



# Playing the Green Building Game

by Norman Scheel, PE., S.E., LEED AP

In the game of golf, there is a saying; “Drive for show, putt for dough.” In the game of “green building” there is a similar saying; “Solar for show, landscape for dough.” You may ask, “What does that have to do with me, the component manufacturer?” Well, if you are going to get in the “GAME,” it’s very important to know how the scoring is done.

When most people are asked if they want a green home, they will think it means putting solar panels on the roof and that’s all. The reality is, compared to other alternatives, photovoltaic panels are a very expensive way to obtain “green points” (the dough). That’s how the scoring is done—with points. Unfortunately, many people in the building community have adopted a similar distorted view about the use of certified lumber in green buildings. For the purposes of this article, FSC-certified lumber will be grouped in with solar panels and considered not worth the one point (okay, possibly two) available for its use. It is **not** a requirement that must be met. The design team, as a prerequisite, is required to include “purchasing preference language” in the construction documents per the LEED for Homes Reference Guide. This Reference Guide states that any tropical wood specified in the purchasing documents must be FSC-Certified Tropical Wood. Since components are not made from tropical wood, this requirement does not apply.

There are some obvious items that make prefabricated components very “green,” without even trying. I’d like to point these out to you. In this article, I will refer to the points available only from the LEED for Homes Reference Guide. Note that I’m doing this for the sake of discussion, and I don’t mean for it to be an endorsement of the LEED program. I’ve chosen LEED for Homes simply because it is a nationally accepted document and others currently being developed are likely to undergo further changes before they are finalized. Many local green programs are in place, and the concepts contained in them are assumed to be similar and generally more liberal than LEED. If ever you come across a comparison between two programs (for instance, LEED for Homes and the Built Green Colorado program), keep in mind that each program uses its own scale for the points required for the levels of certification. It is possible to obtain dual certification in a local program and LEED for Homes. This is because many local programs have based their rating systems on that of the LEED system, so a certification in LEED often translates to a higher certification level in a local program. In general the LEED system has the lower number of points, but they also tend to be the most difficult to obtain. In the LEED system the point thresholds are; certified-45, silver-60, gold-75, and platinum-90. Maximum is 136.

The chart on page 23 shows how LEED for Homes is broken out into categories. Some of these credit categories, like Materials & Resources, for instance, require a minimum of 2 points. Others (Energy & Atmosphere) do not. Regardless, this chart shows that there are many, many points available in the eight categories. While the majority of the points that can be earned with components exist in the MR section, many people don’t know that there are also points available in the EA section. When you compare these numerous credit sources to the few points earned with components built with FSC-certified lumber, you can see that the use of FSC-certified lumber is pretty insignificant.

Where to find green points for component framing beyond FSC certified lumber.

LEED for Homes Certification Thresholds		
Certified	45-59	
Silver	60-74	
Gold	75-89	
Platinum	90-136	
LEED for Homes Rating System	Available Points per Section	Min. Required Points per Section
Innovation & Design Process (ID)	11	0
Locations & Linkages (LL)	10	0
Sustainable Sites (SS)	22	5
Water Efficiency (WE)	15	3
<b>Energy &amp; Atmosphere (EA)</b>	<b>38</b>	<b>0</b>
<b>Materials &amp; Resources (MR)</b>	<b>16</b>	<b>2</b>
Indoor Environmental Quality (EQ)	21	6
Awareness & Education (AE)	3	0
<b>TOTAL Possible Points:</b>	<b>136</b>	

While a variety of LEED points are available without the use of certified lumber, I want to make clear that homes that qualify for green certifications tend to be very high performance, design-driven projects. They are not the kind of buildings where a homeowner or builder can pull something off the shelf that has been done before and call it green. They take a lot of planning and a lot of work. I’m making this point because

our industry is used to this level of sophistication in the truss design area, but often our customers are not. The common case is that the only design involved in most homes is that provided by the truss technician in the form of layouts and truss designs. To get the maximum amount of LEED points, involvement in the design phase is very important. Previous designs can be used but they need to be revised to specify the green requirements. For lower certifications, getting the required points will require little change to the actual construction of the home. It would require much more design and verification expense.

So let’s move on and discuss points available beyond certified lumber. For each of the points listed below, I’ve included a section number corresponding to its location within the LEED for Homes Reference Guide. If you haven’t yet, I encourage you to download the free version available on the U.S. Green Building Council’s website: [www.usgbc.org](http://www.usgbc.org). You can print it from the site and highlight the sections discussed below. The full version is available for purchase and contains information on implementing the credit requirements (342 pages).

## Direct Credits

The first two categories can be viewed as “direct” credits for component manufacturers. Why is this? Because supplying the specified products earns LEED points; points are not determined based on a combination of other materials. In

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## at a glance

- ❑ FSC-certified lumber is not worth the two points available for its use since it isn’t a requirement that must be met for certification in LEED for Homes.
- ❑ Typically, homes that qualify for green certifications tend to be high performance, design-driven projects.
- ❑ LEED credits can be divided into “direct” credits and “indirect” credits, and components contribute to both.

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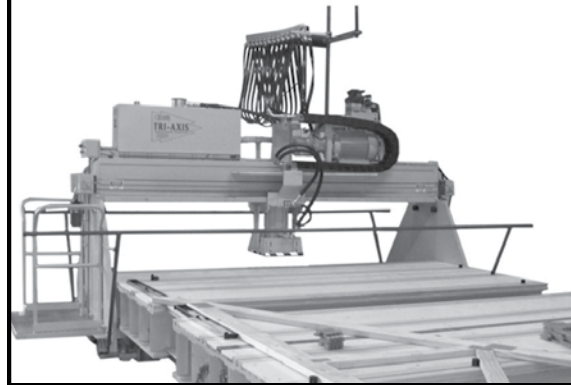
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other words, these credit categories can be earned strictly with components—no additional building material is required. Refer to the charts on page 25 for a description of the requirements.

**MR 1:** Material-Efficient Framing points are available to optimize the use of framing materials. As a prerequisite, a framing order waste factor limit of 10% is required. It is hard to imagine how this prerequisite could be met without the use of prefabricated trusses. This also gives the fabricator the opportunity to offer wall panels and precut packages. To build a stick framed roof with a waste factor of 10% or less would be very difficult. If off-site fabrication is provided for roof, floor and wall components, 4 points are available. Alternatively, for portions of the framing, the points are available individually and must be selected from a table in the reference guide. This table would be used for example if floor and roof trusses are supplied without wall panels. Find a list of these items on page 25.

**MR 2:** An additional 1.5 points (0.5 each) are available if the roof, floor, and wall framing are extracted and fabricated within 500 miles of the site. This is what LEED calls its local production credit (2.2c). (See chart on page 25.)

In addition to the above direct and obvious green attributes of prefabricated components, there are many others that are helpful but not so obvious. A big emphasis in green building is to have all the subcontractors and suppliers on board from the beginning during the design charrettes, or meetings. (See above for definition.) So having a knowledgeable component manufacturer (CM) representative at this meeting to help explain how they can help the project obtain more points is

## What is a charrette?

The word charrette may refer to any collaborative session in which a group of designers drafts a solution to a design problem. While the structure of a charrette varies, depending on the design problem and the individuals in the group, charrettes often take place in multiple sessions in which the group divides into sub-groups. Each sub-group then presents its work to the full group as material for future dialogue. Such charrettes serve as a way of quickly generating a design solution while integrating the aptitudes and interests of a diverse group of people. [from Wikipedia]

invaluable for the CM's business, as well as the design team. (See sidebar on page 29 for tips on how to get engaged in this process.) The following items are things that the design team may need assistance on from the CM. The fact that the CM is knowledgeable and aware of these points should be helpful.

### Indirect Credits

Another important thing to keep in mind is that the points described below are what I call "indirect" points. This means that components can help to earn LEED points, but the points can only be achieved in combination with other materials or design techniques. The credit described next is a good example of an indirect credit.

**MR 3:** Up to 3 points are available for construction waste reduction. The use of prefabricated components practically eliminates all the waste associated with that portion of the framing provided with components. These points are available based on Credit 3.2 in the reference guide. Coordination of the design team with the builder to see that other suppliers do not overload the project with material that will go to waste should be emphasized.

As I stated above, the Materials and Resources section of LEED for Homes isn't the only place building components can help earn points toward certification. With some innovative coordination with the design team, there are advantages and points available in the Energy and Atmosphere (EA) categories.

**EA 5:** Up to 3 points are available for keeping the forced air unit and ducts in conditioned space. This can be accomplished with an intimate relationship with the mechanical engineer designing the duct system in concert with the truss manufacturer to take full advantage of designed in chase

You don't have to supply FSC components to help customers earn LEED credits. Check out credits 1.4, 1.5 and 2.2!

### MR 1 1.4 Framing Efficiencies

Table 1: Efficient Framing Measures for MR credit 1.4

Measure	Points
Precut framing packages	1
Open-web floor trusses	1
Structural insulated panel (SIP) walls	1
SIP roof	1
SIP floors	1
Stud spacing > 16" o.c.	1
Ceiling joist spacing > 16" o.c.	0.5
Floor joist spacing > 16" o.c.	0.5
Roof rafter spacing > 16" o.c.	0.5
Implement any 2 of the following:	0.5
Size headers for actual loads	
Use ladder blocking or drywall clips	
Use 2-stud corners	

Maximum Points: 3

### MR 1 1.5 Off-site Fabrication

Use any of the following alternatives to on-site framing:

A) Panelized construction. Wall, roof, and floor components are delivered to the job site preframed.

B) Modular, prefabricated construction. All principle building sections are delivered to the job site as prefabricated modules.

(Choose A or B, not both)

4 Points for A or B

### MR 2 2.2 Environmentally Preferable Products

C) Local production. Use products that were extracted, processed or manufactured within 500 miles of the home.

0.5 point each for:

- 1) exterior wall
- 2) interior wall
- 3) floor assembly
- 4) roof assembly

Maximum Points: 2

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openings within the conditioned space. Another article could be written on the detailing of this type of system but for the amount of work it takes to gain 3 points, which is substantial, the design team may deem it worthwhile. The truss manufacturer can use the truss layout along with the duct layout design to incorporate this detailing into the truss design drawings. Variations of this concept may be available for parts of the system in conditioned space and parts in the attic. This would be up to interpretation by the rater and possibly the HVAC designer. Either can be offered as an option by the manufacturer.

**EA 7:** Up to 3 points are available for solar hot water heaters. If the roof truss manufacturer designs in an extra load for this installation, it can be a valuable item to the design team for little cost. While it may not always be used, the fact that it has been considered will help. Design changes during the construction

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phase may cause the need for extra points when other points that were being contemplated fall through due to design and/or construction issues. This same load could be used as a back up for future Photo Voltaic panels or other rooftop equipment. Also, up to 3 points are available for vegetated roofs. While these are on low sloped or flat roofs, the concept is similar.

For passive solar designs, many times there is a need to design floors near south facing glazing for additional weight required for thermal mass. The use of floor trusses which are designed for this heavier load is another value that can be offered to the design team.

Another concept which can be used is energy efficient framing to enhance the energy envelope. This system incorporates 2X6 studs at 24" on center and is designed in such a manner as to eliminate the use of headers in the outside walls. In this design process the roof trusses use a raised heel to allow for at least a 9-1/2" deep continuous rim joist to be applied to the heel of the truss to support the loads from the roof. There is then no need for headers above any of the windows and doors, which allows for that area to be replaced with insulation making the energy envelope more efficient. This also eliminates the need for trimmers and cripples, which also saves lumber and replaces it with insulation. An important thing to remember is THIS IS NOT CONVENTIONAL CONSTRUCTION!! These systems are considered highly engineered systems and must be individually engineered for the particular installation on a particular house plan. Meticulous detailing is required by the structural engineer to make this system work. The energy analysis of these systems also requires a more sophisticated procedure to take full advantage of the highly efficient energy envelope.

## Playing on the Same Team

Above all, the most important thing to remember if you want to play the "green game" is to be a team player. In my view, CMs are naturally a couple steps ahead of the curve because you play a significant role in helping builders erect homes that are highly engineered with virtually no waste into the framing process. Both reducing material waste and improving the energy envelope of a building are important aspects to every green building program. Your job is to do the research and collaborate on the most effective means to achieve a green home. I think you'll find that in many cases, the ideal green solution doesn't involve FSC certified lumber. **SBC**

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# Getting Engaged in the Process

Many green building programs encourage the existence of building design teams made up of individuals with input into the sustainable design of the building. In fact, these design team meetings may even be mandatory depending on the program. I believe component manufacturers can and should be involved in these teams as early as possible. Most often, getting involved in green projects during the design phase comes down to simple networking.

My suggestion is to check out some green building seminars in your area hosted by Green Globes, NAHB, USGBC, local HBA or even your local- or state-sponsored green program. The key is to first determine which program seems to be more prominent in your area. If NAHB seems to be the most accepted in your region, seek out the next NAHB seminar scheduled.

When you go to these seminars, prepare to do a lot of networking and looking for contacts. For this reason, it may be most logical to send a salesman from your team. His or her goal is to develop a knowledge base around green building concepts, and start to form ideas of what builders, architects and others are looking for in the process. Most importantly, perhaps, is to view your company as a team player in the "green game," willing to partner with everyone involved in the process.

Don't overlook the fact that there are some marketing and customer service perks to getting involved in the design phase. Through your networking activities, you may find new ways to market the company to builders. Additionally, the more you learn about these programs, the more you'll be able to make them aware of the programs and suggest how they can earn more points. For a customer new to the whole game, your knowledge of how programs work can be highly valuable to them!

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