

Manifesto for the sustainable design of electronics

Recommendations for product design with efficient use of raw materials

Association NVMP (the Dutch Association for the Disposal of Metalelectro Products) has established that the environmentally-friendly processing of most of our electronic waste in the Netherlands is well-organised and that we are recovering most of the steel, copper, plastic and other commonly-used substances in our e-waste.

At the same time, NVMP has also ascertained that high-quality raw materials that we use in small amounts and in complex compounds, which are essential for the functionality of our modern electronics, are lost during the recycling process.

Those high-quality metals are either rare or their supply is critical because producers are dependent on just a few suppliers or on geopolitical constraints. It is essential that we recover these critical metals from discarded electronic devices in order to guarantee their availability in the future.

However, new recycling techniques are not the solution. After all, those technologies cannot overcome the limitations of metallurgy and the laws of nature that affect the recycling of critical substances. The solution is to adapt the product design so that these materials can be recovered using the best available recycling technology.

Research commissioned by NVMP* has resulted in a number of workable empirical rules so that the necessary adjustments can be made in the choice of materials and in the construction and design processes. Association NVMP wishes to make the following four recommendations in order to promote and implement the desired new working method in the electronics chain:

1. Define targets that are technically and economically feasible

Given the laws of nature, it is inevitable that metals and materials that are mixed and combined in products are partly lost during the recycling process. Targets that ignore the laws of nature and the maximum that the industry can achieve with metallurgical processes are doomed to failure and can only end in frustration. On the other hand, realistic ambitions that

are based on the industrial reality of recycling and product design can actually have an inspirational and stimulating effect.

We must therefore focus on the best available technology that has the greatest potential. We can only afford to have ambitious objectives when, using this solid basis, we are able to determine and quantify what is technically implementable and economically feasible.

2. Define standards that apply to all parties

After we started organising the separate collection and recycling of e-waste, it took thirty years before the same quality requirements and accountability obligations applied to all bona fide parties. Mandatory certification and registration that can be introduced by 2015 will ensure that processors and recyclers can compete with each other on a level playing field. And if parties don't play by the rules they can be prosecuted.

The use of certified best available technology is essential if we are to achieve the best results in a recycling chain that uses raw materials efficiently and it must cover the collection, sorting and mechanical recycling right up to the metallurgical final processing. The standards and objectives that we define in this area must apply as soon as possible to all the parties involved, with strict enforcement in order to prevent avoidance and evasion.

3. Work on international standardisation

In order to realise the efficient use of raw materials, it is crucially important to safeguard recycling and high-tech metallurgical infrastructures and the knowledge required to operate these processes on an international playing field. Stimulating knowledge and training young people in the relevant technical areas of expertise are important activities in an international context.

Standards and objectives for product designs that use raw materials efficiently should have an impact internationally and should also make themselves felt in the US and especially in Asia, where many of our electronic devices are developed and produced. As the promoters of the development and standardisation of designs that use raw materials efficiently, we must also carefully examine what other countries are doing. In this context, important activities include consulting and lobbying in international bodies, cooperating internationally to develop new working methods and conducting comparative research into *best practices*.

4. Consult with each other and work together

Sustainable design with the focus on recycling and the efficient use of raw materials requires good harmonisation between the electronics industry,

the collection process, the recycling industry and the scientific sector. The stimulation of practical structures for the exchange of data and information among the various stakeholders to enable making reliable calculations has an important role to play here. This requires open and intensive cooperation.

In consultation with the various stakeholders, over the past few years we have made excellent progress with the recycling of e-waste. The government has regularly chaired that consultation process and has helped parties to find joint solutions while respecting each other's interests. This working method is also the way forward in *Design for Resource Efficiency*.

Association NVMP will take the initiative, together with the government, to organise a round-table discussion focusing on sustainable product design with all stakeholders.

This manifesto was presented to Paulus Jansen, Chairman of the Infrastructure & Environment Commission in the Dutch Lower Chamber, at the *Design for Recycling* symposium held on 29 August 2013.

* For the 10 empirical rules for product designs, that use raw materials efficiently, as drawn up by research agency MARAS commissioned by NVMP, see www.nvmp.nl
For the empirical rules that are partly based on research carried out as part of the UN Environment Programme, see www.unep.org/resourcepanel/Publications/MetalRecycling/tabid/106143/Default.aspx