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Environmental considerations for "end of life" disposal of cables

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Abstract
Cables are collected at the "end of life", EOL. The value of metal within them is paying for the handling and processing. After the metal recovery a polymer fraction remains that is sent for landfill today. New legislation from the European Union on waste material going into landfill has the aim of steering the waste to other solutions such as recycling and recovery.

The polymer fraction of cables (of all types) at EOL today consists of average of 2/3 PVC and 1/3 polyethylene, PE. For recycling and recovery the polymers need to be separated. A possible way of material recycling of crosslinked polyethylene, XLPE, is to grind it and make a compound with PE. For the major part of the polyethylene fraction energy recovery is the most suitable way of recovery.

Key words: Energy recovery, material recycling, cable waste, End of Life of cables, cable disposal

Résumé: Les câbles sont généralement récupérés en fin de vie, car la valeur du métal en lui-même couvre les coûts de manutention et du procédé de récupération. Après le recouvrement du métal, la fraction polymérique est aujourd'hui déposée la plupart du temps dans des décharges publiques. Mais une nouvelle législation de l'Union Européenne sur l'élimination des déchets dans les décharges a pour objectif d'identifier d'autres solutions telles que le recyclage et le recouvrement.

Comme la partie polymérique des câbles en fin de vie, tous types confondus, est aujourd'hui de l'ordre de 2/3 PVC et 1/3 PE, les polymères doivent être séparés pour leur recyclage et leur récupération. Une voie possible pour le recyclage du PRC, est de le broyer et de le disperser dans une matrice polyéthylène. Toutefois aujourd'hui, pour la plus grande partie de la fraction polyéthylène , la récupération en énergie reste la solution la plus appropriée.

Mots clés: Récupération d'énergie, recyclage des matériaux, déchets de câbles, fin de vie des câbles, dépose de cables.

1. Introduction

Today a high degree of cable is recovered because of the value of the copper. The remaining polymer waste is mostly used for landfill. The annual waste volume is still increasing. Actions are needed to reduce landfill due to problems such as lack of landfill capacity and leaching water containing dangerous substances. The method of handling waste varies greatly between European countries. In UK, Finland, Portugal and Spain waste is largely used as landfill, whereas in Switzerland, Denmark and Belgium the major part of the waste is incinerated, Figure 1. Scrapped cables comprise a complex waste, complicating material reuse or recovery. Polymer scrap from cables consists mainly of PVC and polyethylene (PE). The PE fraction contains cross-linked insulation, XLPE, which limits reuse as it cannot be remelted. Polyethylene is mainly carbon and hydrogen and thus only carbon dioxide and water are formed in proper combustion. The energy content can be compared with oil; the polyethylene fraction from scrapped cable has the potential to be used as fuel.

The aim of the EU directive 1999/31/EC is to reduce the volume of waste as landfill. The main content of the EU directive can be summarised thus:

- Landfill waste to be inert to reduce greenhouse gases and hazardous leach.
- Reduce municipal biodegradable waste by 25% within 5 years, by 50% within 8 years and by 65% within 15 years.
- Tyres or chemicals are banned in landfill.

Sweden is implementing a number of changes in legislation concerning waste. Combustible has been prohibited in landfills from 1 January 2002 and organic waste including plastics will be prohibited in landfills from 1 January 2005. A tax on waste was introduced 2001. The aim is to increase costs and thus steer flows of waste away from landfill by making other treatments more economically attractive.