



Strategic Planning for Sustainability

Facilities Management & Operations Center

Name of Event **Sandia National Laboratories**

Name of presenter **Jack Mizner, P.E., LEED AP**

Manager, Corporate Strategic Partnerships

Sandia Overview Statistics

Sandia's facilities and infrastructure systems support a workforce of over 11,415 people, including regular employees, contractors, and resident visitors

Physical area = 188,000 acres

Paved roads = 49 miles

Unpaved roads = 38 miles

Owned buildings = 6.9 million GSF

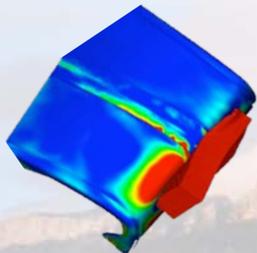
Leased buildings = 461,000 GSF

Total buildings = 7.40M GSF

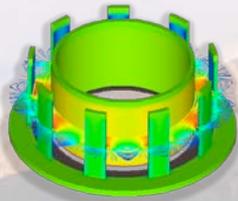


Mission Areas:
Nuclear Weapons
Defense Systems and Assessments
Energy, Resources and Nonproliferation
Homeland Security and Defense

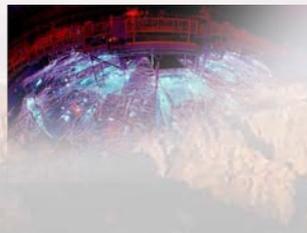
Engineering Sciences



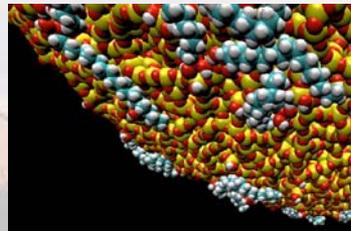
Computer Science



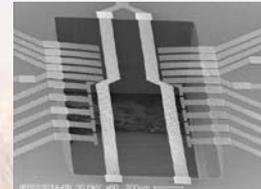
Pulsed Power



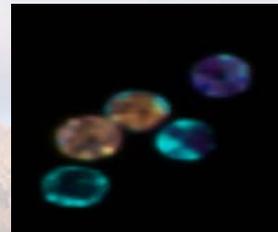
Materials



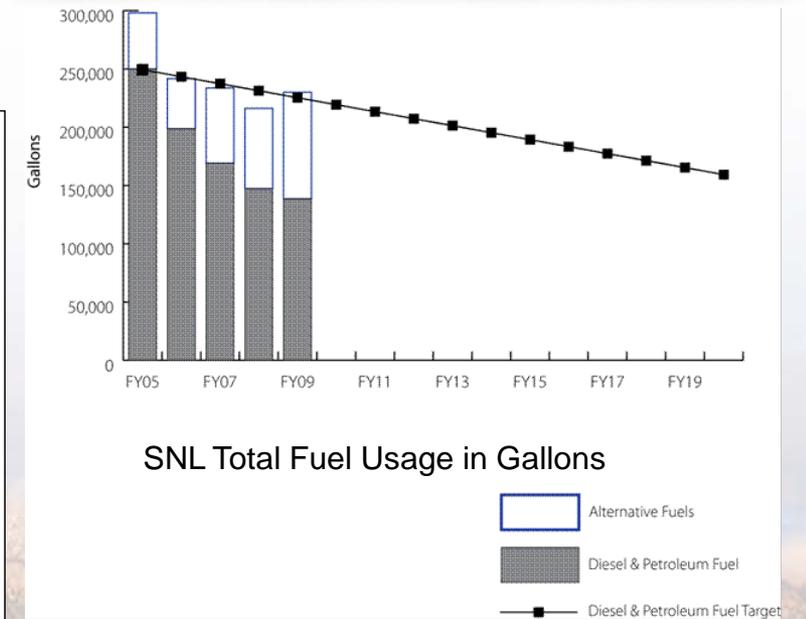
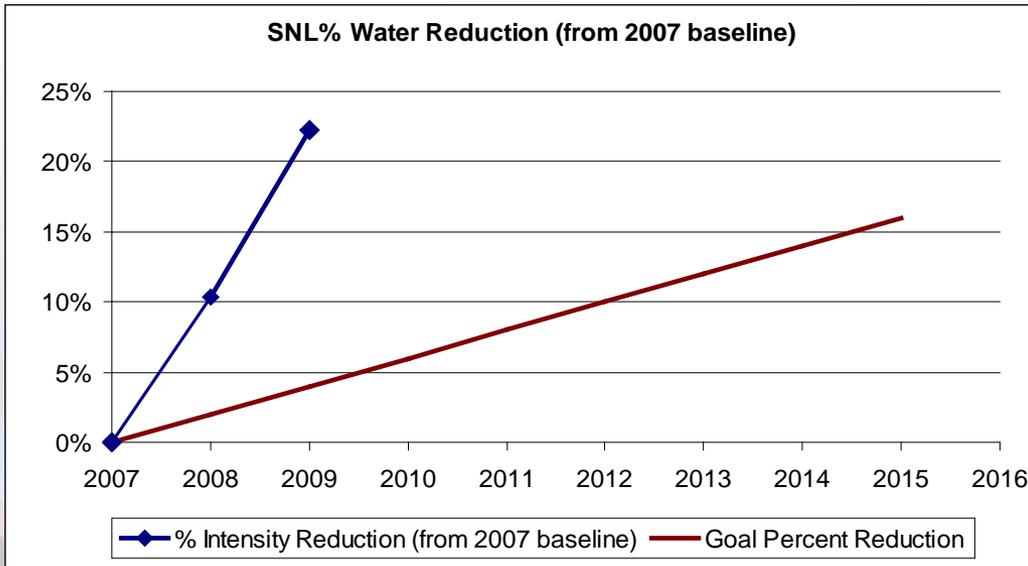
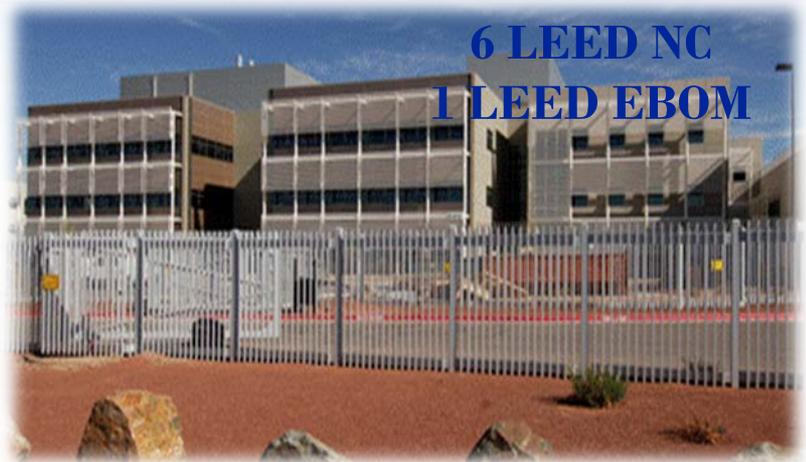
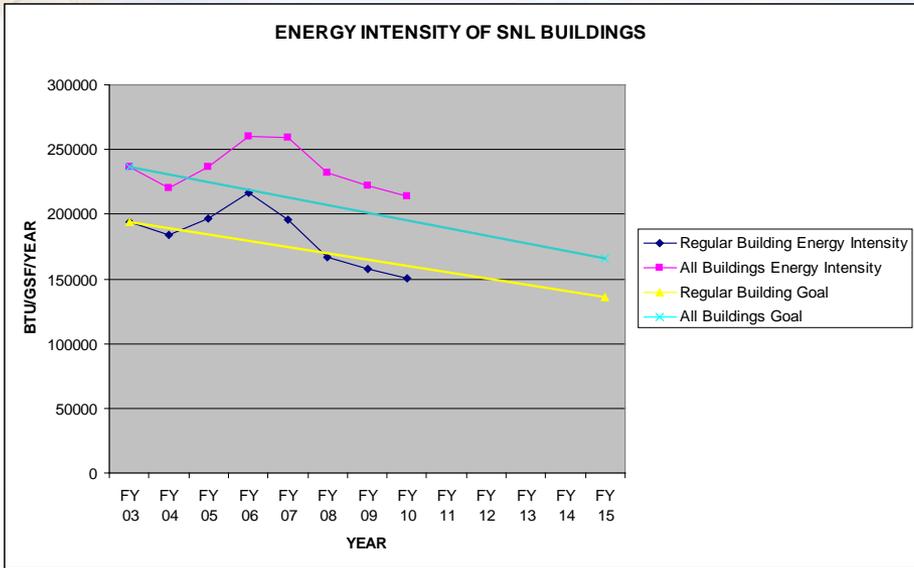
Micro Electronics



Bioscience



Successes



Multiple Requirements and Databases

Executive Orders
Laws DOE Orders
Guidance SSPP
Guiding Principles LEED

CPIBP TYSP
Executable
(or Sustainability) Plans
EMS Documents
IFI Crosscut
Reports: Annual
Quarterly, ad hoc



FIMS
Portfolio Manager
EMS4 CEDR
PPRTS FACTS

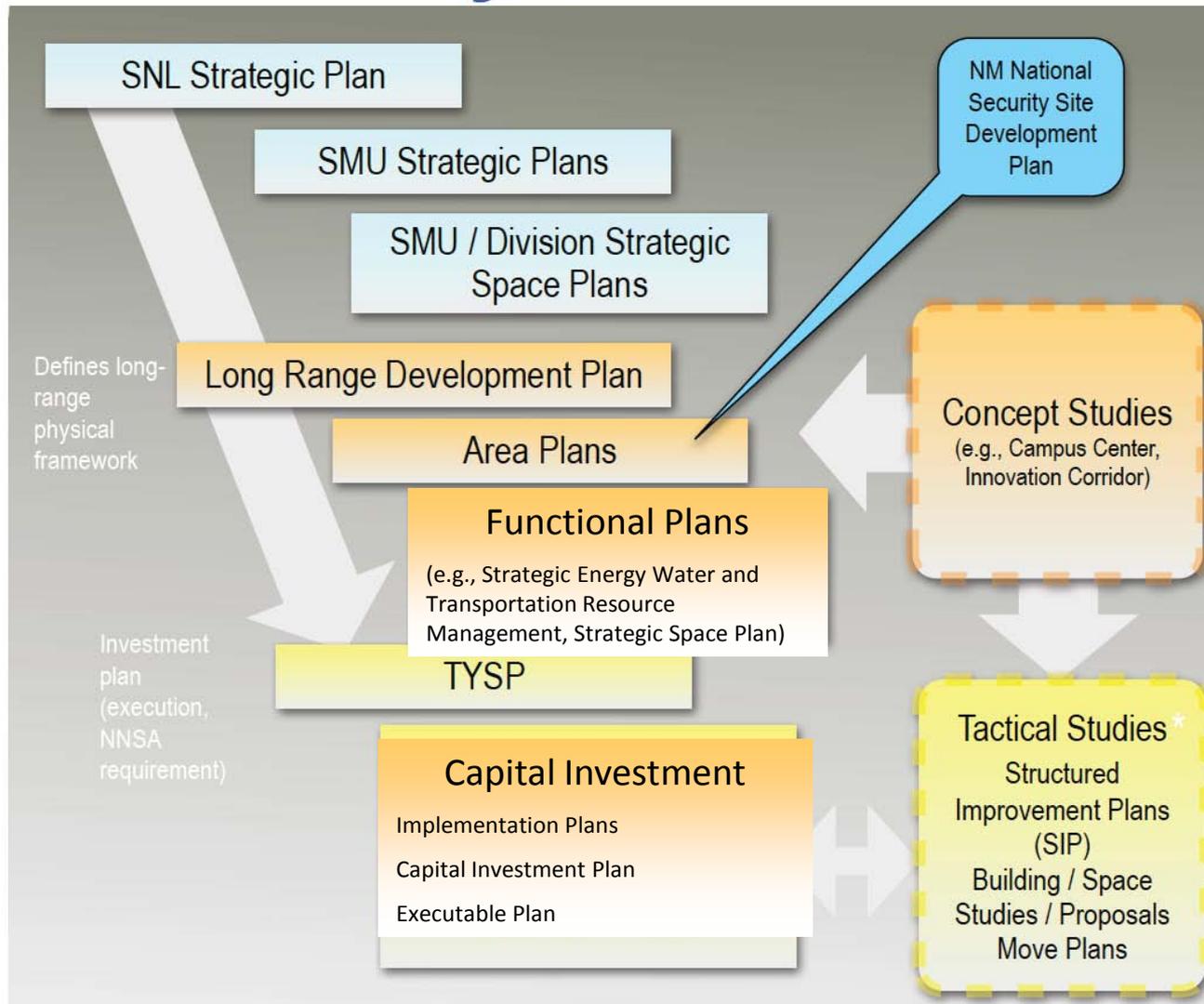
Data Calls
Data Calls
Data Calls
Data Calls

Strategy

- **Where you want to go**
 - Objectives and targets
- **Why you want to go there**
 - Requirements
 - Mission and business needs and justification
 - Translated into a vision
- **Where you are**
 - Trends and baselines
- **How to get there**
 - Strategies
 - Recommendations (immediate, short and long term)
 - Funding needs
- **Projects to achieve vision and targets and implement strategies**
 - Projects and activities defined in Executable (Implementation) Plan



Hierarchy of Plans





Status of the Hierarchy of Plans

Area Plans:

NM National Security Site Development (TA-I Sub Area) Plan (in development)

TA-II & TA-V Sub-Area Plans (complete)

TA-III/IV & TA-IV4 Sub-Area Plans (in development)

Source Documents for upcoming SWEIS

Functional Plans:

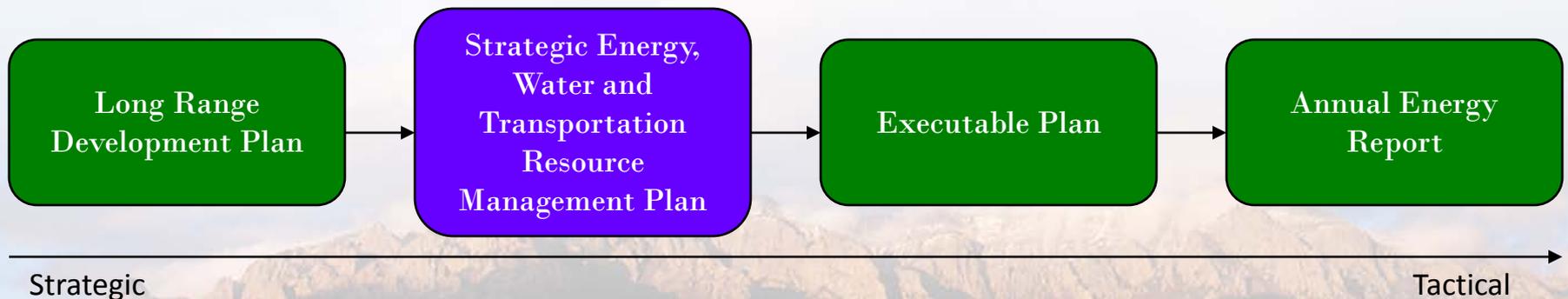
Strategic Energy, Water and Transportation Resource Management Plan

Strategic Operations & Maintenance Plan

Strategic Space Plan

Corporate Strategic Energy, Water and Fleet Resource Management Plan

- This Plan provides a clear link between carbon footprint and water-management objectives, R&D initiatives, site planning, project planning, project selection, and project execution.
- This Plan addresses E.O. 13514 goals and develops long-term strategies to meet them, contingent on resources provided.
- The Strategic Plan directs the Executable Plan.





Strategic Vision

SNL leads the DOE complex, the nation, and the world in innovative, large-scale institutional transformation to a sustainable, carbon-neutral environment while increasing mission effectiveness, resource reliability, and resource security. Each person at SNL understands and accepts his or her vital role in achieving this vision.



Executable Plan

- A Program Plan within our Environmental Management System
- Is an implementation or tactical plan
- Aligns with corporate strategies and objectives
- Identifies activities to support strategies and objectives
- Identifies projects for implementation and selection criteria for choosing them, AND funds projects.
- Identified projects are consistent with the Ten Year Site Plan

FY 10 Energy and Water Projects - Projected Savings

- GPON systems in buildings to allow IDR/MDR HVAC cooling reductions (savings to be determined)
- Convert Bldg. 1090 fume exhaust/By-pass drives (estimated savings \$26,000)
- Install free cooling exchanger at Bldg. 962 (estimated savings \$20,000)
- Install VFD for hi-bay fans at Bldg. 986 (estimated savings \$28,700)
- SNL/CA LED street lamps (estimated energy savings \$3,676; estimated maintenance savings \$35,000)
- SNL/CA relamping projects in Bldgs. C912 and C914 (estimated savings \$8,248)
- Occupancy sensors in Bldgs. 962, 983, 880, 810, 897, 892, 894, 823, 891, and 827 (savings estimate \$151,245)
- Retrocommissioning of Bldgs. 6584, 6587, 1090, 750, 752, 989, 836, and 518 (estimated savings \$300,000)
- Computers off at night but still accessible (estimated savings \$458,000)

Estimated reductions up to 30 billion BTU

Objectives

#	Objective	Scope	Baseline Year	Target Year	Measurement	Target	Notes
2.1.1.1	Ensure that at least 15% of existing buildings of greater than 5,000 gross square feet (GSF) and building leases of greater than 5,000 GSF meet the High Performance and Sustainable Buildings (HPSB) Guiding Principles for Existing Buildings.	All sites included.	FY2009	FY2015	# of buildings	29	The target is 15 % of the FY2009 baseline number of buildings greater than 5,000 GSF (191 buildings).
					GSF	993,600	The target is 15% of the FY2009 baseline GSF for buildings greater than 5,000 GSF (6,624,000 GSF).
2.1.2.1	Reduce Scope 1 and 2 GHG footprints by a minimum of 2.3% annually or by 28%.	SNL/NM	FY2008	FY2020	CO2E	50,323	The target is 28% of the FY2008 Scope 1 and 2 baseline (179,725 CO2E).
		SNL/CA	FY2008	FY2020	CO2E	3,655	The target is 28% of the FY2009 (FY2008 data is not available) Scope 1 and 2 baseline (13,052 CO2E).
2.1.2.2	Reduce Scope 3 GHG footprint by a minimum of .8% annually or by 10%.	SNL/NM	FY2008	FY2020	CO2E	3,964	The target is 10% of the FY2008 Scope 3 baseline (39,645 CO2E).
		SNL/CA	FY2008	FY2020	CO2E	486	The target is 10% of the FY2009 (FY2008 data is not available) Scope 3 baseline (4,862 CO2E).
2.1.3.1	Reduce energy consumption by a minimum of 2% annually or 24%.	SNL/NM and SNL/CA	FY2008	FY2020	BBTU	380.8	The target is 24% of the FY2008 energy consumption baseline (1586.8 BBTU).
2.1.3.2	Reduce energy intensity by a minimum of 2% annually or 24%.	SNL/NM and SNL/CA	FY2008	FY2020	BTU/GSF/YR	55,617	The target is 24% of the FY2008 energy intensity baseline (231,739 BTU/GSF/YR).
2.1.4.1	Reduce water consumption by a minimum of 2% annually or 26%.	SNL/NM and SNL/CA	FY2007	FY2020	gal	150,930,000	The target is 26% of the FY2007 water consumption baseline (580,500,000 gallons).
2.1.4.2	Reduce water intensity by a minimum of 2% annually or 26%.	SNL/NM and SNL/CA	FY2007	FY2020	gal/GSF/YR	21.66	The target is 26% of the FY2007 water intensity baseline (83.3 gal/GSF/YR).
2.1.5.1	Reduce the consumption of petroleum products by SNL Fleet Transportation by a minimum of 2% annually or 30%.	SNL/NM and SNL/CA	FY2005	FY2020	gal	74,988	The target is 30% of the FY2005 petroleum products consumption baseline (249,961 gallons).
2.1.6.1	Become a net-zero energy institution.	SNL/NM and SNL/CA	FY2008	FY2030	BBTU	Net zero	
2.1.6.2	Reduce energy intensity by a minimum of 2% annually or 44%.	SNL/NM and SNL/CA	FY2008	FY2030	BBTU/GSF/YR	101,965	The target is 44% of the FY2008 energy intensity baseline (231,739 BTU/GSF/YR).
2.1.6.3	Use no petroleum products for fleet transportation.	SNL/NM and SNL/CA	FY2008	FY2030	gal	0	

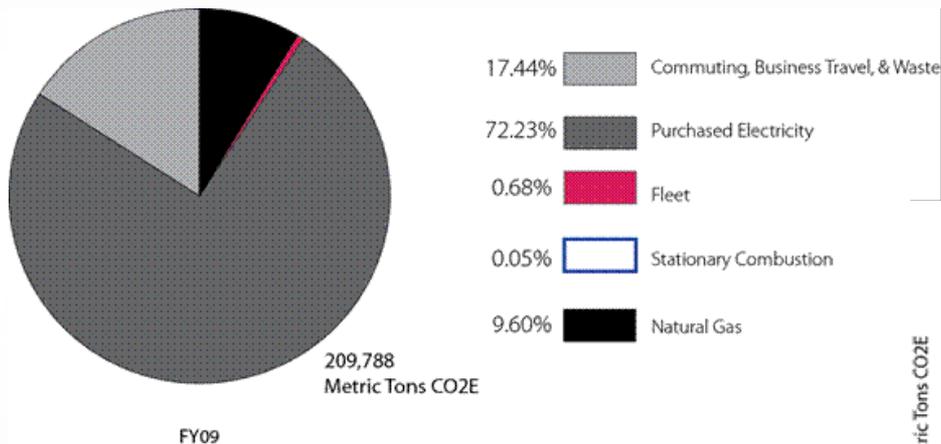


Strategies

- Reduce current demand; use less.
- Eliminate current demand; turn off or remove.
- Use resources efficiently; use fewer resources for the same task.
- Manage new demand.
- Migrate to noncarbon-emitting energy sources.
- Reduce transportation fossil-fuel use.
- Deliver resources to mission-critical activities reliably and securely.
- Provide metering and control systems to track and trend performance.
- Showcase SNL R&D activities.
- Promote a sustainable business model.
- Improve partnerships with external resource providers and collaborators.

GHG Reduction

NM FY2009 Total GHG Emissions Footprint



2.1.2 Green House Gas Objectives

By the end of FY2020, as measured from an FY2008 baseline, SNL will achieve the following objectives:

2.1.2.1 Reduce Scope 1 and 2 GHG footprints by a minimum of 2.3 percent annually or 28 percent by the end of FY2020.

This objective will be measured in Metric Tons Carbon Dioxide Equivalent (CO2E). The objective will be measured separately for SNL/NM and SNL/CA.

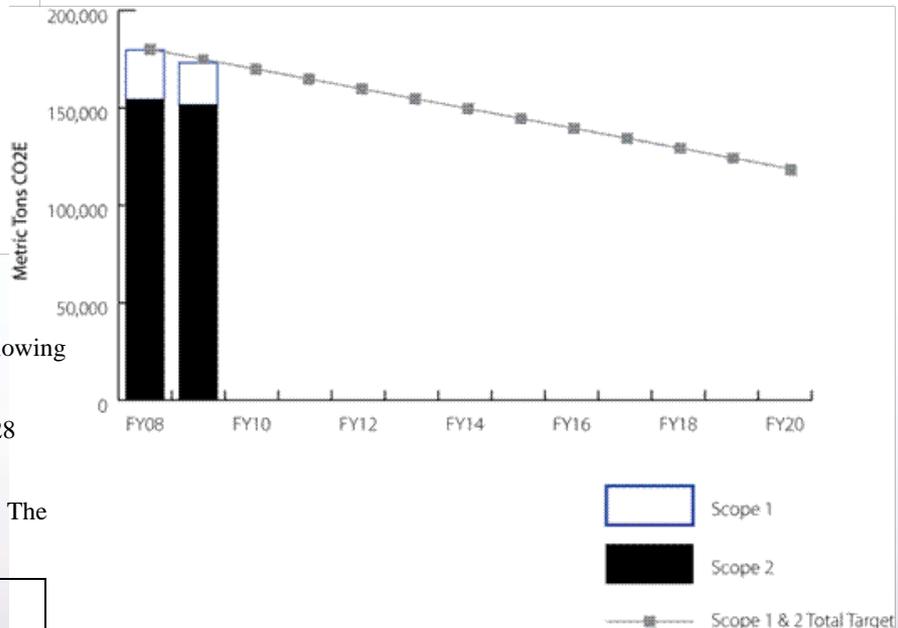
Target: For SNL/NM, 50,323 Metric Tons CO2E

The target is 28 percent of the FY2008 Scope 1 and 2 baseline (179,725 Metric Tons CO2E). (See Figure 3 and Appendix B, Table 2)

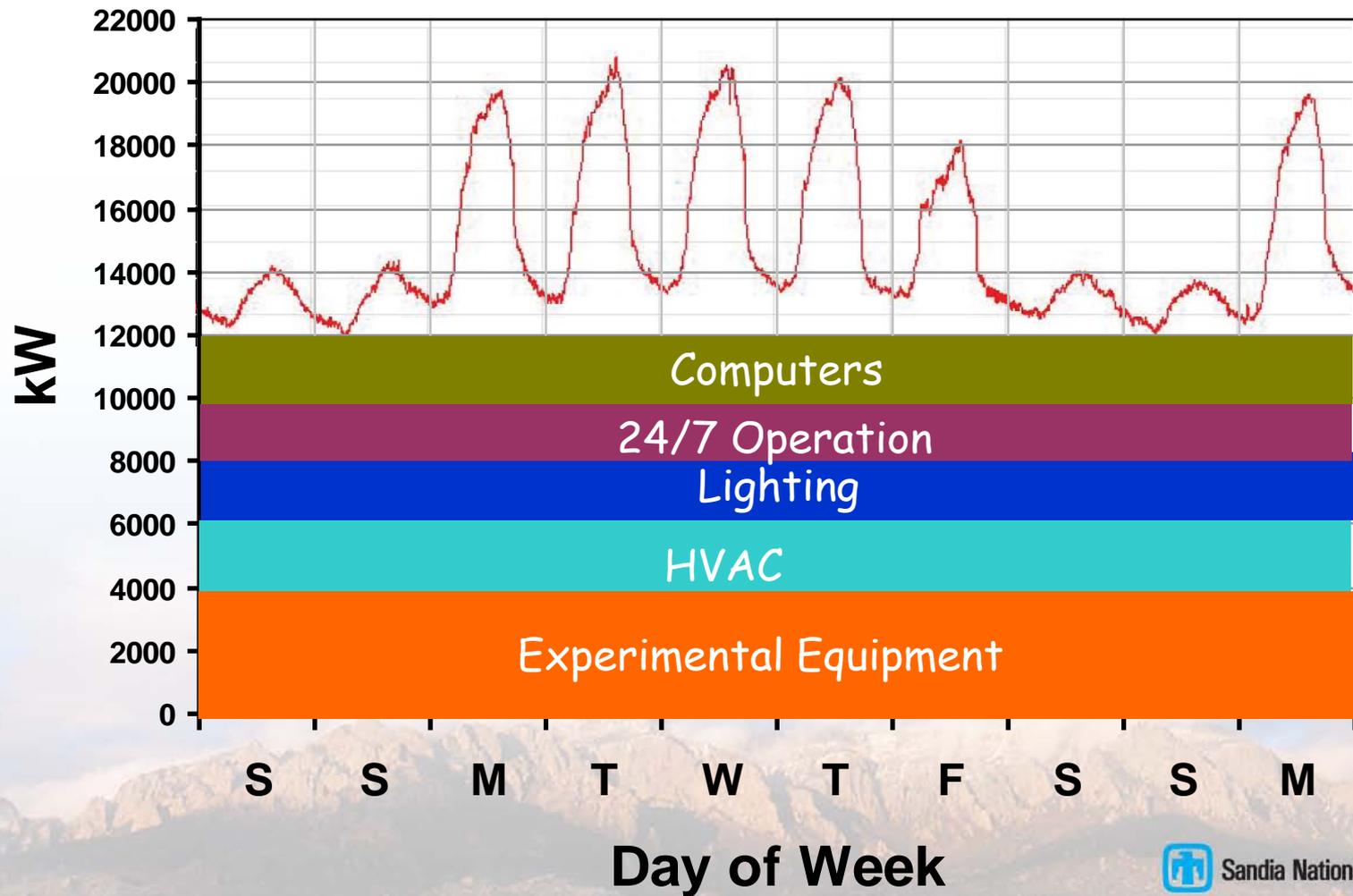
Target: For SNL/CA, 3,655 Metric Tons CO2E

The target is 28 percent of the FY2009 (FY2008 data are not available) Scope 1 and 2 baseline (13,052 Metric Tons CO2E). (See Figure 4 and Appendix B, Table 3)

SNL/NM Scope 1 and 2 GHG Emissions



Daily Load Profile



Corporate Strategies

#	Objective	Corporate Strategy									
		Reduce current demand; use less	Eliminate current demand; turn off or remove	Use resources efficiently; use fewer resources for the same task	Manage new demand	Migrate to noncarbon-emitting energy sources	Reduce transportation fossil fuel use	Deliver resources to mission critical activities reliably and securely	Provide metering and control systems to track and trend performance	Showcase SNL R&D	Promote a sustainable business model
2.1.1.1	Ensure that at least 15% of existing buildings of greater than 5,000 gross square feet (GSF) and building leases of greater than 5,000 GSF meet the High Performance and Sustainable Buildings (HPSB) Guiding Principles for Existing Buildings.	X	X	X		X			X		X
2.1.2.1	Reduce Scope 1 and 2 GHG footprints by a minimum of 2.3% annually or by 28%.	X	X	X	X	X	X		X	X	X
2.1.2.2	Reduce Scope 3 GHG footprint by a minimum of .8% annually or by 10%.					X	X		X		X
2.1.3.1	Reduce energy consumption by a minimum of 2% annually or 24%.	X	X	X	X	X			X		X
2.1.3.2	Reduce energy intensity by a minimum of 2% annually or 24%.	X	X	X	X	X			X		X
2.1.4.1	Reduce water consumption by a minimum of 2% annually or 26%.	X	X	X	X				X		X
2.1.4.2	Reduce water intensity by a minimum of 2% annually or 26%.	X	X	X	X				X		X
2.1.5.1	Reduce the consumption of petroleum products by SNL Fleet Transportation by a minimum of 2% annually or 30%.						X			X	
2.1.6.1	Become a net-zero energy institution.	X	X	X	X	X	X	X	X	X	X
2.1.6.2	Reduce energy intensity by a minimum of 2% annually or 44%.	X	X	X	X	X			X		X
2.1.6.3	Use no petroleum products for fleet transportation.					X	X				

Approach to the Guiding Principles

Guiding Principle (GP)	GP Section	GP #	GP Requirement Description	Credit Type	Documentation	SNL/NM Approach	SNL/CA Approach
Employ Integrated Design	Integrated Assessment, Operation and Maintenance	Integrated 1	Use Integrated Team to develop and implement policy regarding sustainable operations and maintenance	B	None	Use existing information. List responsible Operations Lead as contact person. Reference the Operations Team and the Resource Program Lead as the integrated team. Do not list individuals by name or organization.	
Employ Integrated Design	Integrated Assessment, Operation and Maintenance	Integrated 2	Establish operational performance goals for energy, water, material use and recycling, indoor environmental quality, and ensure incorporation of these goals throughout the remaining life-cycle of the building. Incorporate sustainable operations and maintenance practices within the appropriate Environmental Management System.	C	<i>SNL/NM EMS Manual</i> <i>SNL/CA EMS Program Manual</i> Corporate Procedure ESH100.1.EP.1 <i>Implement the Environmental Management System (EMS)</i>	Use existing documentation. SNL/NM EMS required by EOs 13423 and 13514, DOE Order 450.1A and ISO 14001 certification. Scope has been defined to include energy, water, material use, recycling, indoor environmental quality, and requires performance goals (objectives and targets) at a site-wide level.	Use existing documentation. SNL/CA EMS required by EOs 13423 and 13514, DOE Order 450.1A and ISO 14001 certification. Scope has been defined to include energy, water, material use, recycling, indoor environmental quality, and requires performance goals (objectives and targets) at a site-wide level.
Employ Integrated Design	Integrated Assessment, Operation and Maintenance	Integrated 3	Incorporate a building management plan to ensure that operating decisions and tenant education are carried out with regard to integrated, sustainable building operations and maintenance.	B, C	Building Management Plans at corporate and site-wide - FMOC Operations and Maintenance Strategic Plan FMOC Systems and Components Table Standard Services and SNL System Ownership Corporate Process FAC100.2 <i>Maintain Real Property Assets</i> Corporate Procedure FAC100.2.2 <i>Maintain Buildings and Sites</i> Tenant Education at building level - Training schedules Seminar Agendas/Flyers Newsletters Tenant Education at corporate and site-wide level - Earth Day Earth, Wind, and Sun	Use existing documentation and develop new as required. Use existing Building Management Plans applicable to all buildings and building specific plans if they exist. Tenant Education is accomplished at both the building and corporate site-wide level. Documentation will reflect both.	
Employ Integrated Design	Integrated Assessment, Operation and Maintenance	Integrated 4	Augment building operations and maintenance as needed using occupant feedback on work space satisfaction.	B	Results of FMOC Occupant Survey on work satisfaction at the building level. Resolution of issues identified.	Use FMOC Occupancy Survey to collect this information. Do not generate a stand alone survey to gather this information.	Use FMOC Occupancy Survey to collect this information. Do not generate a stand alone survey to gather this information.

HPSB GP - From Strategy to Implementation

	LEED	FY 10	FY 11	FY 12	FY 13	FY 14	FY 15	FY 15 +
Bldgs	518, 720, 898, 899, 858EL, 858EF, 750	750, 753, 6584, 6587	752, 755, 971	770, 954, 957, 969	758, 811, 886, 1090	809, 856, 859, 861, 885	836, 875, 876, 905	703, 751, 808, 825, 827
# for GP	6	4	3	4	4	5	4	6
Total GP	6	10	13	17	21	26	30	36
% Bldgs	3	5	7	9	11	14	16	19
% GSF (> 5000)	9.7	10.6	11.4	13.3	14.1	15.1	18.4	20.2
% GSF Total	8.8	9.5	10.3	11.9	12.7	13.6	16.6	18.1

Funding Strategies

- \$ Utility Savings Service Center
- \$ Renovation
- \$ Major Restoration
- \$ Deferred Maintenance

Unfunded Need

\$ Internal Investment

Proposal

\$ Line Item Projects

Mission Justification Need

- CRITERIA**
- \$ Solid Business Case
 - \$ Life Cycle Cost
 - \$ Energy Savings
 - \$ Water Savings
 - \$ Operations and Maintenance
 - \$ GHG Reductions
 - \$ Intangibles (regulatory drivers, mission needs)



\$ Measure and Report Results

Funding Needs

Funding Source	FY 11	FY 12 – FY 15	FY 15 – FY 20	FY 20 and beyond
Internal (Indirect)	\$ 2 M	\$ 3M - \$ 5M	\$3 M - \$ 5 M	\$ 5 M – \$ 10 M
DOE/NNSA (Direct)		\$ 3M - \$ 5 M	\$ 5 M - \$ 10 M	\$ 5 M - \$ 10 M
Line Item		Identify	Develop	Implement
Total	\$ 2 M	\$ 6 M - \$10 M	\$ 8 M - \$ 20 M	\$10 M - \$ 20 M

Leverage other funding sources:

- Major Restoration/Renovation
- GPPs
- Alternative Funding Strategies
- Synergy with R&D Opportunities
- Synergy with Energy Security Initiatives



Summary

- Our Strategic and Executable Plans are a part of and complimentary to our EMS.
- Combine Energy and Water Audits and GP Compliance with Building Condition Assessments.
- Reliability Assessment combines grid and mission-critical security with energy independence, also promoting energy efficiency and renewable energy.
- Installed renewable applications mitigate our greenhouse gases and serve our research community.
- Our strategies drive the projects identified and selected in our Executable Plan.