

# A Guide To Sustainable Manufacturing

*Exploring the principles  
and practices of  
building sustainable  
residence hall furniture.*

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# INTRODUCTION

What is a sustainable manufacturing process for residence hall furniture? To answer this question, let's start with a simple definition of manufacturing. According to [Wikipedia](#):

*The manufacturing process is the steps through which raw materials are transformed into a final product.*

So it follows that a green manufacturing process is one in which all materials and processes used to manufacture your residence hall furniture are sustainable.

In this Guide, you'll learn about a state-of-the-art process for sustainable manufacturing and an argument for why it's the best option for your students, your school, and the planet.

In chapter **one**, we look at some of the [questions](#) you need to ask to evaluate whether your residence hall furniture is sustainably manufactured. In chapter **two**, we share the example of our own green manufacturing [process](#).

In chapter **three**, we explore why and how sustainable manufacturing supports local communities. And in chapter four, we conclude with a final [argument](#) for why you should choose sustainably manufactured housing furniture.





## Chapter 1

# 7 QUESTIONS YOU NEED TO ASK

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*Learning about the sustainable pedigree of your furniture.*

How do you know if the furniture that you're buying for your residence hall is ethical?

It's an important question because building residence hall furniture consumes a lot of resources and leaves a big footprint.

What kind of footprint?

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# CREATING ETHICAL FURNITURE

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Your furniture is built from lots of different materials. Those materials are sourced and shipped to a manufacturing plant. Then the furniture is constructed and eventually shipped to you.

At every step in that process, you create waste, spend energy, consume resources, follow regulations (or not), and impact economies.

Although it's not immediately apparent, all of that activity positively or negatively affects the welfare of people, habitats, and the biosphere. *(Note: We've explored these factors in-depth with respect to two popular sources of residence hall furniture—rubberwood and wood laminate.)*

So to really understand how ethical (read sustainable) your furniture is, you need to break down the process. It's the only way because it's complex and there isn't a pat answer to this question.

And when it comes to this line of questioning, what you're really asking is this:

*Is the complex system that creates my furniture governed by an ethic of sustainability?*

To find the answer, you need to ask the right questions. What questions?

To start with, they should reveal if sustainability is a core value in the creation of your furniture. To that end, we've outlined seven questions below which you can ask to help you get to the bottom of this.

## Is the System Sustainable?

The definition of sustainability includes the three pillars of social, environmental, and economic impact, so it's really the best measure of ethical furniture.

According to Herman Daly, one of the early pioneers of environmental sustainability, a strict [definition](#) of environmental sustainability must include the three following criteria:

- For renewable resources, the rate of harvest should not exceed the rate of regeneration (sustainable yield);
- For pollution the rates of waste generation from projects should not exceed the assimilative capacity of the environment (sustainable waste disposal); and
- For nonrenewable resources, the depletion of the nonrenewable resources should require comparable development of renewable substitutes for that resource.

In this context, the following pages contain questions you should ask of your furniture manufacturer. This list is by no means comprehensive, but it gives you some reference points and a place to start. I'll go ahead and provide answers with a positive and negative example for each.

To be clear, the answers I'm providing here are partial. In truth, you should try and understand the entire [production cycle](#) behind your furniture and then apply these questions to every step in that cycle.

Of course, no company is perfect, including ours, but asking these questions will give you a clear picture of whether sustainability is a driving force and factor in the creation of your furniture.



## 1. WHAT IS THE IMPACT ON WORKER HEALTH?

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To answer this question, as I alluded to above, you need to understand the system that creates your furniture.

### THE BAD

For example, if your furniture is made from [rubberwood](#) (*Hevea brasiliensis*), it's probably imported from [China](#) or Southeast Asia. There, the laws governing working conditions fall short of standards here in the United States.

According to a 2014 [report](#) from the International Trade Union Confederation (ITUC), Malaysia and China—both huge sources of rubberwood—rank as two of the worst countries in the world for workers.

What does that mean? According to the ITUC [Report](#):

- Workers have no guarantee of rights. For example, in China, there is only one union in the entire country. And usually, the local chapter is run by a company manager. There is no true representation for the workers.
- Countries with a rating of 5 are the worst countries in the world to work in. While the legislation may spell out certain rights, workers effectively have no access to these rights, so they suffer from unfair labor practices.

### THE GOOD

In contrast, if your materials are sourced and produced in the United States, that's an immediate plus from the vantage point of fairness and human health.

Although it doesn't compare to countries

who score highest for worker health, the US has better working conditions, laws, and regulations in place to protect workers.

## 2. CAN YOU RECYCLE IT?

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This is a super simple question to answer, but it tells you a lot about the material.

### THE BAD

Furniture that is made from high or low-pressure laminate is not recyclable. In fact, if you cut or burn it, it's potentially [toxic](#) to humans and deadly to pets.

Laminate often contains wood-based products glued with different chemicals and resins like [urea-formaldehyde](#). When burned, the plastic layers produce cyanide gas.

### THE GOOD

Solid wood furniture can live many lives even after decades of use in residence halls. You can [upcycle](#) or reclaim it for use in new furniture. You can burn it for energy, and of course, it biodegrades safely and naturally.

## 3. HOW MUCH ENERGY IS USED TO MAKE THE FURNITURE?

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What kind of carbon footprint is generated in the creation of your furniture?

### THE BAD

Let's look at furniture that uses high or low-pressure wood laminates. Because laminate is a non-renewable man-made product, it requires energy-intensive



manufacturing to produce before it even enters the furniture manufacturing process.

And since most of it is created in China, carbon-spewing coal is the chief source of energy laminate production.

Finally, shipping the laminate overseas requires more fossil fuels. All this happens before the actual furniture manufacturing starts. So wood laminate has a large carbon footprint.

### THE GOOD

In contrast, solid hardwood is a plentiful renewable resource that requires no added energy to create. Trees need water, sunlight, air, and soil to grow. And trees are plentiful.

You might be wondering, isn't it bad to cut down trees? Isn't deforestation a big problem? In fact, thanks to massive reforestation efforts, we are growing nearly twice as many trees as we're cutting down.

When it comes to reforestation, according to the educational site, [SeattlePi](#):

*In the United States, deforestation has been more than offset by reforestation between 1990 and 2010. The nation added 7,687,000 hectares (18,995,000 acres) of forested land during that period. The trend in reforesting areas has been driven by organizations such as the U.S. Forest Service and the Arbor Day Foundation.*

## 4. DOES IT HAVE A SHORT SUPPLY CHAIN?

In her book [Green Consumerism: An A-to-Z Guide](#) (p.173), Juliana Mansvelt advises the savvy green consumer to privilege the

following when looking for green furniture.

- Easy repairability and/or ability to be refurbished. (see above: recyclability)
- Short supply chains including components such as locally or regionally harvested wood and local manufacturing - chain of custody assurances.

### THE BAD

Furniture made from both wood laminates and Malaysian hardwoods like rubberwood have long supply chains which include importing raw materials from China and Southeast Asia.

That has implications.

First, those long supply chains translate into a large carbon footprint. And second, there is little or no control over the standards of sustainability that govern those resources. Finally, the local economies who supply the labor and raw materials tend to benefit the least.

### THE GOOD

Our production process is completely [local](#). We make our furniture with solid hardwoods from the Northeast United States.

Because we own our sawmill in Vermont, all of our trees come from within 120 miles of our mill. Once they are processed into lumber, they make the short journey to our manufacturing plant in New Hampshire.

We have one of the [shortest supply chains](#) (if not the shortest) in the residence hall furniture market. And because we control the entire supply chain, we meet and exceed the highest standards of sustainability.

For example, our furniture is awarded the gold standard of sustainable wood furniture



certification—the [FSC®](#) (Forest Stewardship Council®) Chain of Custody standard (FSC-C019618). In March 2014, the Rainforest Alliance re-certified DCI. Our certification is valid to March 2019.

## 5. WHAT KIND OF WASTE IS CREATED?

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### THE BAD

When you manufacture plastic laminate, where does the waste go? Although there is some disagreement about it, laminate is not really recyclable. According to the [website](#) How Products Are Made:

The plastic laminate manufacturing process produces several byproducts, some of which are considered hazardous. Toxic emissions emanate from phenolic resins during the laminating process, and acrylic resins and hardeners used in applying plastic laminates to surfaces are also considered hazardous. Decorative plastic laminate itself is not considered a “recyclable” plastic.

Many big companies in the residence hall furniture market import their laminate sheets from China. You can be certain the waste products that come from that manufacturing process end up in landfills where they can’t biodegrade.

### THE GOOD

At DCI, we have a zero waste policy for our [manufacturing process](#). Our sustainable vertical integration process allows us to manage [every step](#) in the manufacturing process.

We recycle all our wood byproducts into fuel or other wood products. Nothing ends up in the dumpster or the landfill. We use

rough cuts in our pallets and bark to create wood chips for landscaping.

And we go further.

We capture and burn sawdust from our manufacturing processes to make steam and electricity for our factory. When our wood boilers are in use, the factory doesn’t consume any gas or oil (even during cold New Hampshire winters!).

By using a wood boiler to run our kilns and heat our factory and offices, we save an average of 68 gallons of oil an hour and 200,000 gallons of oil per year!

## 6. WHAT IS THE LIFE CYCLE ANALYSIS?

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When evaluating the sustainable qualities of your furniture, one science-based framework is Life Cycle Assessment/Analysis (LCA).

According to the [United Nations Environment Programme](#) (UNEP), “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.”

### THE BAD

When considering the LCA of wood laminate furniture, the [Green Home Guide](#), advises builders (and residence hall furniture buyers) to avoid laminates, saying that:

- Laminate is easy to maintain but ranks low on the durability quotient because it cannot be easily fixed or refinished if damaged.
- At the end of its useful life, it gets pitched into a landfill, where its ability to decompose is minimal.





- It's difficult to quantify what chemicals, if any, will leach from laminates once they hit the landfill or would be emitted into the air if placed in an incinerator.

### THE GOOD

According to LCA [studies](#), compared to non-wood products, wood consistently comes out on top.

The one trouble spot for wood, when it comes to LCA, is the spike in energy required for the kiln drying and treating process. At DCI, we mitigate that energy surge by using recycled wood biomass to power our operation. In the process, we also minimize our carbon and energy footprint while eliminating waste.

## 7. IS IT TOXIC?

Toxicity is potentially the biggest concern related to the sustainable quality of your residence hall furniture. And it's something you should take into account. Despite regulations, many furniture manufacturers still use materials that emit toxic [Volatile Organic Compounds](#) (VOCs).

### THE BAD

Wood laminate is a popular material for wood flooring and also for residence hall furniture. It's an appealing alternative to solid wood because it's cheap and durable. But there are issues.

You may already know about one of the most notorious cases of laminate wood from the infamous Lumber Liquidators formaldehyde violations [profiled on 60 Minutes](#) in 2015.

After that story broke, the Center for Disease Control later issued a [cancer warning](#) to people with Lumber Liquidators laminate flooring from China (the same

basic materials used in laminate furniture).

The CDC had said on Feb. 10 that formaldehyde levels in select versions of the company's laminate flooring could cause two to nine cancer cases per 100,000 people. The new estimate is six to 30 cases per 100,000 people.

### THE GOOD

We use solid hardwood as the basis for all our furniture. The beautiful thing about solid hardwood is that it requires no toxic chemicals in the process of furniture manufacturing.

Ahead of EPA standards, our roll-applied finishing process emits Zero VOC's (toxic chemicals emitted as gases), and our UV-cured finish is [certified MAS Green](#).

### Your Next Steps

In the end, there are a lot more questions you can ask to determine if your residence hall furniture is ethical or not, such as:

1. Is the impact on the biosphere considered at every stage of the production process?
2. Are the raw materials made from [renewable resources](#)?
3. How much of the raw materials are [locally sourced](#)?
4. Are materials sourced outside the company and if so how sustainable are they?

You can learn a lot with a few questions. And as someone who is buying this much furniture, you shouldn't underestimate the positive impact your choice can have on human health and the environment.

All you need to do is ask a few of these questions up front. Before you know it, you'll have the information you need to select the most sustainable residence hall furniture.





## Chapter 2

# A GREEN MANUFACTURING PROCESS

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### *What does sustainable manufacturing look like?*

So now you're looking for residence-hall furniture that meets the highest sustainability standards.

At this point, you might ask yourself, what does a "green" manufacturing process even look like for residence hall furniture and why is it important?

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Let's start at the beginning...with the raw materials. In this case, wood. Solid hardwood is a renewable resource, and it's far and away the [most sustainable furniture material](#).

At DCI, all our hardwood furniture is FSC certified. Unlike other manufacturers, you don't need to make a special request to get it.

In general, most residence-hall furniture manufacturers don't provide FSC C-o-C certification for their solid hardwood products unless you ask for it specially. And then, it's offered at a premium.

Why? Because the certification process is so stringent. FSC is the most rigorous third-party sustainability standard for wood.

We earned FSC certification for our furniture for the same reasons we consistently win contracts with the most ecologically-minded universities like UC Berkeley, UCLA, Dartmouth, and UPenn.

We have the greenest manufacturing process in the residence hall furniture industry.

And there's more to that assertion than a mere boast. [Environmental sustainability](#) is the vital blood that runs through the heart of our values and our operation.



# SUSTAINABLE RESIDENCE HALL FURNITURE

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Over the last two decades, our industry has made strides in not only meeting environmental standards but exceeding them. Our team at DCI has spent 40 years developing a manufacturing process that produces [zero-waste](#).

We are the only company in our industry to achieve that milestone. And it's possible because we make our furniture from solid hardwood.

Developing green manufacturing processes like our zero-waste policy keep us well ahead of environmental standards. We feel that it's not enough to just follow the rules. We also want to set a standard that accounts for the health of the whole biosphere.

## So how do we do it?

To begin with, we own our own sawmill. That lets us control the entire furniture manufacturing process from origin to final product.

## Why is this important?

Because it allows us to monitor quality and maximize efficiencies at every stage in our process—from the trees, we select to the recycled sawdust we use to fire our kilns and heat our factory and offices.

Furthermore, it means that every aspect of our production process is truly [local](#), which is a key aspect of sustainability. It also allows us to carefully evaluate each step in the process for environmental integrity.

## WHY GREEN MANUFACTURING IS SO IMPORTANT

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DCI's level of sustainable oversight is distinctive in our industry. No other company aspires to this kind of environmental standard. Why do we do it and [why should you care about green manufacturing?](#)

We believe that sustainability makes good business sense. But we also feel that setting an example for students is important. We want them to better steward the earth, and we need to model that stewardship for them.

It's inspiring for students to use furniture with sustainable qualities: it lasts for 30-40 years, it supports local economies, it's recyclable, it's reusable, it has multiple lives, and it doesn't pollute landfills, the atmosphere, or our bodies.

But let's break it down.

Why is our green process unique and what's special about it from a sustainability perspective?

## A GREEN MANUFACTURING PROCESS

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To really understand it, we need to take a little journey and follow the wood as it develops from a raw tree into a finished desk.



Here's a quick breakdown of the stages of our green manufacturing process.

- Logs to Lumber
- Transporting the Timber
- High Yield Sawmill
- Zero Waste
- Kiln Drying
- Rough Mill
- Finish Milling
- UV Finish
- Assembly
- Lighting, Packing, Logistics

### 1. Logs to Lumber

The first step in the process is choosing our trees. To ensure that we use sustainably grown and harvested timber, we purchase solid hardwood logs directly from state-regulated forests in Vermont and New Hampshire that adhere to the highest environmental standards.

### 2. Transporting the Timber

The second step in the process is transporting the trees to our sawmill. We own and operate our own sawmill in South Royalton, Vermont. The mill is 75 miles from our main factory in Lisbon, New Hampshire.

We minimize our energy and carbon footprint by choosing trees that are harvested within 120 miles of our sawmill.

### 3. Getting the Most from Each Tree

Our high yield sawmill processes these hardwood logs—primarily ash, oak, and maple—into rough cut lumber. And we use a special saw blade to harvest the most wood from each tree.

The lumber is graded by tree species, thickness, and length according to standards set by the National Hardwood Lumber Association (NHLA) and shipped to

our factory in Lisbon, New Hampshire.

(NOTE: For organizations that own standing hardwood timber, we can provide a “chain of custody” for logs harvested from the customer’s property. We do this at [Dartmouth College](#).)

### 4. Using ALL The Wood: Zero Waste

Once the logs are cut, only a certain percentage—let’s say 80 percent—is fit for manufacturing the furniture.

What about the other 20 percent? We use all of it.

We use leftover hardwood to build our internal furniture components rather than buying Poplar or other species. If we can’t use the wood in furniture construction, then we recycle it in other ways.

Some of it is rough cut that’s not suitable for furniture, so we turn that into wood pallets. Some of it is bark, and we recycle that into wood chips for landscaping. And then some of it is sawdust, which we use as biomass fuel in our boilers to power our kilns and heat our factory.

This zero-waste approach to solid wood furniture manufacturing is unique to DCI. For one thing, it saves energy and reduces our carbon footprint.

But it also ensures that we aren’t filling landfills with the kind of waste that comes from building furniture from engineered wood composites that can’t be recycled, like [MDF](#) and laminated furniture.

### 5. Sustainable Kiln Drying

Next, the rough-cut lumber is placed into kilns. The kilns are heated with the steam generated from those sawdust-powered wood-fired boilers.



One hundred percent of the wood used in these boilers is either a byproduct of our sawmill or plant operations. This makes environmental and business sense and frees us from relying on fossil fuels. We think of it as a virtuous cycle of sustainability.

The lumber is carefully dried to a moisture content between 6-8% and then re-graded. The drying process can take up to 30 days. While we use much of the lumber at our furniture facilities, we also sell some to wholesalers.

## 6. Rough Mill

After the drying process, the lumber enters our high-yield rough mill, where it's planed, cut, glued, and pressed into panels to make furniture.

We grade and separate lumber that doesn't meet our quality control standards for use on exterior panels and then we use it for internal support pieces. This repurposing and efficiency eliminates the need to purchase additional components.

For example, our competitors often need to purchase softer woods like pine and poplar for use as internal supports. But DCI has a built-in competitive advantage because we use quality solid hardwood.

This in part explains why our furniture lasts, on average, 30 years from the time of installation. It's also why we offer a 25-year warranty on all of our furniture.

Processing raw materials from origin to finished product separates us from our competitors, who rely on outside suppliers for dry lumber, pre-manufactured wood panels, and components. Often those materials come from Canada.

## 7. Finish Mill

From the rough mill, we send the solid wood panels to the finish mill to make specific furniture parts.

The finish mill processes are carefully scrutinized, and our manufacturing steps are subject to strict quality control. After passing all quality checks, the panels and parts are ready for urethane application.

## 8. Nontoxic UV Finishing

We use state-of-the-art ultraviolet cured urethane finishing. This is the same material and application method used on pre-finished hardwood flooring, and it's completely non-toxic.

There are a few things to highlight about the benefits of UV finish in terms of both quality and sustainability.

**First**, compared to other finishes, it's more resistant to damage from abrasion and chemical exposure, and the effects of temperature and humidity. We also apply it to the interior of our cabinets to provide the highest dimensional stability.

**Second**, when it comes to wood finish, you need to ensure that when you buy wood furniture, the finishing process doesn't emit [VOC's](#) (volatile organic compounds).

As the [EPA](#) describes it, VOC's are chemicals emitted as gases from certain solids or liquids. They include a variety of chemicals, some of which may have short and long-term adverse health effects.

At DCI, our finishing process emits no VOC's. In fact, our finishing process exceeds EPA Standards.

In contrast, [this study on volatile organ-](#)



[ic compounds](#) in furniture published by the National Institute for Health looked at rubberwood, MDF, and laminates—some of the most popular raw materials used in residence hall furniture—and showed that they still emit high levels of VOCs.

Wood-based panels, wood-based composites, and laminated furniture are the common furniture products made with MDF, HDF, and PB. The study results showed that a large number of VOCs can be emitted from furniture made from these materials.

VOCs are a serious health hazard and a known carcinogen. They have a serious effect on human health and cognition. This indoor air quality [study](#) from Harvard's School for Public Health showed that students exposed to VOCs performed half as well as students in environments with no VOCs.

In terms of the health of your students and residents, you need to take this research seriously and follow up. You can also avoid this health issue altogether and choose residence hall furniture made from solid hardwood cured with a UV finish.

## 9. Assembly

At this point in the manufacturing process, the fully finished components enter final assembly at our Lisbon plant or one of DCI's regional assembly facilities in North Carolina or California.

Here, the parts and panels are put together under pressure, and we apply glue to the mortise and tenon or dowel joints. The furniture is clamped to ensure that all joints are tight and the cabinet is completely square before we drive screws into each joint.

One problem with other construction methods is that over time, the furniture

develops nagging problems like drawers that stick and doors that don't shut evenly.

This is far superior to dry construction and methods which don't use mortise and tenon or dowel joinery to join the rails to the end panels. The result is a product that functions smoothly for decades if not generations.

## 10. Lighting, Packaging, Logistics

We recently converted the lighting in our factory to low energy LED bulbs. The LED motion-sensor fixtures switch off automatically when no one is present.

Our packaging material is made from 100% recycled cardboard. When orders permit, we deploy reusable blanket-wrap shipments.

We use load-optimizing software to ensure shipments are loaded to full capacity. We reduce our carbon footprint within our logistics operations by shipping our product by rail as often as possible.

A fully loaded container of DCI furniture weighs 10 tons. If the distance is 3,000 miles by rail, we only use 60 gallons of diesel fuel to move one of our containers across the country. This calculation is based on information provided by CSX Rail Transportation.

## A VIRTUOUS MANUFACTURING LOOP

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We start with an infinitely renewable resource: [wood](#). It only takes air, sunlight, water, and soil to grow a tree.

When we harvest our trees, we work with state foresters to minimize the impact on local wildlife habitat—we actually aim to



improve it—and maximize long-term forest health.

Then we use every single part of the tree to eliminate waste. Not only is nothing wasted, but we [displace CO2-burning fossil fuels with clean-burning wood](#) which is recycled from our manufacturing process.

We harvest our “waste” to fuel our factory. Wood keeps our lights on in more ways than one.

In the process, we save money, reduce our CO2 footprint, improve forest health, and build beautiful, long-lasting furniture for you. This is our elegant vertical integration process.

It's a [virtuous manufacturing loop](#)—the only one of its kind in our industry. As you can see, controlling the entire manufacturing process from source to product ensures that we provide you with the most sustainable furniture in the residence hall marketplace.

As DCI's President and founder, Henry Kober, is fond of saying, “These practices aren't just good for the environment, they're good for business. They just make sense.”

And that brings us to the next chapter in our sustainable manufacturing process.





## Recycling Our Waste and Powering Our Operation with Renewable Biomass Fuel

We've tried to make it clear that [sustainability](#) is one of our key priorities here at DCI. In that context, part of our mission as a company is to make sure that our operation has a net neutral impact on the biosphere.

One key way that we reduce our ecological footprint is by using renewable biomass fuel to power our manufacturing facility. This is a core aspect of our [Zero Waste](#) manufacturing plant.

In short, we use 100% renewable energy to build your furniture.

But first, what is biomass and why is it sustainable?

### What Is Biomass?

Biomass is a renewable resource because, unlike fossil fuels, no matter how much plant material you use, there is no limit to the amount you can replace. It's created by making energy from organic material like trees and plants.

In our case, we burn wood waste from our industrial processes to power our factory with heat and electricity. That wood waste is our biomass source.

You see, trees absorb and store solar energy from the sun through photosynthesis. Photosynthesis converts solar energy into chemical energy.

When we burn our waste wood, that chemical energy is released, and we can use it to displace non-renewable fossil fuel sources like oil and gas.



## BIOMASS AT DCI

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Here's how it works at DCI.

We build all our furniture from solid hardwood. Usually maple, oak, and ash. In the process of making our furniture, we generate a lot of wood waste in the form of wood chips, rough cuts, and sawdust.

Today, all of our machinery is equipped to capture that sawdust. And we generate an enormous amount of sawdust. That sawdust is the primary fuel for our steam boilers which generates the electricity that powers our factory.

It's an efficient closed loop system, and it eliminates waste.

In fact, by using a wood boiler to power our kilns and heat our factory and offices, we are saving an average of 68 gallons of petroleum oil an hour or over 200,000 gallons of oil per year.

And speaking of petroleum, let's take a look at how biomass stacks up against other sources of energy.

## BIOMASS VS. FOSSIL FUELS

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To begin, here's a short [video](#) primer on biomass that hits the high points and demonstrates why it's a cleaner and better source of energy than fossil fuels.

### Carbon Neutral

Unlike fossil fuels, biomass is [carbon neutral](#). Forests sequester a huge amount of

CO<sub>2</sub>. That storage is part of the natural carbon cycle. So is the release of CO<sub>2</sub> that comes from burning wood biomass.

The carbon that's released is offset by the growth of new forest, which stores much more carbon than mid to late succession or climax forests. By displacing fossil fuels with wood biomass, we [reduce greenhouse gas emissions](#).

And as an aside, by making all our furniture from wood harvested here in the Northeast United States, we are helping to create small patches of new forest and increasing the carbon-storing capacity of those forests.

### Renewable

As you probably know already, fossil fuels are not renewable. Once we use them, they're gone.

Trees, on the other hand, are in limitless supply and grow faster than we can cut them. And the beauty of a tree is that all it requires to thrive is sunlight, soil, water, and air.

### Plentiful

Another advantage of biomass is that it's abundant. And when it comes to trees, it's important to note that trees in the Northeast United States are growing twice as fast as we can cut them.

In America in general, reforestation categorically outpaces deforestation. According to [Seattle Pi](#):

*In the United States, deforestation has been more than offset by reforestation between 1990 and 2010. The nation added 7,687,000 hectares (18,995,000 acres) of forested land during that period.*

And this Boston Globe [article](#) puts those



numbers in context. In the 19th century:

*...only about 30 to 40 percent of the region was covered with forest; Massachusetts was down to 28 percent. Today, according to researchers at the Harvard Forest, New England is back to 80 percent forest.*

Of course, it's the opposite with fossil fuels. They are limited in supply and diminishing all the time. They're also costly to access.

### **Less Expensive**

At DCI, we save money by using our wood waste to power and heat our factory. It's waste, so we literally spend nothing on it. These energy savings are passed on to you, our customers.

We can keep our prices competitive in part because practicing sustainable

business saves us money and makes economic sense.

Oh, I almost forgot another biomass fun fact. During the summer months—when our factory has less heating demands—we donate the sawdust to our neighboring dairy farms for animal bedding.

It's a great opportunity to support the local farms. In case your not familiar with the benefits of working with local businesses, we discuss that in our next chapter.

So this was just a quick primer on the benefits of renewable biomass energy. In the end, using renewable energy doesn't work for every company. But at DCI, it's one of the pillars of our sustainability mission.





## Chapter 3

# THE BENEFITS OF BUYING LOCALLY CRAFTED RESIDENCE HALL FURNITURE

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### *Everything you need to know.*

At DCI, we keep our labor and our supply chain completely local. This is a pillar of our sustainable manufacturing process. It benefits local communities, wildlife, the planet, and our customers.

We're going to explore how buying locally crafted furniture can benefit your residence hall and why it's a key part of sustainable manufacturing, but first, let's look at the big picture.

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The truth is, buying local can be hard. In a globalized economy, much of what we buy is made with imported raw materials. Still, more of it is manufactured abroad by American companies.

Even though quality often suffers, the price is usually lower. And that globalizing trend isn't likely to stop soon.

But from a [sustainability](#) perspective, and in terms of thriving local economies, there's no question that supporting American businesses that source local materials is the most conscious and sustainable choice you can make.

## THE COST OF IMPORTING

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The fact is, a lot of companies in the residence hall furniture market import their raw materials from Indochina. Think [rubber-wood](#). Some of them manufacture it there as well.

When it comes to sustainability, outsourcing your supply chain to the other side of the planet is problematic on many levels. It's not good for our economy, it's bad for the climate, and it sacrifices local jobs for cheap foreign labor.

And that's just the beginning. In some cases, emerging economies will offer up their own natural resources—cutting down precious rainforests and planting rubberwood farms—for short-term profit.

By some estimates, furniture imports from Asia account for 70 percent of the American furniture market. According to an article from the [Yale School of Forestry](#), the U.S. is Vietnam's largest importer of

furniture. Here's why that's important.

Since the mid-1990's the fallout from our appetite for foreign furniture on Vietnam's forests and biodiversity is hard to fathom.

*Illegal logging and unchecked economic development are taking a devastating toll on the forests of Vietnam and neighboring countries, threatening areas of biodiversity so rich that 1,700 species have been discovered in the last 15 years alone.*

## CHOOSING LOCAL

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In contrast, DCI is completely local.

And when you're choosing residence hall furniture, you're always going to be confronted with this choice. Local or not?

Granted, it's hard to visualize and connect to the consequences of that choice when it's playing out halfway across the world.

But that's the challenge.

So, let's break it down and look at why you should consider buying residence hall furniture that's sourced and manufactured in the United States. Fortunately, it's not just about stopping all the bad things. It's also about supporting some really great things.

### Climate Change

A lot of schools are becoming savvy to how they can use their purchasing power to support sustainability.

For example, one big way that colleges and universities can use their purchasing power to prevent [climate change](#) is to buy residence hall furniture that is sourced and manufactured here in the US.



At DCI, we make our furniture from solid hardwood and harvest our timber from within 125 miles of our own sawmill. Those logs then travel a short distance to our manufacturing facility.

If you compare this short supply chain to companies who import wood, plastics, and furniture from Asia, there's no comparison in terms of the carbon footprint. Through our local supply chain, we eliminate a huge source of carbon emissions and fossil fuel consumption.

This pairs well with our [zero waste](#) manufacturing facility which is powered almost completely by wood waste from our [manufacturing process](#).

### **Labor Laws**

US labor laws and regulations are more supportive than those in China—where workers don't really have a voice yet—and less developed Asian countries where many furniture companies source their materials.

Southeast Asia and China are some of the largest exporters of residence hall furniture.

At DCI, the people who make our furniture get paid competitive wages, and receive health insurance, paid vacation, and a 401k.

In China and Southeast Asia, these benefits don't exist.

### **Supporting Local Economies**

Sourcing from and manufacturing in Asia has other issues. For example, where does the money go? At DCI, it flows into the local small-town economies in rural New Hampshire, where 200 local men and women build your furniture.

In Asia, international companies try and

get the most for the least. They hire the cheapest labor they can find to garner maximum profit.

For example, in China, which pays its labor force more than its competitors in Southeast Asia, the [average wage](#) for manufacturing labor is just \$1.74/hour.

And remember, those Chinese workers don't have any bargaining power. There is only one union in China, it's affiliated with the government, and the local branches are run by company managers.

In contrast, DCI inspires loyalty through caring for our employees and empowering them with competitive compensation.

In fact, some of our employees have worked here for 35 years. In a few cases, we have two and three generations from one family working in the factory.

We aren't exaggerating when we say that DCI is a family business.

### **Worker Health and Safety**

As an advanced industrial nation, the United States has developed progressive labor practices to safeguard worker health and safety.

Not only are worker protections mandated by law, but we are also committed to our staff, and we want them to stay with us. That emphasis on safety is a huge priority for us.

In developing countries, these protections aren't as robust.

### **Local Sourcing Saves Money**

Because we source our materials domestically, mostly within 180 miles of our facility, we save money not just on interna-



tional shipping, but on all sorts of taxes, duties, and logistics.

DCI passes those savings on to you.

It's how we can keep our prices competitive while building higher quality furniture than companies that import their furniture and materials.

### **Everyone Has A Name And A Face**

DCI president and founder Henry Kober lives a few miles from the manufacturing plant. He knows every employee on the floor. When there's a production crunch, you can find him out there helping with everyone else.

DCI is like a small-town community. This is not a large faceless company or a small group of people importing foreign furniture and outsourcing every step of the supply chain.

At DCI, we own every step of the process, from harvesting timber to installing your furniture. And everyone has a name, a familiar face, and a local address.

### **It's An Ethical Choice**

These are just a few reasons why buying local residence hall furniture is so important.

If you want your students to know that their school fees are supporting local U.S. economies, protecting worker rights, [safeguarding wildlife habitat](#), and minimizing the carbon footprint of their furniture, then the choice is easy.

To date, DCI is the only [vertically integrated](#) American manufacturing company in the residence hall furniture market. That's something we're proud of, and we want you to be too.





## Chapter 4

# WHY YOU SHOULD CHOOSE SUSTAINABLY MANUFACTURED FURNITURE

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### *Balancing quality, affordability, and sustainability*

When it comes to residence hall furniture, is it possible to balance quality, affordability, and the highest environmental standards?

There are a lot of different kinds of furniture to choose from, but solid hardwood is the best way to balance these priorities.

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More importantly, domestic solid hardwood is the only bona fide source of sustainable residence hall furniture.

There are a lot of reasons for this, which we've already explored in this ebook. And we can briefly review those below. But first, let's take a look at some of the other options.

### **Un-Sustainable Furniture Is The Norm**

Today, engineered wood materials and composites are common in the residence hall marketplace. Veneers, particleboard, and medium density fiberboard (MDF) lower material costs and enable mass production of furniture both here in the United States and overseas.

More often than not, you can get this furniture at a discount.

But as the saying goes, you get what you pay for. But what does that mean when it comes to furniture?

To begin with, these materials rate poorly when it comes to sustainability and life cycle analysis. They're often filled with chemicals, glues, and resins.

As a result, they aren't recyclable or reclaimable, and you can't use them as wood fuel at the end of their life because burning them releases toxic and poisonous fumes.

In fact, a recent [study](#) concluded that many of these materials--rubberwood, MDF, particle board, laminated furniture--still emit [volatile organic compounds](#), which are known carcinogens and dangerous to human health.

It doesn't stop there. Furniture made from said materials lasts half as long as furniture made from solid hardwood.

Furthermore, they produce a large carbon footprint thanks to energy-intensive manufacturing processes and because they're often imported from China and Southeast Asia.

You can learn more about some these materials in [this article](#).

### **Embracing The Cutting Edge Of Sustainability**

But you don't need to compromise on sustainability to get quality and affordability. We embrace and encourage a different approach to residence hall furniture based on the values of sustainability.

It's our belief, backed by science and over 40 years of experience, that furniture constructed primarily from domestic solid hardwood is the "greenest" choice for our customers.

For over 40 years, our craftsmen have used time-tested methods for constructing solid hardwood furniture right here in the United States.

Although our factory is filled with modern machinery and finishing equipment, we value the old-world craftsmanship and authenticity which [solid wood](#) brings to our line of products.

This commitment to solid wood allows us to set the standard for sustainability in the residence hall furniture market.

The sustainable manufacturing process we've outlined in this Ebook sets us apart from the rest of the residence hall furniture industry. But we take other steps to ensure that our operation is sustainable.



For example:

- We use load-optimization software to ensure that our shipments are filled to capacity, so we don't waste fuel.
- We use recycled cardboard to protect our shipments, and by maximizing load capacity, we use as little of it as possible.
- We further reduce our carbon footprint within our logistics operations by shipping our product by rail.
- We regularly reclaim furniture we installed over two or three decades ago, break it down, and reuse the salvageable wood in new projects.
- We use long-lasting LED lighting with motion sensor activation to save electricity.
- We power our operation with wood boilers that are fueled with sawdust from our manufacturing process. Our own recycled wood biomass is the primary fuel for our factory.

### **Sustainability Doesn't Mean "Do The Least Damage"**

A lot of our competitors put a clever marketing spin on their 'environmental' credentials. The truth is, those standards are geared more to doing the least damage possible.

We see it differently. Here's how Wikipedia defines [sustainability](#):

*In ecology, sustainability is the capacity to endure; it is how biological systems remain diverse and productive indefinitely. Long-lived and healthy wetlands and forests are examples of sustainable biological systems. In more general terms, sustainability is the endurance of systems and processes.*

We feel that sustainability is not only our responsibility to the community of life, we also think it's good business. And it's great for the biosphere. We don't need to spin it.

Our aim is to promote good science, good stewardship, and good business.

Embracing the tenets of sustainability is how we do that.

At DCI, we are passionate about sustainability. You can learn more about our green practices in each of the following categories:

- Solid [Hardwood](#)
- FSC Green [Certification](#)
- MAS Green [Certification](#)
- Sustainable [Sourcing](#)
- LEED [Credits](#)
- Sustainable [Manufacturing](#)

You can read our full sustainability overview [here](#).

In order to remain cost competitive, we do make some exceptions to our solid hardwood policy. DCI offers our customers an option to have their Casegoods (dressers, desks, pedestals, bookcases, study carrels and wardrobes) constructed from hardwood plywood. We make each material group available to you with certified green materials.





**Sustainable | Hardwood | Furniture**

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