BUSINESS AND INSTITUTIONAL FURNITURE SUSTAINABILITY ASSESSMENT STANDARD

GUIDANCE DOCUMENT

BIFMA International
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Acknowledgments

The Business and Institutional Furniture Manufacturers Association (BIFMA) International thanks the extraordinary group of stakeholders that came together to assist in the development of this standard:

(List of participants will be listed here.)

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Goals

Established in 1973, the Business and Institutional Furniture Manufacturers Association (BIFMA) International is a not-for-profit trade association of furniture manufacturers and suppliers addressing issues of common concern. The association serves as the industry voice for workplace solutions by providing standards development, statistical data generation, government relations, industry promotion, and education.

BIFMA is committed to promoting sustainable work environments and business practices based on sound economics, environmental protection, and social responsibility. We will accomplish these goals by fostering partnerships between manufacturers, suppliers, end users, and the science community; providing association members with education in the concepts of sustainable design; and developing meaningful tools for quantifying and communicating industry progress to interested parties.

In developing a business and institutional furniture sustainability standard, BIFMA established the following goals:

1. The standard must be meaningful to the marketplace
2. It should help differentiate Environmentally Preferable Business and Institutional Furniture
3. It should help harmonize sustainability standards for the office furniture industry
4. The standard should allow for multiple levels of achievement
5. It should provide an open alternative to proprietary certification programs
6. The standard should provide incentives for smaller companies to participate

Definitions

Air Pollutant: Any substance in air that could, in high enough concentration, harm human, animals, vegetation or material.

Air Pollution: The presence of contaminants or pollutant substances in the air that interfere with human health or welfare, or produce other harmful environmental effects.

Alternative Fuels: Substitutes for traditional liquid, oil-derived motor vehicle fuels like gasoline and diesel. Includes mixtures of alcohol-based fuels with gasoline, methanol, ethanol, compressed natural gas, and others.

Bioaccumulants: Substances that increase in concentration in living organisms as they take in contaminated air, water or food because substances are very slowly metabolized or excreted.

Biodegradable: Capable of decomposing under natural conditions.

Biodiversity: The word is a contraction of "biological diversity," and refers to the number, variety, and variability of living organisms**.**

Biomass: All of the living material in a given area; often refers to vegetation.

Byproduct: Material, other than the principal product, generated as a consequence of an industrial process or as a breakdown product in a living system.

Carcinogen: Any substance that can cause or aggravate cancer.

Child labor: No workers under the age of 15; (or 14 where the law of the country permits) or under the minimum age for employment in the country.

Compost: The relatively stable humus material that is produced from composting process in which bacteria in soil mixed with garbage and degradable trash break down the mixture into organic matter.

Design for the Environment (DfE): Is the systematic integration of environmental attributes into the design of products and processes. There are three unique characteristics of DfE:

- The entire life-cycle is considered
- Point of application is clearly in the product realization
- Decisions are made using a set of values consistent with industrial ecology, integrative systems thinking or another framework.

Ecology: The relationship of living things to one another and their environment, or the study of such relationships.

Ecological/Environmental Sustainability: Maintenance of ecosystem components and functions for future generations.

Ecological Integrity: A living system exhibits integrity if, when subjected to disturbance, it sustains and organizes self-correcting ability to recover toward a biomass and end-state that is normal for that system.

Ecosystem: The interacting system of a biological community and its non-living environmental surroundings.

Electric Power Improvement Portfolio (also abbreviated as "Improvement Portfolio"): The combined improvements to a regional power baseline from new source development, upgrades and retrofits to existing power generation, and efficiency improvements to Transmission and Distribution infrastructure over a defined period.

Embodied Energy: The amount of energy required to produce and transport a quantity of material. Energy used to win raw materials, convert them to construction materials, products, components; transport the raw materials, intermediate and final products; and build them into structures.

Endocrine Disruptor: A substance that can modify hormonal systems by mimimicing or blocking the action of endogenous hormones at their receptors.

Environment: The sum of all external conditions affecting the life, development and survival of an organism.

Environmental Aspects: An element of an organization's activities, products or services that can interact with the environment.

Environmental Impact Profile (also abbreviated as "Impact Profile") — The cumulative summary of life-cycle impact assessment (LCIA) impact indicator results representing the environmental performance of an electric power system, or electric power improvement portfolio, normalized to a specific functional unit (e.g., 1000 GWh).

Environmental Performance Declaration: A report summarizing the environmental impact profile and environmental performance index of a given energy utility improvement portfolio.

Environmental Performance Index: Quantitative comparison of the environmental impact profile of an electric power improvement portfolio to the impact profile of its regional power baseline

Environmentally Preferable Power: Power that represents reduced impacts on the environment as compared to the regional power baseline.

Environmental Policy: Is a statement by the organization of its intentions and principles in relation to its overall environmental performance, which provides a

framework for action and for the setting of its environmental objectives and targets.

Environmental Management System: The part of the overall management system that includes organizational structure, planning activities, responsibilities, practices, procedures, processes and resources for developing, implementing, achieving, reviewing and maintaining the environmental policy.

Forced Labor: Compulsory prison or debt bondage labor. Lodging of deposits or identity papers by employers or outside recruiters for the purpose of restricting or preventing and individual from leaving employment.

Fossil Fuel: Fuel derived from ancient organic remains; e.g. peat, coal, crude oil, and natural gas.

Green Chemistry: Is (a set of principles to aid) the design of chemical products and processes that reduce or eliminate the use and generation of hazardous or toxic substances.

Green Engineering: Is (a set of principles to aid) the development and commercialization of industrial processes that are economically feasible and reduce the risk to human health and the environment.

Greenhouse Gas (GHG) Emissions: Emissions of gases related to human activities that accelerate the “greenhouse effect.” The term "greenhouse effect" describes the natural heat-trapping qualities of trace gases in the Earth's atmosphere. Human activities have significantly increased the concentrations of *natural* greenhouse gases such as carbon dioxide. While carbon dioxide is not the only greenhouse gas, it is the main contributor to warming. Other important greenhouse gases include nitrous oxide and methane, both of which have increased in the last century.

Indoor Air Pollution: Chemical, physical, or biological contaminants in indoor air.

Industrial Waste: Unwanted materials from an industrial operation; may be liquid, sludge, solid, or hazardous waste.

Life-cycle – Means the total impact of a system, function, product or service from the extraction of raw materials through its end-of-life management.

Life Cycle Assessment: (LCA) is a tool for the systematic evaluation of the environmental aspects of a product or service system through all stages of its life cycle consistent with ISO 14040. An LCA is generally quantitative and requires that the results be normalized to a functional unit. An LCA is inclusive of both product and process. An LCA is an analytical tool to implement *life cycle thinking*.

Life Cycle Thinking: is a conceptual approach that addresses environmental problems from a whole-systems or holistic perspective. The essential difference to a LCA is that the results are not normalized to a functional unit, and the results may be expressed qualitatively or quantitatively.

Material Intensity: Refers to the concept of continuously improving the utility and durability of the product or service provided while reducing its total material and energy throughput such as the use of less energy, the generation of less waste, and the use of less mass per unit produced.

Mutagen?

Post-Consumer Material: A material or finished product generated by households or by commercial, industrial and institutional facilities in their role as end-users of the product, which has served its intended purpose and has been diverted or recovered from waste destined for disposal having completed its life as a consumer item. Overstock, returns and obsolete inventories would not be considered post-consumer material.

Post-Consumer Waste: Recovered materials that are diverted from municipal solid waste for the purpose of collection, recycling and disposition.

Pollution: Generally, the presence of a substance in the environment that because of its chemical composition or quantity prevents the functioning of natural processes and produces undesirable environmental and health effects.

Pre-Consumer Material*:* Pre-consumer recycled material is a waste product of a manufacturing process, diverted from the solid waste stream and not normally reused by industry during the original manufacturing process. Pre-consumer material also includes obsolete inventory and returned stock from the distribution chain which has not been sold to end-users. By-products of a manufacturing process that normally are reused within the process and usually don't enter the waste stream are considered industrial scrap and don't count toward recycled content."

Precautionary Principle: When information about potential risks is incomplete, basing decisions about the best ways to manage or reduce risks on a preference for avoiding unnecessary health risks instead of unnecessary economic expenditures.

Recycle/Reuse: Minimizing waste generation by recovering and reprocessing usable products that might otherwise become waste (e.g. recycling of aluminum cans, paper and bottles, etc.).

Recycled Material means waste materials and byproducts which have been recovered or diverted from solid waste. This term does not include materials and

byproducts generated from, and commonly reused within, an original manufacturing process.

Recyclable Material: (need definition)

Refurbishment: Includes renovating, repairing, restoring, or generally improving the appearance, performance, quality, functionality or value of a product. (Source: CA and MN purchasing specs)

Regional Power Baseline: The dispatch territory of the Independent System Operator (ISO), or its equivalent, to which an electric power system, or its improvement portfolio, is interconnected

Regional Power Pool: The mix of power technologies that is interconnected to provide power to the regional power baseline.

Remanufacturing: The process of recovering used, worn-out products ("cores") that would otherwise be disposed and restoring them to "like new" condition. This process involves disassembly, cleaning, and inspection for wear. Damaged components are repaired and refinished. At this point, feature upgrades may be added before the product is reassembled. Finally the product is tested for reliability.

Renewable Energy: A renewable energy source is defined as any energy source that is replenishable and replenished on some reasonable time scale. Potential renewable energy sources include, but are not limited to wind, solar, heat from the earth's interior, oceans, rivers, and eligible biomass. The relative renewability of a given energy source should be documented through the environmental performance evaluation methodology described in ASTM E06.71.10.

Renewable Materials: A renewable raw material is any material that is replenishable and replenished on some reasonable time scale. Renewable material sources include, but are not limited to wood, grass fibers, plant-based plastics, fuels and 100 percent recycled content metals, papers, plastics and glass.

Reuse: A process through which a component is removed from one system and installed in another to provide its original function.

Significant Environmental Aspect: A significant aspect is an environmental aspect that has or can have significant environmental impact.

Social Responsibility (or Equity) - Involves the identification of issues, the development of standards and the implementation of programs that address

corporate responsibility for the ethical treatment of employees, communities and other stakeholders.

Social Responsibility - Involves the identification of issues and the development of standards and the implementation of programs that address corporate responsibility for the ethical treatment of employees, communities and other stakeholders.

Solid Waste: Non-liquid, non-soluble materials ranging from municipal garbage to industrial wastes that contain complex and sometimes hazardous substances. Solid wastes also include sewage sludge, agricultural refuse, demolition wastes and mining residues. Technically, solid waste also refers to liquids and gases in containers.

Source Reduction: This refers to a pollution prevention technique that eliminates the potential for pollution at the source, or where the polluting material enters the product or service cycle.

Stakeholders: People who are (or might be) affected by any action taken by an organization. Examples are: Customers, owners, employees, associates, partners, contractors, suppliers or related people located near by.

Sustainable Development: Is defined as meeting the needs of the present without compromising the ability of future generations to meet their needs.

Sustainable Practices: This refers to efforts by industry to achieve sustainable development goals that call for simultaneous performance improvements in economic vitality; ecological integrity; and social equity.

Sustainable Business Codes: Refers to any voluntary business code of conduct or code of practice that calls for simultaneous improvements in economic, environmental, and social performance.

Tier One Suppliers - Tier one suppliers are those that supply the original equipment manufacturers (OEMs).

Toxic Substance: A chemical or mixture that may present an unreasonable risk of injury to human health or the environment.

Toxic Waste: A waste that can produce injury if inhaled, swallowed, or absorbed through the skin

Triple Bottom Line: Sustainable development involves the simultaneous pursuit of economic vitality; ecological integrity; and social equity. Companies aiming for sustainability need to perform not against a single, financial bottom line, but against the triple bottom line.

Virgin Materials: Resources extracted from nature in their raw form, such as timber or metal ore.

Waste: Unwanted materials left over from a manufacturing process, or refuse from places of human or animal habitation.

Water Management: (need definition)

Elements, Prerequisites and Points

The BIFMA SAS is divided into four elements each composed of various prerequisites and points that are potentially available to entities seeking conformance to the standard. The four elements are:

1. Materials;
2. Energy;
3. Human and Ecosystem Health; and
4. Social Responsibility.

Each element has a prerequisite or several prerequisites that are required as the minimum performance against the standard and users must meet all prerequisites in each element in order to proceed. Once the prerequisite(s) are met; users may achieve additional points toward multiple levels of achievement in each element by meeting the specified performance requirements. Beyond the prerequisites, there are no minimum number of points from any of the four major categories required to earn conformance. The required points can come from any of the four elements.

There are three levels of achievement or conformance available within this standard. All points in the standard have the same weighting or value toward conformance. Below are the three levels with the associated percent of points needed to achieve each level:

Silver	48 percent of total
Gold	61 percent of total
Platinum	74 percent of total

Summarized Score Sheets – Prerequisites and potential points are summarized for each element in tabulated scorecards.

5.0 MATERIALS

5.1 Prerequisite: Design for Environment Program

Intent
Require implementation of a Design for Environment (DfE) program. DFE is the systematic integration of environmental considerations into product and process design. Because it offers new perspectives with a product and business focus, DFE can be a powerful tool to uncover possibilities for greater competitiveness and innovation as well as greater environmental responsibility.

Requirements
Put in place a multi-disciplinary DfE program which may include design, engineering, production, quality assurance and marketing staff.

Documentation
Integration of DfE into an Environmental Management System; or
objective evidence (e.g. procedures documented and implemented) to verify the use of Life Cycle Thinking, including such elements as:

- Life Cycle Assessment (O)
- Materials Use Efficiency (O)
- Renewable Materials (R)
- Recycled Materials (R)
- Recyclable and Biodegradable Materials (R)
- End-of-Life Management (R)
- Water Management (R)
- Energy Efficiency (R)
- Human & Ecosystem Health Considerations (O)

(R): required element of DFE program
(O): optional element of DFE program

Potential Technologies and Strategies:
Resources:

- DFE Guide prepared by National Research Council of Canada http://dfe-sce.nrc-cnrc.gc.ca/overview/overview_e.html.

- Minnesota Office of Environmental Assistance, Better by Design (2006), http://www.moea.state.mn.us/berc/DFEtoolkit.cfm.

5.2 Use of Life Cycle Assessment

Intent
Encourage use of Life Cycle Assessment (LCA) to inform product design and development and to optimize materials choices.

Requirements
Complete an LCA for the furniture product to be assessed to the SAS.

Documentation (3 levels of achievement)
- Evidence that a company has incorporated life cycle thinking into the creation of a product by applying at least two of the four components of ISO 14040*.
- Evidence that a company has completed an LCA utilizing all four components outlined in ISO 14040*.
- Evidence that a company has completed an independent third party review of its LCA .

Potential Technologies and Strategies
Resources:

- Five Winds International http://www.fivewinds.com/index.cfm
- SimaPro http://www.pre.nl/simapro/
- International Standards Organization http://www.iso.org/iso/en/ISOOnline.frontpage
- The International Journal of Life Cycle Assessment
- United Nations Environment Programme Life Cycle Initiative http://lcinitiative.unep.fr/
- BEES (NIST) http://www.bfrl.nist.gov/oae/software/bees.html
- US Life Cycle Inventory Database http://www.nrel.gov/lci/
- IDCE http://www.idce.org/
- GABI http://www.gabi-software.com/index.html?&no_cache=1

***ISO 14040 Note: COMPONENTS OF A LIFE CYCLE ASSESSMENT**

(1) Life Cycle Assessment Goal & Scope Definition
(2) Life Cycle Inventory (LCI)
(3) Life Cycle Impact Assessment (LCIA)
(4) Life Cycle Impact Interpretation

5.3 Increase Materials Use Efficiency

Intent
Reduce the quantity of raw materials used in the manufacture and delivery of products and services in order to minimize the ecological and economic footprint.

Requirements

Measure material efficiency for the facility producing the product to be assessed to the SAS. Substantial conversion of raw materials must occur at this facility (e.g. sawing, routing, machining, forming, stamping, molding, cutting, sewing).

Material Efficiency = (Input Mass – Waste Mass) / Input Mass.

Facility Material Efficiency of 80%

Facility Material Efficiency of 90%

Documentation
Document that 75% of the raw material conversion processes take place at the facility producing the product to be assessed to the SAS. Document mass for raw material input and waste. Waste mass calculations should include materials sent to recycling unless full economic value recovery can be demonstrated. Calculate Material Efficiency = (Input Mass – Waste Mass) / Input Mass.

(Further definition of what is meant by Raw Material Conversion Processes needs to be addressed. Major vs. minor. Raw materials do not include fasteners, glues, minor parts etc?)

Potential Technologies and Strategies
Design for Environment (DfE)
Six Sigma
Lean Manufacturing
Lifecycle Analysis
Dematerialization
Physical Optimization

5.4 Biobased Renewable Materials (excluding wood)

Intent
Increase the use of renewable materials that are obtained from biobased sources and decrease dependency on petroleum-based materials.

Requirements
Select renewable materials for use as an integral component (how do we define integral component in the guidance?) of new or existing product to be assessed to the SAS. (1 point)

Ensure that renewable material production waste is composted or recycled (1 point).

Documentation
Utilize DfE process to compare and select renewable materials. Identify non-renewable materials replaced that meet performance requirements.

Provide documentation that renewable material production waste is composted or recycled.

Potential Technologies and Strategies:

Before using more renewable materials in product, check suppliers' product labels to verify:

- The quality and consistency of organic materials that are sourced from renewable stocks.
- That the materials have been harvested and the stocks managed in an environmentally preferable manner.
- PLA plastics and textiles
- Soy based foams

5.5 BioBased Renewable Materials – Sustainable Wood

Intent
Encourage environmentally responsible forest management and use of non-endangered species of wood.

Requirements
Use of endangered wood is prohibited.

Either a minimum of 50% of the total wood weight of the product is compliant to SFI, CSA or other qualified organizations sustainable forest practices OR a minimum of 20% of the total wood weight of the product is compliant to FSC sustainable forest practices.

AND

Either a minimum of 75% of the total wood weight of the product is compliant to SFI, CSA or other qualified organizations sustainable forest practices OR a

minimum of 30% of the total wood weight of the product is compliant to FSC sustainable forest practices.

Documentation

Using the CITIES list verify and document that the species of wood used in the product are not endangered.

Proof of compliance to a sustainable forest management system from supplier.

Document of weight of wood products used in furniture item and weight of certified wood.

Potential Technologies & Strategies
Consider using wood-based materials and products certified by:

- Cities Convention on International Trade in Endangered Species of Wild Fauna and Flora
- American Tree Farm Systems
- Canadian Standards Association
- Forest Stewardship Council
- Sustainable Forestry Initiative

5.6 Recycled Content

Intent
Increase amount of recycled content material incorporated into products.

Requirements:

Measure Existing Recycled Content in Product: Calculate the amount of the recycled content currently used in the product as a percent of the total materials contained in the product.

Mass Balance: To develop the baseline, a mass balance approach shall be used.

$$\frac{\text{mass of recycled materials}}{\text{mass of virgin materials + mass of recycled materials}} = \%\ \text{recycled materials in product}$$

Determine how much of the recycled material used is pre-consumer or post-consumer, and the percentage of each.

Annualize Estimates of Recycled Content: Annual averages can be used, for the product to be assessed to the SAS, as a practical way to deal with fluctuations and uncertainties in inputs over the course of a given year.

No Transfers of Recycled Content Credits from Other Non-Certified Products: "Transferable credits" of recycled content are not allowed from products not being certified. The product must routinely contain recycled content in the range claimed in order to be eligible for credit.

Use of Multiple Suppliers: In order to make calculations, for the product to be assessed to the SAS, when there are multiple suppliers that change through out a given year, state which single-year calendar year basis is being used. Allocate by mass contributed by each supplier to the total mass in the annual cycle.

Meet First Level Recycled Content Requirements
Incorporate recycled content into the product seeking certification such that total recycled content in that product meets the levels established in EITHER OPTION 1 OR OPTION 2.

Option 1:
Incorporate recycled content materials, into the product to be assessed to the SAS, such that the sum of post consumer recycled content plus one-half of the post-industrial content constitutes at least 40% of the total weight of the materials in the product.

Option 2:
Incorporate recovered materials, into the product to be assessed to the SAS, at the levels specified in the following Table.

TABLE ONE

Recommended Recovered Materials Content Ranges:

Product	Material	Postconsumer Content (%)	Total Recovered Materials Content (%)
Furniture structure	Steel[1]	16	25-30
Furniture structure	Aluminum	--	75-100
Cellulose Loose-Fill and Spray-On	Postconsumer Paper	75	75
Particleboard/ Fiberboard component[2]	Wood or wood composite Agricultural fiber	Greater than 0 --	80-100 100
Fabric	PET	See note 3 below	100
Plastic furniture component	HDPE	70-75	95
Remanufactured or Refurbished Furniture	Various	25-75	25-75

[1] The recommended recovered materials content levels for steel in this table reflect the fact that the designated item is generally made from steel manufactured in a Basic Oxygen Furnace (BOF). Steel from the BOF process contains 25% - 30% total recovered steel, of which, 16% is postconsumer steel.

[2] Particleboard and fiberboard used in the wood components of office furniture may also contain other recovered cellulosic materials, including, but not limited to, paper, wheat straw, and bagasse. The percentages of these materials contained in the product would also count toward the recovered materials content level of the item.

3 The 100% post-consumer content requirement of the CPG for PET fabric is not replicated here.

Second Level Recycled Content Achievement

Option 1:

Same as Option 1 above, except that the sum of post consumer recycled content plus one-half of the post-industrial content constitutes recycled content must comprise at least 50% of the weight of the materials in the product to achieve this additional point.

Option 2:

To earn an additional point for recovered content, manufacturer shall demonstrate that the recovered content of its product exceeds the levels specified in the chart above under Option 2 by at least 20% in each category, relevant to the product to

be assessed to the SAS, if 100% recovered content has not already been achieved.

Documentation:
Utilize BIFMA SAS template to identify amount of recycled materials in product.

Definitions:

Recycled content materials shall be defined in accordance with the Federal Trade Commission document, *Guides for the Use of Environmental Marketing Claims, 16 CFR260.7(e)*, available at www.ftc.gov/bcp/grnrule/guides980427.htm

Recycled material means waste materials and byproducts which have been recovered or diverted from solid waste. This term does not include materials and byproducts generated from, and commonly reused within, an original manufacturing process.

For purposes of this section, "total recycled materials" shall represent the sum of pre-consumer and post-consumer recycled materials incorporated into a product.

- ***Pre-Consumer material:*** Pre-consumer recycled material is a waste product of a manufacturing process, diverted from the solid waste stream and not normally reused by industry during the original manufacturing process. Pre-consumer material also includes obsolete inventory and returned stock from the distribution chain which has not been sold to end-users. By-products of a manufacturing process that normally are reused within the process and usually don't enter the waste stream are considered industrial scrap and don't count toward recycled content."

- ***Post-consumer material***: A material or finished product generated by households or by commercial, industrial and institutional facilities in their role as end-users of the product, which has served its intended purpose and has been diverted or recovered from waste destined for disposal having completed its life as a consumer item. Overstock, returns and obsolete inventories would not be considered post-consumer material.

Potential Technologies and Strategies

Currently, many recycled materials come from industrial sources and have minimal impurities and only slightly inferior properties to the originals. Nevertheless, when recycled materials will be used, one should:

- Specify the required performance properties of the recycled material to control the physical characteristics.

- Establish quality assurance requirements with your supplier regarding recycled material.
- Be aware that the cost of recycled materials depends on their source, percentage of virgin material content, level of contamination and physical characteristics.

By implementing product take-back programs, companies have a cost-effective source of materials and/or parts to recycle back into new or remanufactured products.

5.7 Recycling and Biodegradable Materials

Intent
Increase the use of 'closed loop' processes for recyclable and biodegradable materials in the product.

Requirements
Measurement & Viability

1. Identify and quantify the amount of recyclable and biodegradable materials in the product. All qualifying recyclable and biodegradable materials must be clearly labeled or otherwise identified in a manner that facilitates easy identification of materials during disassembly.
2. Verify availability of recycling/biodegradation facilities (excluding waste to energy) for recyclable and biodegradable materials in product in at least six of ten geographic zones U.S. EPA regions (see appendix for map of regions).
3. Demonstrate commercial viability of extraction of recyclable/biodegradable materials from product.

5.8 Reclamation (Need to clarify this term-definition?)

1. Submit documentation of in-house reclamation program.

Maintain 'material balance' records (Mass of reclaimed material in – Mass of material recycled)

Reclamation - Utilize an in-house reclamation and recycling program in which at least 80% of recycled and biodegradable materials in the product are utilized by the original manufacturer [material producer?] (excluding waste to energy).

Documentation
Measurement & Viability

1. Utilize BIFMA SAS template to identify amount of recyclable and biodegradable materials in product. Products must contain at least 50% recyclable and/or biodegradable material to qualify

2. Use template to identify recycling/biodegradation facilities in six of ten geographic zones (see appendix for zone map) Submit letter verifying material acceptance
3. Submit documentation that product can be quickly and completely disassembled into base materials with simple tools.

Potential Technologies and Strategies
Product design can make a significant contribution to Recyclability. Here are some criteria to follow:

Select just one type of material for the product as a whole or for each sub-assembly. If selecting one type of material is not practical, select plastics in mutually compatible groups, i.e., SAN, ABS, PC, PMMA; PC, PET; or PVC, SAN, PMMA.

Don't cross-contaminate metals, e.g., mixing steel components with copper; aluminum with copper or iron; or copper with mercury or beryllium.
To aid recycling, avoid or minimize materials which are difficult to separate such as compound materials, laminates, fillers, fire-retardants and fiberglass reinforcements.

Choose recyclable materials for which collection programs are in place or anticipated and for which a market already exists, unless the materials are coming back to the manufacturer or supply chain which can use them for the same or similar purposes again.

5.9 Optimize End-of-Life Management

Design for Durability/Upgradeability:

Intent

To maximize the useful life of office furniture products so that they can be readily refurbished and upgraded for multiple uses by the original or subsequent users. Longer product life reduces demand for virgin materials and waste generation, thereby reducing the life cycle environmental impacts of these products.

Requirements

OEM adopts and publicizes policy of designing and manufacturing products that are intended to have a long useful life, capable of withstanding repeated service, repair and handling and that product parts and components are standardized to facilitate maintenance, servicing and re-assembly. In setting such policies, the OEM may distinguish between the functional components which should be

designed for long useful life and multiple reconfigurations and reuse from design components (such a fabric, paint and other surface materials) which may need to be replaced or repaired. (1 point)

Documentation

Requirements listed above will be documented in a formal corporate policy statement, the corporate DFE program, as well as all sales, marketing, use and warranty materials associated with the product or product line in question.

Design for Remanufacturing

Intent

To maximize the degree to which office furniture products can be readily and economically remanufactured, by designing them with remanufacturing in mind. Remanufacturing office furniture products conserves resources and energy and reduces pollution and greenhouse gas emissions.

Requirements

Product is designed in a modular fashion to facilitate the replacement of components that are subject to wear or breakage, likely to go out of style, or likely to be upgraded. (1 point)

- Product disassembly instructions are readily available.
- Dissassembly of the product can be done with standard tools.
- No specialized training is needed by those disassembling the product.
- Dissassembly of the product can occur in a reasonable amount of time.

Documentation
Product specifications and certification (fire, safety, etc.) compliance documents should be available for end users. Components for upgrade and refurbishment should be available for a reasonable length of time at reasonable costs.

Design for Recycling

Intent

Maximizing the degree to which materials from office furniture that cannot be reused or remanufactured will be recycled into value added product. Recycling of

resources, whether renewable or nonrenewable, conserves energy and reduces pollution and other environmental impacts inherent in raw material acquisition, processing and product manufacturing.

Requirements

- Product disassembly instructions are readily available.
- Dissassembly of the product can be done with standard tools.
- No specialized training is needed by those disassembling the product.
- Dissassembly of the product can occur in a reasonable amount of time.
- Product parts are labeled to facilitate separation by material content and identification and separation of toxic components.

Documentation

Product material content and weight documentation.
Product recycling guide with a clear process for disassembly and separation.

Manufacturer Takes Additional Steps to Facilitate Remanufacture or Recycling of Its Products:

Intent

Even if manufacturers take steps, as listed above, to make their products more durable, upgradeable, remanufacturable, and recyclable, significant amounts of discarded office furniture may still go to waste if manufacturers do not actually partner in the recovery process to maximize its potential.

Requirements:

- **Buy-Back/Take-Back/Leasing**: Manufacturer makes buy-back or take-back part of its strategic sales strategy. Manufacturer offers on a consistent basis, a variety of attractive buy-back or takeback arrangements for furniture it is selling new via leasing agreements or by including buy-back and take-back offers in bids on new furniture purchases. As part of this commitment, manufacturer shall ensure environmentally appropriate management of any furniture managed by these means (whether by the manufacturer directly or the manufacturer's designated partners). [2 Points]

- **Research on Recovery Options**: Manufacturers shall research and publish information (so that it is readily available to recyclers and remanufacturers) on the highest value recovery opportunities for their legacy product lines and the materials that comprise them [1 Point].

  Examples:
  - Work surfaces: Identify methods and recyclers who can separate the laminate or particle board from steel work surfaces and recover value from these parts. If there are no viable markets for all resulting materials, identify best disposal options.
  - Office panels: Identify methods and recyclers who can separate the materials (fabric, acoustical, frame) in these panels and find viable markets for these materials. If there are no viable markets for the resulting materials, identify best disposal options.

- **Buy-back/Take-back/Leasing**

Documentation
[ADD HERE]

Potential Technologies and Strategies

A consortium of OEM's could establish a central clearing house that receives, grades and processes used office furniture assets to be used "as is". remanufactured or recycled as returning inventories. Each manufacturer would be a shareholder in the consortium's success. OEM could also decide to set up similar organizations on their own.

OEM's would share in the profits of such a venture and could utilize this operation to market their returning assets to marginal or new ventures that may not have the capital to initial invest in new products.

A consortium like this would provide an opportunity for the market at large (including corporations, governmental entities) to participate by depositing excess assets for future credits or discounts.

OEM's must assist in the development and support of proprietary processes and parts to facilitate the yield and opportunity to regenerate the assets that return via these means.

Definitions:

Refurbishment: Includes renovating, repairing, restoring, or generally improving the appearance, performance, quality, functionality or value of a product. (Source: CA and MN purchasing specs)

Remanufacturing: The process of recovering used, worn-out products ("cores") that would otherwise be disposed and restoring them to "like new" condition. This process involves disassembly, cleaning, and inspection for wear. Damaged components are repaired and refinished. At this point, feature upgrades may be added before the product is reassembled. Finally the product is tested for reliability. (Source: The Energy and Environmental Benefits of Office Furniture Remanufacturing. National Center for Remanufacturing and Resource Recovery, RIT, May 2005)

Reuse: A process through which a component is removed from one system and installed in another to provide its original function. (Source:)

5.10 Water Management

Water Inventory of Factory

Intent

Establish a baseline water inventory to document water sources/withdrawals, uses and discharges for the manufacturing facility where the finished product, to be assessed to the SAS, is assembled or manufactured. Where multiple OEM or supply chain facilities are utilized in production of the product, establish the baseline water inventory for the facility which has the highest water usage rate.

Requirements
Document a facility water inventory by assessing the current sources of water, usage rates, and discharge rates.

Documentation
Record monthly or annual water volumes, including the following:

- Sources/Withdrawals (municipal supply, surface water, groundwater, collected rainwater)
- Uses (embodied in product, process/equipment, cooling & heating, facility, landscaping, sanitary/domestic)
- Discharges (on-site wastewater treatment, POTW, surface water, groundwater, evaporative loss)

Potential Technologies and Strategies
Resources:

- *Publicly-Owned Treat Works (POTW) surveys and baseline monitoring reports.*
- *http://www.globalreporting.org/Home (Global Reporting Initiative)*

Water Efficiency

Intent

Maximize water efficiency to reduce the burden on the water supply and local wastewater treatment systems for the manufacturing facility where the finished product, to be assessed to the SAS, is assembled or manufactured. Where multiple OEM or supply chain facilities are utilized in production of the product, calculate the water efficiency improvement for the facility which has the highest water usage rate.

Requirements

Employ strategies to reduce (monthly or annual) water usage or discharge rates by at least 20%, relative to the established baseline values. (1 point)

Documentation

Document baseline and reduced water usage and discharge rates.

Potential Technologies and Strategies

Use high efficiency fixtures, dry fixtures such as composting toilets and waterless urinals, and occupant sensors to reduce the domestic/sanitary water demand. Consider process water reuse/recycling systems (note: pre-treatment may be required prior to a second use). Replace non-contact cooling water systems with high efficiency chillers or cooling towers. Institute water sub-metering programs to ensure that all water uses within a facility are identified and quantified.

Wastewater Discharge

Intent

Achieve zero net water usage or wastewater discharge rates for the manufacturing facility where the finished product, to be assessed to the SAS, is assembled or manufactured. Where multiple OEM or supply chain facilities are utilized in production of the product, achieve zero discharge for the facility which has the highest water usage rate.

Requirements

Employ closed-loop processes and innovative water sourcing and wastewater treatment technologies to achieve zero net usage and zero net wastewater status.

Documentation

Document a water balance for the facility, showing zero net usage and zero net wastewater discharge rates.

Potential Technologies and Strategies

Implement process changes, water-saving systems (retrofitting and replacement), reuse/recycle systems, alternate water sources, and tertiary treatment processes.

Resources:

- EPA Capsule Report (November, 2000) *Approaching Zero Discharge in Surface Finishing* Web-link: http://www.pfonline.com/mag_images/625R99008AZD.pdf
- Canon Zero Wastewater: http://www.canon.com/about/environment/focus.html
- Interface Zero Wastewater: http://www.interfacesustainability.com/

6.0 ENERGY

Overview
Organizations can lower adverse environmental impacts and operational costs by increasing awareness and attention on improving energy performance. It requires strategically managing the energy used for operating buildings, production processes and finished goods consumption enterprise wide. This section provides guidance and tools to help reduce the amount of energy used and it encourages the use of energy with reduced overall impacts.

Approach
The Energy section focuses on energy conservation from building operations, product design, manufacturing processes and energy consumption of a product during its use. In addition, there are incentives to produce energy on-site and to purchase environmentally preferable power, determined in accordance with ASTM E06.71.10.

6.1 Prerequisite - Develop Energy Policy

Intent
Develop and implement a corporate energy policy that will establish the overall direction of the organization in terms of its commitment to energy conservation and increasing the environmental performance of the regional power baseline.

Requirements
Establish and implement a corporate energy policy for the overall direction of the organization in terms of its commitment to energy conservation and the increasing the environmental performance of the regional power baseline.

The first requirement is that top management must establish and define the energy policy. Note that this requirement does not specifically state that top management must *write* the policy, only that it be committed to the policy and ensure its implementation.

Top management must ensure the policy:

- Is appropriate to the nature and scale to its organization's activities, products, and services.
- Includes a commitment to continual improvement.
- Includes a commitment to comply with relevant local, state, and federal regulations; and with other requirements to which the organization subscribes.
- Provides the framework for setting and reviewing objectives and targets.
- Is documented, implemented and communicated.

In addition, the policy should focus on the organization's mission, vision, and core values. Specific local or regional conditions should be considered as should the organization's image and the views of other interested parties. Other interested parties may include employees, share holders, customers, consumers, local communities, environmental groups, lenders, and regulators.

Documentation

- Corporate Energy Policy Statement

Potential Technologies & Strategies
Consider best management practices and example statements from the EPA Energy Star program as prescribed in the *Guidelines for Energy Management* document located at www.energystar.gov.

6.2 Building Energy Inventory

Establish energy inventory to understand energy consumption.

Requirements
Conduct building energy inventory to create a *Statement of Energy Efficiency Performance* for the manufacturing location of the product being assed to the standard.

Manufacturing location refers to the final assembly of the product. For example, if the work surfaces come from Facility A, the end panels come from Facility B, and the product is assembled in Facility C; then the final assembly is considered Facility C.

Documentation

- *Statement of Energy Efficiency Performance* worksheet with PE verification

Potential Technologies & Strategies

Consider using template from the Energy Star program to help define current energy performance for building type as prescribed in the *Guidelines for Energy Management* document located at www.energystar.gov.

Conduct for 50% of Facilities

Intent

Establish energy inventory to understand energy consumption.

Requirements

Conduct building energy inventory for 50% of the total number of buildings over which a company has operational control or influence for, when producing business and institutional furniture (i.e. manufacturing facilities, offices facilities).

Documentation

- *Statement of Energy Efficiency Performance* worksheet with PE verification

Potential Technologies & Strategies

Consider using template from the Energy Star program to help define current energy performance for building type as prescribed in the *Guidelines for Energy Management* document located at www.energystar.gov.

Conduct for 100% of Facilities

Intent

Establish energy inventory to understand energy consumption.

Requirements

Conduct building energy inventory for 100% of the total number of buildings over which a company has operational control or influence for, when producing business and institutional furniture (i.e. manufacturing facilities, offices facilities).

Documentation

- *Statement of Energy Efficiency Performance* worksheet with PE verification

Potential Technologies & Strategies
Consider using template from the Energy Star program to help define current energy performance for building type as prescribed in the *Guidelines for Energy Management* document located at www.energystar.gov.

6.3 Achieve Energy Star Rating for 5% of Total Square Footage

Intent
Reduce energy consumption to achieve Energy Star Rating.

Requirements
Achieve Energy Star Rating for 5% of the facilities total square footage of the buildings in which a company has operational control or influence over when producing business and institutional furniture (i.e. manufacturing facilities, offices facilities).

Documentation
- *Statement of Energy Efficiency Performance* worksheet with PE verification showing score of a minimum of 60.

Potential Technologies & Strategies
Consider using Energy Star strategies as prescribed in the *Guidelines for Energy Management* document located at www.energystar.gov.

6.4 Embodied Energy

Determine embodied energy used to produce component parts or subassemblies

Intent
Understand the amount of embodied energy required to produce components parts or subassemblies of a product line.

Requirements
Establish baseline of embodied energy used to produce component parts or subassemblies of a specific product line by determining energy usage for raw material production and transportation of components.

Documentation
- Analysis of raw materials, subassemblies, and transportation using available tools noted below.

Potential Technologies & Strategies
Use LCI software tools for gathering and tracking energy usage data. Consider using methods such as:

- BEES (Building for Environmental and Economic Sustainability) developed by the National Institute of Standards and Technology, located at www.bfrl.nist.gov/oae/software/bees.
- Franklin US LCI Database, developed by Franklin and Associates, found at www.pre.nl/download/manuals/DatabaseManualFranklinUS98.pdf
- IDCE (International Design Center for the Environment) eLCie tool, found at www.idce.org.
- LCSEA Framework for Life-Cycle Impact Assessment (ASTM E06.71.10)
- NCMS (National Center for Manufacturing Sciences), found at www.ncms.org.
- US EPA TRACI (Tools for the Reduction and Assessment of Chemical and other environmental Impacts), found at www.epa.gov/ORD/NRMRL/std/sab/taci/index.
- US Life Cycle Inventory Database developed by the National Renewable Energy laboratory found at, www.nrel.gov/docs/fyo5osti/37661 or www.nrel.gov/lci.

Or obtain information from component supplier declaring the above requirements have been met. Include details demonstrating an embodied energy assessment was performed and the data is clearly defined.

Reduce embodied energy used to produce component parts, or subassemblies by 10%

Intent
Reduce the amount of embodied energy required to produce components parts or subassemblies of a product line.

Requirements
Reduce embodied energy consumption by 10% used to produce component parts or subassemblies of a specific product line by determining energy usage for raw material production and transportation of components.

Documentation

- Analysis of raw materials, subassemblies, and transportation using available tools noted below.

Potential Technologies & Strategies
Use LCI software tools for gathering and tracking energy usage data. Consider using methods such as:

- BEES (Building for Environmental and Economic Sustainability) developed by the National Institute of Standards and Technology, located at www.bfrl.nist.gov/oae/software/bees.
- Franklin US LCI Database, developed by Franklin and Associates, found at www.pre.nl/download/manuals/DatabaseManualFranklinUS98.pdf
- US EPA TRACI (Tools for the Reduction and Assessment of Chemical and other environmental Impacts), found at www.epa.gov/ORD/NRMRL/std/sab/taci/index.
- US Life Cycle Inventory Database developed by the National Renewable Energy laboratory found at, www.nrel.gov/docs/fyo5osti/37661 or www.nrel.gov/lci.
- IDCE (International Design Center for the Environment) eLCie tool, found at www.idce.org.
- NCMS (National Center for Manufacturing Sciences), found at www.ncms.org.
- LCSEA Framework for Life-Cycle Impact Assessment (ASTM E06.71.10)

Or obtain information from component supplier declaring the above requirements have been met. Include details demonstrating an embodied energy assessment was performed and the data is clearly defined.

6.5 Embodied Energy – Components

20% of Tier I Suppliers determine amount of energy used to produce components

Intent
Understand the amount of energy consumption required to produce supplied components for a product line.

Requirements
20% of Tier I suppliers, of a specific product line, establish a baseline of the amount of energy used to produce supplied components.

Documentation
- Documentation of energy use data.

Potential Technologies & Strategies
The supplier shall gather and track energy use data. The level and scope of detail will vary from organization to organization. Consider using Activity Based Costing methods such as
- Georgia Tech's *Tools that Reveal Environmental Performance* located at www.gatech.edu/.

- University of Pittsburgh's *Activity Based Costing* method located at www.pitt.edu~roztocki/abc/abctutor/sld001.

20% of Tier I Suppliers reduce the amount of energy used to produce components by 10%

Intent
Reduce the amount of energy consumed to produce supplied component parts or subassemblies for a product line.

Requirements
20% of Tier I suppliers, of a specific product line, reduce 10% of the amount of energy used to produce supplied component parts or subassemblies.

Documentation
- Documentation of energy use reduction.

Potential Technologies & Strategies
The supplier shall gather and track energy use data. The level and scope of detail will vary from organization to organization. Consider using Activity Based Costing methods such as
- Georgia Tech's *Tools that Reveal Environmental Performance* located at www.gatech.edu/.
- University of Pittsburgh's *Activity Based Costing* method located at www.pitt.edu~roztocki/abc/abctutor/sld001.

6.6 Product Manufacturing

Determine process energy used to produce product

Intent
Understand the amount of energy consumed for the specific product line being assed to the standard.

Requirements
Establish a baseline of the amount of energy consumed to produce a specific product line.

Documentation
- Documentation of energy use data.

Potential Technologies & Strategies

Gather and track energy use data. The level and scope of detail will vary from organization to organization. Consider using Activity Based Costing methods such as:

- Georgia Tech's *Tools that Reveal Environmental Performance* located at www.gatech.edu/.
- University of Pittsburgh's *Activity Based Costing* method located at www.pitt.edu~roztocki/abc/abctutor/sld001.

Reduce process energy used to produce product by 10%

Intent
Reduce the amount of energy consumed for the specific product line being assed to the standard.

Requirements
Reduce, by 10%, the amount of energy consumed to produce a specific product line.

Documentation

- Documentation of energy reduction data.

Potential Technologies & Strategies
Gather and track energy use data. The level and scope of detail will vary from organization to organization. Consider using Activity Based Costing methods such as:

- Georgia Tech's *Tools that Reveal Environmental Performance* located at www.gatech.edu/.
- University of Pittsburgh's *Activity Based Costing* method located at www.pitt.edu~roztocki/abc/abctutor/sld001.

6.7 Finished Product Energy Consumption

Lighting products meet California Title 24

Intent
Reduce energy consumption during product usage.

Requirements
Lighting products meet California Title 24.

Documentation

- Lighting specification documentation.

Potential Technologies & Strategies
Reference California Title 24 located at www.energy.ca.gov.

Use of Energy Star Motors

Intent
Reduce energy consumption during product usage.

Requirements
Finished products with motors meet Energy Star requirements.

Documentation
- Motor specification documentation with Energy Star label or equivalent.

Potential Technologies & Strategies
Consider using the Department of Energy's *Motor Master Database* and/or the Energy Star motor requirements.

6.8 Transportation

Carrier and Shipper Strategies

Intent
Reduce environmental impact on carrying freight.

Requirements
Develop and implement technologies and strategies to facilitate reductions in fuel consumption and emissions associated with freight shipping activities. This includes receiving and shipping of raw materials, components, and finished products.

OR

Develop, document, and implement technologies and strategies that help truck carriers save fuel, reduce air pollution, and reduce emissions that contribute to climate change.

Documentation
- Procedure and/or programs documenting strategies and reductions.

Potential Technologies & Strategies
Consider using strategies from the EPA's *SmartWay Transportation Partnership* program located at www.epa.gov/smartway/.

Carrier and Shipper participate in the EPA SmartWay Program

Intent
Reduce environmental impact on carrying freight.

Requirements
Improve fuel efficiency, reduce environmental footprint, and reduce energy consumption by participating in the EPA's *SmartWay Transportation Partnership* program.

Develop and implement technology and strategies as defined by the program for shippers and/or freight carriers.

Documentation
- FLEET Performance Model (**F**reight **L**ogistics **E**nvironmental and **E**nergy **T**racking Performance Model)

Potential Technologies & Strategies
Assess the environmental performance of freight operations using the EPA's *SmartWay Transportation Partnership* program's FLEET Performance Model (**F**reight **L**ogistics **E**nvironmental and **E**nergy **T**racking Performance Model) located at www.epa.gov/smartway/.

6.9 Facility Energy Usage

Obtain Power from an Energy Company whose Improvement Portfolio has an Environmental Performance Index (EPI) of 40 or higher

Intent
Use environmentally preferable power to help reduce greenhouse gasses and other environmental impacts, and to minimize the use of petroleum products.

Requirements
The manufacturing facility of the specific product line being assessed to the standard obtains power from an energy company whose improvement portfolio has an Environmental Performance Index (EPI) of 40 or higher. The EPI score will be obtained and measured by using ASTM E06.71.10, "*Standard Practice for*

Assessing Environmental Performance Improvements of Electrical Power Generation Facility and Infrastructure".

Manufacturing location refers to the final assembly of the product. For example, if the work surfaces come from Facility A, the end panels come from Facility B, and the product is assembled in Facility C; then the final assembly is considered Facility C.

Documentation

- Environmental Performance Declaration obtained from the energy company containing an EPI score obtained in conformance with ASTM E06.71.10.

Potential Technologies & Strategies
Reference ASTM E06.71.10

Obtain Power from an Energy Company whose Improvement Portfolio has an Environmental Performance Index (EPI) of 60 or higher

Intent
Use environmentally preferable power to help reduce greenhouse gasses and other environmental impacts, and to minimize the use of petroleum products.

Requirements
The manufacturing facility of the specific product line being assessed to the standard obtains power from an energy company whose improvement portfolio has an Environmental Performance Index (EPI) of 60 or higher.

Documentation

- Environmental Performance Declaration obtained from the energy company containing an EPI score obtained in conformance with ASTM E06.71.10.

Potential Technologies & Strategies
Reference ASTM E06.71.10

20% of Tier I Suppliers Obtain Power from an Energy Company whose Improvement Portfolio has an Environmental Performance Index (EPI) score of 40 or higher

Intent
Use environmentally preferable power to help reduce greenhouse gasses and other environmental impacts, and to minimize the use of petroleum products.

Requirements
20% of Tier I suppliers obtain power from an energy company whose improvement portfolio has an Environmental Performance Index (EPI) of 40 or higher.

Documentation
- Environmental Performance Declaration obtained from the energy company containing an EPI score obtained in conformance with ASTM E06.71.10.

Potential Technologies & Strategies
Reference ASTM E06.71.10

6.10 On-Site Energy - Reclaiming waste for 1% of total facility energy requirement

Intent
Encourage and recognize increasing levels of on-site renewable energy self-supply in order to reduce environmental and economic impacts associated with fossil fuel energy use.

Requirements
Reuse of materials that would normally go to the waste stream for on-site energy for 1% of total facility energy requirement where final assembly or finished product is manufactured.

Documentation
- Proof of reclamation of on-site energy generated.

Potential Technologies & Strategies
Consider referencing California Rule 21 and the ANSI IEEE *1547 Standard for Interconnecting Distributed Resources* in the California Distributed Energy Resource Guide located at www.energy.ca.gov/distegen/.

Examples of reclamation could be burning sawdust for heat and recovering steam for heat/energy.

6.11 Greenhouse Gases

Develop Greenhouse Gas Inventory for the six major gases

Intent
Establish baseline for Greenhouse Gas (GHG) emissions from such activities as energy use, industry processes, and mobile sources.

Requirements
Develop facility greenhouse emission inventory including all emissions sources of the six major gases defined below:

- Carbon Dioxide (CO_2)
- Methane (CH_4)
- Nitrous Oxide (N_2O)
- Hydrofluorocarbons (HFCs)
- Perfluorocarbons (PFCs)
- Sulfur Hexafluoride (SF_6)

The emissions baseline to be calculated by taking the average of emissions inventories from 1998 – 2001 for the facility where the final assembly of the product is manufactured.

Manufacturing location refers to the final assembly of the product. For example, if the work surfaces come from Facility A, the end panels come from Facility B, and the product is assembled in Facility C; then the final assembly is considered Facility C.

Documentation

- Annual GHG Inventory Summary.

Potential Technologies & Strategies
Consider using the following:

- EPA Climate Leaders GHG Inventory Protocol www.epa.gov/climateleaders/.
- Chicago Climate Exchange Program www.chicagoclimatex.com.

Reduce Greenhouse Gas emissions for the six major gases by 4%

Intent
Reduce Greenhouse Gas (GHG) emissions from such activities as energy use, industry processes, and mobile sources.

Requirements
Reduce greenhouse emission inventory by 4% from the baseline for all emissions sources of the six major gases defined below:

- Carbon Dioxide (CO_2)
- Methane (CH_4)
- Nitrous Oxide (N_2O)
- Hydrofluorocarbons (HFCs)
- Perfluorocarbons (PFCs)
- Sulfur Hexafluoride (SF_6)

The calculated to be based from the facility where the final assembly of the product is manufactured.

Manufacturing location refers to the final assembly of the product. For example, if the work surfaces come from Facility A, the end panels come from Facility B, and the product is assembled in Facility C; then the final assembly is considered Facility C.

Documentation

- Documentation of GHG reduction data.

Potential Technologies & Strategies

Consider using the following:

- EPA Climate Leaders GHG Inventory Protocol www.epa.gov/climateleaders/.
- Chicago Climate Exchange Program www.chicagoclimatex.com.

7.0 HUMAN AND ECOSYSTEM HEALTH

7.1 Prerequisite - Demonstration of Compliance

The facility/facilities shall screen compliance with environmental, health and safety requirements their products and processes to determine applicability to this standard.

Intent

To assure compliance with all applicable environmental regulations and all health and safety regulations which govern toxic and hazardous substance use and risk management associated with human and ecosystem health.

Requirements

The facility/facilities are in compliance with all applicable environmental requirements governing toxic and/or hazardous discharges to the air and water or the generation of toxic and/or hazardous waste. The facility/ies also have no outstanding unresolved significant violations within the past 3 years or current significant noncompliance that have not been corrected or resolved by demonstrated adherence to a binding compliance schedule to abate the violations.

Participation in this standard is inappropriate if the screen shows any of the following types of significant violations:

- Corporate criminal conviction or plea for violation of applicable environmental or health and safety laws requirements within a prior 5-year period.
- Has/have been assessed by a court of appropriate jurisdiction a civil fine, penalty, or damages of $100,000.00 or more for violation of applicable environmental or health and safety requirements within a 3-year period before seeking to attain this standard.
- Has/have been found, by a court of appropriate jurisdiction, to have been responsible for an illegal action that caused substantial endangerment to the public health, safety, or welfare or to the environment within a 3-year period before seeking to attain this standard.
- Has/have been assessed by an enforcement agency action an administrative penalty of $50,000.00 or more for a violation of applicable environmental requirements that occurred within a 3-year period before seeking to attain this standard.

Examples of significant violations include:

- Classified as a Significant Noncompliance (SNC) under the Clean Water Act (CWA) or Resource Conservation Recovery Act (RCRA) programs
- Classified as a High Priority Violation under the Clean Air Act (CAA) program
- Classified as a Major Violation under the Occupational Safety and Health Administration (OSHA) specific to chemical handling, management, and/or exposure

Documentation

To meet the environmental, health and safety compliance requirement, a facility/ies shall:

- Provide a statement signed by a responsible official that he or she has reviewed the facility/facilities compliance record and that, to the best of his or her knowledge, the facility/facilities is/are in compliance with all applicable environmental requirements and has/have no outstanding unresolved past or current violations that have not been corrected or resolved by the facility/facilities adherence to a binding compliance schedule to abate the violations.
- In the case of a change of ownership, provide the environmental record of the new owner in determining whether the compliance requirement can be met.

Potential Technologies & Strategies

Include all media (water, waste, air)
FOIAs
EPA ECHO website

Prerequisite Key Chemical, Risk, and Environmental Management System Policies

Intent
To adopt a policy statement to reduce worker exposure, community impact, risk of legacy issue, and product liability.

Requirements
The policy statement shall be publicly available and document the following minimum elements:

1. Environmental Policy which includes commitments to
    a. Prevention of pollution
    b. Continuous improvement
    c. Compliance with applicable regulations and other obligation
2. Chemical Management Policy which includes…
    a. A statement of how it assesses human and ecosystem health impacts
    b. A statement of how a company reduces human and ecosystem health impacts
3. Incorporation of life-cycle thinking
4. Communication to all persons working for or on behalf of the organization

Documentation
Written policy statement(s) containing the required elements ……..

Potential Technologies & Strategies

An integrated, robust management system that incorporates health, safety and the environment can provide a platform for this and several of the credits in this section. Consider including the requirements of Credit 9.3 - Environmental Management System (EMS)

7.2 Environmental Management System: Compliance with ISO 14001 or equivalent

Intent
Document compliance with ISO 14001 *Environmental management systems – Specification with guidance for use*, or a recognized equivalent.

ISO 14001 is an international standard that specifies the requirements for an environmental management system. It is based on a continuous improvement approach that incorporates the establishment of an environmental policy, targets and objectives, and the continual process of planning, implementing, measuring and checking, and reviewing those elements.

Requirements

Company shall meet the requirements of ISO 14001 *Environmental management systems – Specification with guidance for use*, or a recognized equivalent for all facilities associated with sustainable product manufacturing.

Documentation

Formal EMS system that includes (at a minimum) the following:

- Builds upon the environmental policy required by perquisite 9.2
- Elements that consider the environmental impact of activities
- Commitment and a demonstration of such commitment to legal requirements
- Sets goals to minimize environmental impacts
- Assigns resources and responsibilities to ensure an effect management system
- Appropriate training and competence so all key team members are aware and understand their role in the management system.
- Sufficient documentation to demonstrate an effective system
- Procedures to ensure an effective system
- Emergency response plans
- Key environmental performance indicators identified and a corresponding measurement system
- Self initiated audits
- Correction action procedures
- Periodic reviews

OR

- Current Certificate of Registration to ISO 14001 or equivalent criteria issued by an accredited Registrar
- Demonstrating compliance to ISO 14001 (current version)

OR

Potential Technologies & Strategies
Consult with environmental management systems professional to prepare for corporate registration audit. Compliance to ISO 14001 may be met through federal or state programs such as USEPAs National Performance Track or Michigan's Clean Corporate Citizen program.

7.3 Chemical Management Plan (CMP) - (Facility)

Intent

Establish a system for manage chemicals both in products and processes

Requirements
Develop and implement a system for inventory tracking and control of process, product, and facility management chemicals that includes:

- acquisition
- use
- storage
- transportation
- final disposition

OR

Adopt as part of best management practices (BMPs) chemical hazard recognition using elements of the Process Safety Management Standard (OSHA Std. 29 CFR 1910.119) and EPA Risk Management Plan (RMP) (40 CFR Part 68)

OR

CMP contains a documented action plan for emergency planning and response which includes the basic reporting requirements of SARA Title III (U.S. Code Title 42- The Public Health and Welfare, Chapter 116 – Emergency Planning and Community Right to Know)

Documentation

Purchase orders, manifests, billable materials records, MSDS, regulatory reporting requirements and routine inventory of used and unused chemicals. Self audit, regulatory inspections, EMS. Optional: third party certification.

CMP includes documented elements of PSM and a Risk Management Plan (RMP). Optional: third party certification.

CMP includes basic reporting requirements of SARA Title III. Integrated Environmental Management System. Optional: third party certification.

Potential Technologies & Strategies
Globally Harmonized System (GHS) of Classification and labeling of Chemicals and the Registration, Evaluation, Authorization and Restriction of Chemicals (REACH) may contain elements that align with this credit intent. Additionally an integrated environmental management system (EMS) may provide a good starting point for a Chemical management system. For guidance, Appendix ?? contains a list of chemicals of interest that may be used in furniture or in the production of furniture. This list is intended to be used for guidance and is not an exhaustive list

of all chemicals that should be considered or used in the furniture manufacturing process.

Other website to consider:
- DOE - Environment, Safety and Health – Chemical Management Tools
http://www.eh.doe.gov/chem_safety/tools.html

- MSDS Search http://www.msdssearch.com/

-American Chemistry Council-Responsible Care Program
http://www.americanchemistry.com/s_acc/sec_statistics.asp?CID=176&DID=304

- OSHA Process Safety Management – Hazard Recognition
http://www.osha.gov/SLTC/processsafetymanagement/recognition.html

- EPA's Risk Management Planning Rules http://ehso.com/RMPs.htm

- Emergency Planning and Community Right to Know
http://www.access.gpo.gov/uscode/title42/chapter116_.html

7.4 Assess Process and Product Chemicals

Intent
Through the Design for Environment (DfE) protocol, evaluate the human health and ecosystem health impacts of chemicals (of concern) using life-cycle thinking and improve public and environmental health by designing safer products and processes.

Credits are available for evaluating chemicals of concern at three levels: product, facility, and corporate. An extra credit is available for developing a strategy to minimize the human and ecosystem health impacts of chemical use.

Foot notes:
1. The DfE protocol is established through prerequisite 5.2
2. Chemicals of concern are chemicals with known/anticipated impacts to human health and ecosystem health, as identified/defined in section X [BIFMA SAS Chemical List] of the Guidance Document.
3. Life cycle impact categories pertaining to "human health and ecosystem health" (shall/must/may?) include: Global warming; Ozone depletion; Acidification; Eutrophication; Photochemical smog; Terrestrial toxicity; Aquatic toxicity; and Human health. The current credit does not cover resource depletion and land use (see credits 7.X)

Requirements

Product Level [Material specification]

Identifying all chemicals down to 0.1% (by weight) of the materials specified and used to manufacture the product (seeking conformance) and assess chemicals of concern:

75% by weight of product.
95% by weight of product
99.9% by weight of product
99.99% by weight of product down to 0.01% (by weight) of materials

Process Level [Process chemicals]

Identify 50% (by $(by purchase amount) we need to make this consistent with definition used in the other areas) of all process chemicals down to 0.1% used directly in the manufacture of the product (seeking conformance) and assess chemicals of concern.

Maintenance/Operations Level

Identify 50% (by $) of all maintenance and operating chemicals down to 0.1% not directly used in the manufacture of the product (seeking conformance) and assess chemicals of concern. Maintenance and operations chemicals include maintenance chemicals, janitorial supplies, landscape chemicals, HVAC chemicals, water & wastewater treatment chemicals, etc.

Chemical Reduction Strategy

Develop a strategy to improve public and environmental health by reducing the use of materials and processes that have significant life cycle impacts. Significance should be based on quantity of chemical used, relative impact, applicable impact categories likelihood of impact and feasibility. This strategy shall be based on 9.5.1, 9.5.2 and/or 9.5.3.

Documentation

1. Submit documentation to demonstrate assessment (evaluation) results.
2. Submit a copy of the strategy to reduce chemicals of concern.

Potential Technologies and Strategies

1. Design for the Environment
2. LCI / LCA tools
3. Chemical assessment tools

4. Green chemistry and green engineering
5. EMS

There are many life-cycle based tools that can help assess an organization environmental impacts. The potential list of tools includes McDonough Braungart Design Chemistry's Cradle to Cradle Design Protocol, SC Johnson's Greenlist™, National Center for Manufacturing Sciences' Simplified LCA, and other recognized strategies.

Impact Categories include:

- Acidification
- Bioaccumulation
- Criteria Air Pollutants
- Depletion
- Ecological Toxicity
- Eutrophication
- Fossil Fuel Depletion
- Global Warming
- Habitat Alteration
- Human Health
- Persistence/Biodegradation
- Photochemical Smog
- Solid and Hazardous
- Stratospheric Ozone
- Waste
- Water Intake

The Standard may/will provide a list of chemicals of concern, including a designation of whether the chemical occurs at the level of product, process or other (e.g. maintenance).

7.5 Reduction of Chemicals of Concern

Intent
Minimize impact on human and ecosystem health of chemicals used in or associated with production of furniture.

Phasing-out chemicals of concern from products

Requirements
Commit to a voluntary reduction and/or elimination of chemicals of concerns that are recognized as being one or more of the following:

(i) Persistent, Bioaccumulative and Toxic (PBT);
(ii) Very Persistent, Very Bioaccumulative (vPvB);

(iii) Carcinogen, Mutagen, Reproductive Toxicant (CMR);
(iv) Endocrine Disruptors (ED).

Stategies include elimination or specifying materials where target chemicals are not present.

Note: This credit is constructed to offer a voluntary approach that provides for flexibility, continuous improvement and recognizes that the manufacturer has *control/influence over chemicals of concern through material specification*

Documentation

Submit documentation to demonstrate assessment (evaluation) results down to 100 ppm of all chemicals in final product.

Potential Technologies & Strategies

Use tracking system and strategies associated with Credit 7.5

Reduction from processes

Requirements
Commit to a voluntary reduction and/or elimination of chemicals of concerns that are recognized as being one or more of the following:

(i) Persistent, Bioaccumulative and Toxic (PBT);
(ii) Very Persistent, Very Bioaccumulative (vPvB);
(iii) Carcinogen, Mutagen, Reproductive Toxicant (CMR);
(iv) Endocrine Disruptors (ED)
(v) Eutrophication
(vi) other recognized significant life cycle impact category that directly impacts human or ecosystem health

A chemical is eligible for a point if it is present and/or released at any stage of the processing of the final product. Presence or release during processing may be intentional or unintentional; direct or indirect. (e.g. as in, intentionally added versus background levels). For the purposes of this credit, a chemical of concern is considered successfully phased-out if the presence or release of said chemical in the process is below 1000 ppm. Where reduction is achieved by substitution there shall be no net increase of chemicals from any of the categories.

The total of 4 points can be achieved through a combination of two different strategies: **A** – provides flexibility in which chemicals are targeted for phase-out; chemicals may be present, but must demonstrate a progressive decrease in concentration; **B** – a more rigid and stringent approach in which a select subset of predefined chemicals must be eliminated. Both approaches are needed to obtain the full 4 points. A specific chemical cannot simultaneously earn a point under A and B.

A. One credit point per 10% reduction per applicable chemical compared to a baseline content of said chemical. For re-certification, must demonstrate a further 10% incremental reduction compared to content level filed for previous certification for that chemical OR show reduction in a different set of chemicals without an increase in former set of chemicals. [Maximum X points]

Example 1: Chemical A reduced 10%; Chemical B reduced 20%; Chemical C reduced 10%; TOTAL = 4

Example 2: Chemical A reduced 10%; Chemical B reduced 30%. TOTAL = 4

B. Demonstrated absence of all candidates from a select subset of chemicals of concern (to be defined) at time of first certification or any subsequent re-certification [Maximum 4 points]

Notes:
1. The term “material-of-origin” is used to refer to the source(s) of the chemical and is the relevant point of reference for calculating content of said chemical.
2. This credit is constructed to offer a voluntary approach that provides for flexibility, continuous improvement and recognizes that the manufacturer has *control/influence over chemicals of concern through material specification.*

Documentation

A. Submit documentation to demonstrate assessment (evaluation) results down to 1000 ppm of targeted chemicals and demonstrate reduction within a three year period.

Potential Technologies & Strategies

Use tracking system and strategies associated with Credit 7.5

Reducing Hazardous Emission and Wastes

Requirement

Hazardous waste:

Reduce the amount of hazardous waste generated from the manufacturing of the product by at least 20% on a per unit basis over 3 years

OR

Demonstrate that there is no hazardous waste generated in the process of manufacturing the product.

Air Emissions

Hazardous Air Pollutants

Reduce hazardous air pollutants from the manufacturing of the product by at least 20% on a per unit basis

OR

Demonstrate that there are no hazardous air pollutants released in the process of manufacturing the product

Criteria Air Pollutants

Reduce criteria air pollutants from the manufacturing of the product by at least 20% on a per unit basis

OR

Demonstrate that there are no hazardous air pollutants released in the process of manufacturing the product

Documentation

Demonstrate (on a per unit basis) either reduction of or the elimination of:

- hazardous waste as defined by the Resource Conservation and Recovery Act (40 CFR 240-299)
- hazardous air pollutants as defined by the Clean Air Act (40 CFR 63)
- Criteria air pollutants as defined by the Clean Air Act (40 CFR 50)

Potential Technologies & Strategies

US EPA has a number of guidance documents and programs to support reduction in hazardous waste and air emissions.

A robust environmental management system can provide a platform for identifying, tracking and reducing releases of wastes and air emissions.

7.6 Low Emitting Furniture

Systems Furniture, Seating and Individual Furniture Components

Intent

Ensure good indoor air quality by reducing potentially irritating, odorous, and/or harmful indoor air volatile organic compound chemical emission concentrations from finished products that are to the comfort and wellbeing of occupants.

Requirements

Furniture emissions shall meet the emission requirements of the BIFMA X 7.1 Standard at 168 hours (7days).[1 point]

Emissions from workstations and seating meet the criteria at 168 hours

Workstation systems (open plan and private office)

$TVOC_{toluene}$	< 0.5 mg/m^3
Formaldehyde	< 50 ppb
Total Aldehydes	< 100 ppb
4-Phenylcyclohexene	< 0.0065 ppb

Seating and Individual furniture components

$TVOC_{toluene}$	< 0.25 mg/m^3
Formaldehyde	< 25 ppb
Total Aldehydes	< 50 ppb
4-Phenylcyclohexene	< 0.00325 ppb

Furniture emissions shall meet the individual VOC criteria listed in Annex A at 336 hours (14 days). These criteria is based on California Section 01350 limits as listed in the 2006 California office furniture bid specification.

Individual furniture components(chairs included) may obtain this credit by meeting ½ the maximum acceptable limit. Use the chamber emission factor, and a model calculation using the surface area in the BIFMA M7.1 configuration Appendix 2.

- Panels – 11.08 m^2
- Work surfaces- 6.103 m^2
- Storage Unites – 4.569 m^2

Acceptable chamber testing protocols:

1) BIFMA M7.1 Standard Test Method for Determining VOC emissions from Office Furniture Systems, Components and Seating.
2) Method for Measuring Chemical Emissions from Various Sources Using Dynamic Environmental Chambers, prepared for the Greenguard Certification Program by Air Quality Sciences.
    a. For the one year period from the ANSI approval date of the BIFMA M7.1 as a transition period, the office iVOC concentrations for this credit may be calculated using the

following alternate chamber measurement data provided that the office concentrations are calculated using all other exposure model calculation steps and parameters described in BIFMA M7.1

Documentation
Certification Documents

OR

Lab Reports that comply with BIFMA M7.1 Section 12

NOTE: Additional clarification regarding the appropriate office condition modeling parameters will be added under the requirement section. The task group for this credit is still ironing out the details.

8.0 SOCIAL RESPONSIBILITY

8.1 Prerequisites

Employee Health and Safety Management

Intent
To ensure employee health and safety by establishing management processes that will detect, avoid or respond to actual and potential threats to the health and safety of all personnel.

Requirements
Develop and implement an employee health and safety management process that includes the following components:

- Identification of the local, national and international health and safety laws applicable to the facility.
- Appointment of a management representative with defined responsibilities
- An employee health and safety policy
- Documented procedures for the management of the system including a corrective action process that addresses regulatory compliance and actual and potential threats to employee health and safety
- Establishment and maintenance of employee health and safety metrics
- Health and safety training for all employees
- Regular evaluation of compliance to applicable health and safety laws, as well as internal procedures and requirements

Potential Technologies & Strategies
Consider benchmarking other organizations who have demonstrated effective health and safety management practices and achieved significant improvement in the areas in need of attention.
Review requirements and recommendations from the US Occupational Health and Safety Administration (OSHA) for health and safety practices.
Consider utilizing health and safety management standards such as OHSAS 18001 in designing and implementing the management system.

Documentation
Policies, procedures and records developed to demonstrate compliance to the requirements.

Labor and Human Rights

Intent
To protect and respect the rights of human resources at the local, national and global levels.

Requirements
Forced or involuntary labor is not used or supported in any form. Employment is voluntary.

Child labor is not used or supported in any form.

See definitions section. If other forced labor or child labor definitions apply to the organization's operations than those supplied in this standard, and the definitions are more restrictive, the more restrictive definitions shall apply.

Potential Technologies and Strategies
Reference:
Global Reporting Initiative G3 guidlines - www.globalreporting.org
Institute for Supply Chain Management - www.ism.ws

Documentation
Be able to provide documentation of applicable laws, regulations, and conventions and provide documentation of compliance with the applicable requirements

8.2 Policy on Social Responsibility

Intent
To encourage the adoption of a corporate position on social responsibility

Requirements
Develop a documented, publicly available policy on social responsibility which, at minimum, addresses:

- Fair hiring practices
- Education for applicable employees in this subject area
- Corporate ethics
- Receipt of gifts
- Insider trading

Potential Technologies & Strategies
Consider benchmarking policies of other organizations that have demonstrated effective social responsibility practices

Documentation
Provide copy of social responsibility policy and identify how it is made public.

8.3 External Health and Safety Management Standard

Intent
To enhance productivity and employee welfare by implementing policies and procedures that go beyond the requirements of Prerequisite 1.

Requirements
Conform to the requirements of a publicly available external health and safety management system standard.

Potential Technologies and Strategies
Standards that may be used include but are limited to:

- Employer's Guide to Developing a Safety and Health Program (add link)
- OHSAS 18001 - www.bsi-global.com/Global/OHSAS18001
- Any state health and safety program approved by US Occupational Safety and Health Administration as shown at www.osha.gov/fso/osp/index

Documentation
Provide documentation of audit showing conformance to external standard. This could include: self certification package, third party audits or BIFMA SAS audit.

8.4 Diversity

Intent

To promote diversity in the workforce, management, and corporate governance bodies while recognizing the unique local norms which exist in different countries around the world

Requirements
Develop and maintain a diversity process that includes the following components:

- A diversity policy
- Identification of the local, national and international diversity rules and regulations applicable to the facility
- Documented procedures for the management of the system.
- A corrective action process
- Establishment and maintenance of employee diversity metrics and internal performance tracking and reporting
- Diversity training available for employees
- Regular evaluation of compliance to applicable diversity rules and regulations, as well as internal procedures and requirements.

Potential Technologies & Strategies
Benchmarking other organizations which have demonstrated effective diversity management practices.

Documentation
Policies, procedures and records developed to demonstrate compliance to the requirements.

8.5 Community outreach and involvement

Intent
Encourage companies to be good corporate citizens and to benefit the communities in which they operate

Requirements
Demonstrate at least one volunteer effort and/or financial contribution supporting community projects within the last 12 months

Potential Technologies & Strategies
These are examples of the types of community projects that could be considered:

- Scholarships
- Highway Clean up
- Sponsorship of community charitable events
- Participation in children tutoring programs
- Community benefit programs

Documentation
Provide evidence of contributions of volunteer time or financial contributions.

8.6 Social Responsibility Reporting

Intent
To promote transparency through public reporting of social responsibility activities and results, wherever possible using widely accepted metrics to evaluate the effects of these policies and activities on the companies diverse stakeholders.

Requirements
Publish a public report that, at minimum, addresses:

- Employee Health and Safety Management
- Labor and Human Rights Management
- Diversity
- Community Outreach and Involvement

Requirements
Publish a comprehensive public report that is based on reporting elements in Global Reporting Initiative G3 Social Responsibility section, the SA8000 Social Accountability standard or other recognized guideline.

Potential Technologies and Strategies
Create a social responsibility report and post on company website
Include social responsibility policies and activities in the company annual report
Sources for identifying potential reporting elements:

- websites of firms recognized for corporate social responsibility reporting
- List of S&P companies that issue CSR reports - www.siran.org
- Global Reporting Initiative G3Guidelines - www.globalreporting.org

Documentation
For either point provide copy of social responsibility report demonstrating public availability and identifying the means of public reporting.

8.7 Supply Chain

Intent
To encourage continuous improvement in the supply chain relative to sustainable business criteria and particularly social responsibility through the use of internationally recognized social responsibility criteria.

Establish a documented supplier self-assessment tool containing social responsibility criteria for tier 1 suppliers.

Procedure must contain criteria in at least the following categories:

- Child labor
- Forced labor
- Health and safety
- Discrimination
- Discipline/harassment

Provide completed responses from suppliers to the supplier self-assessment tool containing internationally recognized social responsibility criteria (see above) for tier 1 suppliers comprising not less than 75% of the total direct material spend of the OFM's supply base, measured using actual annual spend data for a time period within the previous 24 months.

Potential Technologies & Strategies
Reference Institute for Supply Management - www.ism.ws

Documentation
For 1st point - Provide copy of supplier assessment tool which includes social responsibility questions

For 2nd point - Provide copies of returned completed supplier assessments.

To be added to Definitions Section:

Social Responsibility - Involves the identification of issues and the development of standards and the implementation of programs that address corporate responsibility for the ethical treatment of employees, communities and other stakeholders.
Based on the definition from the 2005 BIFMA Sustainability Guidelines

Forced Labor: Compulsory prison or debt bondage labor. Lodging of deposits or identity papers by employers or outside recruiters for the purpose of restricting or preventing and individual from leaving employment.

Child labor: No workers under the age of 15; (or 14 where the law of the country permits) or under the minimum age for employment in the country.

9.0 Resources (these lists needs to be reviewed, edited, and assembled correctly)

- BIFMA Sustainability Guidelines

http://www.bifma.org/documents/SusGdlines.pdf

- ASTM E2432-05 Standard Guide for General Principles of Sustainability Relative to Buildings
  Download 6-page standard for $33 at >>
  http://www.astm.org/cgi-bin/SoftCart.exe/STORE/filtrexx40.cgi?U+mystore+vqpm0798+-L+E2432+/usr6/htdocs/astm.org/DATABASE.CART/REDLINE_PAGES/E2432.htm

- ASTM E2129-05 Standard Practice for Data Collection for Sustainability Assessment of Building Products
  Download 10-page standard for $33 at >>
  http://www.astm.org/cgi-bin/SoftCart.exe/STORE/filtrexx40.cgi?U+mystore+vqpm0798+-L+E2129+/usr6/htdocs/astm.org/DATABASE.CART/REDLINE_PAGES/E2129.htm

- ASTM E1991-05 Standard Guide for Environmental Life Cycle Assessment (LCA) of Building Materials/Products
  Download 9-page standard for $33 at >>
  http://www.astm.org/cgi-bin/SoftCart.exe/STORE/filtrexx40.cgi?U+mystore+vqpm0798+-L+E1991+/usr6/htdocs/astm.org/DATABASE.CART/REDLINE_PAGES/E1991.htm

- ASTM E2114-05a Standard Terminology for Sustainability Relative to the Performance of Buildings
  Download 5-page standard for $33 at >>
  http://www.astm.org/cgi-bin/SoftCart.exe/STORE/filtrexx40.cgi?U+mystore+vqpm0798+-L+E2114+/usr6/htdocs/astm.org/DATABASE.CART/REDLINE_PAGES/E2114.htm

- ASTM E917-05 Standard Practice for Measuring Life-Cycle Costs of Buildings and Building Systems
  Download 19-page standard for $39 at >>
  http://www.astm.org/cgi-bin/SoftCart.exe/STORE/filtrexx40.cgi?U+mystore+vqpm0798+-L+E917+/usr6/htdocs/astm.org/DATABASE.CART/REDLINE_PAGES/E917.htm

- Collaboration for High Performance Schools Section 01350
  http://www.chps.net/manual/index.htm#specs

- MBDC Cradle to Cradle

website: http://www.mbdc.com/certified.html
document: http://www.mbdc.com/docs/Certification_Outline.pdf
criteria: http://www.mbdc.com/docs/CertificationCriteria.pdf

- Natural Step System Conditions
  http://www.NaturalStep.org

- GreenSeal Office Furniture Choose Green Report --
  http://www.greenseal.org/recommendations/CGR_office_furniture.pdf

- Unified Sustainable Textile Standard© 2.0
  http://mts.sustainableproducts.com/standards.htm

- SCS EPP Standards -- Carpet Face Fiber, Carpet Broad Loom, and Flooring Management Systems
  - http://www.scscertified.com/manufacturing/manufacture_facefiber.html
  - http://www.scscertified.com/carpet/
  - http://www.scscertified.com/manufacturing/manufacture_flooring.html

- Global Reporting Initiative (GRI) Sustainability Reporting Guidelines (2000) Social Equity Performance Indicators
  http://www.sustainableproducts.com/susproddef2.html#Performance_Indicators

- Business for Social Responsibility – issue briefs
  http://www.bsr.org/CSRResources/IssueBriefsList.cfm?area=all

- Electronic Product Environmental Assessment Tool (EPEAT)
  Description of Voluntary Environmental Performance Criteria for Computers, Laptops and Monitors and EPEAT Product Rating System as Designed by the EPEAT Development Team --
  http://www.epeat.net/files/EPEAT%20Full%20Criteria%20050602.pdf

- EPA/WBDG Federal Green Construction Guide for Specifiers: 12700-Systems Furniture: http://fedgreenspecs.wbdg.org

- DfE Furniture Flame Retardancy Partnership: Furniture foam flame retardants alternatives assessment
  http://www.epa.gov/dfe/pubs/flameret/ffr-alt.htm
- United States Green Building Council (USGBC)

Environmental calculators for measuring the environmental benefits of waste reduction/recycling efforts. They are mostly relevant to materials management:

The Waste Reduction Model (WARM) - calculates greenhouse gas (GHG) emissions implications of alternate management strategies for about 3 dozen materials:
http://yosemite.epa.gov/oar/globalwarming.nsf/content/ActionsWasteWARM.html

The greenhouse gas equivalencies calculator will let you translate those GHG emissions into things like barrels of oil and acres of trees:
http://www.usctcgateway.net/tool

ReCon will help to estimate GHG emissions and energy impacts for purchasing materials with varying degrees of post-consumer recycled content:
http://yosemite.epa.gov/oar/globalwarming.nsf/content/ActionsWasteToolsRecon.html

This tool will let you estimate the GHG emissions of various waste management decisions for durable goods:
http://yosemite.epa.gov/oar/globalwarming.nsf/content/ActionsWasteToolsDGC.html

This calculator (not an EPA product, although they helped fund the development) estimates GHG emissions, energy implications, and some water issues from resource management decisions, including recycling, source reduction and electronics recycling:
http://www.nerc.org/documents/aboutcalc.html

MORE RESOURCES:

BEES (US Govt. developed LCA tool)

California High Performance Schools Best Practices Design Manual
A comprehensive guide to planning, designing, maintaining and operating a high performance school. Includes a materials specification, criteria scorecard and an array of fact sheets on topics ranging from acoustics to mold prevention.

California High Performance Schools (CHPS) List of CHPS-Compliant Low Emitting Materials. Products listed in the Compliant Materials Table have been chamber tested to meet the indoor air quality guidelines outlined in CHPS Specification Section 01350.

California State Recycled Content Product Database

Creating a High Performance Workspace: G/Rated Tenant Improvement Guide. This helpful resource guide identifies key steps toward ensuring healthy, productive, durable, and resource-efficient workspaces. It includes dozens of helpful strategies, fact sheets, model specifications, a glossary of terms, and a list of regional vendors and product manufacturers.

EPA's Energy Star Building Label Program

EPA's Environmentally Preferred Products Database

Green Guide for Health Care
The Green Guide for Health Care™ is the health care sector's first quantifiable sustainable design toolkit integrating environmental and health principles and practices into the planning, design, construction, operations and maintenance of their facilities. This Guide provides the health care sector with a voluntary, self-certifying metric toolkit of best practices that designers, owners, and operators can use to guide and evaluate their progress towards high performance healing environments.

Example Programs/Partnerships/Initiatives The following resources are provided as a partial list of the many available programs and organizations working on sustainable business practices.

- Global Reporting Initiative
  http://www.globalreporting.org

- World Business Council for Sustainable Development (WBCSD)
  http://www.wbcsd.ch

- EPA National Environmental Performance Track Program
  http://www.epa.gov/performancetrack

- Federal Trade Commission (FTC) “Guides for the Use of Environmental Marketing Claims”:
  http://www.ftc.gov/bcp/conline/pubs/buspubs/epaclaims.htm

- Green Suppliers Network
  www.greensuppliers.gov

- The Natural Step
  http://www.naturalstep.org/gateway_business.php