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SAND2020-3520C

LEED v.4 for Campus at Sandia National Laboratories

PRESENTED BY

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Agenda

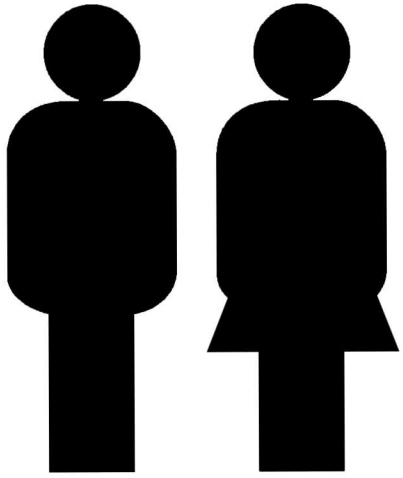
A little bit about Guiding Principles

Is LEED Required?

Why LEED for Campus

LEED Campus

Other surprises

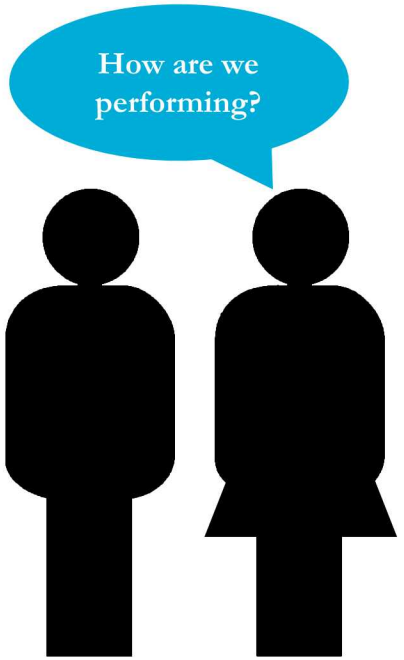


Guiding Principles- What's that about?

All new and 15% of existing Federal Buildings over 5kGSF are required to meet the *2016 Guiding Principles for High Performance Sustainable Buildings*

<u>Current State:</u>

- SNL/NM
  - 34 Guiding Principles Compliant Buildings
- SNL/CA
  - 2 Guiding Principles Compliant Buildings



Guiding Principles Credits

2016 Guiding Principles

New Construction and Modernization

I. Employ Integrated Design Principles
- 1. Integrated Design *(Required)*
- 2. Commissioning *(Required)*

II. Optimize Energy Performance
- 3. Energy Efficiency *(Required)*
- 4. Renewable and Clean Energy *(Required)*
- 5. Metering *(Required)*
- 6. Benchmarking *(Required)*

III. Protect and Conserve Water
- 7. Indoor Water Use *(Required)*
- 8. Outdoor Water Use *(Required)*
- 9. Alternative Water *(Required)*
- 10. Stormwater Management *(Required)*

IV. Enhance Indoor Environmental Quality
- 11. Ventilation and Thermal Comfort *(Required)*
- 12. Daylighting and Lighting Controls *(Required)*
- 13. Indoor Air Quality *(Required)*
- 14. Occupant Health and Wellness *(Required)*

V. Reduce the Environmental Impact of Materials
- 15. Material Content and Performance *(Required)*
- 16. Waste Diversion *(Required)*
- 17. Materials Management *(Required)*

VI. Assess and Consider Climate Change and Risks
- 18. Mission Criticality *(Required)*
- 19. Floodplain Considerations *(Required*)*
- 20. Facility Design *(Required**)*
- 21. Facility Adaptation *(Required**)*

*For new construction GP metrics #1-20 are required.
**For Modernization,

Existing Buildings

I. Employ Integrated Design Principles
- 1. Integrated Design *(Required)*
- 2. Commissioning *(Required)*

II. Optimize Energy Performance
- 3. Energy Efficiency *(Required)*
- 4. Renewable and Clean Energy *(Optional*)*
- 5. Metering *(Optional*)*
- 6. Benchmarking *(Optional*)*

III. Protect and Conserve Water
- 7. Indoor Water Use *(Required)*
- 8. Outdoor Water Use *(Optional*)*
- 9. Alternative Water *(Optional*)*
- 10. Stormwater Management *(Optional*)*

IV. Enhance Indoor Environmental Quality
- 11. Ventilation and Thermal Comfort *(Required)*
- 12. Daylighting and Lighting Controls *(Optional*)*
- 13. Indoor Air Quality *(Optional*)*
- 14. Occupant Health and Wellness *(Optional*)*

V. Reduce the Environmental Impact of Materials
- 15. Material Content and Performance *(Required)*
- 16. Waste Diversion *(Required)*
- 17. Materials Management *(Optional*)*

VI. Assess and Consider Climate Change and Risks
- 18. Climate Resilience and Adaption *(Required*)*

* Twelve out of 18 metrics are required—eight that are specified as required plus four additional.

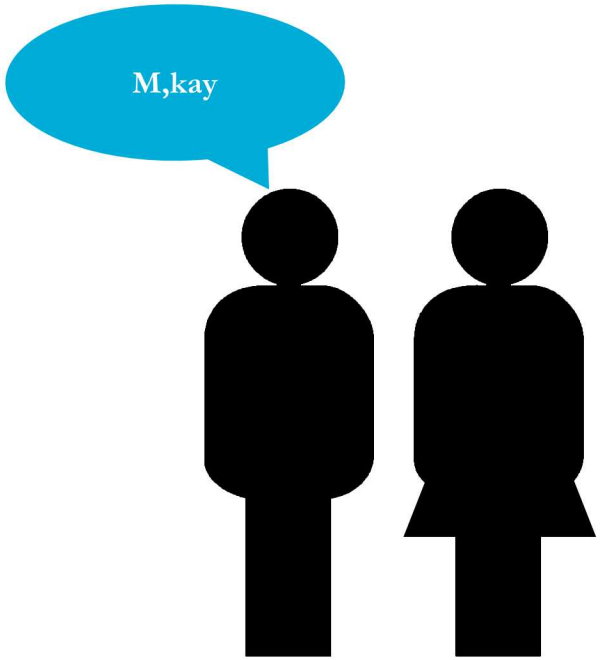
U.S. DEPARTMENT OF ENERGY | Energy Efficiency & Renewable Energy

Is LEED Required

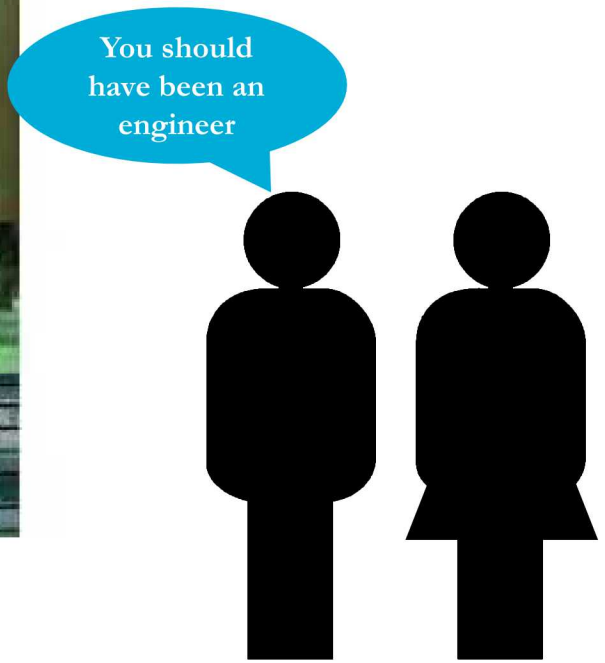
Per DOE O 413.3.b, new buildings over $50M need to be LEED Gold

As part of our prime contract, SNL uses LEED Gold to prove compliance with Guiding Principles

Not all DOE labs are required to do LEED for buildings under $50M



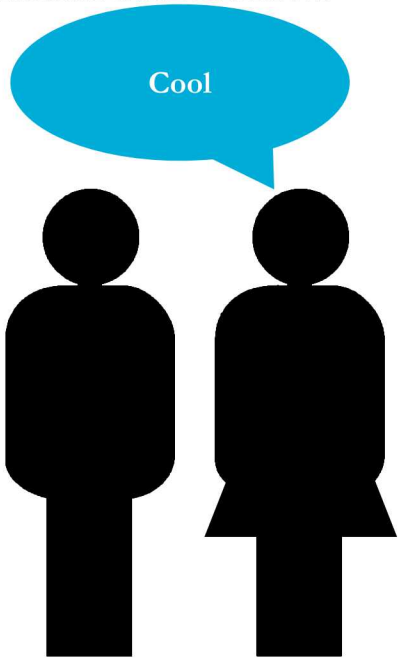
Why LEED for Campus?



Why LEED for Campus?

SNL is already doing and/or required to do many sustainability and wellness initiatives. Here are a few…

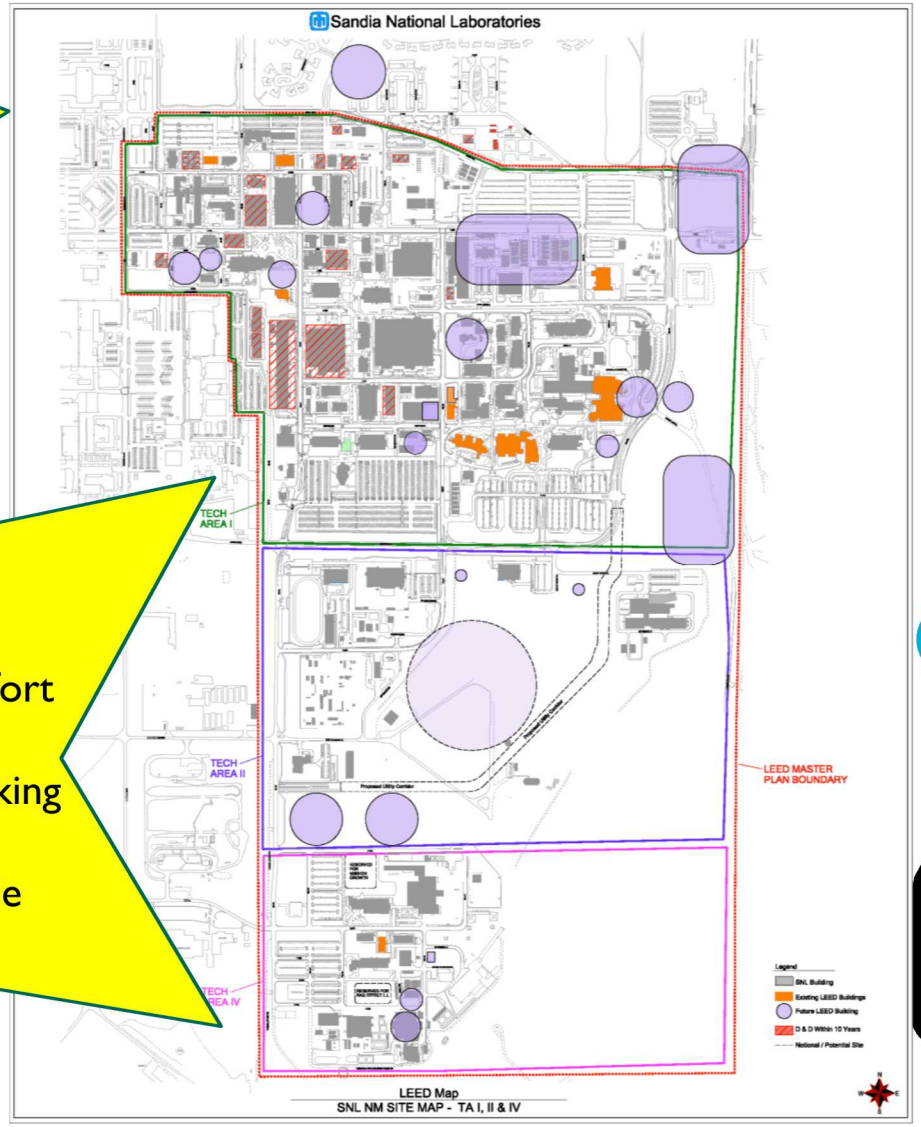
- Meters are required by Federal Law
- ASHRAE 90.1 2013 (30% better) is a Federal Law
- Commissioning is required by Federal Law
- We have a Net Zero Waste by 2025 initiative
- We have storm water requirements per EISA 438
- We have many progressive health initiatives including fitness classes, mental health and nutrition counseling



- LEED Campus effort achieved 9/2017

What's new?

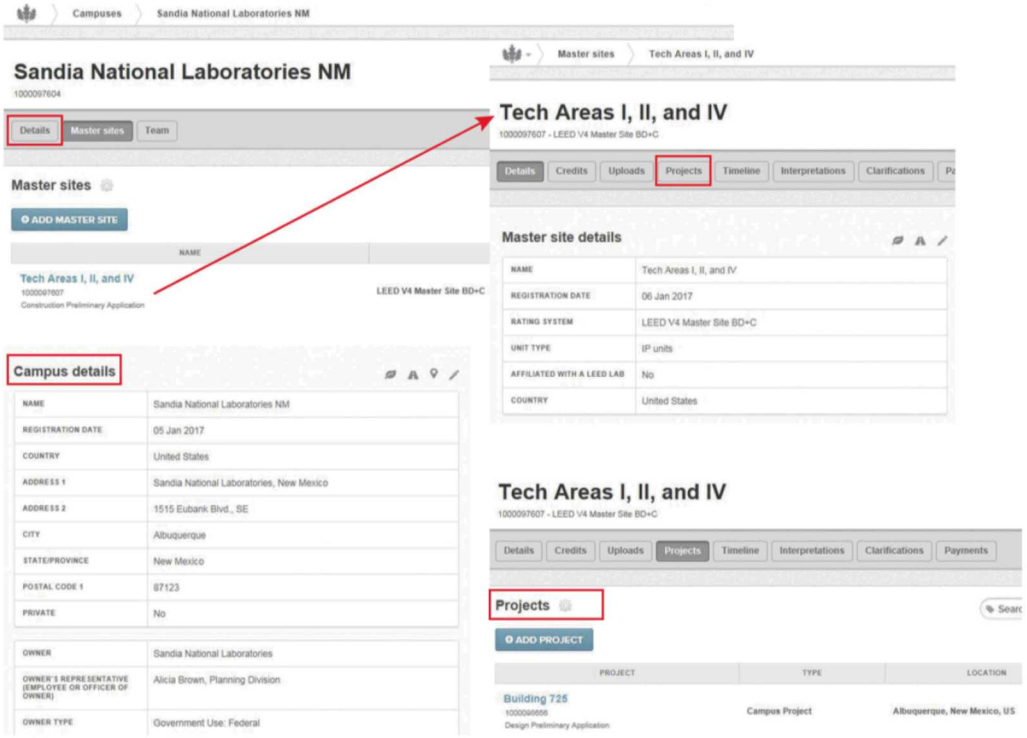
- SNL/CA Campus effort 5/2019
- Added Reduced Parking credit 9/2019
- New Resource Guide 9/2019

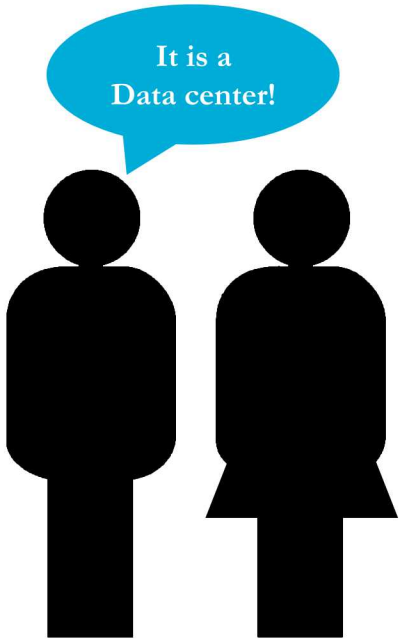


What is LEED for Campus

In order access these "pre-approved" credits and prerequisites, new projects must be registered and certified under the LEED Online Campus platform. Projects will be added under the Master Site (Tech Areas I, II, and IV, #1000097607), which is located under the Campus (Sandia National Laboratories NM, #1000097604).

The SNL NM Data Center was registered under the Campus platform in the Fall of 2017 and will be the first project to certify under the Campus "umbrella".





LEED v4 for BD+C: New Construction & Major Renovation

Sandia National Laboratories NM : Final Assessment

Awarded as Campus- more Data Required

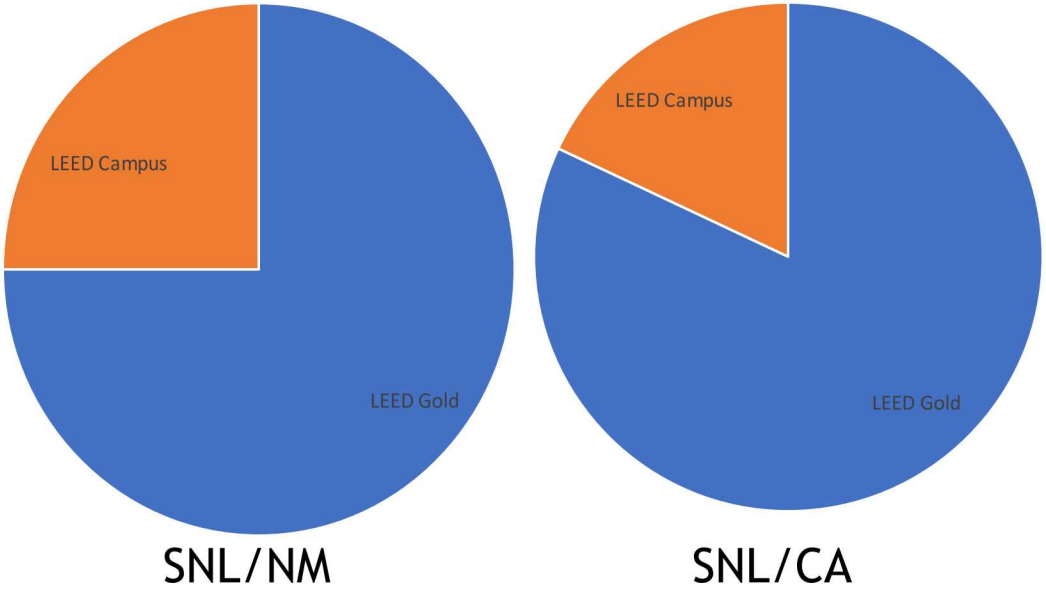
CAMPUS Y	CAMPUS ?	PROJECT Y	PROJECT ?	PROJECT N		PTS
		3			**Integrative Process**	**1**
1	**0**	**2**	**7**	**23**	**Location & Transportation**	**16**
					LEED for Neighborhood Development Location	16
1		1			Sensitive Land Protection	1
					High Priority Site	2
					Surrounding Density and Diverse Uses	5
					Access to Quality Transit	5
					Bicycle Facilities	1
1					Reduced Parking Footprint	1
					Green Vehicles	1
2		**3**	**3**	**4**	**Sustainable Sites**	**10**
					Construction Activity Pollution Prevention	Req
1		1			Site Assessment	1
					Site Development - Protect or Restore Habitat	2
1		1			Open Space	1
					Rainwater Management	3
					Heat Island Reduction	2
					Light Pollution Reduction	1
1	**0**	**4**	**6**	**1**	**Water Efficiency**	**11**
Y		Y			Outdoor Water Use Reduction	Req
					Indoor Water Use Reduction	Req
Y		Y			Building-Level Water Metering	Req
1		1			Outdoor Water Use Reduction	2
					Indoor Water Use Reduction	6
					Cooling Tower Water Use	2
					Water Metering	1
0	**0**	**8**	**21**	**4**	**Energy & Atmosphere**	**31**
					Fundamental Commissioning and Verification	Req
					Minimum Energy Performance	Req
Y		Y			Building-Level Energy Metering	Req
Y		Y			Fundamental Refrigerant Management	Req
					Enhanced Commissioning	6
					Optimize Energy Performance	18
					Advanced Energy Metering	1
					Demand Response	2
					Renewable Energy Production	3
					Enhanced Refrigerant Management	1
					Green Power and Carbon Offsets	2

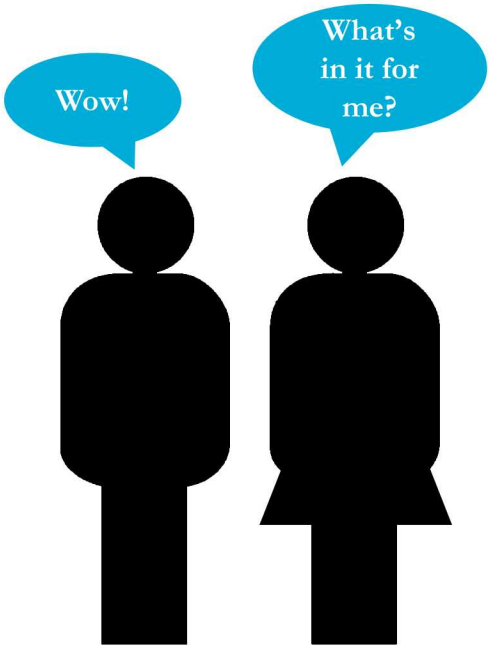
CAMPUS Y	CAMPUS ?	PROJECT Y	PROJECT ?	PROJECT N		PTS
0	**0**	**4**	**3**	**6**	**Materials & Resources**	**13**
Y		Y			Storage and Collection of Recyclables	Req
Y		Y			Construction and Demolition Waste Management Planning	Req
					Building Life-Cycle Impact Reduction	5
					Building Product Disclosure and Optimization - EPD'S	2
					Building Product Disclosure and Optimization - Sourcing of Raw	2
					Building Product Disclosure and Optimization - Material Ingredi	2
					Construction and Demolition Waste Management	2
0	**0**	**0**	**0**	**0**	**Indoor Environmental Quality**	**0**
					Minimum Indoor Air Quality Performance	Req
Y		Y			Environmental Tobacco Smoke Control	Req
					Enhanced Indoor Air Quality Strategies	2
					Low-Emitting Materials	3
					Construction Indoor Air Quality Management Plan	1
					Indoor Air Quality Assessment	2
					Thermal Comfort	1
					Interior Lighting	2
					Daylight	3
					Quality Views	1
					Acoustic Performance	1
5	**0**	**6**	**0**	**0**	**Innovation**	**5**
1		1			Pilot: O & M Starter Kit -IPM/Green Cleaning	1
1		1			Pilot: O & M Starter Kit -Waste Reduction/Procurement	1
1		1			Pilot: Integrative Process for Health Promotion	1
1		1			Pilot: Ergonomics Program	1
1		1			IN: WELL Starter Kit	1
						1
						1
						1
					LEED Accredited Professional	1
0	**0**	**0**	**3**	**1**	**Regional**	**6**
					Renewable Energy Production (Threshold: 1 pt)	1
					Surrounding Density & Diverse Uses (threshold: 2 points)	1
					Access to Quality Transit (threshold: 3 points)	1
					Bicycle Facilities	1
					Heat Island Reduction	1
1		1			Outdoor Water Use Reduction (Threshold: 1 pt)	1
11	**0**	**11**			**TOTALS**	

Certified: 40-49 points, Silver: 50-59 points, Gold: 60-79 points, Platinum: 80-110

Why LEED Campus?

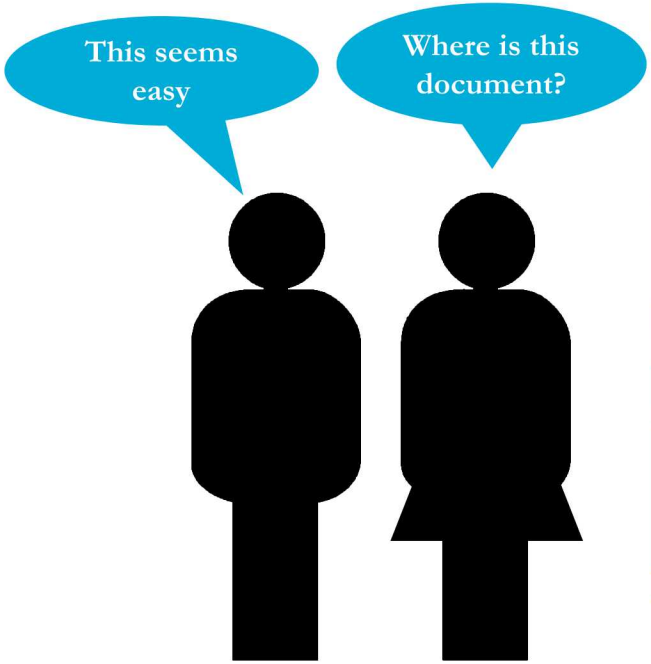
- Increase efficiency and reduce redundancy
- We have pre-certified:
  - (7) prereqs and (11) credits, or 58% of prereqs and 18.3% of credits
  - Out of the total items required for a Building LEED Gold we have 25%
  - SNL/CA has (5) prereqs and (8) credits, or 18% of the total items required for a Building LEED Gold
  - LEED Campus is for BD+C, DC and C&S





LEED Campus and Guiding Principles

- Increase efficiency and reduce redundancy
  - Collect all of our requirements in one location
  - LEED and Guiding Principles Resource Guide (for SNL and A/E partners) to simplify the building certification process when Campus Credits are not available. Also takes users through each credit from a Sandia National Lab's perspective, as well as provides a crosswalk and guidance for achieving Guiding Principles compliance
  - Appendix is for credit documentation and boiler plate forms



Example- Minimum Energy Performance for LEED Energy Efficiency for Guiding Principles

EA Prerequisite — Minimum Energy Performance

Intent: To reduce the environmental and economic harms of excessive energy use by achieving a minimum level of energy efficiency for the building and its systems.

Status: This Prerequisite is required.

Responsible Party(s): SDR and Project Team

Resource(s): 6834 Federal Building Energy Efficiency Standards
SNL Design Standards Manual
FY 201**X** Site Sustainability Plan
Campus Design Guideline
SNL 1000S for Design Build Acquisition

3.5 ENERGY AND ATMOSPHERE

SANDIA DESIGN REPRESENTATIVE

Context: Energy performance is the single largest determinant of LEED points earned; work closely with Project Team to determine the appropriate goal (kBtu per square foot-year of source energy use) early in the project design. Coordinate with SNL SDR to determine whether this project must meet the Federal requirements for 30% reduction as compared to ASHRAE 90.1 2013 (6834 Federal Building Energy Efficiency Standards). The project team will submit proposed energy performance metrics whole building energy modeling simulations as part of the Sustainable Design Report as per the Performance Spec.

PROJECT TEAM

Guidance: Energy performance is the single largest determinant of LEED points earned; work closely with the SDR to determine the appropriate goal (kBtu per square foot-year of source energy use) early in the project design. Employ simple box modeling and whole building energy modeling simulations to determine best strategies for energy performance requirements and objectives. Analyze efficiency measures, focusing on load reduction and HVAC-related strategies appropriate for the facility as required by the Sustainable Design Report. Coordinate with SDR to determine whether this project must meet the Federal requirements for 30% reduction as compared to ASHRAE 90.1 2013 (6834 Federal Building Energy Efficiency Standards).

LEED V4.1 CONSIDERATIONS

Minimum Energy Performance Prerequisite:

- Comply with ASHRAE 90.1 2016, Minimum Provisions and Appendix G
- Projects no longer have a minimum reduction
- Renewables can be included in calculations (on-site or on-campus only)
- 2016 Appendix G: New Metric is Performance Cost Index (PCI), which factors utilities cost and greenhouse gas emissions. Utilities cost and greenhouse gas emissions are weighed equally in these new metrics.
- Option: Prescriptive provisions of sections 5 through 10 ASHRAE 90.1 2016, or Section 11 Energy Cost Budget Method
- Scoring is modified (see Optimize Energy Performance)

GUIDING PRINCIPLES CONSIDERATIONS

Guiding Principle: II. Optimize Energy Performance – GP 3: Energy Efficiency

"D. For New Construction:

1) Ensure energy efficiency is 30% better than the current American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) 90.1 standard (currently listed as 2013), AND

2) Use energy efficient products, as required by statute

E. For Modernization, ensure:

1) Energy use is 20% below the fiscal year (FY) 2015 energy use baseline, OR

2) Energy use is 30% below the FY 2003 energy use baseline, OR

3) The building has an ENERGY STAR rating of 75 or higher, OR

3.5 ENERGY AND ATMOSPHERE

4) For building types not in ENERGY STAR Portfolio Manager, where adequate benchmarking data exists, the building is in the top quartile of energy performance for its building type, AND

5) Use energy efficient products, as required by statute

Provide the following documentation:

- Document reduction calculation method and results
- ENERGY STAR Portfolio Manager documentation"

Guiding Principle: IV. Enhance Indoor Environmental Quality – GP 12: Daylighting and Lighting Controls

Maximize opportunities for daylighting in regularly occupied space, automatic dimming controls or accessible manual controls, task lighting, and shade and glare control.

Provide the following documentation:

- Schematic of floor layout
- Document (photos, list, narrative, design specifications, etc.)"

Long Range and Master Plans are now influenced by LEED Campus

Sites that are walkable/bikeable are prioritized, and sidewalks and bike infrastructure are strongly encouraged in design

Sites near campus amenities (fitness center, cafeteria) are prioritized

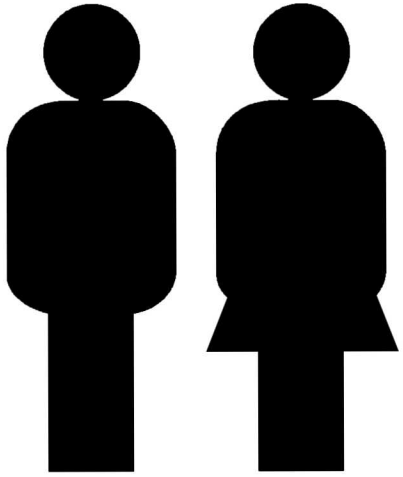
A landscape master plan was developed to preserve and restore usable open space, promote the use of green infrastructure and the inclusion of shade trees along sidewalks

Bike routes have been mapped, users surveyed and covered bike parking is starting to be sited in busy hubs

A new parking structure will be PV ready for our R&D group

A site wide building metering initiative is underway

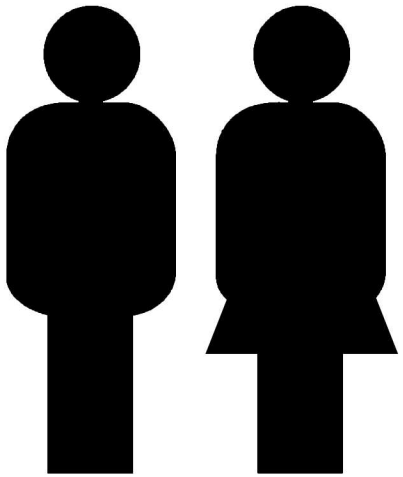
Preventive Health is always involved in planning health for new buildings



Cost Savings

-Not quite apples to apples since we have cost for LEED 2009 vs. LEED v.4

-Campus project costs have saved approx. 20%; mainly in the design credits since the construction credits require material tracking.



Questions