LEED v4.1 Fact Sheet

LEED v4.1 for Building Operations and Maintenance

The U.S. Green Building Council (USGBC) has released a first draft of LEED v4.1 for Building Operations and Maintenance (LEED O+M). If approved by the members, this new set of rating systems will represent a radical shift in how LEED measures the performance of existing buildings.

The backbone of the new rating systems is a set of performance-driven prerequisites based on actual data. These prerequisites are:

- Transportation Performance
- Water Performance
- Energy Performance
- Waste Performance
- Indoor Environmental Quality Performance

Together, these prerequisites make up 90 of the 100 points available—changing the structure of the rating systems such that prerequisites come with points. Energy Performance, for example, gets you from one to 33 points, depending on your energy score.

Here's a summary of some of the other big changes.

Overarching Modifications

First of all, there's a completely new rating system here—LEED O+M: Interiors. So tenants with sub-metered data can now get in on the "existing buildings" action. A bunch of rating systems have gone away, too, like the separate systems for Schools, Retail, Data Centers, etc.

Regional Priority credits no longer exist, nor can you achieve Exemplary Performance anymore. The Innovation category offers only one point.

The process itself is working a little differently this time, too. The draft rating system will go into a "beta test" period, with users offering feedback on the rating systems before public comments open.

What's Arc?

Perhaps the biggest change to the O+M rating systems is how scores (and thus points) get tallied. Most of the points are based on actual

performance, and data gets entered into LEED Online, just like usual. But LEED Online isn't the same anymore. Now it's connected in the background to the Arc platform.

Arc is the work of USGBC's and GBCI's for-profit subsidiary, Arc Skoru. It's also the back end of the LEED Dynamic Plaque. The basic idea is that your project data get benchmarked against the data of similar buildings and scored based on your relative performance.

Location & Transportation: Survey Says … ?

There was only one LT credit before, and now it's become a prerequisite and gotten a new name: Transportation Performance.

The score is based on results of the transportation survey. You need a minimum score of 40, which earns you six points out of a possible 14. Note that your transportation performance score is now based on CO_2e emissions, rather than a percentage reduction in conventional commuting trips. This means you'll need to ask occupants about commute distances in addition to mode(s) of transit.

Sustainable Sites: Reduced to 4 Points

The Sustainable Sites category is taking a big hit. One prerequisite and one credit have gone away (plus two more credits from the Schools rating system), and point totals have been reduced dramatically. So what's staying?

Light Pollution Reduction and Rainwater Management are relatively unscathed. There are some pretty hefty clarifications to Heat Island Reduction, and Site Management is also getting an overhaul.

Unlike in the other categories, there is no performance prerequisite for Sustainable Sites.

Water Efficiency: All Performance All the Time

The Water Efficiency category has changed radically: all credits and prerequisites are completely gone except the Water Performance metric. At the same time, the relative weight of the WE category is going up to 15 points.

As with the other performance-based points, the Water Performance score is produced in the background by the Arc platform when you enter your water data into LEED Online.

Energy & Atmosphere: Goodbye, Portfolio Manager

Although the EA category retains a few more perquisites and credits, the basic idea is the same as with Water Efficiency. This is all about real,

metered data now—as scored in Arc. That means you are now benchmarking against USGBC's dataset rather than against CBECS (the federal-government-supported dataset behind Energy Star Portfolio Manager). And for the first time, it's looking directly at greenhouse gas emissions alongside energy use.

Commissioning and metering credits are gone, along with Renewable Energy and Carbon Offsets. Demand Response has a new name: Grid Harmonization.

Materials & Resources: Getting a Purchase

In the MR category, all purchasing credits are getting overhauled. Waste has been separated out because that's now taken care of in the Waste Performance score—which, again, is getting calculated through Arc.

Indoor Environmental Quality: Big Bump

EQ is seeing the biggest jump in total points allotted, from 17 to 23. At the same time, a lot of credits have been removed, with the idea that the rubber meets the road in the Indoor Environmental Quality Performance score.

Although old standbys like Thermal Comfort and Daylight and Quality Views are gone, these issues are not necessarily directly addressed in the new prerequisite. Projects can choose between an occupant satisfaction survey and an indoor air quality assessment to get a "human experience score" and earn eight to 20 points. But you have a better chance of getting a higher score if you do both the survey and the air quality assessment.

For the Minimum Indoor Air Quality prerequisite, the referenced standard has been updated from the 2010 version of ASHRAE 62.1 to the 2016 version.

LEED v4.1 for New Construction and Tenant Fit-Outs

LEED v4.1 for Building Design and Construction (BD+C) and Interior Design and Construction (ID+C) opened for beta registration on January 22, 2019. Here's a rundown of the biggest changes compared with v4.

Integrative Design Process

The IDP credit structure has changed. Now there are five areas of investigation, of which teams must choose two: Energy Performance, Water Performance, Site Selection, Social Equity, and Health & Wellbeing. Documentation has also changed; the credit now calls for a "project team letter" signed by all the principal project team members.

Access to Quality Transit

One major change in this credit is that there is now only one table for calculating points based on the number of trips, rather than one for multiple transit options and one for rail and ferry. In addition, there are now five thresholds in that table to earn five different point options. The minimum number of weekday trips still starts at 72, and the maximum is still 360, but there are also new thresholds for 100, 144, and 250. In addition, a trip no longer needs to go in two directions to count, and in calculating weekend trips, you can now just count the day with the highest number of trips. This is a big deal for those projects that had bus service that ran at a significantly reduced rate on Sundays.

For those projects that have only commuter rail or ferry service, the effective minimum number of trips has increased significantly, from 24 to 72, but this may be appropriate if one considers all transit trips to be equal.

In addition, private shuttles and other forms of project-sponsored transportation are now a permitted pathway under certain circumstances.

Reduced Parking Footprint

There are new options to earn the one point available for this credit. The Option 1, No Parking or Reduce Parking, allows a new "no parking" pathway for achievement. Option 2, Car-share, awards a point for dedicating car-share parking spots totaling at least 1% of the parking footprint. Lastly, Option 3: Unbundling Parking also allows projects to earn a point by leasing parking separately from residential units or office space. This means that projects may design buildings to have a market- or code-driven number of parking spots, but have the option to earn a point by unbundling or encouraging car sharing.

Electric Vehicles

The Green Vehicle credit in v4 is replaced with a new Electric Vehicles credit in 4.1. Designating spots for green vehicles is removed (i.e., no more parking spaces for hybrids), and the credit now consists of two options: Option 1: EV Chargers (Level 2 chargers) for 5% of parking spaces or with a minimum of two stations; Option 2: EV Ready: Electric Vehicle Charging Infrastructure (Raceway / Conduit) for 10% of parking spaces or a minimum of six total spaces. This latter option should be a great way to encourage future tenants to install the car charging option they want without imposing the cost of those charges on the developer.

Rainwater Management

There are two important changes to this credit. The first is that the term "manage" in v4, which was ambiguous and confusing, is replaced with "retain (i.e. infiltrate, evapotranspirate, or collect and reuse)," which is much clearer, even if it continues to emphasize quantity and doesn't provide for water-quality measures that don't explicitly retain. The second change is that the thresholds for retaining rainwater have been reduced, where the lowest threshold is now the 80th percentile rainfall event as opposed to the 95th event (e.g., in Denver that's 0.6" instead of 1.1" of rain), and the highest is now the 90th instead of the 98th. Similarly, the thresholds for zero-lot-line projects also decreased. These changes may seem small, but they are very significant, and it means that the credit is now far more accessible that it had been under v4.

Cooling Tower and Process Water Use

This credit has two new options that broaden the credit's scope, and the new credit title reflects that ('Process Water Use' is new). Option 1 is mostly the same as the v4 version of the Cooling Tower Water Use credit, while Option 2 now gives credit for "optimizing" water use, including not having a cooling tower (if the baseline system would have had one). For instance, if a large office building which has System 7 or 8 as the baseline uses an air source VRF system, it easily achieves two points in the credit for elimination of cooling tower water use. The other addition to the credit is Option 3: Process Water Use, which allows projects to achieve 1 or 2 points if they use recycled water for process water uses.

Minimum Energy Performance & Optimize Energy Performance

This credit has a number of significant changes. One of the biggest changes is that the baseline ratchets up to ASHRAE 2016. According to the Pacific Northwest National Laboratory, the 2016 version drives an 8.2% increase over 2013, which in turn improved over 2010—the LEED v4 baseline—by 8.7%. This means that LEED is likely now ahead of most local

energy codes, at least for the time being. This also means that it's going to be much harder to earn points in this credit than under v4. But that is probably appropriate since many projects were earning points just by meeting code.

In addition, in a major shift in the way we think "building energy performance," energy points under Optimize Energy Performance are now awarded in part based on annual energy cost reductions (which has been the case since LEED began, and is also the case for most performance-based codes), but also in part based on annual greenhouse gas (GHG) reductions. There are two tables of points corresponding to each. This means that if a project shifts gas usage to electricity (e.g. in most heat-pump applications), this may increase GHG emissions in a low-GHG-intense grid environment, and potentially raise GHG emissions in a grid that is still coal dominated. This will mean that LEED project teams will now have to become better acquainted with the GHG impacts of their projects, and not just assume that energy and operating carbon automatically correlate.

In addition, onsite renewable energy may be subtracted from the total annual energy use in the annual energy cost calculation. However, also, the GHG impacts of new offsite renewable energy (see the Renewable Energy credit) may be subtracted. So in the end, while the baseline is higher and points may be more difficult to achieve in the traditional annual energy cost pathway, there may be opportunities to make up for this by entering into a PPA for new offsite renewables to offset total GHG emissions.

Lastly, Optimize Energy Performance now requires that projects develop an energy performance target is Schematic Design, taking the integrated design credit of v4 and just requiring the analysis to establish an early-phase target.

Renewable Energy

One of the most important improvements in v4.1 is the updated treatment of renewable energy. First, the unit of measure is now reduction in GHG emissions, not annual energy cost (continuing the same pattern as with Optimize Energy Performance). Next, the v4 Green Power credit has been removed from v4.1 and replaced with an offsite renewable energy option that lives within the new Renewable Energy credit. The new credit is therefore about balancing onsite and offsite renewable energy. Offsite options, via power purchase agreements (PPAs) are further broken down into new and existing offsite renewables, where new offsite resources are worth more than existing offsite resources. Onsite resources, as expected, are valued the highest of all.

One can still purchase RECs (or Energy Attribute Credits) or carbon offsets, and three points are available, but much higher thresholds are now imposed, making this a less attractive option than under v4. Also to qualify, existing off-site renewables, Energy Attribute Credits (RECs), and carbon offsets must be procured from projects that have come online or been built within the last 15 years.

This means that all projects should now be thinking about the procurement options for their energy supply, and sourcing any supply that can't be produced from onsite renewables from offsite renewables via PPAs—and ideally from new offsite renewable developments.

Projects that do not have the ability or simply choose not to include any onsite renewables can still earn points for procuring offsite renewable energy. All five points may be earned for new offsite PPAs, and three points may be earned for existing offsite PPAs or RECs.

Grid Harmonization

The v4 Demand Response (DR) credit has gone away and has been replaced with a much broader and better written approach to turning buildings into utility resources. It still has the previous DR option, but now includes Case 3: Load Flexibility and Management Strategies, which is about load shaping relative to grid constraints. This means that project teams will have to become aware of what the grid is doing and encourage projects to utilize storage or demand response to adjust to those grid conditions. This credit will become increasingly important as a means of addressing grid resilience in the age of renewables, especially in those places that are already starting to see high-level renewable energy penetration, providing guidance for buildings to deploy renewable energy, demand response, and storage in a way that creates benefit beyond the building.

Building Life-Cycle Impact Reduction

Some of biggest changes in 4.1 are simple restorations of popular options and pathways from LEED 2009. The new "Path 2" in Building Life-Cycle Impact Reduction is a good example of that, reintroducing the LEED 2009 language about reusing existing building structure and skin (Path 1), and existing interior elements (Path 2). While the calculation methods are familiar from the old LEED, the thresholds in 4.1 are lower, making these points easier to achieve than they used to be.

The other big change in this credit is to Option 4: Whole-Building LCA, which now has several additional paths. Two of these new paths are stepping stones, creating an easier entry point for those encountering

whole-building LCA for the first time. There is now one point, for example, for just doing an LCA study, regardless of the results.

There is also a new Path 4 that assigns the most points (four) to a solution that offers the most significant reduction in embodied carbon.

EPDs, Sourcing of Raw Materials, and Material Ingredients

Each of the three "BPDO" credits in v4 had one option that was relatively achievable (for most projects) and one that was distinctly out of reach. ("Building Product Disclosure and Optimization" has been removed from the credit names.) Those are all fixed now: all six points in these three credits should be doable for most projects, at least in countries where environmental product declarations (EPDs) and ingredient transparency reporting are widely available.

The previously achievable options are now even more consistently achievable: getting to 20 products with EPDs or Health Product Declarations (HPDs) was doable for a typical whole building but daunting for a tenant fit-out or warehouse that used only a small selection of products. Those simpler project types now need only ten products from three manufacturers.

The previously unachievable Options 2 in each of those credits are completely revised to make them much easier. The thresholds that were out of reach have been cut drastically, from 50% and 25% down to 10% of products by cost. As if that weren't enough, you now have the option of skipping the "by cost" calculation entirely and earning these points by using ten different products.

Many of the details in these two credits have also been reworked: there is no longer a requirement for no more than 30% of the products to be in the structure and enclosure, for example, and EPDs that show reduced embodied carbon are given extra credit. There is also extra credit for third-party-verified documentation: both EPDs and HPDs or Declare labels that show minimal hazards.

Both the Sourcing of Raw Materials credit and Materials Ingredients had options that were never really operationalized in v4. Those options have been deleted entirely from v4.1. In the Sourcing of Raw Materials credit it was Option 1: "Raw Material Source and Extraction Reporting," which sent a lot of people chasing down corporate sustainability reports that didn't qualify anyway. In the Material Ingredients credit, it was Option 3: Supply Chain Optimization.

With the removal of Option 1 in Sourcing of Raw Materials, the actions that were part of Option 2 can earn up to two points in v4.1, with a 20% by cost threshold for one point, and double that for two.

Daylight

Version 4 brought us the daylight metrics spatial daylight autonomy (sDA) and annual sunlight exposure (ASE). Under v4.1, the credit still has the same three options (i.e. sDA simulation, illuminance simulation, and measurement), but under Option 1, which is the most commonly used, there is now a lower minimum threshold of 40% sDA to earn 1 point—a much more achievable number for most projects. In addition, the maximum ASE requirement has been removed. This was a huge obstacle in achieving points in v4. Now, reporting the ASE is still required, and projects must include a narrative on how they are addressing glare for spaces with ASE > 10%.