

Recyclability evaluation of a flat-screen television

Summary

Freiburg, 20.02.2017

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Background and objectives

The company Vaillant would like to classify the results of a recyclability assessment for its Green iQ appliances in comparison to other typical appliances that are used every day in order to make this information easier to understand. Internet research carried out by Vaillant into companies that manufacture white goods did not yield any useful results with respect to possible comparative values for large domestic appliances. Vaillant therefore commissioned the Öko-Institut to evaluate the recyclability of such appliances.

Specifically, a combined fridge-freezer and a flat-screen television were examined. The following description refers to the flat-screen television. A similar description is available for the combined fridge-freezer.

Recyclability assessment

When evaluating the recyclability of the flat-screen television, the method used was the same as for the recyclability assessment of the ecoTEC exclusive Green iQ wall-hung boiler. The recyclability assessment assumes the following losses along the recycling chain:

Table 1: Assumptions for estimating loss

	Metals	Plastics	Large electronic components	Small electronic components	Magnets
Sorting loss	1–3%	5–15%	0%	100%	0% ¹
Losses during final treatment	0%	0%/100% ²	84–69% ³	---	30%

Conclusion

The following conclusions can be drawn based on the analyses carried out:

- Given the assumptions made concerning actual waste-management conditions in Germany, **the recycling rate for the flat-screen television examined is estimated to be around 50–61%⁴.**

¹ Sorted completely into the steel fraction. Although sorting into the steel fraction leads to a complete loss in the subsequent final treatment for any rare earths contained, such a method of sorting should be considered effective material recycling.

² Small plastic parts and fragments, elastomers and any plastics that are foamed, filled, painted and coated are subjected to thermal waste treatment, as are black plastics (except ABS and PS). Here, the recycling rate is 0% with a loss of 100%.

³ Recycling information from Hagelüken and Buchert shows that recycling rates of 16% to 31% are achieved with respect to the total mass of input. Hagelüken, C.; Buchert, M.: The mine above ground – opportunities & challenges to recover scarce and valuable metals from EOL electronic devices. Presentation at the IERC, Salzburg, 17.01.2008.

⁴ With respect to the recyclability of the LCD screen (mass 1 kg), no conclusive assessment could be made. For this reason, the decision was made to specify the recycling rate of the flat-screen television for two scenarios: both with and without complete recycling of the LCD screen.

- The resulting cross-comparison shows that **the recyclability of a flat-screen television (50–61%) is lower than that of a wall-hung boiler (about 82% for the ecoTEC exclusive Green iQ).**
- The assessment for both appliances was carried out using a uniform method, which means that the results can be compared at least in purely numerical terms due to the same methodological approach.⁵

⁵ In principle, however, it must be remembered that very different product groups are being compared here. Flat-screen televisions and wall-hung boilers are designed to perform fundamentally different functions. Given very different functional properties, there are specific requirements in terms of construction and design when it comes to material selection. This also means that there are different possibilities for both appliances in terms of optimal recyclability. It should also be noted that the assessment draws on country-specific data (for Germany), especially as regards collection systems, and this information cannot be applied directly to other countries without closer consideration.