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PVC – the waste crisis

PVC - the EU context

In 1997, the Environment services of the European Commission wanted to propose a phase out of the use of Polyvinyl Chloride (PVC) for new cars in the directive on end of life vehicles. However, they failed to get the support of the Commission's Industry services, which argued that PVC is found in many waste streams and should be addressed across all sectors. As a consequence, the Commission committed on 9 July 1997 to:

"consider the evidence regarding the environmental aspects relating to the presence of PVC in waste streams; whereas, on the basis of this evidence, the Commission will review its policy regarding the presence of PVC in waste streams and will come forward with proposals to address problems which may arise in this regard; whereas this is justified on environmental or health grounds;" (OJ C 337/3, 1997).

Subsequently, in 1998, the Commission commissioned five studies related to PVC in waste:

- Chemical recycling of plastic wastes (PVC and other resins) – TNO, December 1999.
- Mechanical recycling of PVC wastes – Prognos, Plastic Consult, COWI, January 2000.
- The behaviour of PVC in landfill - ARGUS, February 2000.
- The influence of PVC on the quantity and hazardousness of flue gas residues from incineration - Bertin Technologies, April 2000.
- Economic Evaluation of PVC Waste Management - AEA Technology, not yet published.

The studies form the technical basis of a Green Paper on the Environmental Issues of PVC that was adopted by the European Commission on 26 July 2000. The Green Paper and the studies can be found at <http://europa.eu.int/comm/environment/pvc/index.htm>. The Green Paper reviews the findings of these studies and presents options for measures on the various problems linked to PVC. With this document, the Commission launches a public consultation process on PVC. Based on the Green Paper and the public consultation process, the Commission intends to present a strategy on how to tackle the environmental problems of PVC at the beginning of 2001.

Summary of key findings of the five EU studies

- **PVC wastes on the increase:** The amounts of PVC wastes are projected to increase more than 80% over the next 20 years, from 4.1 to 7.2 million tonnes/year. Almost 90% of these wastes are post-consumer wastes.
- **Incineration – making things worse:** Incineration of 1 kg of PVC in the EU creates on average 0.8-1.4 kg of *hazardous* wastes (in incinerators with non-wet flue gas treatment) and 0.4-0.9 kg of residues in liquid effluent (in incinerators with wet flue gas treatment). Hazardous waste from PVC incineration will also be more likely to contaminate the environment, as PVC increases the amount of leachates and leachable salts in this waste significantly. Incineration of PVC creates additional costs between 20-335 Euro/tonne. PVC is responsible for 38 to 66% of the chlorine content in

municipal solid waste. The formation of dioxins due to PVC has been beyond the scope of the study. Diverting PVC from incineration always leads to environmental improvements. Nevertheless, PVC incineration is estimated to increase more than fivefold over the next 20 years in a business-as-usual scenario, from currently 0.5 million tonnes/year to 2.6-2.9 million tonnes/year.

- **Landfilling - the ticking time bomb:** Landfilling of PVC results in the release of hazardous softeners. Releases of hazardous stabilisers cannot be excluded. These releases will occur for a very long period of time - longer than the guarantee of the technical barrier of the landfill. PVC waste will furthermore contribute to the formation of dioxins and furans in landfill fires.

- **Recycling – not solving the problem, and problematic in itself:** Recycling was found not to be qualified to contribute significantly to the management of PVC waste in the next decades, reaching at most 18% of total waste in 2020. Assuming that the maximum potential of PVC recycling is achieved, incineration of PVC waste would still increase more than fourfold to 2.2-2.5 million tonnes in 2020. Current recycling rates are at less than 3%. Most current recycling (2%) is downcycling - the recycling of PVC into low quality recyclates that do not replace virgin PVC - and therefore has no environmental benefits. Almost all PVC wastes contain hazardous additives. Recycling these wastes leads to a spreading of these hazardous substances into new products. High-quality recycling of PVC wastes without spreading lead, cadmium or PCBs into the recyclates is estimated to reach a maximum of 5% by 2020. Chemical recycling was found to be not economically viable.

Conclusion

The studies show multiple significant environmental and/or economic problems for each of the PVC waste disposal options. They show that neither incineration nor landfill are 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.

Greenpeace advocates that the following measures be taken against PVC:

- short-term action:
 - phase out of short-lived PVC uses such as packaging and toys,
 - phase out of PVC medical devices, for which alternatives are available,
 - phase out of the use of hazardous stabilisers and softeners,
 - ban on incineration and landfilling of PVC wastes,
 - ban on recycling of PVC containing hazardous additives, and
 - producer responsibility 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,

- mid-term action
 - develop and implement programme on phase out of entire PVC production.