

# *ORNL Sustainable Campus Initiative*

## DOE Integrated Safety Management Workshop

Greg Palko  
September 13—17, 2010



- **Staff:** 4,600
- **Guest researchers:** 3,000 annually
- **Short-term visitors:** 17,000 annually
- **Annual funding:** \$1.4 billion
- **Reservation:** 34,000 acres
- **Facilities:** 4,256,064 square feet on 4,400 acres of land
- Supported by a dedicated fire department, medical center, and security force.
- Extensive utilities with both centralized and distributed systems.



## *Major missions include:*

- **Energy**: Addressing our energy challenges on all fronts, from nuclear power to more energy efficient cars and homes
- **High-Performance Computing**: With unmatched capacity for open scientific research, the Jaguar supercomputer has broken the “petaflop” barrier, or 1,000 trillion mathematical calculations per second, making it possible to model the most complex scientific problems.
- **National Security**: From biochemical sensors to stopping the proliferation of nuclear weapons, technologies that make America safer are among the Laboratory’s top research priorities.

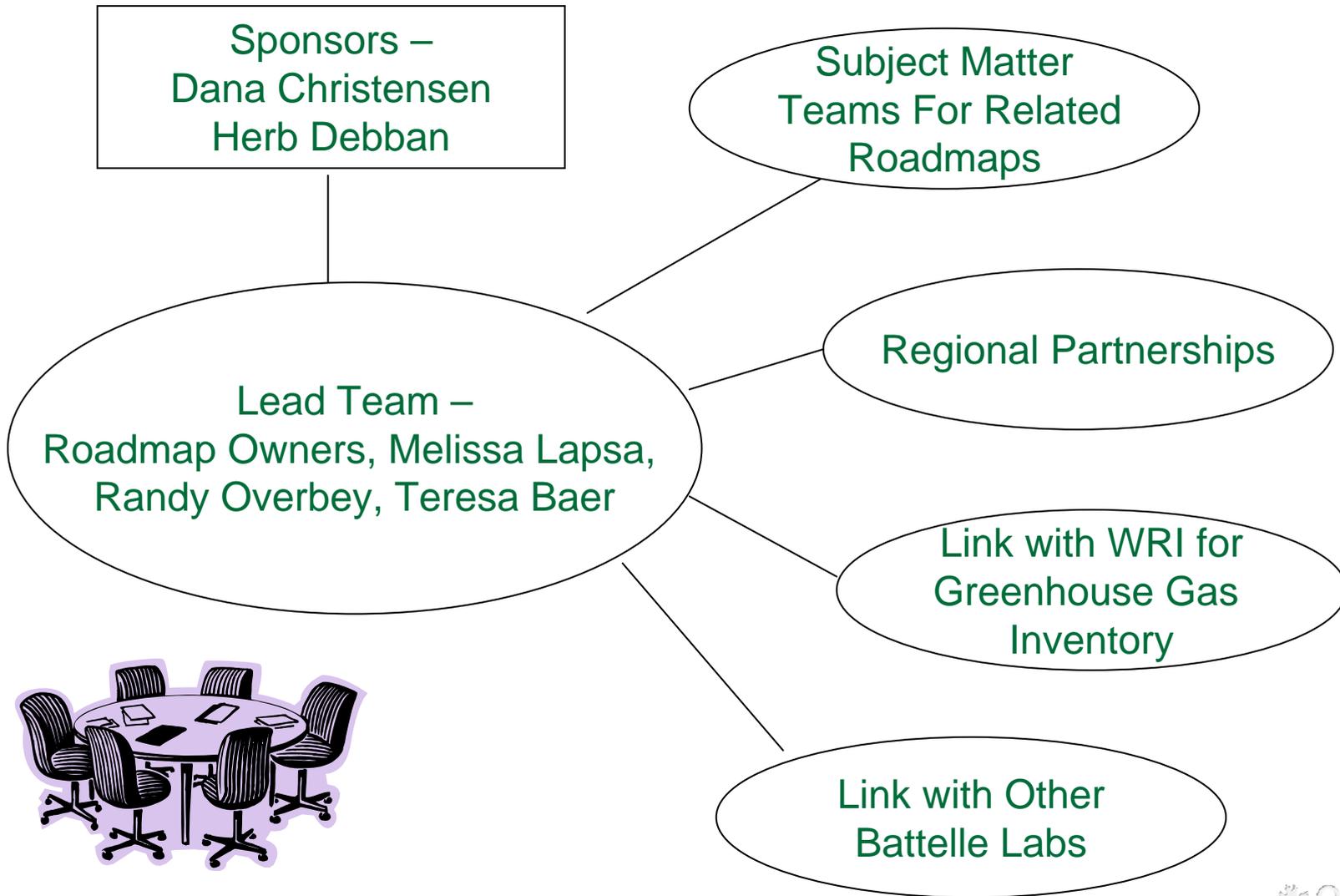
*Major missions include (continued):*

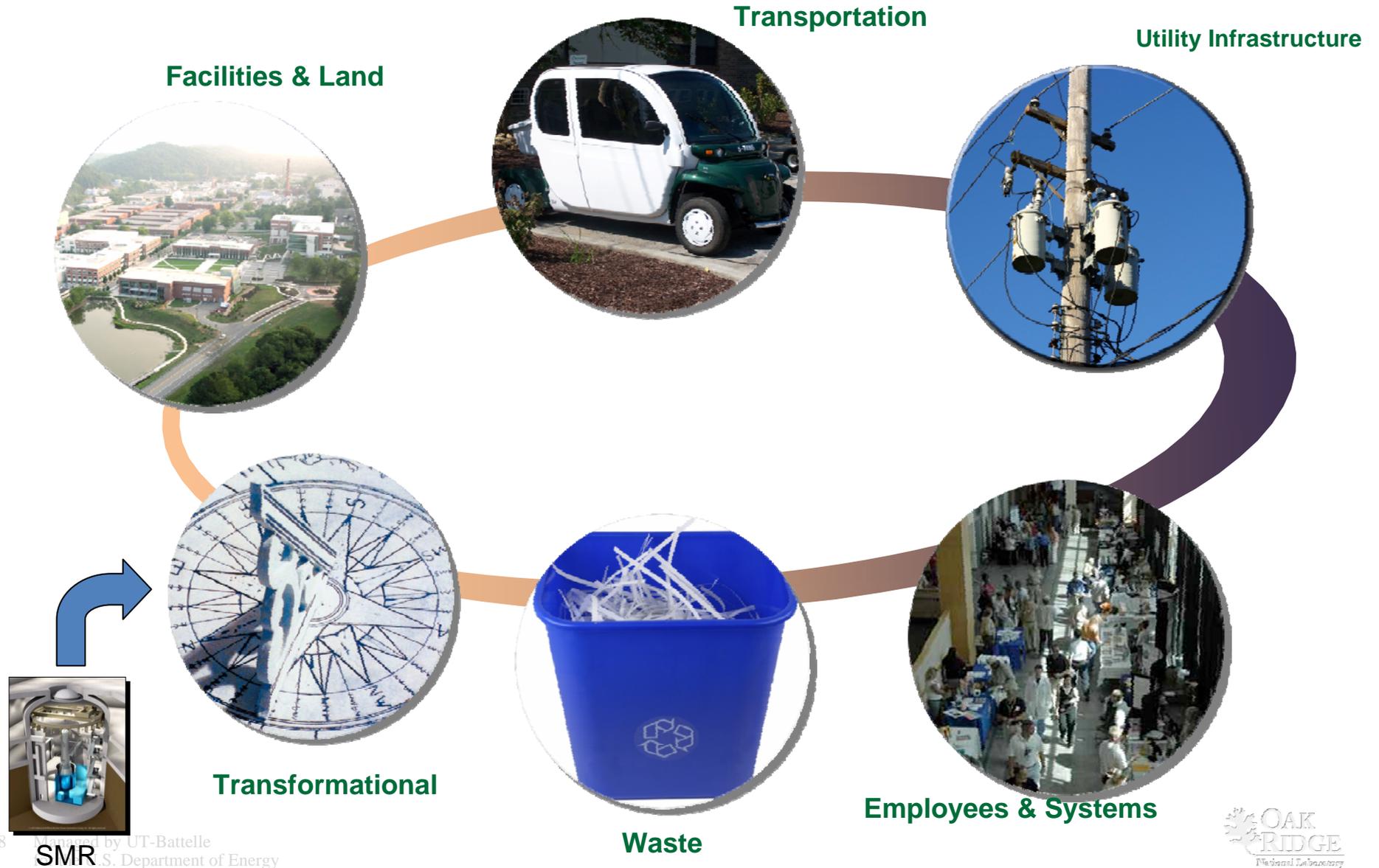
- **Neutron Science**: The Spallation Neutron Source and the High Flux Isotope Reactor together make Oak Ridge the world's foremost center for neutron science.
- **Advanced Materials**: With DOE's first Nanoscience Center; the world's most powerful electron microscope, and the High Temperature Materials Laboratory, Oak Ridge plays a critical role in American industrial competitiveness.
- **Biological Systems**: Whether converting biomass to fuel or understanding the impacts of climate change, biological research at ORNL is helping develop new options for energy, environmental protection, and human health.

- **ORNL's goal is to achieve benchmark sustainability**
  - in campus operation and
  - in research, development and deployment of key technologies
- **Time frame - Ten years, target 2018, with heavy front-end loading**
- **Sponsored and advocated by Executive Leadership**
- **Focus on integration of operations and research**
- **Builds on base of strong ES&H, HR, & Operations**
- **Brought together existing initiatives, providing synergies**
- **Many new initiatives**

*For each sustainability category:*

- **Compared the current condition to the desired future state**
- **Determined actions needed for closing the gaps**
- **Created roadmaps for each category**









- 1. High Performance Buildings, New Construction and Major Renovation**
- 2. High Performance Sustainable Buildings, Existing Facilities, LEED-EB**
- 3. Energy Audits for Existing Facilities**
- 4. Net-Zero Energy Buildings**
- 5. Sustainable Landscaping**
- 6. Land Use**



• 1 million ft<sup>2</sup> LEED-certified campus



**Key Accomplishment:**  
LEED EB for Building 1059

Building  
1059  
retrofits  
complete  
FY09

Building  
1059  
certified as  
LEED Gold  
FY10

List of  
Buildings and  
Organization  
Plan  
FY10

At Least  
15 %  
HPSB  
FY15

All Non-Industrial  
campus buildings  
meet HPSB GP

**High Performance  
Sustainable Buildings**

**FY 10 Deliverables:**

- LEED Gold Certification for 1059
- Develop template for LEED EB Process
- White paper and cost analysis for 1059
- Prepare 3156 and 1509 for certification

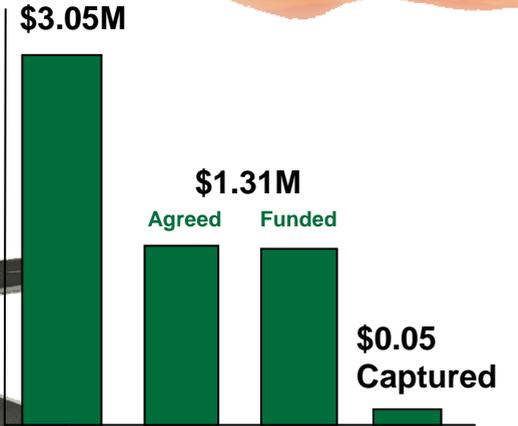
**EO:**

- ❖ 15% HPS EB by 2015, make progress toward 100%
- ❖ Reduce building energy intensity to reduce GHG emissions
- ❖ Implement innovative strategies, e.g., highly reflective, vegetated roofs
- ❖ Identify alternative to renovation to reduce DM

Energy Efficient  
Facilities



Energy Savings Opportunities



Key Accomplishment

Establish  
Audit  
Protocol  
Aug 2009

Audit 25%  
Campus  
facilities  
Sep 09

Fund  
Targeted  
ECMs  
Nov 09

Complete  
targeted  
ECMs  
Sep 10

Repeat  
Cycle  
Annually

*Energy Audits  
for Existing  
Facilities*

- FY 10 Deliverables:**
- ✓ Secure funding for FY09 ECMs
  - Implement and track ECMs to closure
  - ✓ Establish audit schedule
  - Establish audit contract for FY10
  - Conduct FY10 Audits and establish ECMs

- EO:**
- ❖ 15% HPS- EB by 2015
  - ❖ Reduce building energy intensity to reduce GHG
  - ❖ 20% non-potable reduction by 2020 vs 2010
  - ❖ 26% potable intensity reduction by 2020 vs 2007

The Johnson Controls ESPC is an Investment of \$89M with estimated annual savings of \$8M for an aggregate simple payback of 12.78 years.

The ESPC will help meet Executive Order requirements and reduce greenhouse gas emissions while modernizing the utility infrastructure.

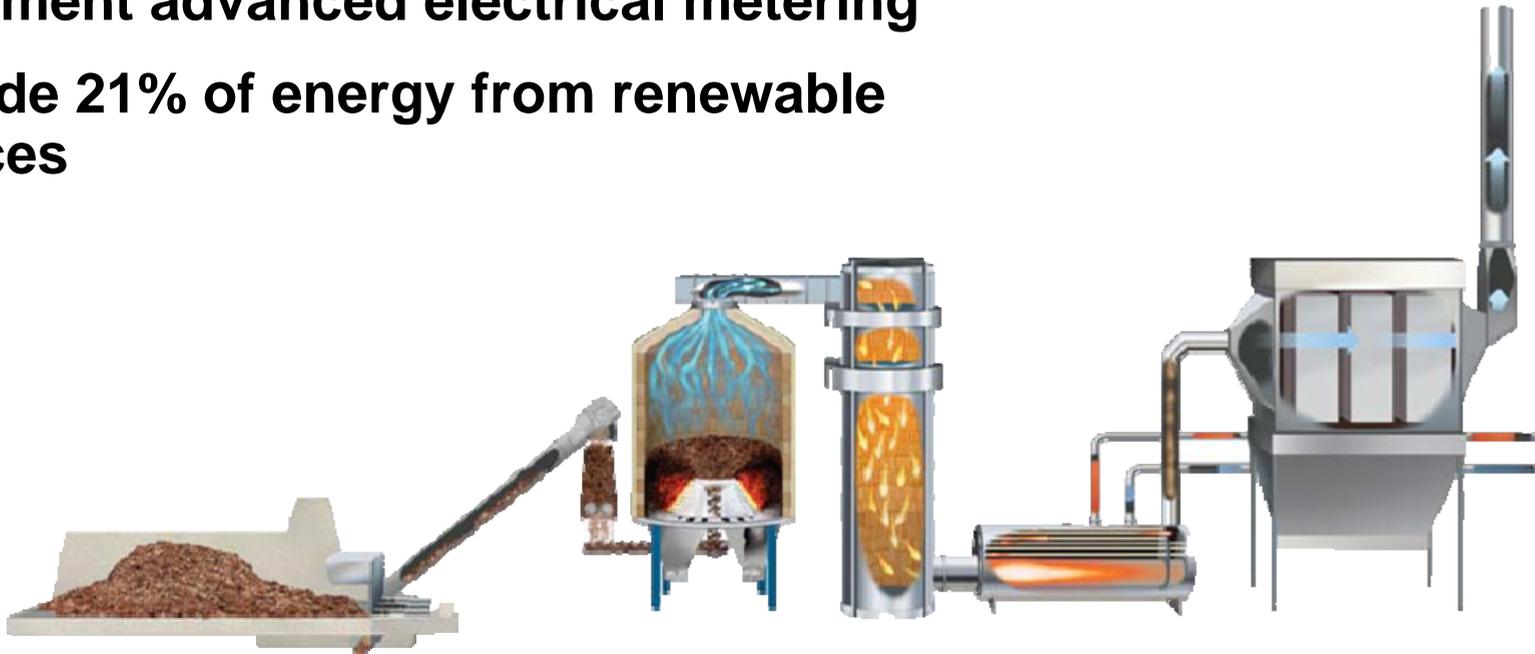
### Energy Conservation Measures include:

- Conversion to Biomass Steam Plant
- Steam Decentralization of Remote Buildings
- Building Management System Upgrades
- Advanced Electric Metering
- Comprehensive HVAC Upgrade
- Energy-Efficient Lighting Upgrade
- Water Conservation



The new biomass-fueled boiler will produce 60,000 pounds of steam per hour. Combined with the Cleaver-Brooks super boiler nearly eliminating the Lab's fossil fuel consumption.

- **Reduce fossil fuel use by >85%**
- **Reduce water use by 170M gallons per year**
- **Reduce energy intensity by 50%**
- **Implement advanced electrical metering**
- **Provide 21% of energy from renewable sources**



**Steam Biomass Plant**

**Key Accomplishment:**  
40% energy reduction  
for Building 3156

Define  
elements of  
technology  
Complete

Set final  
plans for  
3156 and  
3147  
09/10

Complete  
Building  
3156  
09/10

Complete  
Building  
3147  
09/11

Complete  
Building  
3144  
09/12

Max energy  
efficient  
Sub-campus  
Established



New Metasys: HVAC  
shed during unoccupied  
periods, 30 MWh/yr saved

*Balanced  
Energy  
Buildings*

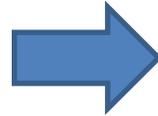
**FY11 Deliverables:**

- Building 3156 Stability
- Pursue Renewable CHP for Buildings 3147 and 3114
- Max Energy Efficiency for Building 3147

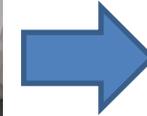
*DOE's first net-zero energy building,  
first retrofitted NZEB commercial building*



IT computer power settings, central printers and smart power strips: 10 MWh/yr saved



New PTHPs: 5 MWh/yr saved



Occupancy Sensors:  
Day time savings of 5 MWh/yr saved



Solar PV array:  
Provides 50 MWh/yr



Building 3156 reaches net-zero energy Consumption reduced from 100 to 50 MWh/year, solar provides remaining demand



New Metasys: HVAC Shed during unoccupied periods, 30 MWh/yr saved

## NZEB: 3156 Energy Reduction Measures



Master conceptual landscape and hardscape plan  
Complete

Detailed landscaping plans consistent with master plan  
Complete

Phased implementation of landscape and hardscape plans  
Complete

Develop long-range habitat and land use plan  
March 2011

Sustainable Site



**Sustainable  
Land Use**

**FY 10 Deliverables:**

- Incorporate educational signage
- Develop conceptual landscape plans
- Establish storm water demonstration area
- Update approved native plant listing
- Update landscaping website
- Maintenance of currently landscaped areas

**SSPP:**

- ❖ Reduce industrial, landscaping, and agricultural water consumption by 2%
- ❖ Implement strategies that reduce potable water use
- ❖ Implement pest management and other landscaping management practices



- 1. Sustainability in the ORNL Vehicle Fleet**
- 2. Sustainability in Employee Transportation**
- 3. Solar-Assisted Charging with EV**

**Key Accomplishment:  
GREET Analysis**

Past Accomplishments,  
➤ White House Closing the Circle  
➤ Best -in-Class  
➤ DOE P2 Star

Fleet reductions and petroleum reductions  
On-going

Continue to modernize the fleet  
On-going

Transition to non-petroleum  
FY15

Zero Net Carbon Emissions by FY25



*Sustainability  
in the ORNL  
Vehicle Fleet*

**FY10 Deliverables:**

- GREET Evaluation of current ORNL fleet
- Future fuels matrix
- Report on viability of CNG in ORNL fleet
- Report on ethanol content of ORNL E85
- Recommendation to Logistical Services on fleet operations
- Address availability of bio-fuels

**EO:**

- ❖ Reduce fleet's consumption of petroleum products 2% annually through FY20
- ❖ Use low GHG emitting vehicles
- ❖ Optimize the number of vehicles in the fleet
- ❖ Reduce GHG emissions

**Key Accomplishment:**

Employee survey and transportation alternatives plan – endorsed by Sponsors

Assessment using employee survey  
FY09

Develop transportation alternative plan (TAP)  
FY09

Brief sponsors  
FY09

Hire coordinator  
FY10

Implement TAP  
FY10

On-going assessment and initiatives

Zero Carbon Emissions

*Sustainability  
in Employee  
Transportation*

**FY10 Deliverables:**

- ✓ Analyze survey results and present to sponsors
- Conduct site audit
- ✓ Develop TAP
- Present plans at Sustainability Seminar
- Expand Smart Commute Web Site
- Start-up 10 vanpools
- Promotions during Earth Day and Transportation Month

**EO:**

- ❖ Reduce scope 3 GHG emissions by 10%

**Key Accomplishment:**

\$13.6M in place for regional project –  
25 charging stations on campus this FY

ARRA  
Award  
08/09

Design of  
charging  
system  
complete  
12/09

First 5  
prototypes  
at EPRI  
09/10

25  
Stations  
at ORNL  
12/10

125 Stations  
Regionally  
March 2012



*Solar-Assisted  
Charging  
with EV*

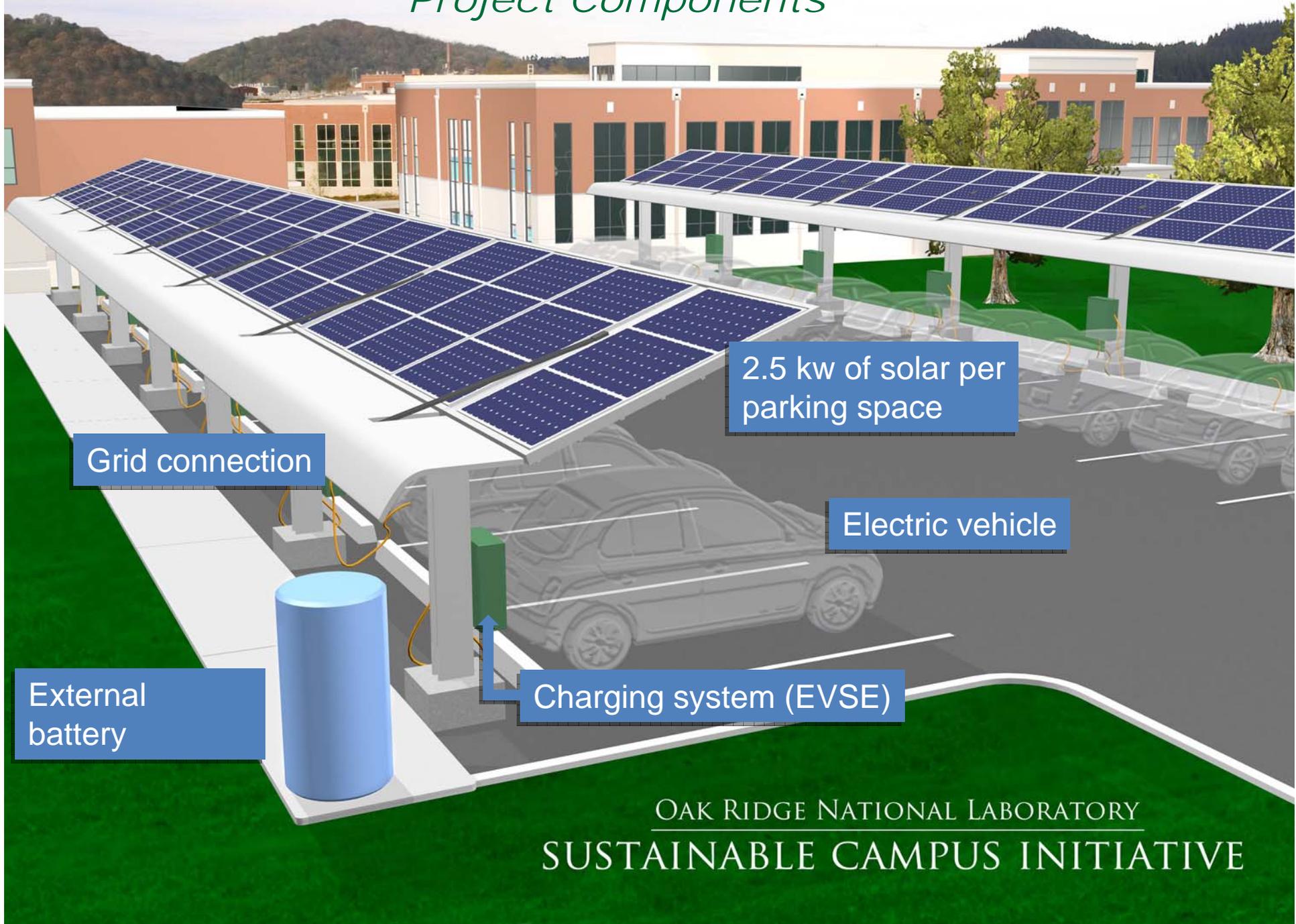
**FY10 Deliverables:**

- Complete design
- Construct five prototypes at EPRI
- 25 stations installed on campus
- Regional plan in place

**EO:**

- ❖ Increase renewable energy generation projects
- ❖ Reduce fleet consumption of petroleum products
- ❖ Use low-GHG emitting vehicles

# Project Components



Grid connection

2.5 kw of solar per parking space

Electric vehicle

External battery

Charging system (EVSE)

OAK RIDGE NATIONAL LABORATORY  
SUSTAINABLE CAMPUS INITIATIVE





- 1. Grid Efficiency, Smart Grid**
- 2. Energy Storage and Peak Power Management**
- 3. Wireless Energy Data “Energy Wall”**
- 4. Renewable Energy Sources**
- 5. Water Management**

**Key Accomplishment:**  
Combined effort on campus-wide design

Define best  
in class  
Complete

Develop  
proposal for  
pilot  
Complete

Secure  
funding for  
pilot  
Complete

Implement  
pilot  
9/10

Evaluate  
pilot  
12/10

Site-wide  
Smart Grid

*Grid  
Efficiency,  
Smart Grid*

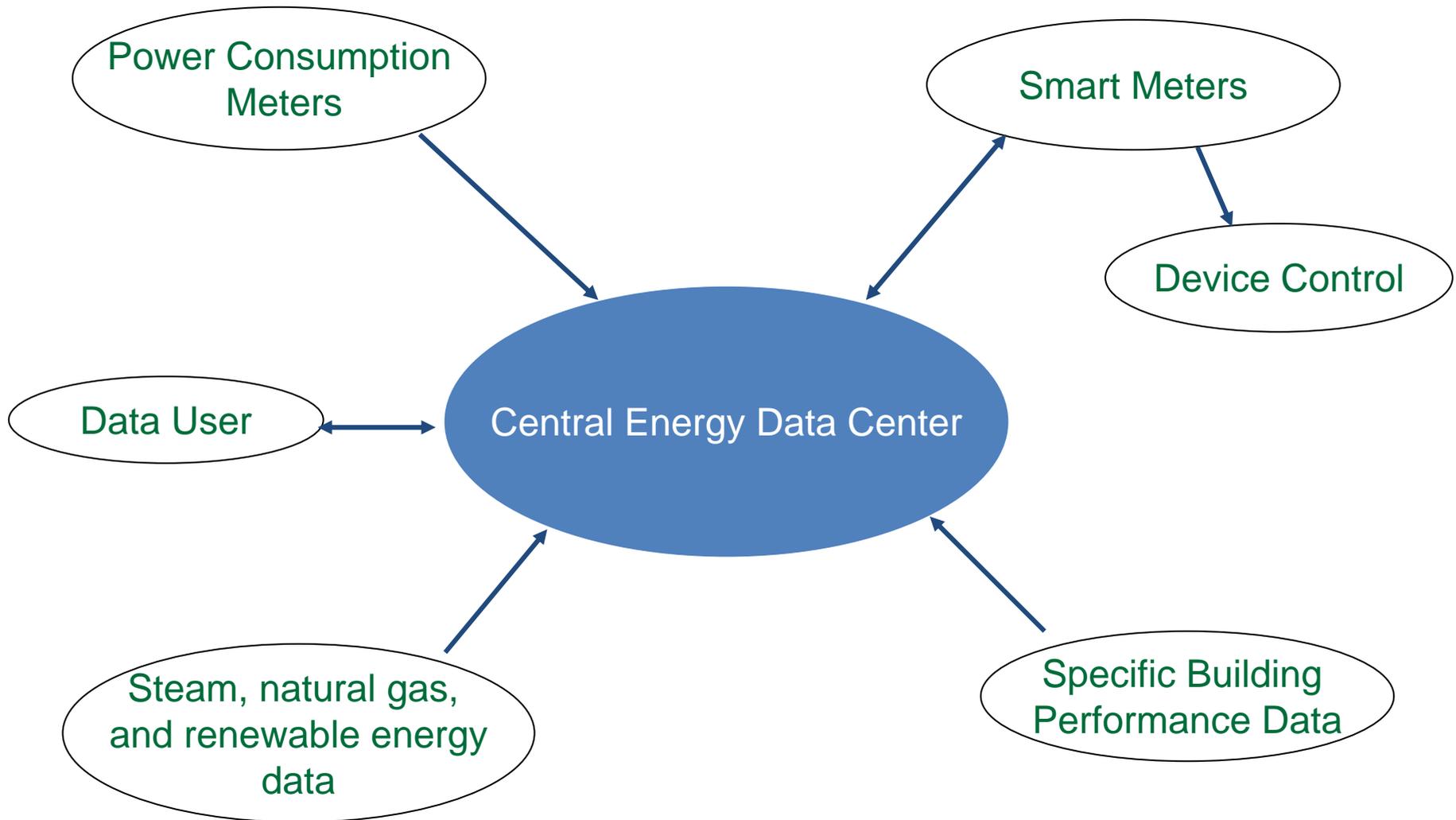
**FY10 Deliverables:**

- ✓ Develop proposal for pilot
- ✓ Presentation to SC sponsors
- ✓ Secure interim funding
- Install meters and develop IT requirements
- Implement pilot

**EO:**

- ❖ Reduce building energy intensity to achieve GHG reductions

# *Common Architecture for Energy Data and Load Control*



Sponsors: Herb, Dana, and Mike Bartell

Assess  
value of  
peak  
reduction  
Complete

Assess  
technologies  
for energy  
storage and  
peak mgmt  
Complete

Complete  
proposal and  
business  
case for  
selected  
technology  
Complete

Secure  
funding for  
feasibility  
study  
Complete

Project  
Implementation  
FY11



*Energy Storage  
and Peak  
Power  
Management*

**Key Accomplishment:**  
Assessment of value of peak  
power management & energy  
storage options

**FY10 Deliverables:**

- Develop hydro option for peak management
- Present to SC sponsors
- Secure Funding for feasibility Study
- Complete feasibility Study

**Key Accomplishment:**

Combined effort on campus-wide design

Feasibility  
study  
Complete

Secure  
funding  
for pilot  
Complete

Complete  
pilot for  
steam plant  
9/10

Proposal for  
campus-  
wide  
energy wall  
9/12

Complete  
Campus-Wide  
Energy Wall  
9/13

*Wireless  
Energy Data  
"Energy Wall"*

**FY10 Deliverables:**

- ✓ Complete proposal and cost estimate
- ✓ Present to SC sponsors
- ✓ Secure funding
- ✓ Integrate IT architecture with Smart Grid project
- Implement pilot

**EO 13514:**

- ❖ Reduce scope 1 and 2 greenhouse gas emissions

**Key Accomplishment:**

62kw solar coming to campus by September (30% larger than BVR)



Meet TEAM  
and EO Goals

Solar  
charging  
stations +  
other projects  
9/10

Secure funding  
for selected  
projects  
3/10

Select and  
document  
specific  
projects  
complete

*Renewable  
Energy  
Sources*

- FY10 Deliverables:**
- Evaluate application GSHP for NZEB and FDD
  - Establish solar-assisted parking spaces
  - Landfill gas white papers for City of Alcoa and Block House Valley
  - Document potential to use data center heat recovery and possible projects
  - Assess bio-fuel power generation

- EO:**
- ❖ Increase use of renewable energy
  - ❖ Implement renewable energy generation projects
  - ❖ Reduce scope 1 and scope 2 GHG emissions 28% by 2020

**Key Accomplishment:**  
60 million gal/year reduction

Assess  
process water  
system  
complete

Evaluate and  
report on current  
initiatives  
9/09

Identify  
additional water  
reduction  
initiatives  
On-going

Implement water  
reduction  
initiatives  
On-going

Reduce water  
consumption by 26%  
FY20

*Water  
Management*

FY10 Deliverables:

- Repair leaks in water distribution system
- Gap analysis for compliance with EO
- Recommendations for EO compliance
- Flow restrictors installed for OTC in Building 6000

EO:

- ❖ 20% non-potable reduction by 2020 vs 2010
- ❖ 26% potable intensity reduction by 2020 vs 2007
- ❖ Reduce industrial, landscaping and agricultural water consumption by 2%



- 1. Recycle and Reuse, Routine Waste**
- 2. Recycle and Reuse, Construction Waste**

**Key Deliverable:**  
30% run-rate  
reduction in waste

Current  
condition

30% run  
rate  
reduction  
9/09

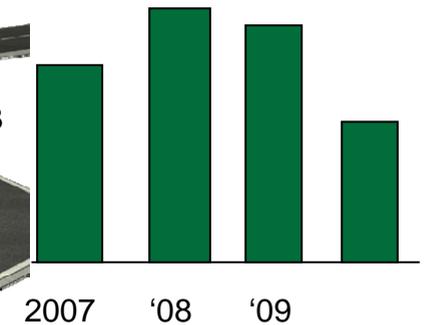
50% run  
rate  
reduction  
9/10

On-going  
evaluations  
and  
targeted  
reductions

Zero Construction  
Waste to Landfill

Waste to the Landfill

YD3



*Recycle and  
Reuse,  
Routine Waste*

**FY 10 Deliverables:**

- Enhanced recycling services in all buildings
- Composting pilot and plan for implementation
- Increase recycle for conference center and special events
- Resolve issue regarding disposal of ash from biomass steam plant

**SSPP:**

- ❖ 50% reduction in landfill waste by 2015 vs 2008
- ❖ Increase diversion of compostable material from landfill
- ❖ Minimize waste through source reduction
- ❖ Reduce printing paper use

- **Eliminated Styrofoam in café**
- **Adding plastic/aluminum recycling in conference rooms**
- **Emptied, sorted and photo documented dumpster contents**
- **Enhanced recycling program**
  - **Containers provided to offices**
  - **Janitors pick up recyclables**
  - **New collection carts for janitors**
- **Video tape promotion**





- 1. Employee, Family, and Community Engagement**
- 2. Employee Wellness**
- 3. Information Technology**
- 4. Green Procurement**
- 5. Sharing Successes**
- 6. External Applications**
- 7. Greenhouse Gas Management**

**Key Accomplishments:**

Web site, Earth Day  
Sustainability Fair  
“Sustainability at Home” Series  
Regular communications  
Brochures

Engaged  
Employees

Develop  
annual  
engagement  
plan  
On-going

Launch  
sustainability at  
home seminar  
series  
Complete

Launch  
sustainability  
newsletter  
Complete

First annual  
sustainability  
awards  
4/10

Sustainability  
summit  
04/11

*Employee,  
Family and  
Community  
Engagement*

**FY10 Deliverables:**

- ✓ Regular, multi-faceted engagement with employees
- ✓ Sustainability at Home seminar series initiated
- ORNL Sustainability Award
- Awards Night Sustainability Award
- ✓ Sustainability Newsletter
- Sustainability Summit



**Key Accomplishment:**  
Continuing strong program

Benchmarkable  
Wellness  
program

Establish  
comprehensive  
wellness  
program  
On-going

Implement  
wellness  
programs  
On-going

Evaluate  
programs  
On-going

Modify  
programs  
as  
needed  
On-going



**ORNL Wellness Program**

*Employee  
Wellness*

FY10 Deliverables

In support of Reward Points Plus continue

- Monthly health series
- Weight management program
- Stress lectures
- Challenges such as Santaclaustrophobia
- Health Fest

**Key Accomplishment:**  
35 -40% reduction in PC  
power consumption and  
funding to go campus wide

Finalize  
initiatives for  
net-zero pilot  
Complete

Pilot IT  
initiatives for  
net-zero  
buildings  
9/09

Evaluate  
pilot  
1/10

Implement  
Verdiem  
campus-wide  
6/10

Identify  
next  
initiative  
9/10

Green IT



*Information  
Technology  
Sustainability*

**FY 10 Deliverables:**

- ✓ Evaluate energy software pilot
- ✓ Develop plan and estimate for site-wide implementation
- Deploy energy software to all systems
- Research alternatives to traditional computing
- Research data center energy consumption

**EO:**

- ❖ Reduce energy intensity to achieve GHG reductions
- ❖ Ensure preferences for EPEAT-registered electronic products
- ❖ Procurement of Energy Star and FEMP-designated equipment



**Key Accomplishment:**  
Roadmaps approved by  
Associate Lab Dir.

Benchmark  
green procurement  
process

Initiate detailed  
plans,  
including  
training  
8/10

Management  
review of  
roadmaps  
complete

Identify  
elements of  
procurement  
roadmap  
Complete

Assess  
current  
condition  
complete

FY 10 Deliverables:

- ✓ Establish green procurement roadmaps
- Gain Leadership Team support
- Complete selected FY10 projects

*Green  
Procurement*

EO:

- ❖ Pursue opportunities with vendors to reduce GHG emissions
- ❖ At least 30% post-consumer fiber products
- ❖ Ensure procurement preference for EPEAT – registered electronic products
- ❖ Ensure procurement of Energy Star and FEMP-designated equipment
- ❖ Ensure 95% of new contracts - products and services are energy efficient
- ❖ Electronics stewardship
- ❖ Suppliers registry of GHG

**Key Accomplishment:  
E-Star Awards**

Presentations  
On-going

Publications  
On-going

Award  
nominations  
On-going

Successes  
shared;  
Recognition  
and Awards!!!!

*Sharing  
Successes*

**FY 10 Deliverables:**

- Presentation at ACEEE Summer Study
- Presentation at GovEnergy 2010
- Presentation at DOE's EE Working Group
- White House Closing the Circle Award for SC
- White House Closing the Circle Award for Net-Zero
- Pres. Award for Leadership in Federal Energy Mgmt
- Publish at least one article in a journal or newsletter



**Key Accomplishment:**  
St. Lucie County MOU

Develop  
Platform

Establish  
MOUs

Develop  
Work for  
Others  
Contracts

Complete  
Projects  
as Agreed

Wide Community  
Impact

*External  
Application*

FY11 Deliverables:

- St. Lucie County WFO Contract
- Complete All Agreed Phases with St. Lucie
- Develop Additional MOUs and WFO Contracts
- No F&O Funding

**Key Accomplishment:**

GHG Inventory Report FY05-09 – being used regularly, including with Secretary Chu

Prepare  
GHG  
inventory  
Complete

Issue  
management  
report  
complete

Complete  
GHG  
reduction  
plan  
12/10

Update  
inventory  
annually and  
monitor  
reduction plan  
On-going

28% reduction in  
Scope 1 and 2 GHG

10% reduction in  
scope 3 GHG

*Greenhouse  
Gas  
Reduction*

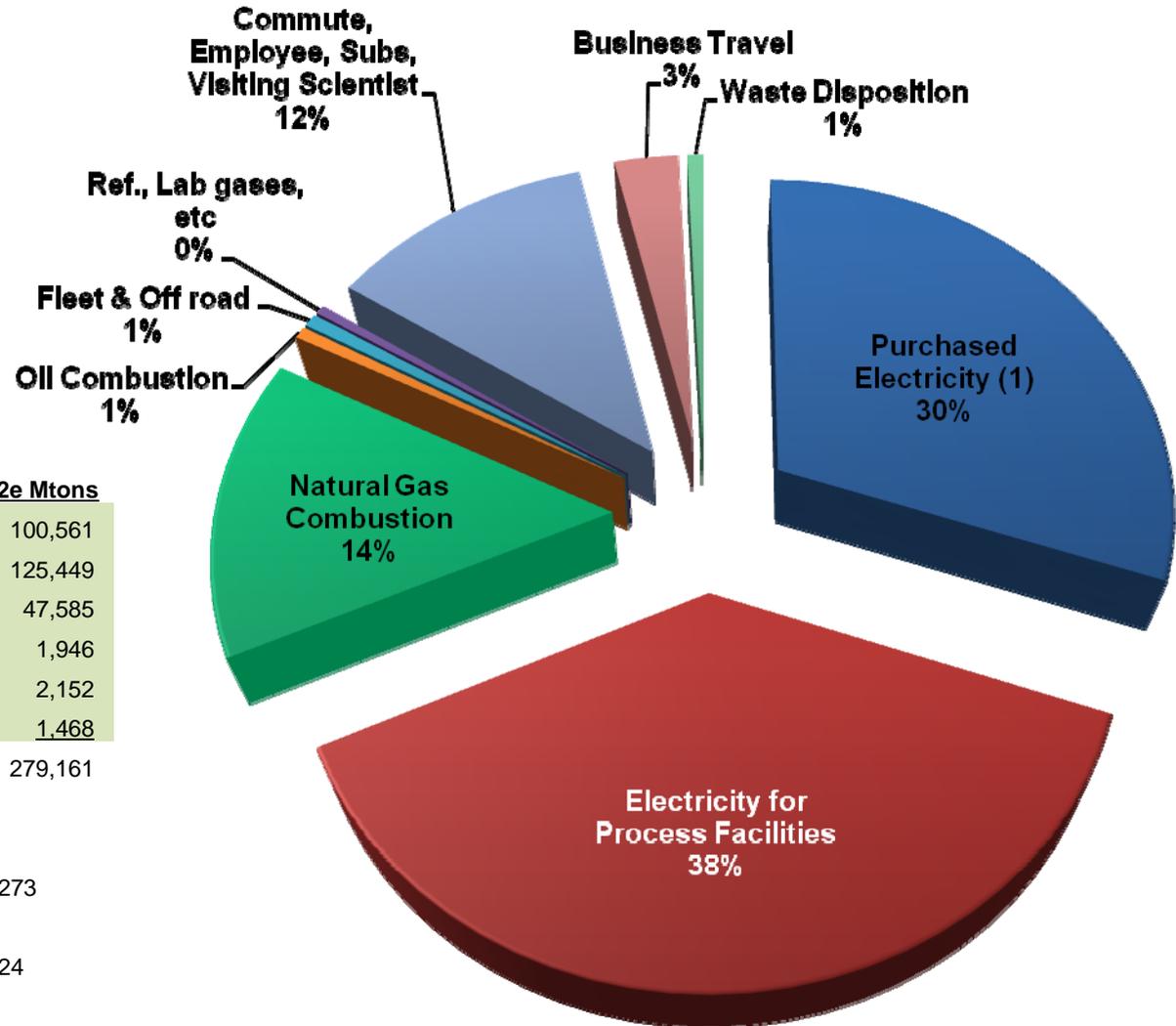
**FY 10 Deliverables:**

- ✓ Finalize GHG Inventory report for FY05-09
- Develop GHG Inventory Reduction Plan
- Include inventory in Annual Report
- Support DOE SSPP, data calls, etc.
- Update for FY10

**EO:**

- ❖ Prepare baseline of GHG emissions
- ❖ Reduce scope 1 and 2 by 28% by 2020
- ❖ Reduce scope 3 by 10%
- ❖ Report GHG emissions annually

The ORNL Team Used WRI GHG Protocol, Public Sector Standard to calculate emissions and document data

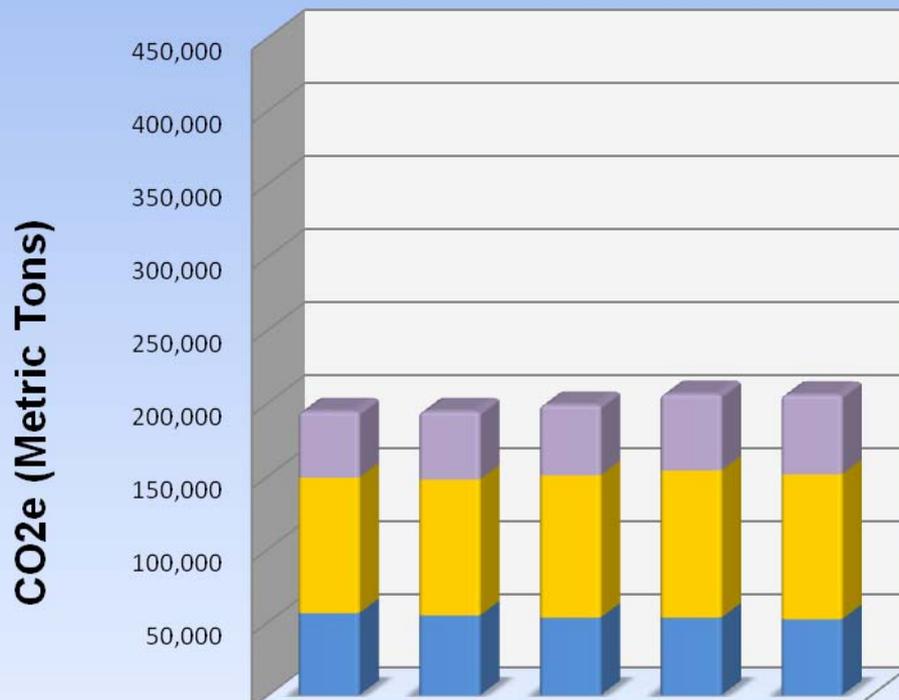


Scope	FY 2008	CO2e Mtons
2	Purchased Electricity (1)	100,561
2	Electricity for Process Facilities	125,449
1	Natural Gas Combustion	47,585
1	Oil Combustion	1,946
1	Fleet & Off road	2,152
1	Ref., Lab gases, etc	1,468
	Scope 1 & Scope 2 Total	279,161
3	Commute, Employee, Subs, Visiting Scientist	40,273
3	Business Travel	9,724
3	Waste Disposition	2,341
	Scope 3 Total	
	<b>Total All Scopes</b>	<b>331,499</b>

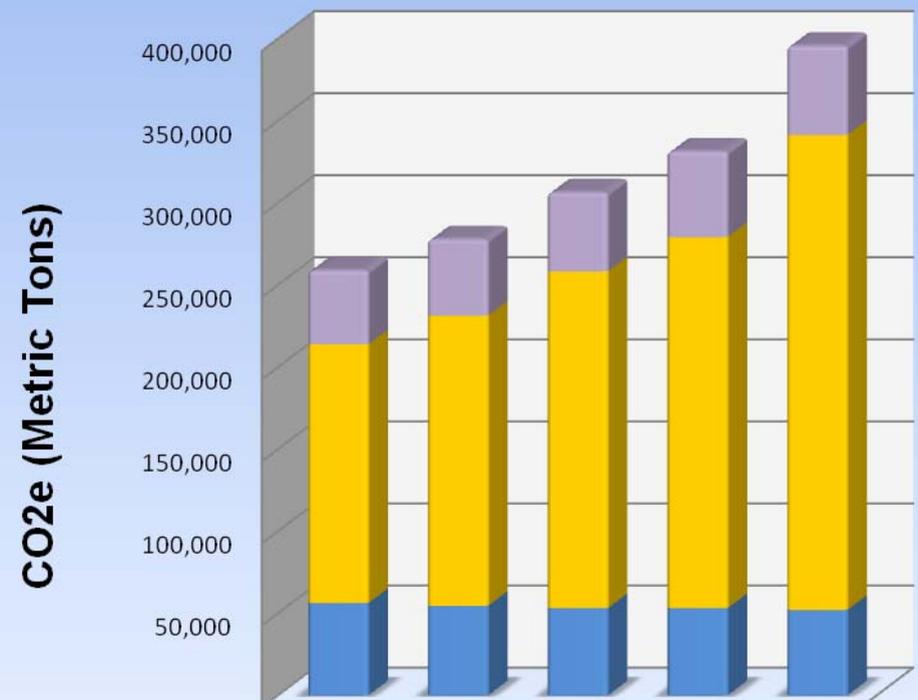
**Details of FY2008 Emissions as a % of all Sources**

**Scope 1, Scope 2, and Scope 3 Emissions  
Without Process Facilities**

**Scope 1, Scope 2, and Scope 3 Emissions  
Including Process Facilities Growth**



	2005	2006	2007	2008	2009 est.
Scope 3	45,144	46,547	48,174	52,238	54,328
Scope 2 w/o Process	92,697	92,996	97,292	100,561	99,032
Scope 1	56,243	54,552	53,147	53,151	52,100



	2005	2006	2007	2008	2009 est.
Scope 3	45,144	46,547	48,174	52,238	54,328
Scope 2 with Process	157,554	176,772	205,103	226,010	289,242
Scope 1	56,243	54,552	53,147	53,151	52,100

**Key Accomplishment:**  
Sustainability Report  
prepared and in review

Repeat annually

Meet with HR  
and  
Communications  
Complete

Develop  
report  
outline  
1/10

First  
draft  
FY09  
report  
4/10

Complete  
Management  
review  
7/10

Issue  
first  
report  
9/10

*Annual  
Sustainability  
Report*

**FY 10 Deliverables:**

- ✓ Approval of concept by Sustainability Champions and Communications Director
- Report outline established
- Develop report
- Finalize metric format
- Develop initial metrics

**EO:**

- ❖ HPSB for new construction and major renovations
- ❖ Beginning 2020 design for net zero by 2030
- ❖ 15% HPS EB by 2015

[View All Site Content](#)**Lists**

- Winners of Earth Day Contests

**Home****About Sustainable Campus Initiative****Lessons Learned****Questions, Comments, Ideas**

- Information Exchange
- Questions

**Resources****Contacts****Webmaster****Disclaimer**

## Sustainability at Oak Ridge National Laboratory

The Sustainable Campus for the Year 2018 Initiative is an Oak Ridge National Laboratory-wide effort. It builds upon ORNL's strength as a premier science and technology organization in integrating energy efficiency, robust and cutting-edge technologies, operational and business processes, and behavior to achieve sustainability. A recent [presentation](#) describes the goals and components of this ORNL initiative.

Sustainability embodies how we make choices in business practices; environmental stewardship, safety, and health; and employee, family, and community engagement. These choices run the gamut from using cutting-edge technologies to such simple actions as turning lights off when leaving a room, participating in work and community recycling programs, and buying [environmentally friendly products](#). Making these choices in a sustainable way increases our options for the future while meeting our needs today.

ORNL strives to be a sustainability leader by embracing sustainable practices and using our enormous expertise to help interested individuals, communities, commercial and industrial facilities, and the nation. Everyone at ORNL can participate in achieving this goal. By doing so, we also can benefit personally and improve our communities.

**R&D Initiatives**

ORNL is leading the way in sustainability research and development in several key areas...

**Campus Facilities & Operations**

Information on campus sustainability progress throughout ORNL's facilities and operations...

**Your Sustainability**

Information to help you obtain sustainability at work, at home, and in your community...

**Learn about sustainability and win up to \$2500! Details at right.**

**Education**

Details [here](#) on how to win gift cards by completing SEEC sustainability learning modules. **The seventh module, Reinventing the Wheels – about environmental transportation options, is now available.** Click [here](#) to access all modules.

**Moving Toward Sustainability**

Staff working in Building 1509 (shown above) recently piloted a new ORNL recycling program for offices.

Read about [recycling](#) at ORNL, including details about what can and what cannot be fed to the ORNL paper recycling bins. Then check [this report](#) on a "dumpster dive" undertaken to see if ORNL's recycling programs are effective.

**Winners of \$ 50 SEEC gift cards announced!**

Click [here](#) to see the list of 80 ORNL staff members who had completed the first four SEEC modules by May 31 and had their names drawn to win \$ 50 gift cards. Eighty individuals who have completed modules 1-7 by August 31st will win \$75 gift cards in early September. Read the [details](#) about how you, too, can be a winner.

**Information Exchange**

Share and discuss your [Comments, Ideas, & Expertise](#) about working toward sustainability. Let others know about your successes, frustrations, and failures.

**Questions**

Ask [Questions](#) to learn about ORNL's efforts to move toward sustainability.

**Sign in to make comments or ask questions**  
**You must be signed in to the site as an ORNL user to post items.** Click on "Sign In" at the top right of the page. Use "ornl\UID" (note that you must use a backslash) and your UCAMS password.

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**ORNL Sustainability Website**

[www.sustainability-ornl.org](http://www.sustainability-ornl.org)

