Creating Sustainable Federal Buildings

Questions and Answers from the January 11-12 Web Cast

1) What is the smallest square footage for LEEDS?

There are no square footage limits to the LEED Green Building Rating System. You can get more information on the website: http://www.usgbc.org OR http://www.leedbuilding.org.

2) How are projects' amount of "construction land fill diverted" claims calculated?

Is there some sort of baseline amount to compare to? Some of the claims do not seem plausible. The diversion amounts that were shown for the Federal sector case studies were calculated for their LEED rating and are substantiated with documentation. You can see the calculation methods in the LEED Reference Guide. Again check the U.S. Green Building Council website: http://www.usgbc.org. Also, on the FEMP website Resources List from this web cast there is more information about construction waste management (websites and sample waste specifications).

3) What about Executive Order on "Greening of the Government"?

We mentioned some but not all of the Executive Orders in the web cast; a great resource for a more in-depth listing of Executive Orders and a short synopsis of them -- check out the DOE publication

Greening Federal Facilities (DOE/EE-0123 publication). You can also call the FEMP Help Desk at (800) DOE-EREC. And of course, you can go to the FEMP website Resource List from this web cast and go to the DOE website.

4) Slide 54 gives the wrong impression. The U.S. is growing 47% more wood than is being harvested. Contrarily we are burning up the Western U.S. because we have refused to manage the forest especially the Federally owned forest.

Good point. Two good resources regarding wood issues are: 1) Forest Stewardship Council http://www.fsc.org and 2) Certified Forest Products Council http://www.cfpc.org.

5) On these projects with the high percentage of construction waste diversion, are the A/E (architect-engineers) providing the contractors the solution to the waste diversion or are they leaving it to the contractors?

“It depends”. You can check the DOE high performance data base or the USGBC website for LEED projects to get further information on these projects (these websites are given on the FEMP web cast Resource List) Most importantly is to address the issue of construction waste management early in the project and to get waste reduction in the project specifications.

6) When replacing windows with double pane, low energy glass in a large building, you say it "saved hundreds of thousands of dollars" in HVAC (heating, ventilation, and air conditioning system) energy. This is not net savings, as the windows are expensive. Would like to know what the window cost was or the payback time period?

Yes, there is the cost of the windows – however, with more efficient windows (good thermal envelope, efficient lighting, etc.) you could reduce the size of your required HVAC system for the project. If you have a retrofit project and are only able to change out the windows – you will reduce operating costs. As far as payback that would depend on several other factors.

7) For Case Studies, I would like to hear a little more on each one. For reusing 80% of existing materials, I would like to know the construction materials of the existing building; for energy savings, I would like to know the type of systems used by the building.

Please check out the case studies in more depth on the U.S. Green Building Council website and also the DOE High Performance Buildings website case study database (See FEMP web cast Resource List for these websites)

8) For Case Studies, I would like to hear construction cost, maybe on a dollar per square foot basis, to determine what it would cost to build a Bronze rated vs. a Gold rated building. I realize that the cost varies by geographic location, and construction type, but how do they compare?

The state of Pennsylvania has a great video called “Making the Case” which shows project LEED ratings and their square foot costs. This video is listed on the FEMP Resource List from this web cast.

9) Has the reduction in construction waste and saving in energy increased the cost to the buildings overall construction cost? And if so, at what percentage?

“It depends.” What we are finding is that IF the project is done in an integrated manner (such as the Federal Aviation Administration (FAA) project we showed as one of the Federal sector case studies) it can easily be on time and on budget.

10) What has been your experience with economic analysis of alternatives when LEED options are considered? It seems that these features and strategies would be the 'correct' (legally/ ethically) ones to incorporate, but may not have a 3-5 year ROI. Realistically, are LEED features going to help the economics of a project? Will it not be common that LEED imposes higher initial costs that must be justified via out-year savings? [7-15 years until payback?]

See answer above. Also, it’s interesting that the USGBC with current LEED projects shows that the initial costs of the projects are “all over the map”; there isn’t a correlation between higher costs with higher levels (Gold, Platinum) building ratings. In fact one of the lowest initial cost projects was a Platinum project.

11) The project GSF: is that site or building size? (slide 73)

Building size. If you check out the case studies on the DOE or USGBC websites (see Resource List on the FEMP web cast site) you will see “apples to apples” in terms of “size” of building and site size.

12) Don't you mean to use cost effective renewable energy sources?

Yes. We were pointing out that all projects should look at the “basics” such as project orientation, form and envelope, etc. before adding renewable energy sources such as photovoltaics.

13) Most of the site issues are driven by economics. Do you think that LEED points are going to change consumer behavior?

Perhaps. At least the issues of density development, brownfield development, and better site selection is brought to the attention of the project team.

14) How and where can I become LEEDS Certified?

Check out the U.S. Green Building Council website and review the LEED Accredited Professional information. (See FEMP web cast Resource List)

15) Hey, don't push the living machine at Oberlin too much! It does essentially eliminate the waste to the municipal system but the energy penalty is approximately 10% of the total building energy use! And this building is OPERATING at 30 kBtu/ft2-yr, with PV of 14 kBTU/ft2-yr or a net of 16 kBtu/ft2-yr. Just published this week--measured energy results:http://www.nrel.gov/docs/fy05osti/33180.pdf

Excellent input for all the participants! Thank You for sharing that!

16) Do you have website addresses for the regulations, greens specs and procurement guidelines that you have referenced in your presentation? For example: Comprehensive Guideline for Procurement of Products Containing Recovered Materials/Comprehensive Procurement Guidelines, Energy Policy Act of 1992, EPA Guidance on Environmentally Preferable Products, "Green Spec" and the military's NAVFAC Planning and Design Policy Statements.

Yes, please check the FEMP web cast Resource List.

17) Can a building be LEED certified after it is built?

YES!

18) Can you give an idea of the cost of getting a building certified? I am interested in residential properties.

The LEED Residential rating system is still in the early stages of development – You can check the USGBC website (see FEMP web cast Resource List) for updates on the Residential rating system.

Cost for “New Construction” LEED projects we covered in the web cast in the Overview of LEED. This is also on the USGBC website.

19) Can you get a LEED certification for 2 floors of a 6 story building recently (2004) constructed in Salt Lake City. We're only going to occupy two floors - 46,000 square feet

Yes. There is a LEED rating system now for Commercial Interiors; go to the USGBC website for further information on the LEED for Commercial Interiors. Check FEMP web cast Resource List.

20) How would you handle LEEDS certification of a facility complex with multiple buildings?

Right now you would apply individually for each building. The USGBC is working on a “Multiple Buildings” (or “Campus/Base”) rating system. For now, you would register and certify each individual building.

21) Where does the scorecard for the certification application come from?

The LEED “scorecard” is the LEED checklist which you can get on the USGBC website.

22) After taking the intermediate class, how do you suggest that one gets practical experience?

It would be great to take the one day LEED Intermediate training (now called LEED-NC Technical Review – after that applying that knowledge to a project or participating in the reviews of a project.

23) The Federal Government keeps talking about goals and I know the Corp of Engineers at least a year ago were instructed to do projects under sustainable design. However, one doesn't see many of these projects. Has any document been issued that requires Federal Agencies to meet a minimum level (i.e. LEED Certification Level)?

Per the web cast in the LEED overview section – there are two slides that show what federal agencies are requiring – i.e. EPA is requiring by 2005 that their new buildings achieve a Silver LEED rating)

24) Yesterday USGBC released two CIRs for LEED-NC. The rulings provided an alternate way for building projects to receive 1 point under Energy & Atmosphere Credit #4 with the use of refrigerant R-123. Please comment.

Good to know and thanks for sharing this with the other participants!

It's always important in doing LEED projects to keep abreast of the CIRS (Credit Interpretation Rulings) on the USGBC website.

25) Is Annual energy cost reduction also counted if you obtain it by peak reduction under a real-time-pricing or time-of-day scenario? (slide 42)

Yes

26) LBNL is working on a set of specifications for contract documents. These will be available to help designers specify commissioning equipment. We hope to have them available through COE (Army Corps of Engineers), Navy, and other specification libraries. Any suggestions for other placement locations would be appreciated.

GREAT! A notification on the Whole Building Design Guide site at http://www.wbdg.org would be most helpful!

27) You might want to discuss displacement air technology which has small to negligible increased installation cost, reduces the need for higher supply air temps and velocities (reduced operation costs), displaces the "stale-sick" air as the fresh air moves that old, bad air up and out to the return instead of the traditional forced-down mixing fresh air with sick air system which can possibly short circuit the supply to the return. (Europe has been doing displacement air for years.)

Thanks for raising this strategy – A good source for many additional HVAC strategies is the Greening Federal Facilities book. (See FEMP web cast Resource List)

28) Is the lighting still the highest load even in Arctic environments where heating loads are significant and roofing performance is critical (RE: your argument for designed skylights)?

Each project in each climate must be analyzed to determine the energy breakdown. We specifically want to make the point that each situation is different and one should not draw conclusions without doing the proper analyses. Structural insulated panels do NOT work for the roof in cold climates. We have had MAJOR structural failures with this system requiring complete roof replacements.. very expensive and messy. We are familiar with the problems and understand that it was not SIP in general, but rather the specific design/construction that was the problem. There are many cold climate SIP applications that work fine. Again, each application must be analyzed and designed appropriately.

29) I understand the motivation within the government to attain the LEED ratings referred to in this course, but I'm concerned about a lack of motivation that may exist within private industry. I've seen too many old

malls that are abandoned in place while a new one is built from scratch in another area. Are there any private industry initiatives, such as tax breaks for high-scoring LEED projects, to help prevent this?

As far as tax incentives – check the US Green Building Council website. There are different states that are setting up or looking into this. Certain states and counties (just like federal sectors) are requiring that their building meet a certain LEED standard.

30) Is EPA buying Green Power "TAGS"? (slide 39)

Yes, EPA is buying “Green Power” to meet the LEED requirements except that as far as I know they are under 1 year contracts with the commitment to renew these contracts yearly. (LEED stipulates a 2 year contract with a Green-e provider)

31) What is a brownfield?

From LEED v2.1 Reference Guide: A “brownfield site” means real property, the expansion, redevelopment, or reuse of which may be complicated by the presence or potential presence of hazardous substance, pollutant or contaminant (Source: Public Law 107-118, H.R. 2869 – “Small Business Liability Relief and Brownfields Revitalization Act”) See http://www.epa.gov/brownfields for further information.

32) We have installed a couple of the waterless urinals and the personnel at the location are less than pleased. The biggest problem is odor from the lack of the urinal being washed down. What are we doing wrong?

Check the amount of time between changing out the blue liquid – sometimes more frequent use and quantity of use may require more frequent changes of the blue liquid. DO double check the maintenance staff’s approach and timing of new liquid administered

33) Is registration of a project expected/required prior to construction? Planning/Design Phase step?

If you are going to go for a LEED rating it is helpful to register a project early in the design (Planning/Design Phase) so that you can get additional information from the U.S. Green Building Council. However, you can register a project even after construction although we would highly recommend that it be done early in the project.

34) Did you just say the Hawaii building was not constructed yet?

Correct.

35) As an ES&H (Environment, Safety and Health) professional, I'm wondering if the responsibility matrix could include an ES&H resource?

The responsibility matrix does have “other” – So, you can easily add ES&H. Also, that is an example matrix – many project teams put together their own.

36) To get a baseline building energy consumption in order to estimate a reduction - How do you do that? Energy model? Hand calculations?

LEED uses ASHRAE (American Society of Heating, Refrigeration, and Air-Conditioning Engineers) standard 90.1. Obtaining the LEED Reference Guide and reviewing the “Optimizing Energy Performance” credit would be a good resource.

37) What is an Executive Order and how does it apply to agencies? Meaning what are agencies obligated to do?

Executive Orders are laws that facility managers (other responsible parties) are required to follow to reduce the energy and environmental impacts of the buildings and transportation fleets they manage. Facility managers (other responsible parties) are required to comply with the specific directives in these documents however, many are unaware of them. See “Greening Federal Facilities” book page 3. (For further resource contacts about the book see FEMP web cast Resource List)

38) Slide 50 states a LEED Application Guide for Healthcare is under development ... is there a draft copy available?

You can always check the U.S. Green Building Council Website for any drafts available. Check http://www.usgbc.org

39) Carpet in federal buildings seems to be a primary contributor to waste in buildings. Many times hard surface flooring can be used in entry lobbies and in corridors with the result being lower maintenance costs and a longer life-cycle item, however, senior leadership does not seem to appreciate these factors, believing that carpet provides a better quality of life environment for work spaces. What is being done to educate and inform non-engineering type leadership in the DoD?

There have been Sustainable Design Training workshops given to the different military services as well as LEED training workshops.

40) Recycling materials: Many manufacturers now have programs where they will remove the interior finish material (like carpet) and send it back to the mainland but there is no tracking of these items that are currently installed in buildings so they end up going to the local landfill here in Hawaii. Secondly, because of our location, recycling should be paramount, but in fact, shipping materials back to the mainland to recycle them is cost prohibitive. How can we eventually solve this?

In Hawaii you DO have recycling and waste concerns! However, there are some good efforts underway with Construction Waste Management – Please check with Wes Saguchi at the Naval Facilities and Gail Suzuki Jones at the State Offices.

41) With the NAFTA in place and the requirement to buy North American products, how can we save on transportation costs in a command such as mine, Pacific Air Forces Hawaii, where our bases are located in far-reaching places like Korea, Japan, Alaska and with several detachments, one of which is Singapore. I recently designed renovated spaces for lodging in Singapore and the GSA (General Services Administration) would not allow me to purchase furnishings from a Los Angeles based manufacturer who produces some components of their products in Indonesia and Philippines. I am forced to transport furniture, drapery, artwork across the ocean.

That is unfortunate.

42) Can you explain who is a member or a non-member of the USGBC?

Many Federal agencies have become members of the U.S. Green Building Council. The Army in your case is a member; so, for Army projects you would submit member project fees. Check USGBC website for further information on membership.

43) The instructors said that LEED levels of achievement are Certified, Silver, Gold, and Platinum. In the slides there were some references to Bronze. What point range does Bronze fit in?

LEED Version 1.0 (Pilot projects) early in the LEED history had achievement levels of Bronze, Silver, Gold, and Platinum – For LEED Version 2.0 and onwards the U.S. Green Building Council has renamed Bronze to now be identified with “Certified”.

44) When some choices are clearly available, are there penalty (negative) points for choosing non-energy efficient methods over energy efficient alternatives, e.g., demolishing existing building instead of renovating it, or electing to use ceramic tile with virgin materials over carpet with recycled material?

Good question. No, no penalty or negative points in the LEED system.

45) In National Guard buildings, the National Guard Bureau determines the square footage allowed for each and every function within a building. There almost never are allowances for what they consider are non-functional areas such as storage space for recyclable waste or additional space required for waste composting tanks. Are there any moves afoot to jolt these archaic federal agencies into present day awareness?

Peer pressure? With many federal agencies incorporating LEED into their project requirements – others will possibly follow!

46) On points for percentage energy reduction (Slide 42), how does one determine the base value for new and existing buildings?

LEED uses ASHRAE Standard 90.1

47) Is the "GreenSpec" available on line?

Yes, see FEMP web cast Resource List.

48) Are there any LEED-related seminars that will give CEU's (Continuing Education Units)?

Check the USGBC website for workshops (that you can get CEUs by attending)

If existing pavement is ground up for recycling, but taken away by the contractor to another (non-government) site and the Government site receives virgin crushed gravel, would there be a LEED credit? You would put that action towards a point for construction waste reduction.

49) It seems a majority of case studies and examples are in climate less severe than northern New England. Are there certain strategies that would or would not work in extremely cold climate?

You are correct that many examples were for climate less severe than New England (except of course examples like Grand Forks, ND that makes New England look like the banana belt), however, many of the strategies and in particular the process works in New England climates. Each project needs to be analyzed as to the most appropriate strategy, not only for the climate but also the building type, orientation, size, complexity, etc.

50) Did GSA ever analyze the Norris Cotton Federal Building in Manchester, NH to see how it stacks up against contemporary energy conscious designs in LEED rating? It was the first energy conservation demonstration project commissioned under GSA Administrator Arthur Sampson around 1977 and I was the project architect. I am curious how it performs against more contemporary designs. Currently

National Guard's A-E selection criteria does not consider energy efficiency design experience as such, unless the evaluator takes it into account under "technical experience" category.

THANK YOU and thank you for your questions, feedback, and your early “sustainability” efforts!

51) What kind of O&M (Operations & Maintenance) savings were found that led to such a short payback period (1 year) (slide 27) at Navy Headquarters building?

Reduced operating costs for energy use.

52) Can you refer us to good studies on light-shelf design?

Gregg Ander’s book on “Daylighting” and Victor Olgyay’s book on “Architectural Lighting” by McGraw-Hill.

What is used as a reference case in the annual energy cost?

LEED uses ASHRAE Standard 90.1 (federal energy standards) or Title 24 for California projects

53) Can glazing be applied to an existing window?

Glazing is the transparent surface (glass) in the window, so yes. If you mean high performance coatings, no. However, low-e films are available to apply to existing glazing (ref: Southwall Company, makers of a low-e retrofit film).

54) A federal project that you showed included bicycle parking and received a LEED credit for it. The project is located 10+ miles from the nearest residential areas and access is along a 55 mph road without paved shoulders. The climate is considered warm and humid. There are significant hills along the access route. Bicycle traffic to the facility averages 1 to 5 per day (before and after the project) with a total facility population of ~4500. How did the addition of bicycle parking add to the sustainability of this project?

Excellent insight – LEED gives a point for “sustainability” for bicycle racks and changing facilities (for 5% of the building occupants) – However, it doesn’t stipulate a “reality” check on whether folks could indeed bicycle to the project location! (The system isn’t perfect HOWEVER, it does get discussions and questions raised!)

55) Shouldn't there be more emphasis placed on making "smart" decisions as opposed to making "green" decisions?

YES YES YES…Thank you for pointing that out! We had hoped to convey that throughout the program – It’s not about “points” or rating system tools – It is about making good “smart” design, construction, and operating decisions!

56) How can we get our energy-saving, water conserving, pollution preventing product to LEED Building Project Managers? Who would we begin to contact to introduce them to our product? This is a product that could help in receiving points in more than one category.

USGBC holds an annual GreenBuild Conference in the fall – 2005 it will be in Atlanta; you might check with the conference organizing committee about having a booth at the conference. You can check on the 2005 GreenBuild conference at http:// www.greenbuildexpo.org. Also, BuildingGreen produces the GreenSpec mentioned during the web cast and they are always checking out new products and doing write-ups on the products in their Environmental Building News Publication. (They are located in Brattleboro, Vermont and are listed on the FEMP web cast Resource List).

57) Are phase change materials starting to be used as an energy reduction tool, to store or absorb heat energy depending on heating or cooling applications? If so, what kind of energy savings are being found? Phase change materials are still not in common use.

Who supports the web site http://www.wdbg.org?

58) Where would we apply for an ENERGY STAR® rating?

You would go to the Energy Star website http://www.energystar.gov/newbuildingdesign. More information about Energy Star is on the FEMP web cast Resource List.

59) On the slide about the FAA Seattle Terminal Radar Approach Control Facility, it listed "129% weighted average recycled content materials." How was this percentage calculated? It doesn't seem intuitive that the percentage could be over 100%. I'm sure that it has to do with "weighted average," but could you give a little bit of explanation?

Per LEED v2 – The calculation method allows for greater than 100% recycled content materials (See LEED v2 Reference Guide on the USGBC website for free!)

60) Also, the "P" in SPiRiT stands for "Project" not "Protocol" as one of the presenters mentioned. Thank You – We corrected that on the broadcast due to your helpful feedback – thanks!

61) There is a rumor that the future of LEED V3.0 and SPiRiT V? will be one in the same. Is this true?

There have been many discussions about what LEED V3 will look like and how SPiRiT will evolve. No final decisions have been made at this time. Keep checking the Whole Building Design Guide and the USGBC websites: http://www.wbdg.org and http://www.usgbc.org.

62) I am an architect, and have been acutely aware of the LEED program ever since before it became a reality. The problem with LEED, and SPiRiT (which I know absolutely nothing about except that it is a clone program or copy cat) is that there is no money or time with which to provide materials and training to obtain anything more than lip service. On our local level, all of our local training was cancelled for FY05, and for those who have mandatory continuing education reporting requirements, are left to their own initiative to satisfy the mandate. Also, if your seminar would provide CLEs (Continuing Legal Education credits), it would be much more attractive to invest the time to watch it.

GREAT input – You can do a self-evaluated CLE from this broadcast with AIA (The American Institute of Architects) (and you can receive a certificate that notes 6 HS&W (health, safety, and welfare) hours were achieved in participating IF you turn in an evaluation of the program).

63) Personally, I'm interested in the next phase of your program, and that is implementation initiatives for documenting the creation of Sustainable Federal Buildings, which should be the nuts-and-bolts, when you get the next step funded and developed.

Thanks for the feedback.

64) How do these building rating systems relate to ASHRAE? Or 10 CFR (Code of Federal Regulations) requirements for federal construction?

The LEED rating system refers to several ASHRAE standards (i.e. ASHRAE 90.1 for optimizing energy performance – LEED uses the standard as a "base" level to do better than by x%) Check out the LEED rating system on the USGBC website: http://www.usgbc.org.

65) I know there are case studies out there but do any of the agency's have lessons learned data that they keep up with? By that I mean, do they keep track of materials they tried that did or didn't work well & why or why not. I think a lot of times there's a great deal of trepidation in trying something new. But... once something has been tried and has proven it works in the given application or that the environment preferred material lasts as long or longer than the material it replaced then we could sell others on using them. Conversely, if they try something that didn't work, then we don't want to recommend that others do it if it's a bad idea or doesn't work well in that particular application

GREAT IDEA! Currently there is not a central data base like that. Some federal agencies (like the National Park Service and others) have started more in-house collections of "lessons learned" with building materials and operations/maintenance products. You can also check the DOE high performance data base (See FEMP web cast Resource List) for projects that have provided "Lessons Learned".

66) Do T-5's have less heat gain than T-8's?

Yes.

67) Can you LEED certify an existing building that used sustainable principles in 1999?

Yes, although it may be difficult to provide (find!) the necessary documentation so long after the project completion. (It may be similar to doing your taxes 6 years after they were due!)

68) In reviewing slide 73 - noting fees for registration and certification. I would have to ask what additional advantage beyond energy efficiency would an agency have for attempting to certify as LEEDS (silver or gold)? It appears that the requirements can extend a level of challenges to the Project Manager (with limited resources) who oversees a large construction project.

LEED formal certification provides PR as well as linking your project's information into a larger databank of information that others could benefit from. Research is being done right now on potential benefits of LEED ratings (energy efficiency, productivity improvements, etc.) However, these have not been completed.

69) What would comprise and IAQ(Indoor Air Quality). How would one locate the testing materials?

A good IAQ Test that LEED recommends is the EPA Protocol for Environmental Requirements, Testing for Indoor Air Quality, Baseline IAQ and Materials for Research Triangle Park Campus, Specification Section 01445. Check http://www.epa.gov/rtp/new-bldg/environmental/specs.htm or call (919) 541-0249

70) Under LEED, residential applications are lacking. Same problem exists for SPiRiT. Where is LEED in the process of identifying an appropriate rating system for residential construction work as the Army and others are undergoing major housing rebuilds of older housing assets with new assets. Application of SPiRiT or LEED to such work is difficult and not always applicable. When do we think there will be a LEED residential application program?

Good question! Best to check directly with the U.S. Green Building Council. (Check the USGBC website for any drafts of LEED products.) As far as we know the LEED residential is "still in the works" looking at regional residential rating systems (Southface's Earthcraft Homes System in the Southeast, Austin Texas

Green Builder Residential Program, Boulder, Colorado's GreenPoints system, etc.) and trying to figure out a coordination and integration with these.

71) How much use of showerheads w/less than 1.5 gpm (gallons per minute) are you seeing?

Little.

72) There is a company in Colorado that now makes showerheads that work with 1.5 gpm.

Great to know, thanks

73) The statements made during the presentation regarding HCFC's (hydrochlorofluorocarbon) conveyed the notion that use of HCFC's is not desirable -- this is simply not true. The USGBC is amending both LEED-NC and LEED-EB to recognize that certain HCFC's are beneficial and deserving of the Energy Credit #4 point. This is due to the near-zero ozone depletion, superior energy efficiency, and positive impact on Global Warming that alternative refrigerants, such as HCFC-123 provide. The U.S. EPA, GSA, and most Federal agencies continue to support HCFC-123 use, for example, in large chillers. The viability of certain HCFC's is further being recognized by the international community involved in the Montreal and Kyoto Protocols who are evaluating the positive implications of refrigerants, like HCFC-123, for consideration of exemption from phase-out.

Thanks for the feedback – YES, the USGBC has added this information to the CIR listing (Credit Interpretation Rulings). We will be more "up to speed" on this in our upcoming workshops – thanks again for pointing that out to us!

74) While making his remarks specifically to slide #10, Greg gave some consumption and impact data which would be useful for many of us. Can these facts be shared as he described them? I think that you are referring to the energy used in the building industry. About 35-40% of the US total energy is used to operate buildings. More is used for material extraction, manufacturing, transportation, and construction resulting in over half of the total energy going into the building industry.

75) How does one get to be a LEED Accredited Professional?

Take a test – You can find out more about the test and sample questions on the USGBC website (Go to LEED and then LEED Accredited Professional) http://www.usgbc.org

76) Not all the website references work. Please verify them and post the references in your website for future reference.

Thank You. Yes, check out the FEMP web cast Resource List (more accurate!)

77) The Waste Spec Website URL does not work. Do you have the correct one? Did you have any luck finding the green charrette manual on the web? Both of these are listed on the FEMP web cast Resource List.

The correct addresses are Waste Spec: http://www.tjcog.dst.nc.us and Charrette Manual: http://www.eere.energy.gov/buildings/highperformance/charrette_handbook.html. You can download the entire version at once or the individual sections as needed.

78) What does FAIA stand for?

Fellow in the American Institute of Architects

79) Please name the "famous folks" on the quiz pages, for the youngsters viewing, and us old folks. The only one that I can recall is Kitty Carlyle!