

Furniture + Sustainability

Understanding the Product Life Cycle

Everything we do has an environmental impact—brushing our teeth and taking out the garbage. But it can be difficult to understand or measure exactly what these impacts are, and it can be even harder to *do something* about them. Over the last thirty years, scientists and standards organizations have been grappling with the question of how to measure a product’s environmental impacts. The very first studies focused on beverage packaging in order to understand which material would generate the least waste, for instance.¹ The concept of a material ‘life cycle’ has begun to change the way that we understand the terms *raw material*, *product*, and *waste*. These terms identify a few of the life cycle stages of a product—which go from raw material extraction, transportation, through manufacturing and production, to use and maintenance, and at the end of the life cycle in its disposal or recycling.

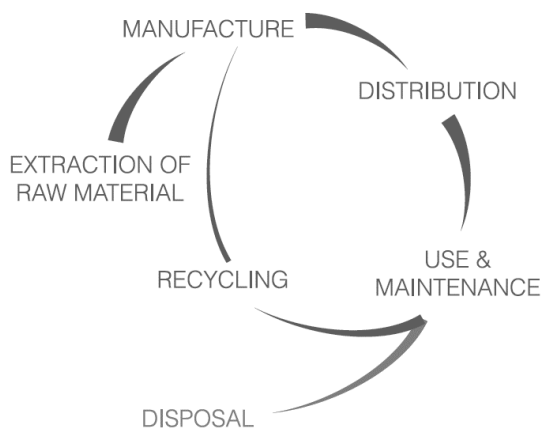


Diagram 1. The Life Cycle of a Product

This life cycle diagram shows that manufacturing and product use need not be a linear cycle that goes in one direction and has a one-time use. Thorough recycling and reuse, materials can have another functionality, be diverted from landfill, and help keep purchasing costs down.

Every step of materials and manufacturing processes (and the sometimes innumerable sub-processes) has an environmental and human health impact- from the energy expended in mechanical processes, to the chemicals and water used to process the polymer or the machinery used to process wood products, all the way to the actual material depletion of oil or the harvesting of trees. Needless to say- this is a topic area that has as much breadth and depth as you can imagine.

Given the overwhelming implications of all of the processes and sub-processes that go into anything and everything available for purchase, how can you ensure your company or organization is making the best-informed environmental choices when it comes to buying furniture?

The Furniture Industry

The following sections take a look at how this life cycle thinking applies during the furniture life cycle from the selection and specification, to the reuse or recycling of each piece of furniture.

Environmental Rating Systems:

There are many product and building certification systems that aim for transparency of products and processes, as well as a higher environmental standard when it comes to manufacturing and design. Helpful as they may be, wading through the weeds of each of these product ratings or certifications can be more than a little daunting. Let's take a little space to demystify some of these standards:

The US Green Building Council's **LEED** rating system is a **building** certification system. The more points a project can achieve, the higher the level of the certification. The furniture that is specified in a project can help achieve several points in different areas. In LEED 2009 and earlier furniture can help accrue points if it is manufactured regionally, if wood components are sustainably sourced following the Forestry Stewardship Council's (FSC's) guidelines, or if it qualifies as a low-emitting product that guarantees a healthy indoor environment. For LEED V4, the Materials and Resources section of the certification system looks very different, and furniture can help gain points if it meets certain life-cycle criteria. The following are the product life cycle criteria that LEED v4 requires furniture to fulfill towards points in certain areas.

- + **Environmental Product Declarations (EPDs)** are documents that provide comparable claims about the environmental impact of a product: they can be product specific or industry wide; third-party certified or manufacturer's own claims. There are different ways that products can help to achieve a certain LEED credit and win one or more points towards certification. The more rigorous the EDP, the more that a piece of furniture will be able to contribute towards certification. The referenced norms for EPDs are ISO standards 14044, 14025, 14040, 14044, and EN 15804 or ISO 21930.ⁱⁱ
- + **Raw material and extraction reporting:** Manufacturers can either self-report or hire a third party to verify their triple bottom line: sustainability, social and economic elements. The acceptable formats for this kind of reporting are *Global Reporting Initiative (GRI) Sustainability Report*, *Organisation for Economic Co-operation and Development (OECD) Guidelines for Multinational Enterprises*, *U.N. Global Compact: Communication of Progress*, and *ISO 26000: 2010 Guidance on Social Responsibility*.ⁱⁱⁱ
- + **Material Ingredient reporting:** For this credit, manufacturers are asked to report chemicals of concern and be more transparent about product ingredients. This can also be done by self-reporting or through third party certifications, and each carries a different weight. What the USGBC is looking for here are products with *Green Screen*, *Health Product Declarations*, or *Cradle to Cradle* certification- or a Manufacturer's inventory or supply chain certification.^{iv}
- + **Low Emitting Materials:** Furniture is required to have low Volatile Organic Compound (VOC) emissions, tested through the ANSI/BIFMA Standard Method M7.1–2011 and compliant with ANSI/BIFMA e3-2011 Furniture Sustainability Standard (Level certification).^v

On that note, **Level certification** is a third-party certified **furniture standard** put out by BIFMA (Business & Institutional Furniture Manufacturer's Association). It has three levels and has requirements for the product, the facility in which it is produced, and for the organization. This standard is specific to

furniture and a piece of furniture is level certified once it completes a threshold above a certain number of points in the categories of materials, energy and atmosphere, ecosystems health, and social responsibility.

Purchasing Policies:

Environmental product ratings are great tools to standardize the products your organization is buying. But at the moment of a purchasing decision, these qualifications are often overlooked in the rush to get-what-you-needed-yesterday. For this reason, in order to build sustainability into the operations of your company, it is time well spent to require a sustainability criteria to be met on all new purchases. Many of us know that LEED Silver is a requirements for many organizations or universities as they develop or renovate buildings. Much the same way, furniture standards can be developed to streamline the way that you purchase items—and make sure that these purchases are in line with the values and direction of your organization. **Standardization** can help to ensure the future reuse of furniture, and will make the process of inventories and asset management more feasible in the long run.

Installation and Maintenance:

Furniture purchasing and installation are really two parts of the same process. In order to make the most of your sustainable furnishings they have to be installed well, and in order for the installation process to be sustainable, it should be managed well. It starts with the **packaging**: in order to arrive in perfect condition, furniture (and many products) are transported in packages that include cardboard, styrofoam, wooden pallets, and plastic. These elements can quickly add up on any sized project, and it is important verify the **recycling practices** of your contractor or installation company. Next comes the staging and assembling of the furniture. Different products call for different procedures: for instance some demountable walls are made to be cut in field and often require a special staging area for the process to happen correctly. Making sure there are **best-practices** in place throughout the installation process can minimize damages to the project and minimize material waste.

Finally, eco-friendly **cleaning products** can also help ensure that the sustainable attributes of your furniture are enhanced by a diligent maintenance policy that also positively impacts indoor air quality and occupant health.

Refurbishing, End of Life Plans and Asset Management

The options are more varied than you might at first think when it comes to dealing sustainably with old furniture. There is the practical and economic reuse- simply move furniture to another area and continue to use it, as is. Depending on the condition of the furniture and the situation of the organization, there might be a place for refurbishing or remanufacturing. Both of these options allow you to spruce up your piece- whether through reupholstering, a new coat of paint, or a different wood stain or laminate finish. And how do you keep track of this process? **Asset management** allows you to plug and play your existing furniture into new areas of the organization, while knowing what is in the process of being re-

manufactured, and what's in your 'stock' that can be reused. Inventories, images, and a well-organized warehouse are the key tools in hand when it comes to asset management.

How Reuse + Asset Management can affect your Bottom-line

For those of us who get carried away dreaming of the green possibilities- how will this affect your bottom line? A sustainable purchasing policy and a well-organized furniture inventory can be a very reasonable business decision. Remanufactured furniture is a fraction of the cost of buying new and re-using already purchased items, or refinishing them, is also only a fraction of the cost of buying new. The caveat is the *cost* of warehouse space you use when you decide to store, inventory and reuse. If you put the furniture away and forget about it, you'll have a growing stock of frozen assets for which you are paying rent- but with a proactive procurement plan, this stock can be an asset as you consider moving around your space and taking advantage of what is already up your sleeve.

Triple Bottom Line: When making a case for these sustainable policies, it can be important to frame it in terms of the triple bottom line- people, planet, and profit- or in other words looking at the social, environmental and economic issues associated with a decision. This can be an effective argument for implementing sustainable practices in your organization, so *metrics* are also a key component of an effective reuse management strategy. Understanding how many tons of furniture waste is diverted from landfill by your facility or organization can help you understand how much impact a sustainable policy is having on your company.

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References:

Diagram 1: Acevedo Pardo, Carolina. *A Comparative Life Cycle Assessment of a Social Interest Housing Building: Bamboo vs. Concrete: A Master's Thesis*. 2014. p 16.

Diagram 2: Acevedo Pardo, Carolina. *A Comparative Life Cycle Assessment of a Social Interest Housing Building: Bamboo vs. Concrete*. Thesis Defense Presentation. 2014. Slide 12.

ⁱ Henrikke Baumann and Anne-Marie Tillman. *The Hitch Hiker's Guide to LCA: An Orientation in Life Cycle Assessment Methodology and Application*. Lund, Sweden: Studentlitteratur, 2004. p 47.

ⁱⁱ These stipulations correspond to the LEED v4 credit "Building Product Disclosure and Optimization—Environmental Product Declarations" from *Leed Reference Guide for Building Design and Construction*. 2013 edition. p 513-14.

ⁱⁱⁱ These stipulations correspond to the LEED v4 credit "Building Product Disclosure and Optimization—Sourcing of Raw Materials" from *Leed Reference Guide for Building Design and Construction*. 2013 edition. p 525-526.

^{iv} These stipulations correspond to the LEED v4 credit "Building Product Disclosure and Optimization—Material Ingredients" from *Leed Reference Guide for Building Design and Construction*. 2013 edition. p 541- 43.

^v These stipulations correspond to the LEED v4 credit "Low Emitting Materials" from *Leed Reference Guide for Building Design and Construction*. 2013 edition. p 657-661.