

# NM Higher Education Department

## Planning for Capital Outlay Projects

Energy Efficiency Requirements

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By

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# Sustainability challenges



- Energy Cost going up and climate change
- Building Repair & Replacement cost up
- Tuition cost going up
- Enrollment going down
- Perceived value of HED Education ?

## Challenges create Opportunities

We cannot continue to function in our current manner if we do not make more sustainable choices.

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Planning for Energy Efficiency

## Governor Michele Lujan Grisham - Executive Order 2019-003

OBJECTIVE - achieve a statewide reduction in greenhouse gas emissions of 45% by 2030 as compared to 2005 levels. A CLIMATE TASK FORCE IS ESTABLISHED.

LEAD AGENCIES -The Secretary of the Energy, Minerals and Natural Resources Department ("EMNRD") and the Environment Department ("NMED")

PROCESS: Convening meetings, facilitating stakeholder participation, and providing strategic direction to achieve goals.

- ★ All State Agencies shall evaluate the impacts of climate change on their programs and integrate climate change mitigation.

- ★ Task Force shall evaluate policies and regulatory strategies to achieve reductions in green house gas pollution.

- ★ Task Force will develop a New Mexico Climate Strategy document with initial recommendations and a status update, where applicable to the Governor

Update: EMNRD and NMED are requesting a grant from EPA. \$3 Million is available.

Phase 1 - Revise and Update New Mexico's Climate Plan.

Phase 2 - Implement measures developed from the plan. \$4.6 Billion will be available nationwide for implementation. EMNRD and NMED will send out letters requesting participation from each agency.

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## Paths to Climate Change sustainability:

- Evaluate impacts of Climate Change on your operation
- Evaluate impact of your programs on Climate Change
- Improve Performance utilization of facilities
- Improve Energy Efficiency of facilities
- Conserving Resources especially water
- Implement Integrated Design
- Plan for a future with less resources



## What is “Sustainable”?

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Planning for Energy Efficiency

# Executive Order 2006-01 Requirements

- New Construction more than 15,000 S.F.
  - LEED Silver and 50% Median Energy performance
- New Construction and Renovation 5000-15,000 SF
  - 50 % Median Energy performance
- Renovation more than 15,000 SF
  - LEED Silver and 50% Median Energy performance
  - 50 % Median Energy performance
    - If 2 of 3 systems (HVAC, Lighting, Plumbing) upgraded
- All other new or renovations
  - employ cost effective energy efficient measures

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Higher Education Department has final approval

# Leadership in Energy and Environmental Design (LEED)

## By the US Green Building Council

The LEED rating system, created by the USGBC, provides third-party verification that a building or community was designed and built using strategies aimed at increasing performance, reducing waste, and improving quality of life.

Credits are grouped into six major categories: Sustainable Sites, Water Efficiency, Energy & Atmosphere, Materials & Resources, Indoor Environmental Quality, and Innovation in Design & Regionalization.

The greater number of points, the more likely the building will qualify for LEED Certification.

LEED 2009 rating system has a total of 110 points available.

- Projects that achieve 40 points are LEED Certified

- 50 points earns LEED Silver

- 60 points earns LEED Gold


- 80 points earns LEED Platinum certification.

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*Target Finder* is a no-cost online tool that enables architects and building owners to set energy targets and receive an EPA energy performance score for projects during the design process.

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Target Finder : ENERGY STAR


 TARGET FINDER

[Return to ENERGY STAR Web site](#) > Target Finder

### Target Finder


**\*REQUIRED**  
Select a target rating and/or compare your Design Energy to the target.

#### 1. Facility Information

\*Zip Code:  Facility Name:   
City:  State:  



#### 2. Facility Characteristics



\*Select Space Type(s) for this project.  
[Space Type]

Office (General) 

*Gross Floor Area	*Occupants	*Number of PCs	*Operating Hours/Week
60000 Sq. Ft.	400	400	60 Hours

#### 3. The Target<sup>1</sup>





Target Rating  Energy Reduction Target 

Select  50% 

\*Choose the design target and select "View Results" to display associated energy use for the target

#### 4. Estimated Design Energy

Use results from energy analysis and enter total estimated energy for the design. Select "View Results" to compare Estimated Energy Use to your Target.

Energy Source	Units	Estimated Total Annual Energy Use <sup>2</sup>	Energy Rate (\$/Unit)
Electricity 	MBtu 		\$ / MBtu
[Select Energy Source] 			\$ /

<sup>1</sup> Target Rating is the EPA energy performance rating 1 – 100 scale. A 75 or higher denotes ENERGY STAR. Energy reduction target is the percent reduction for a similar building's average energy consumption or the equivalent of an EPA Rating of 75.

<sup>2</sup> Annual Energy Use – the fuel use percentage is determined from DOE-IDA. The Electric % is typical of the area designated by zip code. Natural gas is used as 2<sup>nd</sup> energy source. The defaults for percentage of energy use by fuel type will be displayed on the Results page.

[Clear Form](#) [View Results](#)

Figure 2







The resulting screen shows the kBtu/SF/year that must be achieved to meet the requirements. In this example, the target is 51.9. kBtu/SF/year for a 60,000SF office building in Santa Fe with 400 occupants, all using PCs. The engineering team can then design to that level of energy consumption. Both the data entry page (Figure 2) and the results page (Figure 3) must be printed as pdfs and submitted for compliance with the executive order.

In applying this to the Energy Optimization credit for LEED, the engineers will run a standard ASHRAE 90.1 base model, according to the LEED guidelines. They will then model the designed building until they achieve the goal based on Target Finder. The difference between the base model and the designed model will establish the number of LEED credits that will be achieved for Energy Optimization.

The mix of fuels is used to calculate the target. If this fuel mix does not accurately reflect the expected usage, these numbers should be adjusted.

#### Target Energy Performance Results : ENERGY STAR



[Return to ENERGY STAR Web site](#) > **Target Energy Performance Results**

### Target Energy Performance Results

NOTE: Assumptions are 80% electricity and 20% % Natural Gas. Target & Top 10% energy use for this facility are calculated based on the typical fuel mix in the zip code specified.

[View Statement of Energy Design Intent](#)

Target Energy Performance Results (estimated)			
Energy	Design	Target	Top 10%
Energy Performance Rating (1-100)	N/A	92	90
Energy Reduction (%)	N/A	50	45
Source Energy Use Intensity (kBtu/Sq. Ft./yr)	N/A	135.7	145.8
Site Energy Use Intensity (kBtu/Sq. Ft./yr)	N/A	51.9	56.2
Total Annual Source Energy (kBtu)	N/A	8,143,544.4	8,610,483.7
Total Annual Site Energy (kBtu)	N/A	3,116,451.1	3,371,516.4
Total Annual Energy Cost (\$)	N/A	\$ 68,918	\$ 63,740

#### Facility Information

State Office Building  
Santa Fe, NM 87501  
United States

[Edit](#)

Facility Characteristics		Estimated Design Energy	
Space Type	Gross Floor Area (Sq. Ft.)	Energy Source	Units
Office (General)	60,000	Electricity	kBtu
Total Gross Floor Area	60,000	Natural Gas	kBtu

Source: Data adapted from DOE EISA. See EPA [Technical Datafiles](#).

Do so by clicking the Edit link under the results. That will take you back to the first screen. Under Section 4. Estimated Design Energy, you can enter the specific amounts from the LEED models. Be aware that doing so may change the results.

Target Finder shows both the Site Energy Use Intensity and the Source Energy Use Intensity. For our modeling the Site intensity is the goal.

Figure 3

If your building has a combination of building types, some of which are in Target Finder and some of which are not, you can combine the energy targets to find the overall goal for your project using a weighted average approach as shown in Figure 4. .

Project Name:	Sample Project								
Energy Target:	46.39								
	Baseline Source								
		Baseline Source							
		SE	TL	CBECS	Other*				
<u>Building Type</u>						<u>Energy Baseline</u> kBtu/Sq.ft/year	<u>Energy Target</u> from TL kBtu/Sq.ft/year	<u>Energy Target</u> (50%) kBtu/Sq.ft/year	<u>Energy Target</u> kBtu/year
Retail/Dining/Office		52,500	x				45.1	-	2,367,750.00
Food Service		800		x		258.30		129.15	103,320.00
Public Assembly		1,000		x		91.90		46.95	140,850.00
								-	-
								-	-
								-	-
Totals		56,300							2,611,920

\* Include description of baseline source

\*\* Enter from Target Finder report or calculate 50% of Energy Baseline

Include Target Finder pages, CBECS listing with Building Activity highlighted, and other supporting documentation as applicable.

Figure 4

# First Unitarian Church of Albuquerque LEED-NC 2009 Credit Checklist



**Green Ideas**  
Environmental Building Consultants

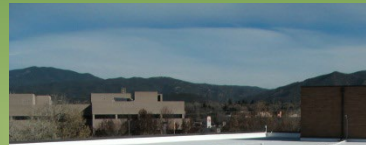
YES	?	??	NO	Sustainable Sites - 26 Possible Points		Credit Champion
Y				Prereq 1	Construction Activity Pollution Prevention	Joel Loes
1				Credit 1	Site Selection	Lisa Logan
5				Credit 2	Development Density & Community Connectivity	Lisa Logan
			1	Credit 3	Brownfield Redevelopment	Linda Skye
6				Credit 4.1	Alternative Transportation, Public Transportation Access	Lisa Logan
1				Credit 4.2	Alternative Transportation, Bicycle Storage and Changing Rooms	Mike Madden
3				Credit 4.3	Alternative Transportation, Low-Emitting/Fuel-Efficient Vehicles	Mike Madden
2				Credit 4.4	Alternative Transportation, Parking Capacity	Mike Madden
1				Credit 5.1	Site Development, Protect or Restore Habitat	Lisa Logan
1				Credit 5.2	Site Development, Maximize Open Space	Lisa Logan
1				Credit 6.1	Stormwater Design, Quantity Control	Doug Hughes
1				Credit 6.2	Stormwater Design, Quality Control	Doug Hughes
	1			Credit 7.1	Heat Island Effect, Non-Roof	Lisa Logan
1				Credit 7.2	Heat Island Effect, Roof	Mike Madden
			1	Credit 8	Light Pollution Reduction	Patrick Garey
23	1	0	2	Totals for Sustainable Sites		
YES	?	??	NO	Water Efficiency - 10 Possible Points		Credit Champion
Y				Prereq 1	Water Use Reduction-20% Reduction	Kyle Best
2				Credit 1.1	Water Efficient Landscaping, Reduce by 50%	Genieve Sanchez
			2	Credit 1.2	Water Efficient Landscaping, No Potable Use or No Irrigation	Genieve Sanchez
			2	Credit 2	Innovative Wastewater Technologies	Kyle Best
2				Credit 3	Water Use Reduction, 30%, 35% or 40% Reduction	Kyle Best
4	0	0	6	Totals for Water Efficiency		
YES	?	??	NO	Energy & Atmosphere - 35 Possible Points		Credit Champion
Y				Prereq 1	Fundamental Commissioning of the Building Energy Systems	Pete Lewis
Y				Prereq 2	Minimum Energy Performance	Morgan Royce
Y				Prereq 3	Fundamental Refrigerant Management	Morgan Royce
19				Credit 1	Optimize Energy Performance, ASHRAE 90.1-2007. 12%=1, 14%=2, 16%=3, 18%=4, 20%=5, 22%=6, 24%=7, 26%=8, 28%=9, 30%=10, 32%=11, 34%=12, 36%=13, 38%=14, 40%=15, 42%=16, 44%=17, 46%=18, 48%=19	Morgan Royce
7				Credit 2	On-Site Renewable Energy, 1%=1, 3%=2, 5%=3, 7%=4, 9%=5, 11	Morgan Royce
2				Credit 3	Enhanced Commissioning	Pete Lewis
			2	Credit 4	Enhanced Refrigerant Management	Morgan Royce
			3	Credit 5	Measurement & Verification	Morgan Royce
			2	Credit 6	Green Power	Lisa Logan
28	0	0	7	Totals for Energy & Atmosphere		
YES	?	??	NO	Materials & Resources - 14 Possible Points		Credit Champion
Y				Prereq 1	Storage & Collection of Recyclables	Mike Madden
			3	Credit 1.1	Building Reuse, Maintain Existing Walls, Floors & Roof. 55%=1, 75%=2, 95%=3	Mike Madden
			1	Credit 1.2	Building Reuse, Maintain 50% of Interior Non-Structural Elements	Mike Madden
2				Credit 2	Construction Waste Management, Divert from Disposal. 50%=1, 75%=2	Joel Loes
			2	Credit 3	Materials Reuse, 5%=1, 10%=2	Joel Loes
1	1			Credit 4	Recycled Content, (post-consumer + 1/2 pre-consumer). 10%=1, 20%=2	Joel Loes
1		1		Credit 5	Regional Materials, Extracted & Manufactured Regionally. 10%=1, 20%=2	Joel Loes
			1	Credit 6	Rapidly Renewable Materials, 2.5%	Joel Loes
			1	Credit 7	Certified Wood	Joel Loes
4	1	1	8	Totals for Materials & Resources		
YES	?	??	NO	Indoor Environmental Quality - 15 Possible Points		Credit Champion
Y				Prereq 1	Minimum IAQ Performance	Mike Madden
Y				Prereq 2	Environmental Tobacco Smoke (ETS) Control	Linda Skye
			1	Credit 1	Outdoor Air Delivery Monitoring	Mike Madden
			1	Credit 2	Increased Ventilation	Morgan Royce

Certified 40-49 points Silver 50-59 points Gold 60-79 points Platinum 80+ points

# Energy Efficiency Standards for Public Buildings -15-3-36 NMSA 1978

- Energy Star Rating of 75 Required
    - **New Buildings** – more than 3,000 SF
    - Additions – more than 3,000 SF
    - **Renovations** of at least 2 systems
      - [HVAC], [Electrical and Lighting], [Roofs and walls]
  - **Exceptions**
    - Appropriated funds before Jan. 1, 2011 and designs before July 1, 2010.
    - Historic listed properties in state register and national register.
    - Building Renovation Cost exceeds Life Cycle Savings
-

- Institutions of Higher Education have implemented over \$82 Million in Energy Project that improve sustainability.



- LED Lighting
- Efficient Boilers and Chillers
- Efficient Air Conditioners
- Solar Photovoltaic systems
- Microgrid Systems
- Battery energy storage

# Energy Performance Contracting

Public Facilities Energy Efficiency and Water Conservation Act

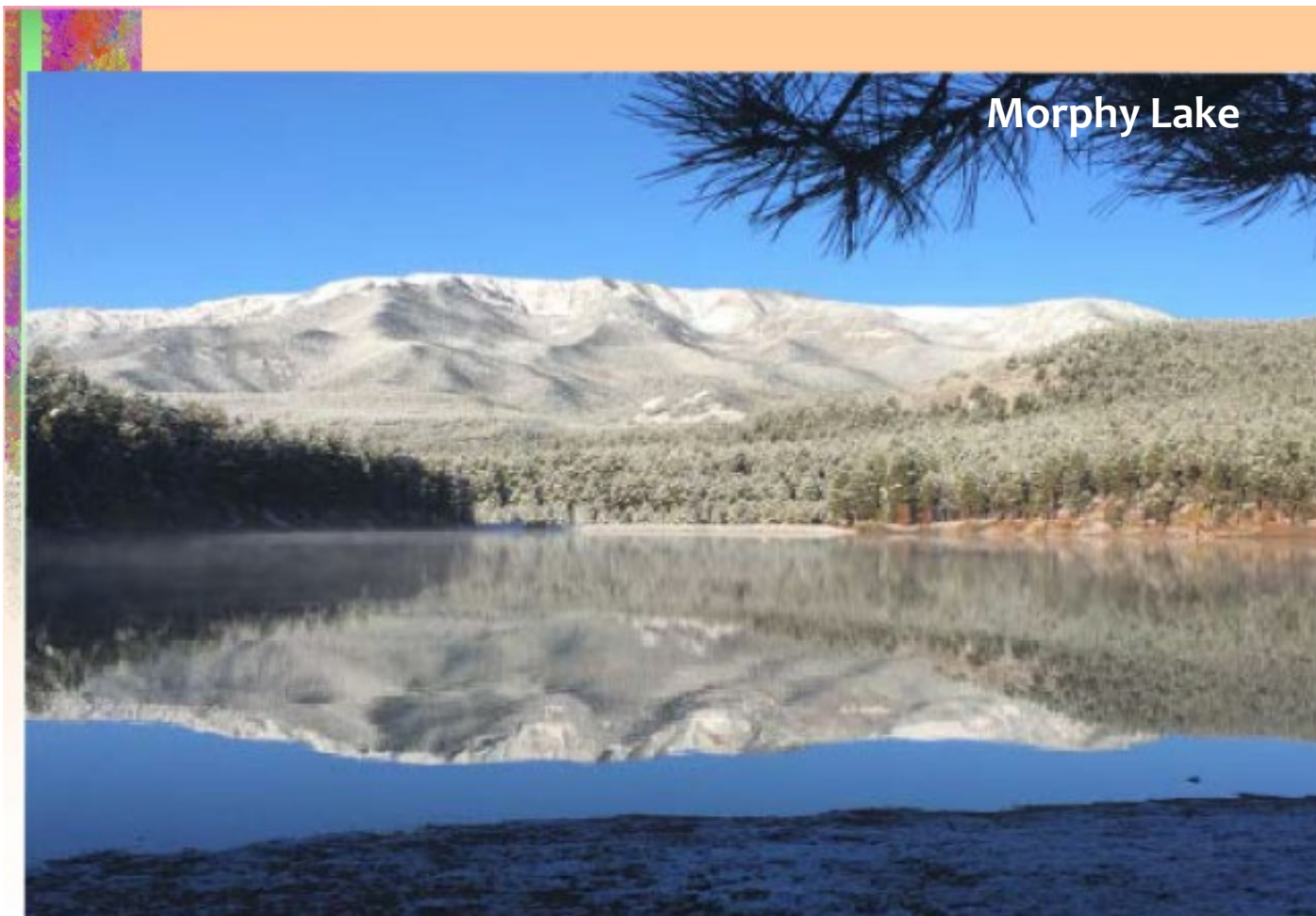


**A successful Path to Climate Change sustainability has been ENERGY SAVINGS PERFORMANCE CONTRACTING. In the past few years over \$82 million in energy efficiency and renewables energy projects have been implemented by Higher Ed. Facilities.**

- **Reduce energy, water and maintenance costs**
- **Make infrastructure improvement**
- **Energy Savings pay for project.**
- **Energy Saving are guaranteed**
- **Turn-Key process**
- **Not dependent on legislative funding or Local taxpayer**
- **Contractor remains connected to project for term of contract**
- **Monitoring and Verification of savings Reports provided**
- **Addresses deferred maintenance**
- **No bid price uncertainty-exact price known**
- **Adequate financing available - NM Finance Authority or Banks**
- **Can leverage other state funds or utility rebates**
- **~~Institutional funding or legislative requests can be concentrated on higher needs.~~**

# List of Higher ED. Energy Performance Projects

AGENCY/ENTITY	TOTAL PROJECT COST (\$)	CERTIFICATION DATE	AREA (ft <sup>2</sup> )	CONTRACT DURATION (Years)	PV GENERATION (kWh)
Totals	\$ 82,639,395	N/A	9,811,938	N/A	5,521,507
New Mexico State University	\$ 15,734,306.00	12/13/2013	3,431,407	13	-
Eastern New Mexico University	\$ 4,542,316.00	8/12/2016	1,274,460	12	-
San Juan College	\$ 7,301,907.00	8/23/2016	920,319	17	-
Clovis Community College	\$ 4,794,503.00	7/7/2017	365,619	15	661,618
New Mexico Tech	\$ 9,337,037.00	6/14/2019	1,182,429	12	1,154,987
Santa Fe Community College	\$ 8,177,132.00	6/14/2019	718,300	20	-
New Mexico Military Institute	\$ 6,454,977.00	7/1/2019	615,890	25	-
Western New Mexico University	\$ 6,961,101.00	6/10/2020	640,892	25	648,356
UNM South Campus	\$19,336,116	2/24/2023	662,622	18	3,056,546



QUESTIONS?