

Quantifying the resource potential of selected end-of life products for five critical metals

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The use of waste as a resource has been a topic of interest for numerous sustainability and zero waste strategies including the recently developed circular economy concept. The European Commission points out that valuable materials are leaking from European economies and Europe could benefit economically and environmentally from making better use of those resources. The European Minerals Yearbook developed by the FP7 funded project Minerals4EU (2013–2015) produced case studies that estimate the potential contribution of secondary raw materials from selected end-use products towards satisfying Europe's demand for 8 metal commodities, including 5 critical ones (Pt, Pd, Dy, In, Y). Full details of the methodology and short case studies are available at <http://minerals4eu.brgm-rec.fr/search/site/m4eu-myb>.

A significant part of the European demand for palladium (Pd) (27–81%) and platinum (Pt) (17–46%) is already covered by recycling autocatalysts from non-electric passenger vehicles. Decreasing export rates for waste cars and optimising collection and recovery rates approaching 100%, the extraction of Pd from autocatalysts alone could satisfy between 41–125% of the European demand for this metal. For Pt the corresponding range is 26–73%. Dysprosium (Dy) recovered from end-of-life laptops and desktop PCs could contribute between 28–38% towards the European demand and indium (In) from end-of-life LCD TV, monitors and laptops between 15–19%. In reality however, only small parts of the European demand for Dy (<0.4%) and In (<0.2%) are covered by secondary sources due to inefficient recycling technologies and waste collection practices available.

Case studies on the selected critical metals are presented to illustrate the present and potential future contribution of secondary raw materials in strengthening Europe's security of supply.