RECY CLING

DECLARATION BY THE METALS INDUSTRY ON RECYCLING PRINCIPLES

28
Ni
Nickel

The metals industry works towards the establishment of an accurate understanding of metals recycling. Environmental models and policy discussions that concern product recycling should characterize material recycling in a manner that is appropriate and that promotes the objectives of sustainable development.

Objectives

To this end, the metals industry supports the characterization and modeling of recycling of metal-containing products in a way that:

1. Encourages good environmental practices;
2. Aids assessment of the overall life cycle of products and understanding of materials;
3. Supports the management of the life cycle of products and stewardship of materials;
4. Is consistent with scientific knowledge and technical practices; and
5. Reflects economic realities without creating market distortions that impede environmental objectives.

Nickel INSTITUTE
knowledge for a brighter future

ABOUT METAL RECYCLING

Metals are highly recyclable and in fact a large percentage of metallic material is effectively recycled. Collected metal scrap is converted to new material of equal or similar quality through metallurgical processes, including remelting and refining. Some products require metal grades that demand minimal processing; other products may require more metallurgical and process controls to meet specifications. Metal inputs for metal production are principally sourced via the most cost effective route, whether this is from primary ores or from recycling of recovered metal resources. The source of the metal however, whether primary or from recycling, can not be determined by material properties. Therefore, scrap that is sorted and clean commands a higher market price owing to the ease of subsequent processing through recycling. The final economic value of the metal product is determined by its utility for applications and its recycled content may be high or low, depending, amongst other aspects, on the availability of secondary material at the time of manufacture.

Metal scrap that is collected for recycling is material that does not have to be managed as a waste. It is a valuable resource that is converted into value-added commodities. Perhaps even more importantly, recycled metal substitutes or displaces the necessity to mine new metal. Consequently, metal recycling offsets primary production processes—and their associated environmental impacts and energy consumption—required to dig, crush, grind and otherwise metallurgically process virgin ore. Recycling increases the material and energy efficiency of product systems throughout the life cycle and thus is good management practice.

FACTS

The following are relevant to metals recycling:

1. Recycling of metals has environmental, economic and social value. Consequently, and for many years, metals from end-of-life products are widely recycled at high rates.

2. Recycled metal is readily sold on the market. The constraint to greater levels of metal recycling is the availability of feedstock material.

3. Metals are characterized by metallic bonding that provides distinct structures and properties. As this type of bonding is not affected by melting, metals can be, and are, recycled over and over again.

4. Material grade is determined by conformity to established specifications. The origin of metal (whether primary or recycled) in a specific lot of material is driven by availability and economics.

5. Metal may be lost during product use (e.g., via corrosion or wear), and some material may not be economically recoverable at end-of-life due to material dispersion or difficulties in separating components.

6. Since there is growth in the demand for metals and since metal products often have a long service life, there is a limited supply of used metals available for recycling into new products. Primary metal production fills the gap between the availability of secondary material and total demand.

COMPARISON OF APPROACHES FOR MODELING RECYCLING

Two approaches for assessing the benefits of recycling are commonly used: the “recycled content” approach and the “end-of-life” recycling approach. Their perspectives and purposes are different.

a) Recycled content approach

The recycled content approach uses a metric that looks back to where material feedstock was sourced, and provides a measure of waste diversion. This approach is based on a waste management perspective, where the general aim is to promote a market for recycled materials that is otherwise limited, uneconomic or immature.

The recycled content approach assumes that the use of recycled material is a good indicator of environmental benefit. However, the metric uses statistical information on material flows and is not based on an actual assessment of environmental performance. For example, if product durability is improved, less scrap material will be available in the short term. This, in turn, is reducing the possibility of a high recycled content in the short term.

The recycled content approach may be a useful metric for material that would otherwise be incinerated or landfilled as waste (assuming that these waste management treatment processes would result in higher environmental impacts than the materials recycling), which can be diverted to recycling and reuse. Importantly, this is not the case for metals—as discussed above, metal recycling is economical and the recycled metal market is mature.

Unfortunately, application of the recycled content approach may create market distortions and environmental inefficiencies. If a designer specifies high recycled content in a well-meaning effort to reduce environmental impacts, it may stimulate the market to direct recycled feedstock towards designated products and away from production where recycling is most economical. For metals, where there is a limited supply of recycled feedstocks, market stimulation is ineffective and may result in inefficient processing and unnecessary transportation.

b) End-of-life recycling approach

The end-of-life recycling approach is based on a product life cycle and material stewardship perspective. It considers the fate of products after their use stage and the resultant material output flows.

In characterizing a product system using this approach, the environmental consequences of the product of interest are studied, including its end-of-life management. Possible changes to improve the product system can be considered. The specific origin of input material (whether primary or recycled) is not relevant because it is the net conservation of material that typically minimizes total environmental impacts. Under this framework, consistent with ISO 14044[1],it is acknowledged that material not recycled needs to be replaced by primary material feedstock.

A designer using an end-of-life recycling approach focuses on optimizing product recovery and material recyclability. By facilitating greater end-of-life recycling, the decision-maker mitigates the loss of material after product use. This approach assesses the consequences at the end-of-life of the product based on established technical practices, and supports decisions for an efficient market. This concept allows design for recycling.

CONCLUSION

For purposes of environmental modeling, decision-making, and policy discussions involving recycling of metals, the metals industry strongly supports the end-of-life recycling approach over the recycled content approach.

The weakness of the recycled content approach arises from the fact that a simple account of the history of a material provides no assessment of actual environmental performance. The recycled content metric does little to guide decision-makers wishing to better manage metals and metal containing products. Moreover, and of particular concern, pursuit of recycled content may generate market distortions and result in environmental and economic inefficiencies.

The end-of-life recycling approach encourages manufacturers, policy-makers and other decision-makers to evaluate real performance and improve the design and management of products, including their disposal and recycling. This forward-looking perspective supports sustainable development. By supporting solutions where high amounts of metal are made available for the future by recycling, it assists society in meeting “the needs of the present without compromising the ability of future generations to meet their own needs.”[2]

November 30, 2006

[1] International Organization for Standardization (ISO). International Standard, ISO 14044, Environmental management – Life cycle assessment – Requirements and guidelines. 2006.

[2] World Commission on Environment and Development (WCED). Our common future. 1987.

This Declaration is endorsed by:

- American Iron and Steel Institute
- Eurofer (European Confederation of Iron and Steel Industries)
- Eurometaux (representing the European non-ferrous metal industries)
- International Aluminium Institute
- International Chromium Development Association
- International Copper Association
- International Council on Mining and Metals
- International Iron and Steel Institute
- International Manganese Institute
- International Molybdenum Association
- International Zinc Association
- International Tungsten Industry Association
- ITRI (formerly International Tin Research Institute)
- Lead Development Association International
- North American Metals Council
- Nickel Institute

Nickel INSTITUTE

knowledge for a brighter future

Nickel Institute

communications@nickelinstitute.org
www.nickelinstitute.org