An Approach to Sustainability that Improves Environmental, Safety and Operational Performance

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OAK RIDGE NATIONAL LABORATORY
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Kathy Carney - Bio

- **Director of Environmental Protection and Waste Services Division at ORNL**

- **Masters of Science in Environmental Management**

- **Certified Hazardous Materials Manager**

- **Twenty + years experience in delivering effective and efficient environmental and waste management services at a number of DOE and Battelle Operated Facilities**
  - **ORNL, Brookhaven Nat'l Lab, Battelle Memorial Institute, Fernald**

- **Assisted team efforts that lead ORNL and BNL to ISO 14001 and CMA Responsible Care^{tm} Partnership at BMI**

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A Sustainable ORNL

- ## The Forces of Sustainability
  - ### What is it?
  - ### How did we get here?

- ## Sustainability in the Development
  - ### Integrated Management System Approach
  - ### Sustainable Campus Initiative

- ## Sustainable Outcomes
  - ### Improvements in Environmental, Safety and Operational Performance
  - ### Cultural Shifts that Produce Lasting Change in the Work Place and Community
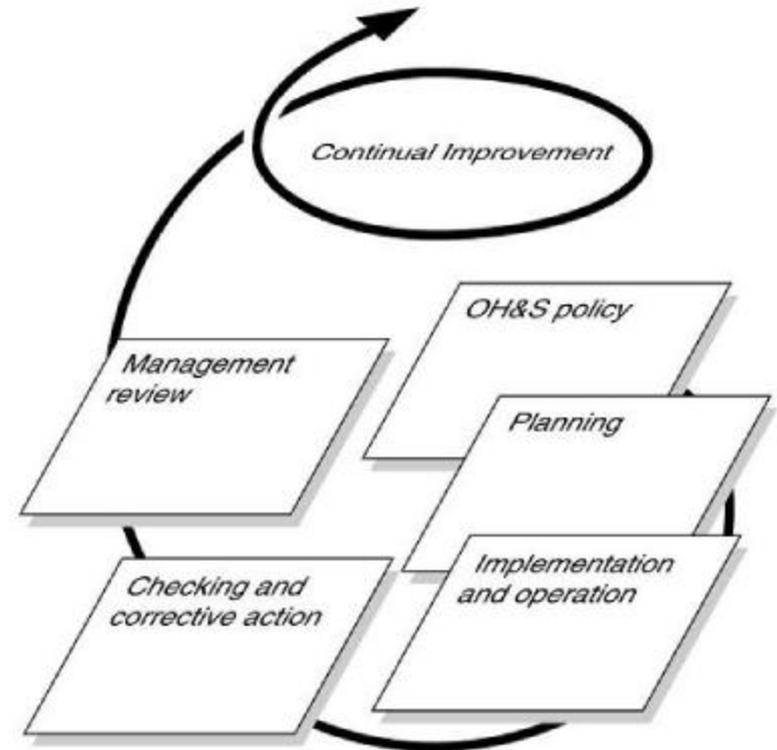 - ### Performance that Cultivates Sustained Business Growth

Sustainability

- **What is it anyway?**

- **Definition has changed with time and will continue to change**

- **Emerged from the global awareness of the 21st Century – understanding the impact of human activity on the global environment**

- **Has transcended the "Environmental" bucket to be defined in terms of social and economic dynamics**

Why were EMS's so successful?

ISO 14001 Elements

- **Policy**
- **Requirements management**
- **Objectives**
- **Roles and responsibilities**
- **Training**
- **Document control**
- **Operational control**
- **Monitoring and measurement**
- **Nonconformity management**
- **Records**
- **Management review**
- **Internal audit**

Continual Improvement

Management review

OH&S policy

Planning

Checking and corrective action

Implementation and operation

Comprehensive system focused on business management and improvement

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ORNL's Sustainability Success Model: Simultaneous Excellence

Excellence in Science & Technology

Excellence in Laboratory Operations/ES&H

Excellence in Community Service

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The goal of the Laboratory Agenda is to promote simultaneous excellence

Excellence in Science and Technology	Excellence in Laboratory Operations and ES&H	Excellence in Community Service

Critical Outcomes Driven by Leadership

Deliver scientific advances … that sustain and enhance ORNL's distinctive capabilities	Sustain and improve ORNLs ability to serve the needs of DOE and the nation through responsible stewardship	Be viewed by our neighbors as a highly valued partner in the region
	Build Future Workforce	
	Enhance Operational Discipline	
	Revitalize Facilities	
	Sustainable Campus	

Flow down into all management systems to prevent "silo's" of excellence

An integrated approach to ESH&Q promotes the laboratory agenda: eliminates redundancy and "silo's" of excellence

	ISO 14001 Environmental Management System	Occupational Health and Safety Assessment Series 18001	ISO 9001 Quality Management System
4.1 Systemic Requirements	• Document your EMS • Implement your EMS • Maintain your EMS • Continually Improve your EMS	• Establish and maintain a management system that ensures conformance to the standard	• Develop your QMS • Implement your QMS • Improve your QMS
4.2 Policy Requirements	• Define your organization's environmental policy • Document your policy • Implement your policy • Maintain your policy • Communicate your policy	• Establish an overall sense of direction • Define the principles of action • Set objectives • Identify responsibility • Establish targets for performance • Demonstrate formal commitment	• Develop quality system documents • Prepare quality system manual • Control quality system documents • Maintain quality system records
4.3 Planning Requirements	• Identify your environmental aspects • Clarify legal and other requirements • Establish objectives and programs	• Planning for Hazard Identification, Risk assessment and risk control • Legal and other requirements • Objectives • OH&S Management Programs	Management requirements • Support quality • Satisfy your customers • Establish a quality policy • Carry out quality planning • Control your quality system • Perform management reviews

ORNL East Campus, March 2002

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ORNL East Campus Today

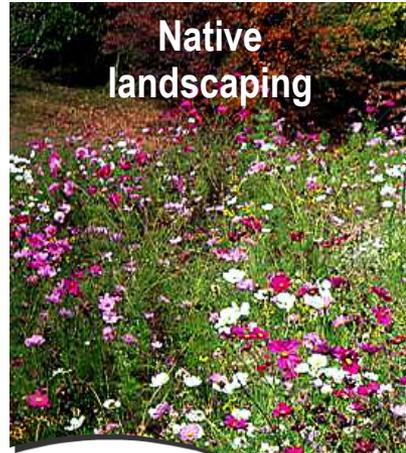- **1 million ft² LEED-certified campus**

- **A first for DOE and Tennessee**

Sustainable Landscaping

Native landscaping

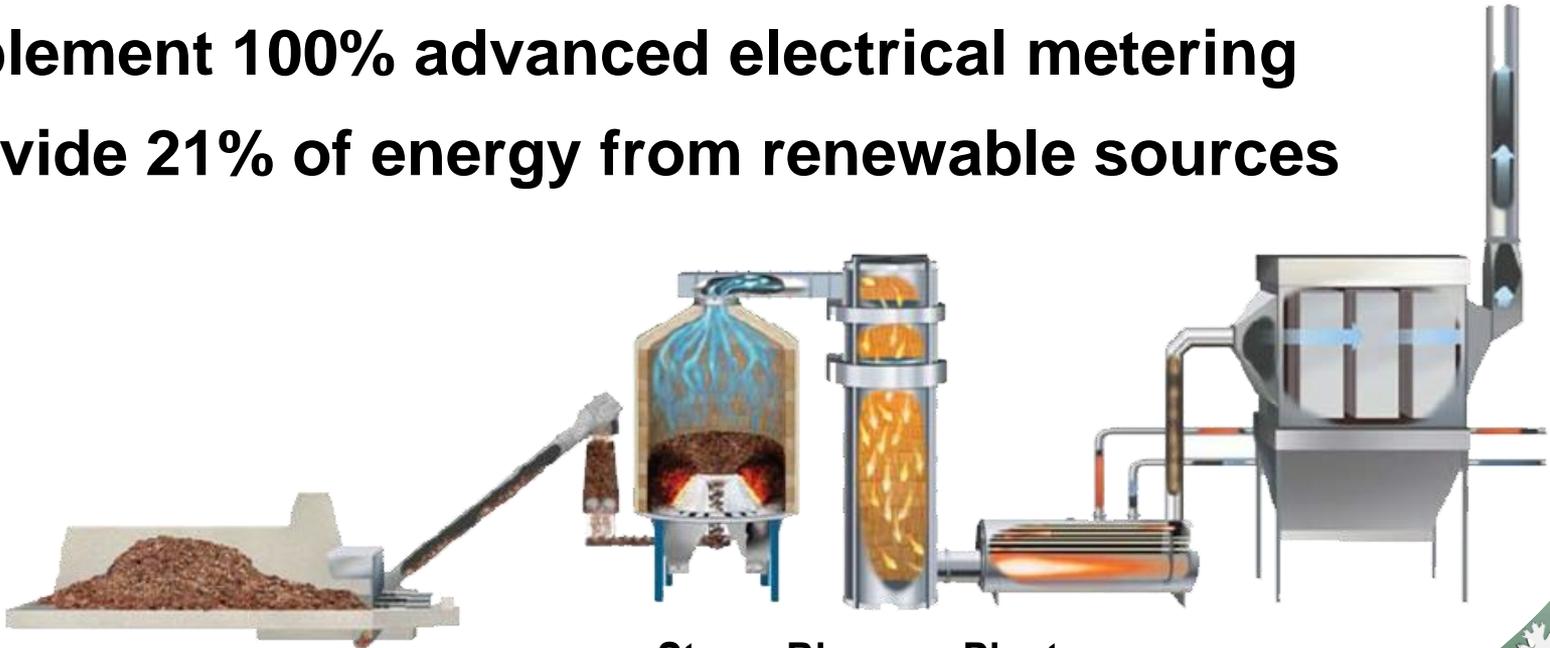Pond cleanup and wildlife management
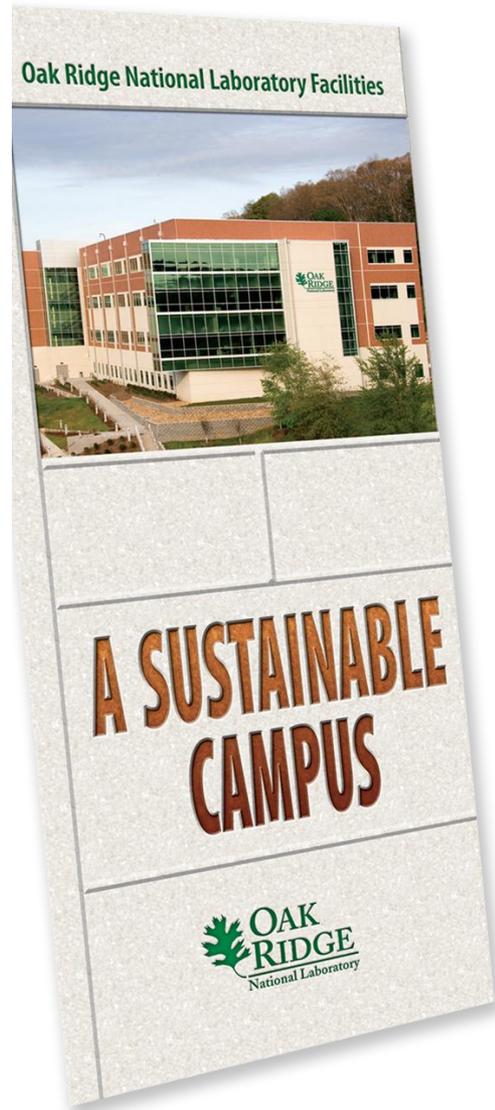
Walking trail

Quadrangle area

Green Transportation

Energy Savings Performance Contract

- **Replacement of 60 year old boiler with biomass-fueled boiler system that will reduce fossil fuel use by >85%**

- **Reduce water use by 170M gallons per year**

- **Reduce energy intensity by 50%**

- **Implement 100% advanced electrical metering**

- **Provide 21% of energy from renewable sources**

Steam Biomass Plant

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Continue to Build on Sustainable Practices

- **To date we have added 33% more area to ORNL with only a 5% energy change**

- **We now have 1 million square feet of green building space**

- **Planning on zero-energy buildings**

Sustainable Campus Initiative

Components	Examples
Transformational technology	• **High-impact demonstration projects**
Leading-edge technology	• **Solar applications** • **Innovative transportation technologies** • **Advanced building technologies** • **Biofuel developments**
Known technology	• **Renewable sources** • **Green buildings** • **Hybrid vehicles** • **Demand-side management**
Foundational methods	• **Energy efficiency** • **Recycling/reuse strategies** • **Waste management** • **Heat recovery**

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Simultaneous Excellence = Sustainability

The Laboratory Agenda – ORNL's Strategic Planning Process