

Category	Comment #	Issue Summaries	Credit	Likes and Dislikes	Ways To Improve	Language Changes	Responses	Proposed Changes to LEED-EB for Second Comment Draft	Type of Change
EA	EAp1-Com1	Building envelope commissioning	Prereq 1 (Existing Building Commissioning)	Building envelope commissioning is not included in the requirements for existing building. The heat, air, and moisture transfer systems, including the rainwater management system, of any existing building needs to be examined as part of this process. (This also holds true for all of the other LEED products dealing with the building exterior, including LEED NC and LEED Core and Shell). Buildings can degrade due to water ingress, shortening their longevity and durability, requiring replacement of resources, potentially causing occupant discomfort due to water intrusion problems, such as microbial growth, cause occupant discomfort due to uncontrolled humidity (depending on climate) and air flow across a system, and without examining the existing envelope system, regardless of what is completed in EA prereq 2, have a system that is not as thermally efficient, causing a waste of energy. For all of these reasons, and that many existing buildings and new buildings undergo extensive repair programs due to envelope deficiencies (some very easy to correct, by a knowledgeable envelope specialist) resulting in higher operating costs and disruption, building envelope's should be required to	For building envelope commissioning for air buildings, we propose the following five step process. (This is listed in two papers pending publication) Additionally, there are several firms (ours included) who have already completed building envelope commissioning projects for LEED buildings, including one LEED building where an envelope investigation was completed after the fact due to a systematic failure resulting in the use of new resources in a very short period of time. COMMISSIONING THE BUILDING ENVELOPE The LEED rating system requires commissioning as a prerequisite to achieving a rating. However, the rating system reference guide (USGBC, 2001) under the title "Design Approach" does not specifically indicate that building envelope commissioning is required. The reference guide is by no means a standard, as its intent is to provide general guidance to the	As noted above, please consider adding language that requires building envelope commissioning as follows: Commissioning of the building envelope, by computer modeling, and drawing and field analysis to examine heat, air, and moisture transfer, and provide design recommendations to improve the systems to enhance the longevity of the structure, examine possible down sizing of mechanical equipment, and to improve occupant comfort levels, resulting in less water and air infiltration, and a more energy efficient envelope. Please see ... (insert the five step process listed under my comments on 2, above) for more information on this process.	The addition of building shell commissioning will be considered for a future revision of LEED-EB. It will be considered for inclusion in the LEED-EB Reference Guide.	No Changes	None
EA	EAp1-Com2	Historical Buildings	Prereq 1 (Existing Building Commissioning)	This credit may threaten historic buildings because it doesn't acknowledge that some improvements that would optimize the energy performance of a building require demolition of original building fabric. Installation of insulation is a good example.	The rating system should acknowledge the unique challenges the rehabilitation of a historic building represents. Projects should not be penalized because they conserve original fabric at the loss of some element of energy performance.	A significant number of additional points should be awarded for the appropriate rehabilitation of historic buildings. Consult with the National Park Service to establish meaningful language to be included.	See response to General Comment 5.	No Changes	None
EA	EAp1-Com4	Integrate more with NC	Prereq 1 (Existing Building Commissioning)	good credit - operations of building should be systematically checked against owner's needs to ensure sustainable operation	could be better integrated into the NC credit for additional commissioning and the recommissioning manual. Provide a tie-in for buildings that achieved the additional cx credit in NC.		Buildings owners that earn the commissioning prerequisite and the additional commissioning credit under LEED-NC will be rewarded by improved building performance. See response to EAp1-Com12 for description of intention to add a performance based way to earn the LEED-EB commissioning prerequisite.	No Changes	None
EA	EAp1-Com9	Clarify and broaden scope of credit	Prereq 1 (Existing Building Commissioning)	This is a good concept for existing buildings.	we feel this credit could be strengthened with the following items - engage a CX agent - develop CX plan - complete functional performance tests - review and upgrade O&M documentation - establish an owner operator training plan and oversee training Please clarify if only a commissioning agent can develop and implement periodic test procedures and generate the Basis of Operation document. Is the "Owner Operational Requirements" a formal document, or just a set of criteria established by the owner for the commissioning agent? Please indicate if a commissioning agent must be present for the repairs and upgrades, etc. In the case that the Owners Operational Requirements are not met. We think "O&M Documentation and Training" should be included in the "intent" of this credit, as <a href="#">these items are important for building</a>	The first paragraph of Requirements is a little unclear and could use some clarification. Consider: "Develop and implement a Systems Operations Plan that includes the following components... (include list from Requirements as bullet points)"	The words, "have in place over the performance period" are used because LEED-EB covers ongoing recertification as well as initial certification. The second sentence of the first paragraph will be edited to read: "The Owner's Operational Requirements needs to address the following: building functional and operating requirements, sustainability goals, and on-going system optimization for the following building systems: heating, cooling, humidification, lighting, water consuming, and facility control systems."	Make changes included in the Response Column	Editorial
EA	EAp1-Com12	Retro-Commissioning	Prereq 1 (Existing Building Commissioning)	5. In order to accomplish the Building Owner's Operational Requirements through "Existing Building Commissioning" process, I would like to propose that each building under the LEED-EB rating protocol, conduct an independent "Retro-Commissioning" analysis every five(5) years, from a "whole-building" perspective, thus maintaining and/or enhancing its energy efficiency quality, which in turn, helps the environment and the life-cycle-cost-effectiveness. It is perfectly fine to complement this activity with USEPA/USDOE's "Energy Star" program for the buildings.	Require each building under the LEED-EB rating protocol to conduct an independent "Retro-Commissioning" analysis every five(5) years	None	In future revisions of LEED-EB, the intention is to add a performance based way to earn the commissioning prerequisite based on delivered performance including IEQ and energy and water efficiency.	No Changes	None
EA	EAp2-Com1	Performance period issues	Prereq 2 (Minimum Energy Performance)	For initial submittal must provide 12 months of utility bills. Does this mean that in the case of remodel or upgrades to an existing building that include new mechanical systems that the owner must then wait 12 months to collect utility bills before submission?	Maybe only 6 months or consider a before and after scenario where documentation shows the results of the new equipment over the old less efficient equipment.	None	For the initial certification under LEED-EB, the applicant may show that the most recent 3 months of building operating performance data meet the standards. This means for initial certification under LEED-EB, at least 3 months of utility data does need to be collected to demonstrate current building performance. For the impact of any building improvements to be included in performance, the data collection on energy use needs to be post improvement.	No Changes	None
EA	EAp2-Com2	Historical Buildings	Prereq 2 (Minimum Energy Performance)	This credit may threaten historic buildings because it doesn't acknowledge that some improvements that would optimize the energy performance of a building require demolition of original building fabric. Insulation is an example.	The rating system should acknowledge the unique challenges the rehabilitation of a historic building represents. Projects should not be penalized because they conserve original fabric at the loss of some element of energy performance.	A significant number of additional points should be awarded for the appropriate rehabilitation of historic buildings. Consult with the National Park Service to establish	See response to EAp1-Com2	See response to EAp1-Com2	See response to EAp1-Com2
EA	EAp2-Com4	Broaden allowable approaches and software to meet credit	Prereq 2 (Minimum Energy Performance)	I like that a minimum level of energy efficiency for a base building is to be established. However, there are more than just the EPA Energy Star approach that can be used satisfactorily. They have not been mentioned or addressed.	In the Requirements section mention of the ASHRAE 90.1 Standard might be mentioned as a source for compliance in some form. Has the "best of breed method been addressed?" It would seem that the technology of DOE and their building represents. Projects should not be penalized because they conserve original fabric at the loss of some element of energy performance.	Someone regarded as an expert in this area alone need to review the limiting approach provided to date. Maybe the Pilot Program buildings have addressed this and this is all they can agree on but there seems to be more available from all the literature and research that has been done over the years.	LEED-EB uses EnergyStar as the metric for building performance because it compares actual building energy use to the actual energy performance of similar buildings under similar climatic conditions. EnergyStar provides a fixed rather than a relative energy performance scale.	No Changes	None
EA	EAp2-Com8	Broaden allowable approaches	Prereq 2 (Minimum Energy Performance)	Ø If a building goes for LEED-EB after a systems upgrade, it cannot supply sufficient energy bills to satisfy this pre-requisite. In such a case, ASHRAE 90.1-1999 and modeling could be the default for one year, after which Energy Star would be used to verify the energy performance.	Allow ASHRAE 90.1-1999 and modeling as default for first year after systems upgrade		See responses to EAp2-Com1 on amount of performance data for initial certification. See responses to EAp2-Com4 on the reasons EnergyStar was used for LEED-EB energy performance metric.	No Changes	None

EA	EAp2-Com6	Conflicts with IAQ credits		Prereq 2 (Minimum Energy Performance)	This prerequisite should address the safety aspects of reaching for Energy Performance. This section may conflict with the goals of other sections. Please consider these comments in conjunction with EA Credit 1 Optimize Energy Performance.	These credits do not note the importance of "safely" in reducing energy use to reach the EPA Energy Star 60 rating. Especially in existing buildings, measures to "tighten" a building and/or reduce energy through cutting outside air can have serious detrimental effects on the IAQ, the health and the building systems. Indoor air pollutants can build up, mold can grow, and mechanicals can loose effectiveness - all in an Energy Star building. A large number of points are available in EA Credit 1 and might outweigh the single points available for IAQ, IEQ, etc. available in subsequent sections.	1. Add a second paragraph (bullet) to the "Requirements" section of both: "Reduction in energy consumption to meet the requirements of this section shall not cause building conditions to fall below the Owner's Operational Requirements or generally accepted guidelines for IAQ and IEQ. Compliance with these conditions must be documented through periodic quarterly testing." 2. Perhaps the title should be "Maximum Energy Performance"	The IEQ prerequisites and credits as well as code requirements address maintaining IEQ.	No Changes	None
EA	EAp2-Com7	Partially occupied buildings		Prereq 2 (Minimum Energy Performance)	There are ways that projects can receive an inflated Energy Star score. One such way is a building that is only partially occupied during the year. The energy consumption for these spaces will be considerably less and will affect the overall energy consumption of the building. Lights are turned off and temperatures are usually maintained at a setback.	We propose that the average tenanted area is used as the overall building area for buildings which fall into a tenanted type facility category.	We would like to suggest a slight change to the submittal requirement wording. The requirement asking for the most recent 12 months of building utility bills should be changed to at minimum the most recent 12 months of building utility bills.	One of the Energy Star inputs is the level of building occupancy. This requirement addressed the impact of occupancy on building energy use. The words, "annually over the performance period" will be added to the second bullet under submittals.	Make changes included in the Response Column	Editorial
EA	EAp3-Com2	Set allowable leakage levels lower		Prereq 3 (CFC Reduction in HVAC&R Equipment)	Requiring an annual discharge rate of less than 5% seems odd. If you have any amount of refrigerant leakage, you have a serious problem that needs to be fixed.	Require less than 1% leakage, or better yet, 0% leakage.	Provide documentation showing that the annual refrigerant leakage rate is below 1%.	The trigger rate under EPA rules is 15% for comfort cooling. The allowable rate specified in LEED-EB prerequisite is 1/3 of the EPA trigger rate.	No Changes	None
EA	EAp3-Com3	Very favorable with credit		Prereq 3 (CFC Reduction in HVAC&R Equipment)	Prereq 3 draft is excellent as it will allow CFC free refrigerants that will be excellent in both ODF and GWP even though they may be a HCFC!	NA	NA	N/A	N/A	N/A
EA	EAp3-Com5	Provide more guidance and include in Owner's Plan		Prereq 3 (CFC Reduction in HVAC&R Equipment)	The prerequisite is a good idea. There is no reference to the need to include this in the Owner's Program. There is no tie back to ASHRAE Guideline 3-1996 to ensure program and procedures are in place to reduce CFCs. You have to provide more guidance to people.	The cost avoidance for the chiller replacement should consider operating and maintenance costs associated with the replacement. If I have an old chiller which is energy inefficient and needs a nursemaid to make sure it operates then that should be included as part of the cost avoidance. Submittals - Initial and Re-certification I Provide documentation showing that the annual refrigerant leakage rate to be below 5% and the leakage over the remainder of unit life is being maintained below 30% Comment: There is no method of ensuring that the documentation submitted meets the quality and integrity verify CFC reduction. The monitoring of CFC reduction should be part of the "Owner's Plan" and mechanisms in place to ensure these goals are met. ASHRAE Guideline 3-1996 documents the practices and procedures for reducing the emission of CFCs, but is not referenced in the EA prerequisite. Section 8.1.4 provides direction on the monitoring and operation to ensure reduction of CFCs. Monitoring of CFCs should be included into EA Credit 3.3 and additional		The recommendation that the monitoring of CFC emissions and reduction should be part of the "Owner's Plan" and mechanisms in place to ensure these goals are met will be included in the LEED-EB Reference Guide. ASHRAE Guideline 3-1996, which documents the practices and procedures for reducing the emission of CFCs, will be included in the LEED-EB Reference Guide as a resource. In the economic analysis of cost and benefits of replacement the maintenance costs need to be included.	No Changes	None
EA	EAp3-Com6	Allow R 123 with document lower 3% leakage rate.		Prereq 3 (CFC Reduction in HVAC&R Equipment)	With regard to Refrigerant R123, I believe that the damage to the environment is higher from the allowed high pressure 134a equipment than from a disallowed low pressure R123 system. These high pressure machines take more energy per ton than the low pressure machines, creating more green house gas emissions. In the refrigerant cycle the low pressure machines will take air in not leak refrigerant out as they would in a high pressure machine. When we look at the life cycle impact to the environment of these two refrigerants I believe a case can be made for both. I recommend that we allow R 123 with record keeping documenting refrigerant losses maintained at less than 3% of the total unit charge.			R-123 is an HCFC so it is allowed under this prerequisite. Under EA Credit 4 replacement of CFC-11 with HCFC-123 is specifically encouraged.	No Changes	None
EA	EAc1-Com1	Historical Buildings		Credit 1 (Optimize Energy Performance)	This credit may threaten historic buildings because it doesn't acknowledge that some improvements that would optimize the energy performance of a building require demolition of original building fabric. Insulation is an example.	The rating system should acknowledge the unique challenges the rehabilitation of a historic building represents. Projects should not be penalized because they conserve original fabric at the loss of some element of energy performance.	A significant number of additional points should be awarded for the appropriate rehabilitation of historic buildings. Consult with the National Park Service to establish meaningful language to be included.	See response to EAp1-Com2	See response to EAp1-Com2	See response to EAp1-Com2
EA	EAc1-Com2	Give more points for window replacements and give credits for improvements (%) over baselines not by EnergyStar score		Credit 1 (Optimize Energy Performance)	This credit as it stands now is over optimistic. The standard is for existing buildings many of which were built long before the base ENERGY STAR / ASHRAE 90.1-1999 standards were in existence. These buildings will have a difficult time and will require a fair amount of modifications just to reaching the ENERGY STAR score of 60. To reach scores of 83 to 99 will require major modifications throwing the building into the NC standard. At the same time, a LEED-NC or EB certified building that have been functioning for 5 years shouldn't automatically get up to 10 points because of the original design which is being carried forward into the EB era. The purpose of EB should be continuous improvement so the past 5 years now becomes the base and the new credit is based on improvements over that reference.	Since I do not have a good feel for what an ENERGY STAR score of 63 means for I have not had the opportunity to work with it very much, I am going to use LEED-NC EA Credit 1 for Existing Building - Major Renovations as the tool to explain my position. The following are recommended: o As with the LEED-NC EA Credit 1 for existing building - major renovations, the points should start at 5% improvement over (in this case) ASHRAE 90.1-1999 and progress in 5% increments. o Total points should be limited to 5 with the corresponding score of 79. For modifications that exceed 80, the project should be placed under the NC standard. o For building that are presently certified by LEED either NC or EB, the buildings present score becomes the base and improvements are calculated from that reference again starting at 5% and going to a 5-point limit. o By adding the energy credit of one point under SS Credit 7 for adding insulation to the roof, one additional credit is still going toward Optimize Energy Performance. o One item that has a major impact on a building's energy usage is	See Point 2 above.	See responses to EAp2-Com4 on the reasons Energy Star is used for LEED-EB energy performance metric. The full range of Energy Star scores from 60 - 100 earn points in LEED-EB so that older buildings can get to the lower end of this range and gradually increases their performance and Energy Star Score over time.	No Changes	None
EA	EAc1-Com3	Broaden allowable approaches and software to meet credit		Credit 1 (Optimize Energy Performance)	It is good to show an increase over some pre-defined measure. However, as stated earlier are there other measures that can be used in this regard. A lot of research has been done in this effort of energy improvement of building performance and could also be used	Same comments as made in EA Prerequisite 2	Same comments apply as in Prerequisite 2	See response to EAp2-Com4	See response to EAp2-Com4	See response to EAp2-Com4
EA	EAc1-Com5	Conflicts with IAQ credits		Credit 1 (Optimize Energy Performance)	Same as comments for Minimum Energy Performance Please consider together (See EAp2-Com6)	Same as comments for Minimum Energy Performance Please consider together (See EAp2-Com6)	Same as comments for Minimum Energy Performance Please consider together (See EAp2-Com6)	See response to EAp2-Com6	See response to EAp2-Com6	See response to EAp2-Com6
EA	EAc1-Com6	Partially occupied buildings		Credit 1 (Optimize Energy Performance)	There are ways that projects can receive an inflated Energy Star score. One such way is a building that is only partially occupied during the year. The energy consumption for these spaces will be considerably less and will affect the overall energy consumption of the building. Lights are turned off and temperatures are usually maintained at a setback.	We propose that the average tenanted area is used as the overall building area for buildings which fall into a tenanted type facility category.	We propose that the average tenanted area is used as the overall building area for buildings which fall into a tenanted type facility category.	See response to EAp2-Com7	See response to EAp2-Com7	See response to EAp2-Com7

EA	EAc1-Com7	Equipment commissioning process and performance testing		Credit 1 (Optimize Energy Performance)	I would also like to suggest that consideration be given to the equipment commissioning process I believe more credence should be provided for Energy Star scores above 50. I do not believe that there is any return for anyone trying to commission buildings that are performing at this very high level. They are performing at this level because there is an excellent process already in place. Let's focus our resources on the areas that could have the greatest return and that is the assets that have not been benchmarked. I believe that if we could document comfort by tracking the number of calls; not more than one out of range call per 250,000sq ft per day from all sources we would provide a better work environment. The goal should be to provide a comfortable efficient environment with the temperature, humidity and CO2 levels documented to be in range. The current process appears to be more directed towards testing results rather than performance outcomes. Energy conservation and human comfort not more testing would provide the greatest return for our clients.				See response to EA1-Com12 addressing how future revisions of LEED-EB will consider a performance based approach to earning the commissioning prerequisite. Based on this comment, the following requirements will be considered: (1) Energy Star scores above 50, (2) Fixture water use at least 20% below the baseline, (3) Not more than one out of range call per 250,000sq ft per day from all sensors for temperature, humidity and CO2 levels.	No Changes	None
EA	EAc1-Com8	Require narrative on optimization		Credit 1 (Optimize Energy Performance)	Require a narrative describing how the energy performance has been optimized.	Require a narrative describing how the energy performance has been optimized.			LEED-EB is focused on performance outcomes. Demonstrated energy performance satisfies the minimum performance requirement and can earn up to 10 points. Therefore, requiring a description of energy optimization strategy is not necessary.	No Changes	None
EA	EAc1-Com9	Very favorable with clarity of credit		Credit 1 (Optimize Energy Performance)	EA1: Wow. 10 whole points summarized in 4 little lines with a simple table. Now we're talking					N/A	N/A
EA	EAc2-Com1	5% onsite threshold too high		Credit 2 (Onsite and Offsite Renewable Energy)	On-site renewable energy credits should be reduced to 1%, 3%, and 5% since the most feasible solution for electric renewable energy technologies for commercial buildings is photovoltaics which are quite expensive. Also, low-temperature solar thermal application should count in the list of applications allowed (solar water heating, transpired solar collectors).	In the past, this credit has often been too expensive to pursue for most private companies. This will allow more on-site renewable energy applications and not limit it to expensive systems.	"Consider and employ active solar applications (photovoltaics, solar water heating, and transpired solar collectors), geothermal, wind, biomass (other than unsustainable harvested wood), and biogas technologies."	See response to comment EA2-Com7 on defining range of acceptable on-site renewable energy options. See EA2-Com10 for proposed changes to renewable energy points.	See response to comment EA2-Com7 on defining range of acceptable on-site renewable energy options. See EA2-Com10 for proposed changes to renewable energy points.	See response to comment EA2-Com7 on defining range of acceptable on-site renewable energy options. See EA2-Com10 for proposed changes to renewable energy points.	
EA	EAc2-Com6	5% onsite threshold too high for high rises		Credit 2 (Onsite and Offsite Renewable Energy)	I have one of the largest installations of photo voltaic panels on a high rise in the nation. On a million square foot building, there is no way to get 5%. Not very fair to have the largest installation on a high rise and not get a point.	N/A	N/A	See EA2-Com10 for proposed changes to renewable energy points.	See EA2-Com10 for proposed changes to renewable energy points.	See EA2-Com10 for proposed changes to renewable energy points.	
EA	EAc2-Com8a	5% onsite threshold too high for older buildings		Credit 2 (Onsite and Offsite Renewable Energy)	--	Consider cutting performance thresholds by half to accommodate older stock of buildings and then ramp up with each new version of this rating system.	--	See response to EA2-Com1	See EA2-Com10 for proposed changes to renewable energy points.	See EA2-Com10 for proposed changes to renewable energy points.	See EA2-Com10 for proposed changes to renewable energy points.
EA	EAc2-Com10	Thresholds set too high		Credit 2 (Onsite and Offsite Renewable Energy)	1.) The EPA currently recognizes organizations that purchase green power at a 5% threshold. To our organization, that equates to a \$17,000 cost premium for our electrical utility spending. The current credits for off-site renewable energy establish minimums of 25% and 35% for one point. Establishing limits at these levels will discourage many organizations from seeking this credit and expanding our markets for renewable energy sources. At 25%, our cost premium would rise to \$55,000 annually. In the near future (January 2005) organizations in the Washington Metropolitan Area are anticipating significant increases in their electrical utility rates. These two situations combined could keep organizations from considering green power options for their utility requirements. We would like the USGBC to reconsider the minimum threshold established for one point under this credit.			Clarifying language will be added so that it is clear that points can be earned with a mixture of types of actions. The distinction between in region and out of region renewables will be removed and reconsidered once there is effective competition in the renewable energy marketplace in all regions of the country. In future revisions of LEED-EB the following adjustment of the scales for onsite an off site renewable energy will be considered. Clarifying language will be added so that it is clear that points can be earned with a mixture of types of actions.	Make changes included in the Response Column	None	
EA	EAc2-Com7	Eliminate hydrogen as renewable option		Credit 2 (Onsite and Offsite Renewable Energy)	There is no definition of "on site renewable energy"	This should not include the use of hydrogen on site.	Onsite renewable energy should be limited to energy generated within the site boundaries by conversion of solar, wind, geothermal, or hydro energy.	The second sentence in the Potential Technologies & Strategies section will be changed to read: "Acceptable on-site renewables include: PVs, solar thermal, geothermal, wind, biomass (other than unsustainably harvested wood), and biogas technologies.	Make changes included in the Response Column	Clarification	
EA	EAc2-Com8b	Eliminate system schematic		Credit 2 (Onsite and Offsite Renewable Energy)	--	In an attempt to reduce the documentation LEED staff will need to review, consider forgoing the system schematic since the metered energy output will be submitted (it matters less what it looks like and more how it performs).	--	Having drawings showing the location of the on-site renewables and how they are connected to the building system is helpful for the review of these systems	No Change	None	
EA	EAc2-Com8c	Change offsite requirements		Credit 2 (Onsite and Offsite Renewable Energy)	--	Consider allowing projects to submit proof of having purchased two years worth of green energy over the last 5 years as an alternative to purchasing energy for the last year and next year.	--	Delivery of renewable energy from either on-site or off-site sources must be documented for the whole performance period.	No Change	None	
EA	EAc2-Com9	Include renewable portfolio standard (1%)		Credit 2 (Onsite and Offsite Renewable Energy)	4. For "On-site and Off-site Renewable Energy" requirements, I would like to propose that a Realistic Minimum Green Power Procurement Goal be set and accomplished for the LEED-EB credit, such as "1% per year" through a variety of existing and/or proposed local utility programs involving green certificates, green tags, and environmental attributes. The "1% per year" renewables requirement for grid-connected buildings can also be achieved partially through "on-site generation", using Solar, Wind, Geothermal, and Biomass, either individually and/or in some combination as Hybrids.			See EA2-Com10 for proposed changes to renewable energy points.	See EA2-Com10 for proposed changes to renewable energy points.	See EA2-Com10 for proposed changes to renewable energy points.	
EA	EAc2-Com11	Combination onsite and offsite?		Credit 2 (Onsite and Offsite Renewable Energy)	Ø What is the benefit of a Reliability Council? This should be made clear for user understanding. Ø What about point-rating a building that uses a combination of on site and offsite renewable energy?			See EA2-Com10 for proposed changes to renewable energy points.	See EA2-Com10 for proposed changes to renewable energy points.	See EA2-Com10 for proposed changes to renewable energy points.	
EA	EAc3.1-Com1	Wrong category		Credit 3.1 (Building Operation & Maintenance, Staff Education)	Not sure this belongs in energy and atmosphere category.	--	--	See response to Comment EA2-Com2.	No Change	None	
EA	EAc3.1-Com11	Wrong category		Credit 3.1 (Building Operation & Maintenance, Staff Education)	EA3.1-3.3: Not clear these credits are exclusively about energy. If they are, let's be explicit. If it's not, let's consider putting them in the green housekeeping credit, since that's the way much of these credits read anyway. Or, we could do something really radical and organize a separate credit category that's focused on processes and that is unique to EB.	Integrate into the green housekeeping credit	None	See response to EA3.1-Com1	See response to EA3.1-Com1	See response to EA3.1-Com1	
EA	EAc3.2-Com1	prerequisite instead of credit		Credit 3.2 (Building Operation & Maintenance, Building Systems Maintenance)	good idea	This should be a prerequisite. It partly covered by the first two prerequisite, i.e. a facility can't really have the minimum energy performance prerequisite without doing the building operations and maintenance.	see item 2	This credit is appropriately focused on O&M. The energy prerequisite and the 10 energy points provide a strong reward for the energy saving results of O&M and other energy saving actions.	No Change	None	

EA	EAc3.1-Com8	Too vague and required training hours sets too high		Credit 3.1 (Building Operation & Maintenance, Staff Education)	The existing language does not make it clear how many of the maintenance staff must receive the training: just those that work in that particular building on a regular basis, or anyone who might work in the building at some time? 30 hours also seems like an arbitrary (and high) number.	The staff members expected to receive the training must be clarified and the hours perhaps reduced to something like 16 (two full work days or four half-days). If the requirement is to provide 30 hours of training to all potential maintenance personnel I believe the cost to owners will be prohibitive.	Replace "each staff person" with "each staff person with primary responsibility for building maintenance" throughout. Replace 30 hours with 16 hours throughout.	The words "each staff person" will be replaced with "each staff person primarily working on building maintenance" throughout. 24 hours a year of training will be required. A statement will be added that the training must be of high quality and relevant to building operation and maintenance.	Make changes included in the Response Column	Clarification
EA	EAc3.1-Com10	Required training hours sets too high		Credit 3.1 (Building Operation & Maintenance, Staff Education)	30 hours per year is quite high; sounds like they will have to enroll in a full time university program just to meet this credit.			See response to EAc3.1-Com8 on staff training.	See response to EAc3.1-Com8 on staff training.	See response to EAc3.1-Com8 on staff training.
EA	EAc3.1-Com9	Include BOC training as an option		Credit 3.1 (Building Operation & Maintenance, Staff Education)	3. Under "Building Operations and Maintenance" section, requiring Staff Education of at least 30 hours per year. I would like to propose that Building Operator Certification (BOC) Training be provided to the Building Operation & Maintenance staff that includes Level 1 and Level 2. This nominal fee-based training is provided by the Northwest Energy Efficiency Council (NEEC) and its sister non-profit organizations across the United States. The website is www.theBOC.info			See response to EAc3.1-Com8 on staff training.	See response to EAc3.1-Com8 on staff training.	See response to EAc3.1-Com8 on staff training.
EA	EAc3.2-Com3	Add credit (1 point) for creation of "Owner" Standard Operating Procedures (SOPs)		Credit 3.2 (Building Operation & Maintenance, Building Systems Maintenance)	You require maintenance "best practices" for the M in O&M, but forgot the Operations impact on sustainability. Add something to cover the O portion of O&M. The operation & maintenance requirements of the building again relate back to the Owner's Program.	Provide additional credit (1 point) for the creation of "Owner" Standard Operating Procedures (SOPs) for the "best practice operators" of the building systems. The SOPs provide building operators with the "what/why/how" to operate systems. The SOP is a critical component of the system and related back to the "Owner's Program." SOPs provide direction for operation as the "Maintenance Best Practices" provide directions for maintenance of building systems. SOPs are needed for both operation and maintenance. Both maintenance and operation. Maintaining the severest performance of systems is an important part of recognizing the changes in a building lifecycle. For example buildings designed less than 2 decades ago considered the cooling load (range) at more than 2 times today's levels. Load reductions have been realized by several items including the prevalence of LCD monitors, and more efficient lighting. As a building turns greener, the mechanical performance of its systems may remain at peak levels, but the delivered performance of the systems may no longer match changed building conditions. Even short time frame changes, such as overall tenant occupancy and building use, can have an effect on the changes needed to delivered performance in order to meet the needs of the entire system.	WHY: be holistic and provide total solution for O&M provide "maintenance best practices" as well as Operations "standard procedures".	In future revisions of LEED-EB an additional credit (1 point) for the creation of "Owner" Standard Operating Procedures (SOPs) for the "best practice operators" of the building systems will be considered.	No change	None
EA	EAc3.2-Com5	Address the delivered performance of systems within credit		Credit 3.2 (Building Operation & Maintenance, Building Systems Maintenance)	Preventive Maintenance is an extremely important part of sustaining positive conditions. Planning and targeting both equipment maintenance and delivered performance is essential in meeting ongoing requirements. It is of particular concern that this section address not only the mechanical performance of systems, but the delivered performance of systems.		1. Add a second paragraph (bullet) under "Requirements": "The effectiveness of the equipment maintenance program shall be measured by periodic testing to confirm that maintenance practices are producing desired conditions as determined by the Owner's Operational Requirements. Testing of the systems shall take place at the beginning of the heating and cooling season, and in the middle of the heating and cooling season for a total of 4 tests per year." REASON: Preventive Maintenance programs are only effective over a finite time period. The natural deterioration of mechanical equipment and systems as a whole, the aging of building materials, and the changing characteristics of building occupants requires the review and periodic adjustment of any PM program.	See response to EAc1-Com12 for description of intention to add a performance based way to earn the LEED-EB commissioning prerequisite.	No change	None
EA	EAc3.3-Com1	Required submittals for "performance over performance period" too difficult & cumbersome		Credit 3.3 (Building Operation & Maintenance, Building Systems Maintenance)	Required submittals for "performance over performance period" will be difficult and cumbersome to provide.	drop the required submittals for "performance over performance period" will be difficult and cumbersome to provide.		Performance over time is the key to successfully reducing the environmental impact of building O&M. Documenting this performance over the entire performance period is a key part of the documentation	No change	None
EA	EAc3.3-Com2	Require use of high accuracy sensors		Credit 3.3 (Building Operation & Maintenance, Building Systems Maintenance)	Great	You should require that high accuracy sensors be used. They usually don't cost that much more. Gil Avery has a great article on this topic on the Kele.com website. He also wrote an article a few years ago about this same topic that was longer and in more detail. Call Kele. I'm sure they could get it for you. The gist of the argument, is that the sensor inaccuracies even though they seem like they're small, can end up being additive due to system effects, and cause much more inaccuracy than expected. Not the small percentage that you might have expected on first glance. Also, the building automation system should be required to alarm on the date of the anniversary when the sensors need their calibration re-checked. Otherwise, no one will remember. This is a huge problem. Without this, the continuous improvement of building performance may not be real. How do you know if you're saving energy or if the sensors are just drifting. Some sensors such as humidity sensors are also notorious for having a short lifetime. This will ensure that all the data being collected for analysis is valid. Otherwise	None	This will be addressed in the LEED-EB Reference Guide.	No change	None
EA	EAc3.3-Com3	Give more points		Credit 3.3 (Building Operation & Maintenance, Building Systems Maintenance)	Give more Points! Recommend 2 Points! This credit needs to be expanded to include operator transactions and monitoring building systems separate for Credit 5.1-5.3 Enhanced Metering. Metering focus is energy savings, not operational guidance. You need to be more holistic in you applications, tie everything together.	Requirements: The system must include: 1) Continuous monitoring of system equipment performance and of indoor environmental conditions delivered in the building, 2) Alarms for performance or conditions that require repair and 3) A system in place that delivers prompt repairs to problems identified." Comments: The building system requirements to achieve continuous monitoring of target building performance goals are defined in the OP and implemented through O&M SOPs. There is no reference to these documents for this EA Credit. It is recommended that item 4, be added to the system requirements so that building operator transactions may be monitored. The monitoring of operator transactions is an inherent part of the building system. The benefit of monitoring operator transactions is that it allows Monitoring of the above alarms & faults are not part of EAc3.1-5.3, building system points should be moved to this credit and the points expanded. IPMVP does not provide any guidance on monitoring building system alarms, operator transactions or building system performance goals. This information is doc	The system must include: 1)Continuous monitoring of system equipment performance and of indoor environmental conditions delivered in the building, 2)Alarms for performance or conditions that require repair and 3)A system in place that delivers prompt repairs to problems 4)A system in place that monitors operator transactions The continuous monitoring of the following items: (Up to 3 points can be claimed – one point for each 4 action items implemented/maintained). For each monitored items: prepare, implement and maintain a SOP for gathering data to improve building performance over time. - Document building system alarms & operator transactions -Document building system maintenance work order issues. - Document schedule changes made to building equipment. - Provide SOP for off-loading monitored data to secure location for use by system optimization program -Monitor CFC ppm level (per ASHRAE Guideline 1 section 8.1.4.5) -Monitor equipment faults and alarms for Boilers -Monitor equipment faults and alarms for Chillers, Cooling Towers -Monitor equipment faults and alarms for Air Distribution -Monitor equipment faults and alarm	This is already addressed in a number of places including IEQ credit 7.2. In future revisions of LEED-EB, consideration will be given to creating a separate credit for providing a system operating plan that includes: 1) Continuous monitoring of system equipment performance and of indoor environmental conditions delivered in the building, 2) Alarms for performance or conditions that require repair and 3) A system in place that delivers prompt repairs to problems identified."	No Change	None

EA	EAc3-Com4	Consider periodic testing instead of continual monitoring	Credit 3.3 (Building Operation & Maintenance, Building Systems Maintenance)	The continual monitoring of building conditions allows service personnel to tune the building on a momentary basis. This is the most effective way of delivering constant and stable conditions through automated equipment. Consideration of periodic testing should be considered in appropriate applications.	In certain applications, with stable equipment, populations, and activities, constant monitoring may not be an effective use of resources. The inclusion as part of this credit, or in a separate credit, of both installed and periodic (portable) testing may be a more efficient option for many proponents while effectively meeting the goals of this rating system.	For more information, see the "Requirements" section after the "Operational Requirements" REASON: to clarify which goals 2. In the "Requirements" section after all the words "continuous" add "or continual" REASON: This allows periodic testing as well as constant testing opening the possible LEED point to a wider range of older building which do not have BMS installations. 3. In the "Requirements" section in the second line after "indoor comfort" add "ventilation, and indoor pollutants." REASON: This best illustrates the performance of the HVAC system and its relationship to building occupants and other systems. 4. In the "Requirements" section at the end of the first paragraph add: "alarms are based on the parameters set out in the "Owner's Operational Requirements" REASON: the standards for "alarms" should be related to generally accepted guidelines which will be spelled out in the "Owner's Operational Requirements" 5. In the Submittals section after all the words "continuous" add "or continual" REASON: to be consistent if the "Requirements" section was	This is a credit rather than a prerequisite so it is appropriate to require "continuous" monitoring.	No Change	None
EA	EA04-Com1	Decrease documentation period from 12 to 6 months	Credit 4 (Additional Ozone Protection)	Requirement to document less than 3% loss of refrigerant per year. If this has not been measured or tracked in the past must the owner show documentation over a 12 month period and therefore delaying certification for that 12 months.	Use a six month documentation at 1.5% loss.	None	See Response to comment EA2-Com1 on amount of performance data required for initial certification under LEED-EB	No Change	None
EA	EA04-Com3	Require zero leakage rates	Credit 4 (Additional Ozone Protection)	Disagree with allowable leakage rates for refrigerants. There should be no leakage.	-	-	See response to Comment EA3-Com2 on Ozone leakage. The trigger rate under EPA rules is 15% for comfort cooling. The allowable rate specified in LEED-EB EA Credit 4 is 1/5 of the EPA trigger rate.	No Change	None
EA	EA04-Com6	Expand allowable HCFC list and consider global warming effects.	Credit 4 (Additional Ozone Protection)	I do not like how this credit previously disclosed many refrigerants that are HCFC's. The scientific community has clearly shown that the Montreal Protocol, although effective, did not consider the full issues at hand. The Kyoto Protocol shows a great concern for Global warming and should definitely be considered. As with all things, the refrigerant issue should consider all factors; global warming, ozone depletion, and energy efficiency. Moreover the inclusion of the leakage requirement is essential because all refrigerants are dangerous if released into the atmosphere, so containment is crucial.	Consider the global warming effects and include some requirements.	None	This issue is being reviewed by the USGBC TSAC and LEED-EB will incorporate the conclusions drawn by the USGBC from the TSAC review when it is completed.	No Change	None
EA	EA04-Com7	Keep HCFC-123 as option	Credit 4 (Additional Ozone Protection)	I like that this credit recognizes HCFC-123 as a safe refrigerant as long as it is a tight construction and emissions of refrigerants over the performance period are less than 3% of charge per year. HCFC-123 chillers are highly efficient therefore environmentally friendly.	No comment	No comment	See response to EA04-Com6. And see response to comment		
EA	EA04-Com10	Allow low pressure R-123 refrigerants with lower leakage levels	Credit 4 (Additional Ozone Protection)	Low pressure R-123 refrigerants are a balanced approach when proven not to be an atmospheric concern. Low pressure refrigerants are much easier to contain than medium or high pressure refrigerants.	R-123 is an effective approach when viewing efficiency, ODP (Ozone Depletion Potential) and GWP (Global Warming Potential). The issue of ODP should be removed for this credit as it applies to R-123	R-123 is an effective solution to a balanced atmospheric approach and ODP should be removed for R-123.	See response to Comment EA3-Com6 and response to Comment EA04-Com6	See response to EA3-Com6	See response to EA3-Com6
EA	EA04-Com20	Offer HFCs as additional alternative	Credit 4 (Additional Ozone Protection)	The requirements section for this credit appears to indicate that HCFC-123 is the preferred replacement. HFCs should also be mentioned as an alternative. HFCs will ultimately not be manufactured.			The proposed clarification will be made.	Make changes included in the Response Column	Clarification
EA	EA04-Com13	More balance needed	Credit 4 (Additional Ozone Protection)	I believe that this is a good requirement as a start because it recognizes the significance that refrigerants have on our environment over a long period of time. I believe that the requirements for containment are significant due as it not only addresses the ozone depletion issue, but also the effects that refrigerants have on global warming.	I believe that further consideration of balancing the effects of ozone depletion especially considering the containment requirements specified in this draft with the higher efficiencies available from some HCFC's and their value in helping with global warming should be considered. Not only environmental considerations but economic considerations make refrigerant leakage unacceptable today so efficiency should be considered in equipment selection.	I have no specific language suggestions at this time.	See response to Comment EA04-Com6	See response to Comment EA04-Com6	See response to Comment EA04-Com6
EA	EA04-Com21	Inconsistent with LEED-NC	Credit 4 (Additional Ozone Protection)	EA4: So you can have a system with Halons or HCFCs as long as you don't operate it? Also, I'm nervous about the prescriptive R-11/123 drop-in language at the end. What's TSAC said about that? This could be perceived as a major, problematic inconsistency with NC and other LEED products.			The language on R-11 replacement with R-123 was approved by the LEED-EB Committee.	No Change	None
EA	EA04-Com4	Very favorable to credit as is	Credit 4 (Additional Ozone Protection)	I think this is right on. Refrigerant R-123 has low ozone depletion potential and since it can provide the most efficient chillers available, it can provide the best choice for existing and new buildings. If it can be documented that the refrigerant stays in the chiller, then it is clearly the best choice. The high efficiency of the R-123 low pressure design allows low energy cost for the owner, and reduces the electrical drain on the electrical grid, creating less need for adding power plants in the future. I feel that this language should also be added to the LEED-NC guidelines as well and be an option to the existing requirements.	I think this is right on.	No changes.	N/A	N/A	N/A
EA	EA04-Com5	Very favorable to credit as is	Credit 4 (Additional Ozone Protection)	Your addition of allowing equipment that has low leakage rate is very much in line with the TSAC preliminary direction. This method will help create sustainable buildings, since if the refrigerants used are maintained inside the equipment, there is no direct effect on the atmosphere. I commend and thank the committee that made this inclusion since it allows a balance of energy, ozone depletion potential and global warming potential (which is also greatly affected by energy use.)	No change necessary	No change necessary	N/A	N/A	N/A
EA	EA04-Com8	Very favorable to credit as is	Credit 4 (Additional Ozone Protection)	I would like to add my comments on the LEED-EB EA Credit 4. Certainly, any refrigerant that does not leak from the device will not have an impact on the environment. Of prime concern is maintaining the balance between the energy used, the impact on global warming, and the ozone depletion potential. LEED-EB EA Credit 4 helps USGBC respond appropriately to the TSAC report.	No change needed	No change needed	N/A	N/A	N/A
EA	EA04-Com9	Very favorable to credit as is	Credit 4 (Additional Ozone Protection)	I like the idea of taking cooling equipment's leak rate into account. Refrigerant is a problem only if it leaks. The change to allow credit for low leak rate encourages the use of refrigerants that may have a minor impact on ozone depletion but a large benefit on efficiency and global warming.	NA	NA	N/A	N/A	N/A
EA	EA04-Com11	Very favorable to credit as is	Credit 4 (Additional Ozone Protection)	I speak in favor of this draft. It is a common sense approach to balancing ozone depletion with energy efficiency and global warming. Our experience in servicing HVAC equipment has shown that the industry has responded by providing equipment that performs within the limits required by this standard.	No change	No change	N/A	N/A	N/A
EA	EA04-Com14	Very favorable to credit as is	Credit 4 (Additional Ozone Protection)	Excellent to allow tight energy efficient chillers that use R-123. The best and most efficient larger chillers often use R-123 and balance very low ODP with excellent energy conservation and related low global warming. This is better than old requirement that precluded the use of R-123 in properly designed applications.	The new credit is improved and fine as is.	no changes	N/A	N/A	N/A
EA	EA04-Com17	Very favorable to credit as is	Credit 4 (Additional Ozone Protection)	The importance of this credit is clear because it allows for the optimization of three important elements: (1) ozone depletion, (2) global warming, and (3) energy efficiency. The critical nature of achieving a balance between these elements has been widely discussed and publicized. Thank you for reviewing and incorporating our comment on this very important issue. Sincerely, Richard W. Cooper for Hutton Trust, Houston, Texas.	ok as is	ok as is	N/A	N/A	N/A
EA	EA04-Com19	Very favorable to credit as is	Credit 4 (Additional Ozone Protection)	The credit strengthens the LEED rating system by balancing energy, ozone depletion potential, global warming potential and leakage rate.	No change needed.	No change needed.	N/A	N/A	N/A

EA	EAc5.1-5.3-Com1	Require submit of schedule of manufacturer's required calibration and maintenance tasks	Credit 5.1-5.3 (Performance Measurement, Enhanced Metering)	One of the drawbacks of data collection is the increased maintenance and cost associated with the sensors and metering devices. This periodic maintenance is often neglected and over time results in incorrect data. This issue is important with respect to the requirements for trending information and LEED recertification. Incorrect data is meaningless when utilized to compare with calibrated, correct data, such as the initial operation of a sensor or meter.	This issue could be resolved (at least in theory) by including all sensor/meter manufacturer recommended calibration and maintenance tasks into the owners Master Maintenance Schedule, or equivalent. I recommend that submittal of documentation be required, illustrating all required maintenance and calibration and include the time period between tasks. I also recommend a required submission indicating the owner or facility is intent and schedule to adequately maintain/calibrate/replace sensors.	Submittals – Certification and Re-Certification For each device utilized to collect metering information, provide the schedule of manufacturer's required calibration and maintenance tasks. Provide a letter signed by the owner stating that manufacturer's recommended maintenance has been submitted and is accounted for in the building's general preventative maintenance schedule or has been satisfied by separate contract.	In future versions of LEED-EB, consideration will be given to including sensor calibration as a specifically required component of a preventative maintenance program	No Change	None
EA	EAc5.1-5.3-Com2	Too expensive and time consuming	Credit 5.1-5.3 (Performance Measurement, Enhanced Metering)	Looks expensive and time consuming to maintain all the equipment and keep all the records.	-	-	Measurement of actual performance is key to knowing what is actually happening with building performance rather than thinking we know what is happening. Encouraging more measurement of performance is the purpose of these points.	No Change	None
EA	EAc5.1-5.3-Com4	Clarify and broaden scope of credit / IPMVP too narrow for intent of credit	Credit 5.1-5.3 (Performance Measurement, Enhanced Metering)	1. The section of items to be "metered" needs to be revised. This is similar to the list provided in NC and it creates confusion. The intent is fine, but the list of required items should be clarified. Monitored and metered are two different things and some of the items should be continuously monitored, while it is appropriate to meter others. 2. The IPMVP was developed for some very specific applications in the area of Energy-Savings Performance Contracts. Trying to apply this as a LEED credit is not using it as it was intended. I believe this credit would benefit from a wholesale revamp. The level of detail required in the IPMVP is not necessary to meet the overall intent of the credit- to be able to monitor and optimize the efficient operation of the building. The complexity of the IPMVP protocols and expense of the metering called for make this an unattractive credit to implement.	the amount of data required for submittal, even though it is just one day, is going to be a very large volume. Most of this data will be easily accessible via a building control system, but difficult to compile into a report format.		Yes the IPMVP was developed for some very specific applications in the area of Energy Savings Performance Contracts and is focused on documenting energy savings resulting from specific energy efficiency actions. For these reasons, the third sentence in the Strategies Section will be changed to read: "IPMVP Volume I: Concepts and Options for Determining Energy Savings can be used to track energy savings of specified energy efficiency measures in buildings using metered data."	Make changes included in the Response Column	Clarification
EA	EAc5.1-5.3-Com5	Require separate electric meters on the chillers, the cooling tower fans, and the pumps that are variable speed.	Credit 5.1-5.3 (Performance Measurement, Enhanced Metering)	No Comment	For the chilled water system efficiency. The term chilled water system efficiency is not specific enough. For water cooled chillers, you should require separate electric meters on the chillers, the cooling tower fans, and the pumps that are variable speed. Otherwise it will be impossible to improve your performance, because reducing power on one of these, will cause the others to rise. By having the power for each of these three separate components, you can tell if you are actually improving your total system performance.	None	This will be addressed in the LEED-EB Reference Guide.	No Change	None
EA	EAc5.1-5.3-Com7	Include in Owner's Plan and move building systems monitoring components to EA Credit 3.3	Credit 5.1-5.3 (Performance Measurement, Enhanced Metering)	The continuous metering goals for the M&V plan should be defined in the Owner's Plan, as well as the SOPs required ensuring building energy goals are met. The Owner's Plan should provide detailed information about data gathering requirements of the M&V plan. Owner's Plan makes sure that building systems and enhanced metering requirements are not an after thought. Specific data requirements such as data retention, frequency of collection, data integrity should be included as an OP requirement as this information will be used to define building systems requirements. The M&V plan along with other building documents provide the framework to ensure that a building is sustainable.	Remove the building system monitoring components from this credit and move them to EA 3.3. Revise enhanced metering components monitored (see recommendations below).		This will be considered in future revisions of LEED-EB	No Change	None
EA	EAc5.1-5.3-Com10	Include measurement of delivered performance of systems	Credit 5.1-5.3 (Performance Measurement, Enhanced Metering)	This credit supports the value of performance testing in addition to mechanical testing in a preventative maintenance program. (See EAc3.2-Com5)	Repeat of comments on EA credit 3.2- 1 (See EAc3.2-Com5): Measuring the delivered performance of systems is an important part of recognizing the changes in a building lifecycle. For example buildings designed less than 2 decades ago considered the cooling load (range) at more than 2 times today's levels. Load reductions have been realized by several items including the prevalence of LCD monitors, and more efficient lighting. As a building turns greener, the mechanical performance of its systems may remain at peak levels; but the delivered performance of the systems may no longer match changed building conditions. Even short time frame changes, such as overall tenant occupancy and building use, can have an effect on the changes needed to delivered performance in order to meet the goals of this rating system.	none	See response to EAc3.2-Com5 & response to Comment EAc1-Com2.	See response to EAc3.2-Com5	See response to EAc3.2-Com5
EA	EAc5.1-5.3-Com11a	Enhanced metering requirements	Credit 5.1-5.3 (Performance Measurement, Enhanced Metering)	1. Enhanced metering requirements need to be more flexible and based on the actual needs of the building. Choosing from 11 specific metering tasks does not provide sufficient flexibility in creating the most effective metering plan. For example, if a facility has heat pumps rather than chillers, they should be allowed to meter their heat pump system and receive credit within LEED. Or if they have an ice storage system. Or if they have packaged rooftop units. The list is endless. According to the current LEED requirements, metering the energy and performance of these cases would not count towards this credit.	1) Improvements: We propose that the USGBC consider changing the Enhanced metering credits to allow LEED-EB participants flexibility in selecting the specific metering areas according to the needs of the building. A list of potential areas still could be provided for clarification of the credit's intent, but the facility would not be limited to the list.	See above comments	Additional metering options can be added at any time through the CIR process.	No Change	None
EA	EAc5.1-5.3-Com11a	Monitoring versus metering	Credit 5.1-5.3 (Performance Measurement, Enhanced Metering)	2. For the current list of metering categories, we have provided individual comments. Overall, many of the metering categories are actually monitoring applications. "Metering" needs to be better defined if it is to include non-metering applications.	2) Option Notes 1. Lighting systems and controls See comment #8a at the bottom of this entry. 2. Building electric meters 3. Indoor water risers and outdoor irrigation systems 4. Chiller efficiency at variable loads 5. Cooling load Monitoring cooling load may not be an appropriate metering application since load depends highly on ambient conditions and building usage patterns. 6. Air and water economizer and heat recovery cycle operation These metering activities should not be lumped together, since very few buildings have all three. A building should select airside economizer, water-side economizer, or heat recovery cycle operation as separate categories. A building that has all three cycles should receive credit for performing these M&V tasks individually, otherwise they are penalized compared to a building that only has an airside economizer and is (presumably) exempt from the water-side economizer and heat recovery operation MSV. 7. Boiler efficiencies The pilot phase ruling was that measuring one per year is sufficient. Does this ruling still apply? The leniency based on the intent	See above comments	See responses to EAc5.1-5.3-Com11a and EAc5.1-5.3-Com2.	No Change	None
EA	EAc5.1-5.3-Com11a	Lighting systems and controls	Credit 5.1-5.3 (Performance Measurement, Enhanced Metering)	3) Lighting systems and controls: Unless schedules or lighting sweeps are modified or the lights are overridden ON, the lighting electrical loads will remain consistent. By monitoring lighting schedules, sweep controls, and override functions, operators will be able to detect any inefficiencies in their lighting operation. When monitoring lighting consumption directly, the data must be analyzed to determine if the lighting loads are appropriate. By merely measuring the lighting loads, there is no actionable item for operators. Therefore, lighting schedules and adjustable lighting controls (including checking lighting sweep settings and logging override operation) would have been checked to determine if the lighting loads were appropriate or not.	3a) Improvements: We request that the intent of Enhanced metering credit for lighting monitoring be met by monitoring lighting schedules and adjustable lighting controls (like lighting sweep) on a weekly basis. Additionally, the lighting override would be monitored continuously to determine how often the override was enabled. The goal of the credit is to identify problems and fix operation – monitoring lighting schedules and adjustable controls are a direct and more cost-effective way to achieve that goal.	See above comments	See responses to EAc5.1-5.3-Com11a and EAc5.1-5.3-Com2.	No Change	None

EA	EAc5.4-Com2	Separate into direct and indirect emission reductions	Credit 5.4 (Performance Measurement, Emission Reduction Reporting)	I think the quantification of emission reductions from LEED projects is needed. However, the design of the proposed credit needs to be improved. The credit is intended to "document emission reduction benefits of building efficiency actions..." which is a fine intent, however, substitution of renewable energy often provides far greater reductions than does efficiency. Although renewable energy is mentioned in the paragraph titled "Requirement" it should be highlighted in the "Intent" statement more clearly. Similarly, the GHG benefits of material selection can also be important to the overall footprint of the project. The Requirement section instructs the owner to "Track and record the significant emission reductions" but does not define what constitutes significant. The greenhouse gas, Carbon Dioxide (CO2), is explicitly mentioned throughout the document, however, this definition should be broadened to include all greenhouse gases, reported in units of CO2-equivalent. Other greenhouse gases will be important. HFC selection for air conditioning systems can have impact on total GHG impacts of the project. Methane that is collected from waste and used as a fuel source could	The credit should focus upon emissions in two classes: direct emissions that are emitted from and are clearly "owned" by the facility, and indirect emissions that represent the environmental footprint of the building but occur elsewhere, quite possibly under different ownership. Where direct emissions reductions occur, building owners should be encouraged to quantify, bank, sell, trade or retire credits. One point could be given for a project that demonstrates a percentage reduction in overall emissions footprint. Quantification, particularly for greenhouse gas emissions, should include all greenhouse gases recognized by the international community, and should be made in terms of carbon dioxide-equivalent units.	Intent: Document direct and indirect emission reduction benefits derived from building efficiency options, material selection, and renewable energy utilization. Retire a portion of the direct emission reductions through appropriate local, regional or national emission markets. Requirement: Track and record energy consumption, material selection, and renewable energy utilization to determine emission reductions of greenhouse gases (reported as carbon dioxide-equivalent (CO2-eq)), sulfur dioxide (SO2), nitrogen oxides (NOx), mercury (Hg), small particulates (PM2.5), large particulates (PM10), and volatile organic compounds (VOCs). Report the reductions in emissions as compared to the baseline condition of building consumption patterns prior to project changes. Quantity reductions of direct emissions, (those that occur from the site itself) and separately, indirect emissions, (those that occur offsite in order to meet the demand of the building.) Quantifications must be sufficiently documented to be accepted by a third party certification program.	The purpose of this credit is to document the emission reductions delivered by the energy efficiency and renewable actions. The range of emission reductions addressed was chosen because it addresses the major pollutants caused by fossil fuel combustion and it benefits building owners for the range of pollution reduction benefits to be recognized. Building owners certainly have the right to assert that they own the emission reduction benefits that result from the efficiency improvements and renewable energy actions they implement and to retire these emission reductions. Furthermore building owners ultimately receiving this ownership will provide added financial benefits for sustainability actions when markets for these emission reductions develop. When markets for these emission reductions develop and mature, specific requirements for participating in these markets will develop. Until these markets have actually developed and matured, the specific requirements that will be accepted for emissions reduction reporting for these markets are unknown. So doing these emission reduction calculations in a practical way in th	No Change	None
EA	EAc5.4-Com3	Allow extra credits for combination with EA Credit 2	Credit 5.4 (Performance Measurement, Emission Reduction Reporting)	good idea	Credit 2 is for renewable energy. In meeting the requirements of credit 2, the amount of fossil fuel required to generate power for a facility is reduced thus reducing the emissions associated with the facility. So, can credit 5.4 be considered a bonus point for implementing credit 2?	See item 2 above.	This credit recognizes both the emission reduction benefits from both energy efficiency actions and from renewable energy actions.	No Change	None
EA	EAc5.4-Com5	Correlate with Enhanced Metering Prereq and/or EnergyStar energy ratings benchmark	Credit 5.4 (Performance Measurement, Emission Reduction Reporting)	This EA Credit has a prerequisite. That prerequisite is EA Credit 5 Enhanced Metering. Reporting of emissions is a secondary output that comes from enhanced metering. This performance measurement requirement needs to be documented in the Owner's Plan and M&V plan. Since the initial LEED-EB certification requires an initial EnergyStar rating, any emissions savings can only be measured against a benchmark. You could only get this credit after you have improved your EnergyStar score (go from 60 to 75). If this credit is to be rewarded the building must reduce energy on at least an annual or equipment basis. If you give this credit to LEED_NC or initial LEED_EB buildings these emission reductions are estimated and not real.	Require annual reports. The report reduction in energy use must follow recognized protocol such as the PMPV or EnergyStar.		The Reference Guide will include a statement that the recommended approach for measuring energy savings is the use of the Energy Star energy savings relative to a minimum Energy Star rating of 60. The Reference Guide will also include guidance on how to do this calculation.	No Change	None
EA	EAc5.4-Com8	Preferred credit as written for LEED-EB pilot rating system	Credit 5.4 (Performance Measurement, Emission Reduction Reporting)	1.) We initially qualified for this credit under the Cleaner and Greener program which we found to be thorough and practical. To insure the credibility of this credit, a third party voluntary certification program should a) cover a full range of emissions, b) retire at a minimum, 10% of the emission reductions and c.) ask their primary suppliers to participate in the program.			OK	No Change	None
EA	EAc5.4-Com9	Provide online calculator tied to EnergyStar info	Credit 5.4 (Performance Measurement, Emission Reduction Reporting)	Ø A calculator system should be made available online and tied to the Energy Star information to assist in figuring out the emissions reductions.			See response to Comment EAc5.4-Com5	No Change	None
EA	EAc6-Com1	Documentation period too long	Credit 6 (Documenting Sustainable Building Cost Impacts)	Requirement to provide previous 5 years of building operating costs could be difficult to obtain in many cases where you are buying an existing building that has been poorly managed.	Add a provision that if this data is not available or partially available that the missing data be a theoretical calculation based on the equipment performance or calculated electrical and water consumption.	This will be tough to develop specific language.	If the building in newly acquired requirement will be from date of acquisition. This will be clarified in the Reference Guide.	No Change	None
EA	EAc6-Com5	Documentation period too long	Credit 6 (Documenting Sustainable Building Cost Impacts)	Page 69 - Documenting previous 5 years is overly burdensome. Three years would be more appropriate and information 4 or 5 years old is less relevant.	n/a	n/a	See response to EAc6-Com1	See response to EAc6-Com1	See response to EAc6-Com1
EA	EAc6-Com6	Documentation period too long	Credit 6 (Documenting Sustainable Building Cost Impacts)	--	Consider reducing down from last 5 years to just last one, to encourage greater participation.	--	See response to EAc6-Com1	See response to EAc6-Com1	See response to EAc6-Com1
EA	EAc6-Com2	Wrong category	Credit 6 (Documenting Sustainable Building Cost Impacts)	This credit, similar to the one on building operation, does not belong in the energy category. Perhaps create another category.	--	--	Energy is a large factor in operational cost/benefit analysis; having it in the EA section is appropriate. In future revisions of LEED-EB, creation of a separate section for "Costs, Benefits and Education" will be considered.	No Change	None
EA	EAc6-Com3	prerequisite instead of credit	Credit 6 (Documenting Sustainable Building Cost Impacts)	This should be a prerequisite. The purpose of EB is to show how the building is operating and that there is improvement. Cost are a key factor in this analysis so it should be done, not give a point if the owner chooses to do it.	Move to prerequisite category.	See Point 2.	Quantifying the costs and benefits is key to making the case for sustainability and involves significant additional work for the building owner and operator.	No Change	None
EA	EAc6-Com4	Include documentation in Owner's Plan	Credit 6 (Documenting Sustainable Building Cost Impacts)	Again the need to document overall building operating costs needs to be included in the Owner's Plan. The methodology to do this needs to be provided to building operators staff. Stating that "positive impacts" should be documented sounds like your "testing for success". The operational costs, maintenance, energy, labor and monitoring costs need to be rolled together and compared against some type of building benchmark data such as tenant retention, sick days.	remove "positive impacts" from Potential Technologies & Strategies. change to: Track building operating costs to identify sustainable performance improvements to the building and operations.		The words "positive impacts" will be changed to positive or negative impacts"	Make changes included in the Response Column	Editorial
EA	EAc6-Com8	Requires benefits calculation methodology	Credit 6 (Documenting Sustainable Building Cost Impacts)	EAc6: Good idea, but not yet ready for prime-time. Without a benefits calculation methodology we're pretty much guaranteeing garbage (in)garbage out and it's not clear whether we're helping or hurting ourselves. I'd table this idea for now, unless you're willing to do the work to make it meaningful.	Include calculation methodology		Add sentence to requirements: "Cost impact reporting needs to include for each prerequisite and credit: first cost, change in annual operating cost, projected net lifecycle cost impact." A template will be provided for inputting the data	Make changes included in the Response Column	Clarification

**Editorial / Clarification Responses Required or Favorable Comments**

Category	Comment #	Issue Summaries	Credit	Likes and Dislikes	Ways To Improve	Language Changes	Responses	Proposed Changes to LEED-EB for Second Comment Draft	Type of Change
EA	EAp1-Com3	Clarification needed	Prereq 1 (Existing Building Commissioning)	This item is essential as it covers all energy and water consumption in the building.	The scope and level of effort isn't clear. Second bullet under Requirements slides "define and implement periodic test procedures...". It doesn't give detail as to what is required but leaves it for the owner to have the work done. I would expect a broad range of responses to this prerequisite.	I don't have any specific language changes. To completely cover this topic would take a large document and since this is a voluntary program, you may not want to make it too difficult, but more detail is needed if this is to be consistent between different buildings and different owners.	Implementation details will be included in the LEED-EB Reference Guide. See response to comment EAp1-Com9	No Change	None

EA	EAp1-Com5	Editorial	Prereq 1 (Existing Building Commissioning)	1. Building Commissioning for existing buildings is an excellent prerequisite for LEED-EB Certification, but the description provided under Requirements may be inadequate. The description is open to broad interpretation and therefore may not satisfy the intent of the prerequisite. It is curious that building or system commissioning is not mentioned at all in the body of the text. Yet, the Basis of Operation (BO) and Owner's Operational Requirements (OOR) are typically established as a result of the commissioning process.	2. Commissioning should be referenced in the body of the text in order to avoid any ambiguity. Additionally, we believe that appropriate reference material for the commissioning process should be included. The AABC Commissioning Guideline, published by the Associated Air Balance Council, has an entire chapter devoted to Commissioning in Existing Buildings (Chapter 7). A reference to this publication would be helpful. "Field Testing" should be required as a means of developing the Basis of Operation by any other means would be unreliable. The two sentences in the second paragraph under Requirements should be in reverse order so they read in a logical sequence. We do not believe the building owner should be allowed to change the Owner's Operational Requirements if the performance does not meet the original requirements. We believe that a new Owner's Operational Requirements and Basis of Operation should be established through the commissioning process. The paragraph in the requirements beginning "Modifying the Owner's Operational Requirements to convey..." at	3. We suggest that the first bullet point under Requirements be revised as follows: "Establish the Owner's Operational Requirements that define functional and performance criteria of the building and its occupants. The Owner's Operational Requirements needs to address the following: building functional and operating requirements, sustainability goals, and ongoing system optimization. The systems of concern typically include heating, cooling, humidification, lighting, water consuming, and facility control systems. Based on the Owner's Operational Requirements, implement a commissioning plan in accordance with the AABC Commissioning Guideline." We suggest the second bullet point be revised to read as follows: "Conduct field testing to develop the Basis of Operation that documents the current operating state of the facility's building or primary systems. Define and implement periodic test procedures that proactively demonstrate that the building and primary systems are operating in accordance with the current Owner's Operational Requirements. Certified, independent professionals shall provide all testing and commissioning services." We suggest that the first sentence	These additional references will be included in the LEED-EB Reference Guide. See response to comment EAp1-Com9	No Change	None
EA	EAp1-Com6	Editorial	Prereq 1 (Existing Building Commissioning)	This is where the operating costs of any building eventually consume more than the total cost of the initial investment of the building. It is very important to be fully covered.	The title of the Prerequisite would be better understood if it were changed to read, "Existing Building Re-Commissioning or Retro-Commissioning." This is the case because after a building has been built and either initially Commissioned or never Commissioned.	In the section on Potential Technologies & Strategies add the wording: "Refer to the ASHRAE, PEEL BUILDING COMMISSIONING ASSOCIATION, AMERICAN AIR BALANCE COUNCIL, OR NATIONAL ENVIRONMENTAL BALANCING BUREAU for technical reference concerning the application of Re-Commissioning and Retro-Commissioning. This is important in order to provide some technical reference sources for the work that is to be accomplished.	These additional references will be included in the LEED-EB Reference Guide. See response to comment EAp1-Com9	No Change	None
EA	EAp1-Com7	Editorial	Prereq 1 (Existing Building Commissioning)	This prerequisite is good. It as it ties back to the overall design intent for the building. The goal is to meet the needs of the OP not the current needs and sustainability. Intent needs to be reworded. Intent: Verify that fundamental building systems and assemblies are performing as intended "to meet current needs and sustainability requirements".	The Owner's Program as defined in ASHRAE Standard Guideline 1 is defined "The document that outlines the owner's overall vision for the facility and expectation of how it will be used and operated. The intent of this prerequisite is to ensure that the building systems meet the Owner's Program. The Owner's Program (OP) by definition must include sustainability requirements. It is the OP that provides direction to the design team, commissioning agents and building maintenance & operation staff."	Change: "to meet current needs and sustainability requirements" to "to meet the Owner's Program".	The objective of commissioning for existing buildings under the LEED-EB is to "Verify that fundamental building systems and assemblies are performing as intended to meet current needs and sustainability requirements."	No Change	None
EA	EAp1-Com8	Clarification needed	Prereq 1 (Existing Building Commissioning)	n/a	n/a	n/a	The issues of repair, upgrades and 5-year implementation plans are all already addressed in the requirements section.	No Change	None
EA	EAp1-Com11	Editorial	Prereq 1 (Existing Building Commissioning)	Note: We have raised 11 issues in this section and provided clarification and suggested improvements for 9 of them in section 2. Section 3 incorporates these suggestions into specific proposed language changes. 1. The pilot version of the RCx prerequisite focused on producing a Building Operation Plan for how the systems should operate. In the draft version, this terminology has changed to "Owner's Operational Requirements". This is a new term, and it needs to be defined more carefully. The level of detail to which these requirements should be defined is very important. A functional and operating requirement that states, "The heating system is required to operate to maintain comfort conditions at minimal energy use" is at one end of the spectrum, and is much different than providing a three page sequence of operation for HOW the system will achieve that requirement. Must the Owner's Operational Requirements include updated sequences of operation? We believe that documenting how the systems operate was a strong attribute of the pilot version, and absolutely essential for persistence of commissioning benefits. Without this documentation, operators	1. Improvements. The RCx prerequisite must deliver an updated sequence of operations at minimum 2. Improvements: Cut "sustainability goals". Replace with "measurable performance goals to ensure the benefits of commissioning persist". 3. Improvements. Be more specific. Provide a plan for addressing ongoing operations for the retrocommissioning process. 4. Improvements: These questions need to be clarified in order to avoid a wide variety in the way the prerequisite is implemented. 5. Improvements: All retrofits must be commissioned to verify that the intended improvements have been correctly implemented. 6. Improvements: Cut "water-consuming" and replace with "process water related to HVAC". 7. Improvements: Cut "basis of operation" and simply ask for what is desired. 8. Improvements: Only allow deferred testing on non-major HVAC systems. Deferred implementation of fixes allows sufficient flexibility for the major HVAC systems. 9. Improvements. None noted 10. Improvements: Incorporated into section 1 discussion 11. Improve	For clarity, we have provided a single recommendation for language changes based on all the previous comments, as shown below. Carry out comprehensive building retrocommissioning, including the following procedures: Develop comprehensive sequences of operation that document how the major HVAC systems in the building should operate. Major systems include: heating, cooling, humidity control, lighting controls, process water related to HVAC, and building automation systems. Investigate the operation of these major HVAC systems to verify that they are working according to the specifications of the comprehensive sequences of operation. Repair, optimize, or upgrade these major HVAC systems where deficiencies are found. All retrofits must be commissioned. Update the sequences of operation, noting where sequences have changed to fix deficiencies. Note deficiencies that have not been corrected at the time of LEED Submittal. Provide a timeline for implementing these repairs within 5 years. All low-cost/no-cost measures must be implemented within the first 2 years. Provide a plan for ongoing recommissioning procedures that addresses the problem areas of t	See response to comment EAp1-Com13	See response to EAp1-Com13	See response to EAp1-Com13

EA	EAp1-Com10	Editorial	Prereq 1 (Existing Building Commissioning)	This prerequisite is important for establishing a clear picture of building expectations and a solid reference point to build improvement plans. It is an excellent first prerequisite for both proponents and reviewers.	The "Owner's Operational Requirements" are the key to many of the credits that follow. It is important that these are written with detail to provide a solid base for requirements.	1. In the first bullet, last sentence under Requirements: either combine "heating, cooling, humidification" to "HVAC operation" OR add "dehumidification, outside air management," to the last. REASON-dehumidification is just as important if not more so than some of the other items noted. Outside air management appears in many places in the next segments regarding both energy conservation and IAQ. This is primarily HVAC operation performance. 2. These "Owner's Operational Requirements" should include standards and/or the sources of standards that need to be met REASON- it is a bit subjective where the proponent for the certification determines accurate criteria and how that criteria will be judged. 3. The "Potential Technologies and Strategies" section in the first "submittal" section add "primarily" before the words "through test results" and "secondarily through" before the word "observations". REASON- observations are important and may vary greatly by individual. Testing whenever possible provides for consistent reporting and clear reporting of conditions. As technology advances, reporting of co	See response to EAp1-Com13	See response to EAp1-Com13	See response to EAp1-Com13
EA	EAp1-Com13	Editorial	Prereq 1 (Existing Building Commissioning)	EAPR1: Three words: War and Peace. Surely we can economize on the language without losing clarity in what we want people to do.			Change Intent to read as follows: INTENT: "Verify and ensure that fundamental building elements and systems are installed, calibrated, and operating as intended so they can deliver functional and efficient performance." Change Requirements to read as follows: REQUIREMENT: 1. Carry out a comprehensive existing building commissioning including the following procedures: 2. Develop a comprehensive building operation plan, that meets the requirements of current building usage, and address the: heating system, cooling system, humidity control system, lighting system, safety systems and the building automation controls. 3. Prepare a commissioning plan for carrying out the testing of all building systems to verify that they are working according to the specifications of the building operation plan. 4. Implement the commissioning plan documenting all the results. 5. Repair or upgrade all systems components that are found to not be working according to the specifications of the building operation plan. 6. Re-test all building components that required repairs or upgrades to verify that they are working according to the specific	Make changes included in the Response Column	Editorial
EA	EAp2-Com3	Editorial and clarification	Prereq 2 (Minimum Energy Performance)		1. For initial certification, clarify how much data (how long of a period) is to be covered in "Summary of annual bills". 2. Clarify how the "annual summary" is to be presented, e.g., monthly data, or total annual numbers. 3. Provide a provision for dealing with companies that do not want to release billing data due to confidentiality or contract issues - there is a good chance this will be an issue for some owners.	1. Change "Summary of annual bills" to "summary of annual data" or "summary of annual billing data". Bills tend to be on a monthly or quarterly basis.	Summary of annual bills means a table of monthly or quarterly energy bills for each type of fuel with annual totals and performance period totals	No Change	None
EA	EAp2-Com5	Clarification needed	Prereq 2 (Minimum Energy Performance)		Please clarify if buildings simply need to meet Energy Star equivalency or actually earn Energy Star rating. We feel the latter would be overly onerous. Is someone at LEED going to review the last 12 months of energy bills submitted by every project seeking LEED EB certification? Are we overwhelming the LEED staff with documentation to review?		The Energy Star calculations and score must be provided. Applying for Energy Star rating and receiving this from the USEPA is not required but encouraged.	No Change	None
EA	EAp2-Com9	Well-written credit	Prereq 2 (Minimum Energy Performance)	EAPR2: Now here's a well-written credit. (Not that there aren't others, but the contrast in clarity and conciseness is so stark with EAPR1 that I couldn't resist.)			OK	No Change	None
EA	EAp3-Com1	Editorial	Prereq 3 (CFC Reduction in HVAC&R Equipment)	Typo at the end of the first paragraph. Should be "its refrigerant charge," no it	it	its	Make the suggested editorial changes	Make proposed editorial change	Editorial
EA	EAp3-Com4	Editorial	Prereq 3 (CFC Reduction in HVAC&R Equipment)	satisfactory	no comments	check the wording and spelling in the Requirements section: energy "that" needs to be added leagake" needs to be added	Make the suggested editorial changes	Make proposed editorial change	Editorial
EA	EAp3-Com7	Editorial	Prereq 3 (CFC Reduction in HVAC&R Equipment)	EAPR3: "Definition of the required economic analysis..." should be in the RG. Check for grammar.	EAPR3: "Definition of the required economic analysis..." should be in the RG. Check for grammar.	Include the definition of the required economic analysis..." in the RG. Check for grammar.	Make the suggested editorial changes and check for grammar	Make proposed editorial change	Editorial
EA	EAc1-Com4	Clarification needed	Credit 1 (Optimize Energy Performance)		Please clarify if buildings simply need to meet Energy Star equivalency or actually earn Energy Star rating. We feel the latter would be overly onerous.		See response to comment EAp2-Com5	See response to comment EAp2-Com5	See response to comment EAp2-Com5
EA	EAc2-Com2	Clarification needed	Credit 2 (Onsite and Offsite Renewable Energy)	If one were to do both on site renewable energy and purchase of offsite renewable energy. How would it be treated. Example: A building installs PV panels to meet 10% (2 points) and then purchases Renewable energy certificates to 50% of the buildings load (2 points). Would they get 4 credits? I believe they should.	See above	See above	Yes. Clarification will be added to make this clear	Make proposed editorial change	Editorial
EA	EAc2-Com3	Clarification needed	Credit 2 (Onsite and Offsite Renewable Energy)	Good idea	Is this easy points for facilities that are in an area that is served by hydro-electric power? Low-impact hydro sources is the criteria in the second paragraph under Potential Technologies and Strategies. Is that term defined anywhere?	See item 2.	See response to comment EAc2-Com4	No Change	None
EA	EAc2-Com4	Clarification needed	Credit 2 (Onsite and Offsite Renewable Energy)	1. It is unclear if this credit is focused on the generation of electricity from renewable energy sources. Many of the items seem to imply that is the intent, but it is not clearly stated. What about renewable fuel sources that displace on-site fossil fuels? This should be clarified. 2. Environmental attributes are not allowed to be traded. This mechanism provides owners a potential method of improving project economics and can often make the project economically viable.	1. provide clarification on how the % of energy use is to be calculated (perhaps this is in reference guide?). For example is it total energy in BTU for the building (gas, steam, oil, electricity, etc)? Is electricity in BTU to be source or site energy? Is supposed to be amount of electricity generated on site and/or purchased from certified renewable sources compared against total building electric consumption?	1. Is the credit intent really only to reduce fossil use, what about electricity generated from nuclear plants? If the power sources in a particular area are not fossil based, does a project not qualify?	Low impact hydro is defined by Center for Resource Solutions (CRS) Green-e certification program. Offsite renewable energy and renewable energy environmental attributes must meet the standards of the requirements of the Green-e certification program but these do not need to be Green-e certified.	No Change	None
EA	EAc2-Com12	Editorial	Credit 2 (Onsite and Offsite Renewable Energy)	EAc2-12.4: Much of the requirement language belongs in the RG. Let's try and tighten.	Move requirement language to RG	None	Move the following sentence from requirements to LEED-EB Reference Guide: "Green power may be procured from a Green-e certified power marketer, a Green-e accredited utility program, or through Green-e certified Tradable Renewable Certificates."	Make proposed editorial change	Editorial
EA	EAc2-Com5	Editorial	Credit 2 (Onsite and Offsite Renewable Energy)	Satisfactory	no comments	check misspelled word in last sentence of Potential Technologies & Strategies last sentence should have the word "your" instead of "you" electric utility	Make the suggested editorial changes	Make proposed editorial change	Editorial

EA	EAc3.1-Com2	Clarification needed		Credit 3.1 (Building Operation & Maintenance, Staff Education)	good credit - ongoing training is critical	clarify if there are requirements for certification/accreditation of training provided. Can the training be provided by in house staff?		Training can be provided by internal staff or external sources. This will be noted in the LEED-EB reference Guide.	No Change	None
EA	EAc3.1-Com3	Clarification needed		Credit 3.1 (Building Operation & Maintenance, Staff Education)	This credit needs further definition so it does not become excessively burdensome. This tends to work for office buildings and other building of this type but for other types of buildings it is too broad. As an example, a manufacturing plant has building operation and maintenance staff. However, most of this staff is working on production equipment and not the building and its systems, specifically energy usage of the building. This is normally specifically assigned to individuals that have this responsibility. At the same time, 30 hours a year of training will generate a very redundant program not gaining what is being sought. This technology does not change that fast.	Requirements should state that those individuals working in this area be identified and this list is to be updated a minimum on once a year. Those in the program are required 20 hours of training a year. Anyone new joining this staff is required 30 hours of training their first year.	Requirements: Have in place over the performance period a building operation and maintenance staff education program that identifies those individuals that are responsible to carryout this task and updates this list a minimum of once a year. Those individuals will receive at least 20 hours of education each year over the performance period on building and building systems operation, maintenance, and achieving sustainable building performance. Anyone new joining this staff is required 30 hours of training their first year on the team.	See response to comment EAc3.1-Com8	See response to comment EAc3.1-Com8	See response to comment EAc3.1-Com8
EA	EAc3.1-Com4	Clarification needed		Credit 3.1 (Building Operation & Maintenance, Staff Education)	Very good credit concept for existing buildings.	Clarify minimum standards for training (e.g. do they need to be organized courses taken off-site?)	-	See response to comment EAc3.1-Com2	See response to comment EAc3.1-Com2	See response to comment EAc3.1-Com2
EA	EAc3.1-Com5	Clarification needed		Credit 3.1 (Building Operation & Maintenance, Staff Education)	The credit requirements may be too vague. The types and/or categories and/or subjects of education should be specified. (HVAC operation, janitorial and hygiene, light and energy...). No detail defining what type of "qualified professional" who can educate the group opens the value of the education (and the credit) to question. Although even more difficult, an attempt to define the roles (generally of those considered "building operation and maintenance staff" will make it more clear for proponents to properly budget for this credit. Finally, there is no provision to diversify the education over several subjects: a certain percentage of "re-education" could be a limiting factor.	Education is an important part of an effective overall approach and it needs to be effective to meet the intent of this section.	none	See response to comment EAc3.1-Com8 and EAc3.1-Com2	See response to comment EAc3.1-Com8 and EAc3.1-Com2	See response to comment EAc3.1-Com8 and EAc3.1-Com2
EA	EAc3.1-Com6	Editorial		Credit 3.1 (Building Operation & Maintenance, Staff Education)	These comments are submitted collectively by the following individuals and organizations: Cynthia Putnam, Northwest Energy Efficiency Council; Jim Rutherford, Northwest Energy Efficiency Partnerships, Inc. Peggy Reins, Midwest Energy Efficiency Alliance Brenda Jessen, Energy Center of Wisconsin Roger Ebbage and Brian Herndon, Northwest Energy Education Institute; Joel Newman, Sacramento Municipal Utility District; Category: Energy and Atmosphere Credit: 3.1 Building Operation & Maintenance: Staff Education We commend the USGBC LEED-EB committees for incorporating this credit, 3.1, into the current LEED EB draft, Updated February 23, 2004. We submitted comments on the previous draft, LEED EB, Version 2.0, recommending an operator training credit. We believe this credit is important to the sustainability of existing buildings because it supports the intent of the EA Credit 1, to achieve increasing levels of energy performance above the prerequisite "by ensuring operations and maintenance staff have the skills and knowledge to properly maintain energy-using equipment and to optimize equipment operation in support of the building perfor	We believe this credit could be improved by specifying a general set of learning objectives that comprise an effective staff education program to support achievement of the building performance goals. Learning objectives offer users of the rating system a framework for shaping a course of study to address individual staff education needs in support of sustaining building performance. Suggested learning objectives are offered in Item 3, under specific language changes.	We would propose supplementing the existing language in the REQUIREMENTS and TECHNOLOGIES AND STRATEGIES sections to offer the following clarifications: REQUIREMENTS (proposed language) An effective education program for facilities operators and maintenance personnel must address, at a minimum, the following learning objectives. Upon completion of staff education, participants must be able to: - Explain the Owners Operating Requirements for the building and the Basis of Operation documents. - Interpret the building's Energy Star score or energy consumption index. - Define operation and maintenance requirements of the energy-using systems and equipment in the building. - Implement the building's best practice operation and maintenance plan to sustain energy performance. - Implement components of the building's best practice operation and maintenance plan to achieve energy and operational savings. POTENTIAL TECHNOLOGIES & STRATEGIES (proposed language) Topics for staff education might include, but are not limited to, the following: Energy Conservation Strategies HVAC Systems; Maintenance Programs HVAC Systems; C	Types of training will be addressed in the LEED-EB Reference Guide	No Change	None
EA	EAc3.1-Com7	Editorial		Credit 3.1 (Building Operation & Maintenance, Staff Education)	This credit has been added since the pilot version, and we agree that it is a very worthwhile and appropriate credit. The staff at our pilot LEED-EB project would greatly benefit from a training program, and in fact, they ask for more training.	The language of this credit needs copy editing. The word "building" is used too much, and the sentences are awkwardly constructed. The most valuable training for most operators is on-site troubleshooting training from a skilled controls technician - this could be added as "Potential Technologies & Strategies".	See above comments	See response to comment EAc3.1-Com6	See response to comment EAc3.1-Com6	See response to comment EAc3.1-Com6
EA	EAc3.2-Com2	Editorial		Credit 3.2 (Building Operation & Maintenance, Building Systems Maintenance)	good credit - preventative maintenance systems are critical to ensuring long term performance	don't like use of "post warranty" maintenance.	suggest using "manufacturer's recommended" maintenance in place of post warranty.	The words "manufacturer's recommended maintenance" will be used in place of "post warranty maintenance".	Make proposed editorial change	Editorial
EA	EAc3.2-Com4	Clarification needed		Credit 3.2 (Building Operation & Maintenance, Building Systems Maintenance)	-	Please clarify difference between "Best Practices Equipment Maintenance Program" and typical maintenance regimen.	-	A detailed description of best practices preventative maintenance program will be provided in the LEED-EB Reference Guide	No Change	None
EA	EAc3.2-Com6	Clarification needed		Credit 3.2 (Building Operation & Maintenance, Building Systems Maintenance)	The intent of this credit works well with the sustainable operational goals set forth by LEED-EB. However the requirements and implementation strategies are not detailed enough.	Put more specifics on the extent of monitoring required to create a credit that helps building performance persist after retrocommissioning. It would be appropriate to ask the facility staff to monitor the 10 most significant issues identified during the retrocommissioning process. Alarms need to go beyond traditional maintenance and safety alarms such as plugged filters, high static cut-out, or fan status. The alarms added to comply with this credit could be: - chiller cycling - if the preheat coil and cooling coil are active simultaneously - when a VAV box calls for 100% flow for greater than 2 hours. Documenting performance should entail providing documentation of alarms and an operator's log for how alarms were responded to. Asking for the % of time that desired conditions are delivered is too onerous. To track both occupant conditions and operating conditions, the credit could require that the # of work orders related to alarms be tracked as well as the # of complaint calls.	See above comments	See response to comment EAc3.2-Com4	See response to comment EAc3.2-Com4	See response to comment EAc3.2-Com4
EA	EAc3.3-Com5	Clarification needed		Credit 3.3 (Building Operation & Maintenance, Building Systems Maintenance)	Note: We are commenting on EA Credit 3.3 Building Systems Monitoring in the Public Comment Version. The intent of this credit is very important. The general structure of requiring a continuous monitoring system, alarms, a system for repairs, and documentation of alarms that occur is good. The main issues we see are: - The need for more language describing the extent of monitoring required. Do all zones need to be monitored? All major pieces of equipment and control functions? Without some direction, this credit is a question mark. - Acknowledgment that required alarms relate to system operations and comfort, not just maintenance. - Without an expensive programming addition, it is not clear how facilities will document the % of time desired conditions are delivered in the building on a floor area weighted basis. Furthermore, do "desired conditions" only refer to zone comfort conditions, or for desired system performance as well? What is the threshold for acceptability? If this metric is only intended for monitoring comfort conditions, then we are back to the way buildings are currently run - as long as everything is comfortable, everything is ok.	Put more specifics on the extent of monitoring required to create a credit that helps building performance persist after retrocommissioning. It would be appropriate to ask the facility staff to monitor the 10 most significant issues identified during the retrocommissioning process. Alarms need to go beyond traditional maintenance and safety alarms such as plugged filters, high static cut-out, or fan status. The alarms added to comply with this credit could be: - chiller cycling - if the preheat coil and cooling coil are active simultaneously - when a VAV box calls for 100% flow for greater than 2 hours. Documenting performance should entail providing documentation of alarms and an operator's log for how alarms were responded to. Asking for the % of time that desired conditions are delivered is too onerous. To track both occupant conditions and operating conditions, the credit could require that the # of work orders related to alarms be tracked as well as the # of complaint calls.	See comments above	This credit addresses continuous monitoring of both system equipment performance and of the indoor environmental conditions delivered. The details of implementation will be addressed in the LEED-EB reference guide.	No Change	None
EA	EAc3.3-Com6	Editorial		Credit 3.3 (Building Operation & Maintenance, Building Systems Maintenance)	1) In the response to Group 14 Question (EBP-G14-EA-C3-Q#1) the answer might be expanded to include words to the effect that the monitoring of CO2 is included so that feedback on ventilation performance is provided so that this important building function can be managed effectively over time by making sure that the intended amount of ventilation is provided without wasting energy in achieving this goal	Make language changes	Include words to the effect that the monitoring of CO2 is included so that feedback on ventilation performance is provided so that this important building function can be managed effectively over time by making sure that the intended amount of ventilation is provided without wasting energy in achieving this goal.	Add to requirement after "space conditions" the words: (temperature, humidity, and co2) Add to requirement before "equipment" the word: "major"	Make changes included in the Response Column	Clarification
EA	EAc4-Com2	Editorial		Credit 4 (Additional Ozone Protection)	Shows a retrofit from CFC-11 to HCFC-123, it doesn't show a similar thing to go from CFC-12 or CFC-500 to HFC-134a	It should reflect a retrofit from CFC-12 or CFC-500 to HFC-134a along with the CFC-11 to HCFC-123. Many CFC-12 or CFC-500 chillers have been retrofits to HFC-134a.	Provide documentation that all existing base cooling equipment for the building that used CFC-11, CFC-12 or CFC-500 have had this refrigerant replaced with HCFC-123 or HFC-134a.	Encouragement to consider replacement of CFC-12 or CFC-500 refrigerants with HCFC-123 or HFC-134a will be added to the LEED-EB Reference Guide.	No Change	None

EA	EAc4-Com12	Editorial	Credit 4 (Additional Ozone Protection)	I feel the LEED-EB EA credit 4 advocates the balance between Ozone depletion(ODP) of HCFC's and Global warming Potential(GWP). As in the case with the use of refrigerant R-123, it has (of the commonly utilized refrigerants today) the lowest GWP at 53 of all refrigerants along with an extremely small ODP of .02. After over ten years as a refrigeration service technician and 30 years later as a application engineer PE in the HVAC industry, I can confidently state that the high majority of air conditioning systems today rarely leak like in the old days. Thus, with the addition of limits of 3% emissions of charge/year using EPA rule 608 and certain lifetime leakage limits such as 25% maximum leakage over the life of the equipment, superior energy efficient refrigerant systems utilizing HCFC & HFC's for example promote environmentally sustainable concepts by minimizing power plant GWP while saving energy in buildings. Lastly, as an refrigeration mechanic, the thought of HFC blends with zeotropes and azeotropes not allowing an AC system to be topped with 1/2 or 1 lb. every couple years scares me. In my mind looking at all the issues from zero ODP Montreal protocol is	To help encourage the use of new or existing environmentally sustainable chemicals used as refrigerants, language permitting very low ODP and GWP refrigerants with limits similarly as stated above for minimizing leakages should be considered. I endorse wording that advocates refrigerant in a sealed vessel with low leakage attributes, does not have a direct affect on the environment.	LEED Reference guide 2.0 states: Base building level HVAC and refrigeration equipment and fire suppression systems that DO NOT contain HCFC's or Halon, HCFC's and HFC equipment having efficiency levels below (xxxxxx) could be stated as part of the LEED rating as does ASHRAE 90.1 charts. With the addition of limits of 3% emissions of charge/year using EPA rule 608 and certain lifetime leakage limits such as 25% maximum leakage over the life of the equipment, superior energy efficient refrigerant systems would be promoted.	See response to comment EAc4-Com8	No Change	None
EA	EAc4-Com15	Editorial	Credit 4 (Additional Ozone Protection)	This credit is consistent with the preliminary Technical Scientific Advisory Committee (TSAC) report, which sets out to balance the considerations of ozone depletion, global warming and energy efficiency. Additionally, this credit recognizes that as long as a refrigerant is contained in the vessel, then it does not harm the environment.	The central focus of this credit should be to minimize refrigerant escape to the atmosphere, rather than selecting certain refrigerants.	Change Heading to be "Sustainable Environmental Protection" Change Intent to: "Minimize refrigerant emissions from HVAC and refrigeration systems." Delete the first sentence under "Requirements." Change the Potential Technologies & Strategies to: "Implement policies and procedures to comply with Title VI, Rule 608 of the EPA Clean Air Act including personnel training." Delete the first item under "Submittals for initial and re-certification."	See response to comment EAc4-Com8	No Change	None
EA	EAc4-Com16	Editorial	Credit 4 (Additional Ozone Protection)	--	--	Consider maintaining LEED NC name for this credit for consistency under the LEED brand.	The name for this credit "Additional Ozone Protection" is clearer since it represents additional action beyond what is done for EA prerequisite 3.	No Change	None
EA	EAc4-Com18	Clarification needed	Credit 4 (Additional Ozone Protection)	There appears to be a discrepancy between the Requirements and the Submittals of this credit. The first and second line of the requirements read as if both are required to earn this credit while the submittal requirements separate the two as alternative compliance methods. This needs to be clarified.	We feel that separating them as two alternative compliance methods does not meet the intent of this credit. The first and second alternatives should be combined into one alternative leaving in place the third option.	(see above)	Change first sentence of requirements to: "Do not operate base building HVAC, refrigeration or fire suppression systems that contain CFCs, HCFCs or Halons. OR"	Make changes included in Response Column	Clarification
EA	EAc5.1-5.3-Com3	Clarification needed	Credit 5.1-5.3 (Performance Measurement, Enhanced Metering)	good idea	The requirement is a little confusing. It states that one point can be obtained for each 4 actions implemented/maintained. Does that mean if boiler efficiency is tracked in four separate boilers that one point is awarded or do four separate systems have to be included, and if boiler efficiency is the item does it have to be improved or just monitored? Can items not on the list, such as peak power demand limiting be used?	see item 2	To qualify an action needs to cover all the equipment of each type - For example metering the water to each of the cooling towers would qualify as one action. This will be clarified in the LEED-EB Reference Guide.	No Change	None
EA	EAc5.1-5.3-Com6	Editorial and clarification	Credit 5.1-5.3 (Performance Measurement, Enhanced Metering)	Satisfactory	Define the frequency of "continuous" to mean a specific number, such as every minute, hour, four hours, day, month, the frequency could be somewhat different for each kind of performance measured. The Hewlett Packard chip facility in Loveland CO might be a good source for an example of a far out data collection system For more information check with AEE in one of their old publications.	change the performance reporting requirement from one day to one week. This would provide a view over the 24 hour period as well as the week period of performance.	Continuously means at least one every 15 minutes. This will be clarified in the LEED-EB Reference Guide.	No Change	None
EA	EAc5.1-5.3-Com8a	Clarification needed	Credit 5.1-5.3 (Performance Measurement, Enhanced Metering)	n/a	n/a	I find the wording used under the requirement heading to be confusing. Specifically the words "... Separate building electric meters that allow aggregation of all process loads." It is not clear if you are asking for one building meter which has all aggregated loads metered at one point, or whether you want multiple meters such that specific loads can be definitively tracked? Based upon my experience with trended data and energy use, the usefulness of the metered data increases as you meter further into subsystems with less systems aggregated. This is why I am confused about your wording because less aggregation is better.	Yes submetering is a good thing. The point here is to be able add up all the process load metering results so that the total process loads can be separated from the other buildings loads.	No Change	None
EA	EAc5.1-5.3-Com8b	Clarification needed	Credit 5.1-5.3 (Performance Measurement, Enhanced Metering)	Finally under Submittals - "Provide quarterly reports ..." Does this mean that meters must have already been in place when the application for LEED EB certification is submitted or does the performance period and metering begin at the time of LEED EB initial certification?	n/a	Also there seems to be a need to reword some of the other text. For example you ask for "Variable Frequency Drive (VFD)operation." Since most buildings do not have only one VFD don't you mean "Operation of all variable frequency drives," and rather than "boiler efficiencies" don't you mean "Efficiencies of all boilers"?	See response to comment Gen-Com1	No Change	None
EA	EAc5.1-5.3-Com9	Editorial and clarification	Credit 5.1-5.3 (Performance Measurement, Enhanced Metering)	--	Is it acceptable to meter only a representative sample of listed items like lighting?	Consider maintaining LEED NC name for this credit for consistency under the LEED brand.	See response to comment EAc5.1-5.3-Com2	No Change	None
EA	EAc5.1-5.3-Com12	Clarification needed	Credit 5.1-5.3 (Performance Measurement, Enhanced Metering)	Ø Which of these items in the list are best included together in an on-going metering program? (Which most effectively combine in practice?) Are there standards for developing on-going metering systems, and are they included in the LEED-EB Reference Guide?	--	--	Information about metering will be provided in the LEED-EB Reference Guide.	No Change	None
EA	EAc5.4-Com1	Clarification needed	Credit 5.4 (Performance Measurement, Emission Reduction Reporting)	Has market research been done for this point? What percentage of the US gets credit for reporting emissions credits? In the Rocky Mountain Region it is uncommon.	--	--	There are many voluntary emission reduction reporting programs around the country for various types of emission reductions. Some are national and some have a regional or state focus	No Change	None
EA	EAc5.4-Com4	Editorial	Credit 5.4 (Performance Measurement, Emission Reduction Reporting)	Satisfactory	no comments	in the Requirement section check the word "good" and see if it should be "goods" and services	Make the suggested editorial changes	Make proposed editorial change	Editorial
EA	EAc5.4-Com7	Provide examples of suitable third party voluntary certification programs	Credit 5.4 (Performance Measurement, Emission Reduction Reporting)	--	Can you list some examples of suitable third party voluntary certification programs? May be too much to ask building managers to ask the same of their suppliers.	--	Asking suppliers to report emission reductions has not been a problem for certified projects. A list of organizations that provide third party emission reduction reporting, certification and retirement will be included in the LEED-EB Reference Guide.	No Change	None
EA	EAc5.4-Com10	Clarification needed	Credit 5.4 (Performance Measurement, Emission Reduction Reporting)	EA5.4: NRDC does not support this kind of reporting because it give a false impression of what's been accomplished, given the realities of the flaws in the inventories, reporting and the lack of reality of the so-called retirements. I don't know if it's sufficient to trigger a negative from us, but it's a death-helld position by some.  That issue aside, the wording is complex and nearly impenetrable in paragraph form. Let's let some daylight in by breaking up into bullet points.	--	--	The requirements will be broken up in to a list of bullet points	Make proposed editorial change	Editorial

EA	EAc6-Com7	Vague	<p>Credit 6 (Documenting Sustainable Building Cost Impacts)</p>	<p>Ⓜ How does this credit fit into Energy &amp; Atmosphere? This is very vague.  Ⓜ Perhaps it would be useful to note the benefits of building cost impact research to improving building/user performance and environmental/user health, etc. Explain how records of building cost impacts will be used toward meeting the goals of green building.  Ⓜ Perhaps it will be useful for LEED-EB users of this credit to simplify their operating costs reporting to include general operating costs pre-, during-, and post-LEED EB renovations/retrofits. Include measures for differentiating "sustainable" building improvements from "non-sustainable" ones in Reference Manual documentation, to assist in this process.</p>			<p>See responses to credits EAc6-Com2, Ac6-Com, Ac6-Com5, and Ac6-Com8</p>	No Change	None
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