



***DC SOLAR***

 **stok**

# LEED

RESOURCES

## SUSTAINABILITY

Sustainability is at the heart of what we do at DC Solar. Our mission is to promote a healthier planet by offering clean, renewable solar products that make a difference in how people use and think about power. Whether it's providing clean, off-grid EV charging at a concert venue, safety lighting on a college campus, or power generation at a construction site, DC Solar's products and services aim to provide superior mobile solar energy while reducing carbon footprints.

The key benefits of our sustainable products include:

- Reduced air pollution
- Reduced noise pollution
- Reduced fossil fuel transportation and consumption
- Reduced greenhouse gas generation
- Use of on-site available energy resources



In our effort to encourage sustainable practices in construction, DC Solar and its partner Stok have raised the bar by providing innovative solutions to meet USGBC LEED credit requirements. DC Solar's "Solar Eclipse" mobile solar generator promotes innovative sustainable strategies while also achieving a LEED point. Using either LEED for New Construction or LEED for Commercial Interiors Rating Systems, DC Solar's "Solar Eclipse" mobile solar generator can contribute to earning one LEED point in the 'Innovation in Design' credit category. LEED certified buildings save both money and resources, as well as have a positive impact on the health of occupants.

DC Solar Solutions and Stok have set a remarkable precedent inviting designers and builders to implement innovative contributions to construction phase environmental impact reduction, all while earning an additional LEED credit.

*"We are proud that a LEED designation has been added to our offering of tools that help provide a healthier planet. It not only helps us fulfill our company mission, but it also underscores the effectiveness of mobile solar technology and the role it can play in construction and beyond." – Jeffrey Carpoft, CEO, DC Solar*

To learn more about LEED credits, [Click Here](#)

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## **LEED - INNOVATION IN DESIGN – CREDIT**

### **CONSTRUCTION ENERGY USE REDUCTION**

#### **INTRODUCTION**

The purpose of this LEED Interpretation request is to establish a precedent for reducing nonrenewable on-site energy consumption during the construction phase.

#### **CONSTRUCTION ENERGY**

##### **INTENT**

To reduce environmental and economic impacts associated with construction phase energy use.

##### **REQUIREMENTS**

For construction phase power consumption, use on-site temporary renewable sources equivalent to at least 1% of predicted annual building energy use during occupancy. (use LEED NC EA1 design case energy model or CBECS if no energy model available)

##### **BENEFITS AND ISSUES TO CONSIDER**

###### Environmental Issues

As building codes, rating systems and market demand continue to decrease occupancy phase energy consumption, construction phase energy consumption will continue to increase as a percentage of the whole. See LEED for New Construction EAp2 for a primary description of environmental issues and benefits. Additional benefits of reducing nonrenewable construction phase energy consumption include:

- Reduced air pollution
- Reduced noise pollution
- Reduced fossil fuel transportation and consumption
- Reduced on-site fuel spill containment issues
- Reduced greenhouse gas generation
- Use of on-site available energy resources
- Occupancy phase energy consumption is falling

###### Economic Issues

Construction energy can be expensive during phases when temporary power is not yet available on-site. Additionally, traditional diesel generators often run at a significantly higher power production than the actual current draw. This standard practice consumes more fuel and wasted energy than is necessary, leading to avoidable construction fuel costs. Construction phase energy use metering has the added benefit of quantifying this impact, making it possible to report on and improve performance.

## RELATED CREDITS

Construction Activity Pollution Prevention (NC SSp1) – “Air born Dust and Particulate Generation Control” is usually accomplished through an erosion and sedimentation control plan, therefore this credit is primarily focused on soil particulates as opposed to products of combustion particulates and pollution. The Proposed Credit improves Construction Activity Pollution Prevention through reduced combustion particulates and air pollution associated with on-site gas and diesel construction generators.

On-Site Renewable Energy (NC EAc2 & CI SSc1o2p11) – The Proposed Credit takes a construction phase perspective.

Construction Waste Management (NC & CI MRc2) – Currently a landfill focused Credit, but for the Proposed Credit can be also be interpreted from the standpoint of reduced air pollution and reduced energy transportation impacts by using on-site energy resources.

Regional Materials (NC & CI MRc5) – This LEED Credit targets “reducing the environmental impacts and pollution resulting from transportation of materials.” The Proposed Credit approaches this from the standpoint of “energy” transported to the site as compared to solar radiation, which is a regionally available (on-site) resource.

Minimum Acoustic Performance (NC IEQp3) – This is focused on occupancy phase performance of schools but has wide application for the Proposed Credit.

Construction Indoor Air Quality Management Plan – During Construction (NC&CI IEQc3/3.1) – Source Control of Gasoline & Diesel Fueled tools.

Enhanced Acoustical Performance (NC IEQc9) – This is focused on occupancy phase performance of schools but has wide application for the Proposed Credit.

Other Quantifiable Performance (CI SSc1o2p12) – This is a potential application of the Proposed Credit to the LEED for Commercial Interiors system.

Minimizing Site Disturbance (ND GIBc7) – Focused on trees, plants and pervious surfaces, but is applicable to the Proposed Credit.

Pilot Credit 57: Enhanced Acoustical Performance (ALL Systems) – Exterior Noise Control – This credit is primarily focused on pre and post construction noise but is applicable to the Proposed Credit.

Pilot Credit 66: Community Contaminant Prevention (ALL Systems) – Airborne Releases – Equipment without internal combustion are not specifically eligible but is applicable to the Proposed Credit.

## IMPLEMENTATION

Construction phase on-site energy consumption is usually provided by grid based electricity and temporary diesel or gasoline-powered generators. These power sources are generally both nonrenewable and polluting, and their total energy consumption is not tracked or reported. This Proposed Credit seeks to encourage reduced construction phase energy consumption via the following alternative renewable energy sources:

- Photovoltaic systems
- Wind energy systems
- Solar thermal systems
- Biofuel-based electrical systems
- Geothermal heating systems
- Geothermal electric systems
- Low-impact hydroelectric power systems
- Wave and tidal power systems

## CALCULATIONS

Determine the annual building energy consumption (EA1 design case energy model or CBECS if no energy model).

Calculate the minimum required renewable energy consumed and produced during the construction phase.

$$\begin{array}{l}
 \text{Construction Phase} \\
 \text{Renewable Energy Use} \\
 \text{Threshold} \\
 \text{(kWh AC)}
 \end{array}
 =
 \begin{array}{l}
 \text{Annual Building Energy} \\
 \text{Consumption (predicted)} \\
 \text{(kWh AC)}
 \end{array}
 \times 1\%$$

Compare the Construction Phase Renewable Energy Use Actual to the Construction Phase Renewable Energy Use Threshold to verify that Actual exceeds the Threshold.

$$\begin{array}{l}
 \text{Construction Phase} \\
 \text{Renewable Energy} \\
 \text{Use Actual (kWh AC)}
 \end{array}
 >
 \begin{array}{l}
 \text{Construction Phase} \\
 \text{Renewable Energy} \\
 \text{Use Threshold} \\
 \text{(kWh AC)}
 \end{array}$$

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## DOCUMENTATION GUIDANCE

Renewable energy use tracked and reported for this credit must occur during the LEED project construction phase (between the start date of initial groundbreaking including demolition, site and earth work) and the date of project occupancy.

Renewable energy equipment reporting will include equipment designed production estimates, data logs or meter readings of total kWh delivered during this construction phase. Equipment or approaches that report in units other than kWh will need to be converted and added to the kWh total. Energy produced by equipment that is grid-tied and back fed to the electricity grid during the construction phase is also eligible for contribution. Grid-tied equipment needs to be installed with proper utility provider arrangements for safety and other concerns.

All energy consumption and production data or reports must be dated to show that energy use occurred during the construction phase.

## RESOURCES

1. All current USGBC Rating System Reference Guides and resources
2. LEED Interpretation #10270

## APPENDIX - ASSUMPTIONS

The credit threshold was established by referencing the energy values in LEED Interpretation #10270.

The threshold is conservative in recognition of additional less quantitative benefits including reduced construction phase noise, reduced air pollution and reduced fuel spill pollution, etc.

## LEED ID CREDIT INSTRUCTIONS

### REQUIREMENTS

Use DC Solar Solutions “Solar Eclipse” mobile solar generator(s) during the construction phase of the building pursuing LEED certification, beginning at the time of ground breaking and continuing through occupancy.

Show that the energy consumed and produced during this period is equivalent to at least 1% of predicted annual building energy use during occupancy phase. This credit is currently worth a maximum of one (1) LEED point in the “Innovation in Design” Credit Category, using either the LEED for New Construction or LEED for Commercial Interiors Rating Systems.

### STEPS

1. Find the “Proposed Design” building energy use through Method *a* or *b*:
  - a. EnergyPro Method
    - i. Obtain the EnergyPro report (EAP-2) from the design team
    - ii. At the bottom of page 4 find the “Proposed Design” “Subtotal – Model Output” value in kBtu/year
  - b. CBECS Method
    - i. Go to [CBECS](#), enter the project details, & click “Search” in the bottom left corner of the screen.
    - ii. Populate the top five items as follows:
      1. Census Division (click “view map” for help)
      2. Climate (click “view map” for help)
      3. Building Type (just select a top level category)
      4. Vintage (to search an adequate sample size, pick about 3 selections: i.e. before, during, and after the actual building construction date of the original existing building or current new construction date)
      5. Square Footage (to search an adequate sample size, pick 3 selections: i.e. below, correct, and above the actual square footage)
      6. You can enter more details but it complicates the search





Project Name		
<b>Building Operational Energy Consumption</b>		
1,541,000	=	Proposed Design - Subtotal (kBtu/yr)
451,621	=	Proposed Design - Subtotal (kWh/yr)
<b>Target Solar Eclipse Energy Production</b>		
4,516	=	TARGET - Construction Phase Renewable Energy Production Target (kWh AC)
<b>On-Site Generator Package</b>		
SCT20	=	DC Solar Generator Model #
2,400	=	Generator Name Plate (Watts)
1	=	Generator Quantity (ea)
5	=	Production Average (hrs/day)
274	=	Work Days of Construction (ea)
5%	=	Percent Overcast Days Per Year (%)
<b>Quantity of Solar Eclipse Mobile Generators Required</b>		
2	=	Solar Eclipse (ea)

*Note: Populate grey cells with project specific data.*