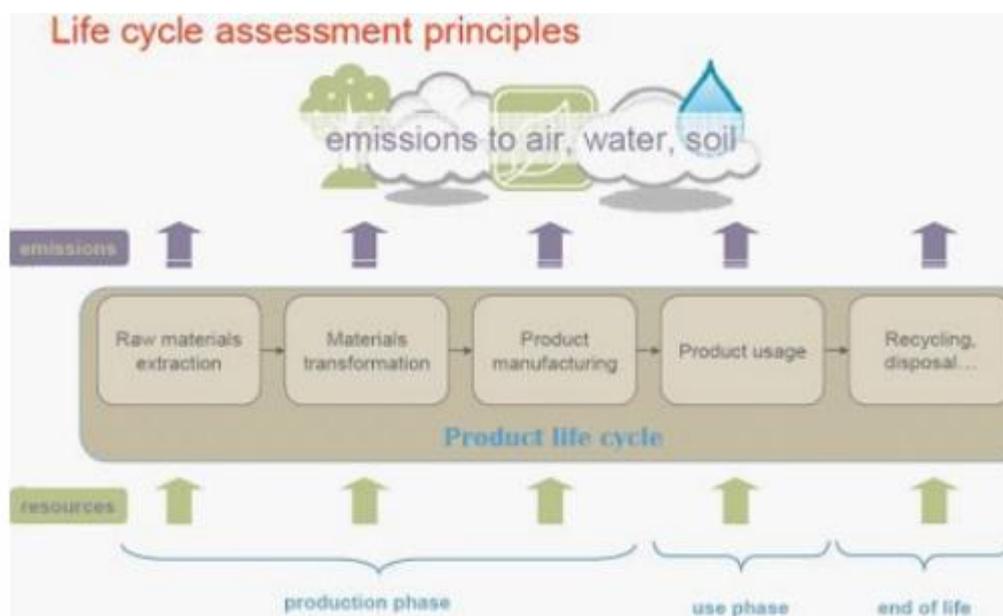


## Steel in Construction: Life Cycle Analysis and Module D

LCA - Life cycle analysis or assessment, now a common method for all resources and products, is of course also important for steel in construction. ArcelorMittal is fully committed to promoting the sustainability of steel. LCAs in the construction industry will now include the so called "Module D" which considers the end of life recycling possibilities of construction materials in general and metals and steel products in particular.

### 1) What is LCA ?

The procedures of LCA are part of the International Standards Organisation (ISO) 14040 series of standards. LCA provides a methodology to take into account the environmental impacts of the manufacturing processes of a product, the extraction of the raw materials used by these processes, the use and maintenance of the product by the consumer, its end-of-life (recycling, reuse or disposal) as well as the various methods of transport occurring between every link of the chain.



### 2) LCA for steel products

Correct modelling of the recycling potential of steel products at the end-of-life phase is critical for our sector to compete with other materials and demonstrate the performance of steels solutions to meet the demand for "best in class" sustainable buildings.

At ArcelorMittal, safe, sustainable steel has long been our tagline. A life-cycle approach translates

the relatively high input of energy and associated emissions of the transformation process from units of mass into units of functionality (i.e. “functional equivalence”, e.g. the same load bearing capacity over certain length for different beam solutions).

Our advanced high strength steels showcase their premium structural performance over conventional steels or competitive materials in Life Cycle Assessment (LCA) benchmarks measured over unit of functionality.

In Europe, an environmental product declaration (EPD) is a standardized way of quantifying the environmental impact of a product or system following Life Cycle Analysis.

For us as a steelmaker, it is also strategically important to demonstrate this life-style approach - in terms of governments and policies – so that the long service-life, re-use and multi-recycling characteristics of steel are adequately appreciated and measured.

However, a recurring point of contention in the tools used to define these government policies is how to quantify the environmental benefits of recycling.

Typically steel products made over the integrated route have a scrap content limited to a value between 10-20% where as the product at end-of-life will be recycled at rates between 85-95%. The ‘recycled content’ method only incorporates the environmental benefits realised today, in contrast with the ‘end-of-life’ method that additionally accounts for the future environmental benefits emerging from scrap that will be generated at end-of-life.

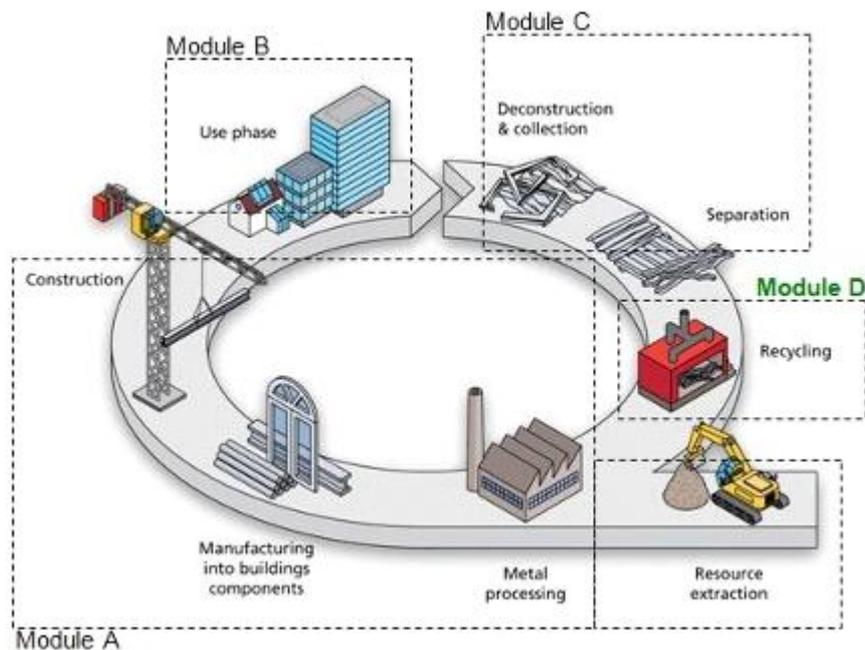
Metal industries like ours are advocating the “end-of-life recycling rate” as the most appropriate indicator for metals while available volumes of scrap are insufficient to match demand.

### **3) Steel and construction**

The construction and infrastructure industry is our biggest client; a large percentage of the steel we produce ends up in buildings across the world – from the new One World Trade Centre in New York City to low-cost housing communities in South Africa.

Government environmental regulators’ studies indicate that the construction industry is responsible for a huge part of the CO2 emissions and energy consumption and up to 70% of all waste. This has brought the construction industry to the top of the regulators’ list of priorities.

To enable the adequate assessment of the sustainability of buildings and public or civil-works, products used in construction of buildings are increasingly required to provide EPDs for all products used listing clearly the major environmental impacts over different stages of its life-cycle.



#### 4) CEN/TC 350 and the importance of Module D

In Europe, to avoid the creation of trade barriers in the common market, the European Commission gave a mandate to its normalisation body, CEN/ TC 350, to develop a harmonised standard to define the methodology to implement and calculate EPDs and assess sustainable performances at building level.

Knowing that the EPDs of products are the basis of their competitive strength in the environmental assessment of a building, all the relevant material sectors took an interest in guiding the calculation method developed under CEN/TC 350 to reflect the specific competitive strengths of the material they represented.

The result was the publication of the final standard, called EN 15804 at the end of 2012. This standard includes a “Module D” which provides the opportunity to account for the benefits of end-of-life recycling of steel in an EPD.

The inclusion of Module D is a major accomplishment which extends the reporting of environmental benefits of recycling from recycled content percentages only to equally include the end-of-life recycling possibilities. This method and inclusion is especially significant for steel products made predominantly from iron ore, for example flat steel products made via the integrated route. Being net generators of scrap, these products can now claim the environmental credits of future recycling in Module D.

This also has other repercussions. If Module D were not included, it would have caused a significant negative impact on the competitive position in environmental assessments for all of ArcelorMittal's products.

#### **5) Entrenching Module D into all assessments**

Currently Module D - with the end of life recycling benefits - is an optional module for assessments of buildings and constructions.

The added value of making Module D reporting mandatory is already recognized in Germany (IBU system) and Belgium (Royal Decree on building products) and in France at the beginning of 2014.

Recently, AISI in the United States has shown interest in the European methodology to implement EPDs, including our "Module D" approach and the new version of LEED building assessment is also considering EPDs as part of the environmental performance of buildings.