVE ANY SPECIAL CONDITIONS ATTACHED TO IT? IF SO, WHICH?

It emerges from the answers to question 1 that recycling only needs to be considered in the case of cadmium-stabilised waste PVC products. Since it is permissible to destabilise PVC with lead without restriction, regulations at the waste stage are not suitable. As correctly stated in the Green Paper, recyclers have an interest in recycling waste material back into products similar to the original products. To a great extent this would result in material cycles that can easily be followed.

Mechanical recycling of unadulterated - or heavy-metal-containing-PVC waste is an ecologically and economically sensible, and technologically mature, economic activity. It is to the point and recognised that this (type of) recycling should be restricted to individual product categories (e.g. windows ...> windows, pipework ...> pipework). Relevant projects are currently underway in the Federal Republic of Germany as an industry specific project/activity within individual companies.

Moreover the EU Commission has more recently stated that such a method of procedure is appropriate and has applied it by means of legal instruments: Commission Decision of 8 February 1999 laying down the conditions under which the heavy metal limit values set out in Directive 94/62/EEC on packaging and packaging waste do not apply to plastic boxes and pallets. This also creates, precisely for cadmium, an ecologically and economically reasonable recycling exemption. In view of the Commission’s communication on the applicability of the precautionary principle equality of treatment of similar situations as regards PVC products appears necessary and appropriate here.

Answer to Question 4:

It is ensured by the voluntary renunciation of Cd stabilisation from 2001 and the recycling efforts made by the PVC industry that the flows of waste substances containing Cd can be monitored. No special conditions/regulations are needed.

V. RE QUESTION No 5:

WHICH RANGE OF MEASURES WILL BE MOST SUITABLE FOR THE CHEMICAL RECYCLING OF PVC WASTE?

As a supplement to the mechanical and incineration types of recycling raw-material recycling makes particular sense if collection, sorting and preparation are no longer viable in ecological and/or economical terms. The PVC industry has therefore begun various raw-material recycling projects on its own initiative. Here it is above all waste with a high chlorine content that is to be recycled, as shown by various projects in Europe.

Raw-material recycling will therefore in the future make a far bigger contribution to plastic-waste recycling in future. This fact is also acknowledged in various studies.

Thus the TNO's EU study on raw-material recycling has concluded, following "careful estimates" that, when wastes having a high chlorine content are treated chemical processes offer more advantages than other processes. A comparison between the energy-recovery process and chemical recycling has, however, so far not identified any clear "technology winners", since the data situation is still not adequate.

A study by the Ecological Institute e.V., Darmstadt, and the German Project Union, Essen, 3 entitled "comparison of the raw-material and energy recycling of packaging plastics" reached the conclusion, in November 1999 that, in an overall ecological survey (for Germany) raw-material recycling is to be preferred to incineration in waste incineration plants. The cost differential between raw-material plastic recycling and waste incineration will clearly narrow over the coming years - more particularly via advances made in sorting technologies. However, no high-chlorine products were examined.

According to two expert assessments by the Fraunhofer Institute for Process Technology and Packaging, Freising and the Fraunhofer Institute for Chemical Technology in Pfinztal

(and others) submitted in June 1994, an excellent ecological balance has been confirmed in the case of the raw-material recycling process used by the Schwarze Pumpe GmbH's secondary raw materials recycling centre (the SVZ). As compared with mechanical recycling the SVZ process is at the very least equivalent even in the worst-case scenario.

The results of a series of tests conducted by VKE and the SVZ GmbH on recycling the shredder light fraction (SLF) were published in April 2000. It was basically possible to establish that waste fractions with a high plastic content from the motor industry - including PVC - that fluctuate widely in terms of their composition, can be recycled on a massive scale without causing any particular problems.

Measurements concerning the emission potential of chemical recycling processes taken at the cylindrical rotary kiln used for wastes containing chlorine in Schkopau between January and March 2000 showed that, during the raw-material recycling of wastes with a high PVC content, the resultant emissions (including dioxins and furans) lay within the legally prescribed limit values. Similar good results are also expected for the slag bath facility in Tavaux that is currently being built.

Answer to Question 5

The current level of knowledge - including that relating to raw-material recycling - illustrates the view of the PVC industry, that the best results in ecological and economic terms can be achieved via a recycling mix consisting of mechanical, raw-material and energy-extraction processes.

Such a recycling mix may not be regulated by excessively restrictive prerequisites and rates in the individual means of recycling. Rather will the best recycling option be taken up via the natural inherent dynamics involved in the type and availability of PVC wastes and a taking into account of yield considerations - according to the current state of the art. The crucial factor here is the absolute quantity of recycled PVC waste. Thus new procedures and innovations - for example the VINYLOOP solvent procedure - and future developments will also be taken into account and industry will be offered scope for mobilising its investments to meet specific requirements.

The PVC industry's "Voluntary Commitment" is to be taken to be a suitable means of further expanding PVC raw-material recycling. It contains an obligation to recycle

200 000 tonnes of post-consumer PVC up to 2010. Raw-material recycling will make an important contribution to achieving that figure.

VI. RE QUESTION NO 6:

WHAT RANGE OF MEASURES WOULD MOST EFFECTIVELY DEAL WITH THE PROBLEMS CONNECTED WITH THE INCINERATION OF PVC WASTE

Knowledge gained from the horizontal studies

Here the Commission primarily bases itself on the two studies, by Bertin and AEA. Basically the results agree with those from earlier studies. Differences will be marked *in italics:*

PVC incineration increases the amounts of flue gas scrubbing residues (RRR) since in the main HCl is neutralised. Since roughly 50% of HCl emissions can be traced back to PVC the resultant costs are higher than in the case of average household refuse (acquisition of the neutralising agents and dumping of the RRR). No other factors affect costs. *Earlier studies (TNO, Reimann etc.) have described this aspect similarly but differently (examination of other products, effect of the MVA utilisation levels). Then other domestic refuse components can also cost more than PVC. In principle this negative aspect is linked with the use of chlorine in PVC which otherwise determine the lower costs, lower energy use and the relatively CO2 emission from this material in a positive manner.*

In future flue gas scrubbing technologies will be applied which generate lower costs in terms of PVC. *That development was not taken into account in the studies, and equally little account was taken of the techniques aimed at avoiding the production of neutralising salts (as in the case of the HCl recovery practised in most new plants in Germany, such as bicarbonate technology.* Both technologies aim at the use of the chlorine and not at dumping its salts).

In terms of heavy metals PVC effects the flue gas scrubbing residues (RRR) above the average levels only in the case of Cd and not in the case of Pb and other heavy metals. With or without PVC RRR are a special waste. PVC tends to make the NVA slags less hazardous, but the effects are slight. *Cd from PVC (not from other materials!) is a problem of dangerous waste from the past in accordance with the Voluntary Commitment, which will soon no longer exist. In this connection the move towards a*

positive part played by chlorine in flue gas flows could be more important since the heavy metal content of the slag could be improved and concentrated in a smaller proportion of the RRR. Whether and to what extent PVC here makes quantifiable cost savings could only be clarified via further studies. Specifically not examined was the (positive) part played by chlorine (PVC) in reducing mercury emissions (Hg). This too saves money (or at least lowers risk potential). There have been no studies on quantification.

The topic of "dioxins" will not be dealt with in the studies. The Commission reports that there is no link with dioxin formation below roughly 1% chlorine. However, there could be a link above that threshold which should be examined, since in the future it is possible that more PVC is incinerated. Refuse incinerators in Europe contribute roughly 40% to dioxin emissions. *Advanced flue gas scrubbing could significantly reduce dioxin emissions from MVA (waste incinerators). In addition it would seem clear that dioxins play a lesser part in toxicological terms as roughly compared to polycyclic aromatic hydrocarbons (PAH).*

The mechanical recycling of waste, above all to form high-value products comes off better in ecological terms than incineration or landfill. This item of knowledge is trivial and applies in practice to all wastes and not only to PVC: during recycling into high-value products instead of incineration. Indeed, both the emissions arising from the production of new materials and also the incineration emissions are avoided. Thus the plastics industry, too, gives pride of place to recycling into high-value products among the other recycling options. Precisely the recycling of PVC building products (windows, piping, etc.) is a good example here. Recycling into high-value products is economically more viable than waste incineration and landfill if the ecological benefits are converted into cost benefits. *Expressing ecological costs in monetary terms is undisputedly an important aim, but at the moment it has far from reached maturity. This is demonstrated by the extremely wide fluctuations in assessing all of the ecological variables so far assessed. The PC products that are good in terms of ecological balance and very good in economic terms will emerge very well to well from any such assessment throughout their service lives, and in comparison with the competing products.*

Internalising the external MVA costs

Basically internalising external costs is a target for a market economy. This includes abolishing all subsidies for materials that are competing with each other. Should one here begin with PVC - with the small amounts and at the same time great economic benefit? Is such a selective approach legally acceptable? This also includes internalising external ecological costs, e.g. CO_2 emissions, where PVC can be compared favourably with many competing products. A definite warning must be given here that selective internalisation (internalisation only in individual areas) can also give false signals.

Support for RRR technologies which reduce the quantities of and/or use the wastes currently arising: technologies of this type exists and their significance will increase in the future. The PVC industry has a natural interest in this development and has placed appropriate emphasis in its voluntary commitments regarding waste matters. These developments reduce not only PVC-specific but also other wastes caused by other waste components.

Further studies on the potential link between PVC waste and dioxin emissions from waste incinerators: As before the dioxin debate takes great prominence. Since, however, a great many studies and metastudies have already been carried out on this point without making any significant contribution, the best forward-looking action that can be taken would be to promote the application of the good state-of-the-art practice of 0.1 ngl-TEQ/m^3 throughout the EU as laid down in the directive of waste incineration (COM(1998)558). This problem would then thus be solved for other pollutants being assessed as part of the dioxin discussion, such as the significantly more important polycyclic aromatic hydrocarbons (PAH).

Answer to question 6:

The proposed range of measures includes product-specific action such as promoting the recycling of high-value products. Targets should be set not only for PVC products, but also for the alternatives in order (a) to achieve greater effects and (b) not to influence the competition between materials one-sidedly. The current trend towards RRR technologies with slight waste degeneration, lower costs and larger-scale salt recovery should be boosted.

VII. RE QUESTION NUMBER 7:

IS SPECIAL ACTION NEEDED WITH REGARD TO THE LANDFILLING OF PVC WASTE? IF YES, WHAT?

The ARGUS and Rostock-University horizontal studies jointly examined the behaviour of PVC products under landfill conditions and thus clearly added yet another to more comprehensive new studies. One weakness of all preceding studies: only PVC products and no individual competing material were examined: materials whose decomposition products or themselves, which, under landfill conditions, are known to enter percolating water, metals, (grills, dissolved products, during the alkaline or acid landfill phase), organic, natural substances such as paper, wood or linoleum etc.; it is precisely in the latter group that excavation in landfills show that rotting-down is very incomplete and even after decades stacks of newspapers still contain legible parts. All of these materials will pollute the percolating water during the monitored service life of landfills. However, data concerning minimal emissions are only available for PVC products.

Only very small quantities of phthalates are found in percolating water. Phthalates are quickly degraded biologically, as shown by the conservative Sturm test (OECD test specification No 301B). The not entirely complete biological degradation is normal: even sugar is not fully degraded. In addition bioaccumulation is slight. The overall emission derived from the maximum value (30 ppb) for 25 differing percolating waters in British landfills has only a marginal effect on emissions at 7.5 t/year. At this point the ARGUS study wrongly gives a value that is 33 times higher.

Heavy metals, predominantly from soft-PVC, can enter the percolating water, but plays no significant role as compared with other heavy metal sources according to an overall survey of the literature.

There are apparently no direct dioxin measurements in the event of landfill fires but it cannot be disputed that dioxin is generated. However, it could be shown by means of risk assessments such as those by the former fire experts at the German Federal Environment Agency, for fires having to some extent significantly higher proportions of PVC in their fuel (Lengerich, fire at Düsseldorf airport, burning of pure vinyl chloride monomer, etc.), that polycyclic aromatic hydrocarbons (PAH), and not dioxins are the most important fire pollutants in toxicological terms.

The landfill costs depend upon the site's technical equipment of the landfill (collecting and cleaning percolating water, rainproof covering etc.). No PVC-specific costs are known.

Answer to Question No 7:

Since there are no pointers to any particular problems, no PVC-specific action is justified.

RE QUESTION NUMBER 8:

WHAT INSTRUMENTS ARE SUITABLE FOR DEVELOPING A HORIZONTAL STRATEGY CONCERNING PVC? SHOULD A PVC-SUBSTITUTION POLICY BE ENVISAGED FOR A NUMBER OF PRODUCTS? IF SO, HOW?

It is correctly pointed out here that the Green Paper's analysis of PVC additives concentrates on PVC waste management.

The basic constraints of such an approach are also set out in the Green Paper itself. At the moment intensive risk assessments to EU standards are currently being drawn up precisely for the range of additives listed in the Green Paper. Regulation by the Commission before that work is completed would run counter to the claims made by the Commission itself regarding serious application of the precautionary principle (Commission communication 2.2.2000).

According to the Commission's own statements in the Green Paper, any potential PVC substitution policy would have to be based on a comprehensive assessment of the most important environmental impacts of not only PVC but also of potential substitutes throughout their entire life cycle. PVC is the material that has been the best investigated in the terms of its environmental impact. Comparable investigations of alternative materials have so far been limited. Hasty recommendations concerning substitution will entail a risk of problem displacement of even aggravation.

Thus any PVC substitution policy should be preceded by answers to the open questions regarding PVC and efforts should also be made to acquire a comparable level of knowledge on alternatives. Only then can a serious risk assessment within the meaning of the Commission communication on the precautionary principle be applied.