



U.S. DEPARTMENT OF
ENERGY

Nuclear Energy

INL Site Sustainability

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What is Sustainability

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- "Meeting the needs of the present without compromising the ability of future generations to meet their own needs."

Brundtland, 1987 World Commission on Environment and Development

- "With a serious commitment to energy efficiency, widespread deployment of technologies we have, and an aggressive investment in science, we can dramatically reduce our carbon emissions and reinvigorate our economy at the same time. This is not only our opportunity; it is our responsibility to future generations."

Dr. Steven Chu, Former Secretary of Energy



Elements of Sustainability

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■ Laws

- Energy Independence and Security Act of 2007
- Energy Policy Act of 2005
- Energy Policy Act of 1992
- National Energy Conservation Policy Act, 1978

■ Executive Orders (E.O.)

- E.O. 13514, Federal Leadership in Environmental, Energy, and Economic Performance, October 2009
- E.O. 13423, Strengthening Federal Environmental, Energy, and Transportation Management, January 2007

■ DOE Directives

- DOE O 436.1, Departmental Sustainability

■ Plans

- DOE Strategic Sustainability Performance Plan
 - http://www1.eere.energy.gov/sustainability/pdfs/doe_sspp_2012.pdf
- INL Site Sustainability Plan
 - https://inlportal.inl.gov/portal/server.pt/document/123417/fy_2013_inl_site_sustainability_plan_final_%2812-12-12%29_pdf



■ DOE Headquarters

- NE as the Primary Secretarial Office
- EM for the ICP mission
- Sustainability Program Office (SPO) as DOE-HQ lead for Sustainability

■ DOE-ID

- Environment and Sustainability Division – Coordination and Integration
- Facility and Infrastructure Division – manages NE facilities and operations
- Waste Disposition and Facility & Material Disposition Divisions - ICP

■ Contractors

- BEA
- CWI
- ITG



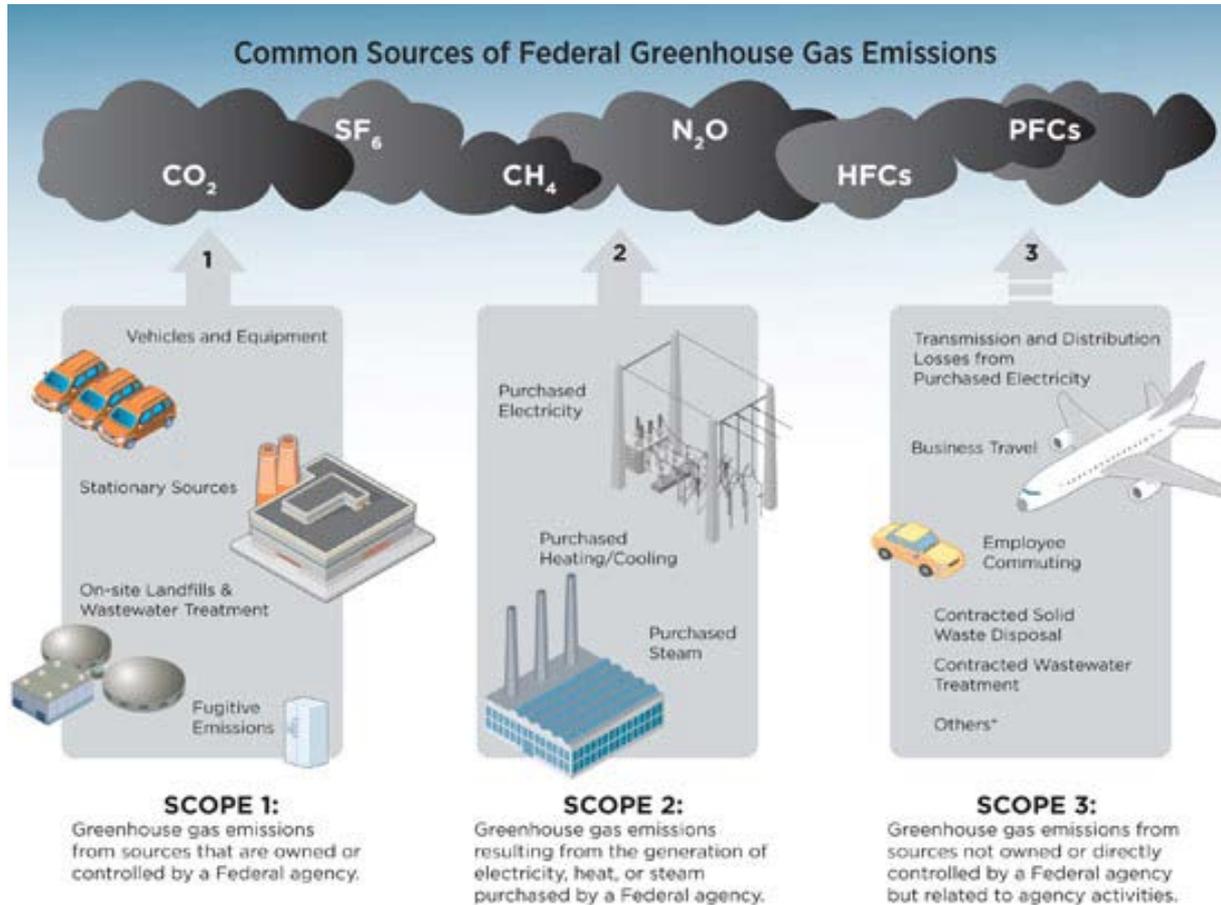
Sustainability Program Office (SPO) Key Milestones Status for FY12

DOE Goal	FY 2012 Status
28% Scope 1 & 2 GHG reduction by FY 2020 from a FY 2008 baseline	-20.3%
13% Scope 3 GHG Reduction by FY 2020 from a FY 2008 baseline.	-7.3%
30% energy intensity reduction by FY 2015 from a FY 2003 baseline	-13.8%
7.5% of annual electricity consumption from renewable sources by FY 2013	9.9%
26% water intensity reduction by FY 2020	-11.4%
30% reduction in fleet petroleum consumption by FY 2020	-20.3%
10% annual increase in fleet alternative fuel consumption by FY15 baseline	154%
Reduce Fleet by 35%	35%
15% of Building Stock meets Federal Guiding Principles for HPSB by FY15	2%
Divert at least 50% of non-hazardous, non-C&D, solid waste by FY 2015	33%
Divert at least 50% of construction and demolition waste by FY 2015.	30%



Greenhouse Gases

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- FY 12 Emissions: 139,244 MT CO_2e
- Reduced scope 1 by reduction of fleet size and changing fuel types for vehicles and heating.
- Scope 2 affected from changing to electric heating.
- Scope 3 decreased by managing travel and using alternatives.

*Additional, significant Scope 3 emission sources exist beyond the examples provided.



Energy Intensity Reduction



- Energy Intensity = Energy Use / Building Square Footage
- Reduce energy use through Energy Conservation Measure or behavior changes
- Solar Thermal Wall Installation - Preheats air using solar energy reducing the amount of other energy needed for heat.
- Relatively low cost, effective technology at the INL Site.



Renewable Energy

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- Numerous investigations and feasibility studies performed.
- Large scale wind and solar energy generation currently found infeasible.
- Have small scale generation: some lighting, monitoring stations, wastewater pond circulators
- Investigating feasibility of geothermal energy for building heat or possibly electricity generation.
- Currently purchase Renewable Energy Credits (RECs) to meet renewable energy goal.



Petroleum and Alternative Fuels



- FY 12 use: 750,000 gallons gasoline equivalent (-20% from FY05)
- Superior performance in reducing petroleum and increasing use of alternative fuels.
- Reduction of fleet size
- Change of fleet composition
- Tracking of E85 utilization
- Bus driver best practices
- Tri-fueled buses partnering with industry and suppliers



High Performance Sustainable Buildings



- New buildings have been specified to attain LEED Gold which meets HPSB requirement
- Existing buildings improvements accomplished by incorporating sustainability into equipment and operations changes
- Analyzing best opportunities for existing buildings
- Not cost effective to retrofit existing buildings with limited or uncertain missions
- Difficult goal to meet across DOE complex





Waste Diversion and Pollution Prevention (P2)



- Successful diverting municipal waste (trash) – 33% (527 Metric Tons) in FY12; Expect >50% in FY 13
- Challenges in diverting construction and demolition waste – 30% (3,971 MT) in FY12
- P2 programs support sustainability by avoiding waste generation
- CWI received 2013 Idaho DEQ Pollution Prevention Champion Award – one of three in the State!

INL Site Specific Factors Affecting Sustainability

- Low cost of electricity – long return on investment
- Cost of performing work
- Relative high cost of fossil fuels
- Lack of natural gas availability
- Capital funding availability for sustainability projects
- Potential impacts to missions
- Uncertain EM building lifetimes



Projected INL Site Sustainability Goal Performance

Goal	Risk
28% Scope 1 & 2 GHG reduction by FY 2020 from a FY 2008 baseline	Moderate
13% Scope 3 GHG Reduction by FY 2020 from a FY 2008 baseline.	Low
30% energy intensity reduction by FY 2015 from a FY 2003 baseline	Moderate
7.5% of annual electricity consumption from renewable sources by FY 2013	Low
26% water intensity reduction by FY 2020	Moderate
30% reduction in fleet petroleum consumption by FY 2020	Low
10% annual increase in fleet alternative fuel consumption by FY15 baseline	Low
Reduce Fleet by 35%	Complete
15% of Building Stock meets Federal Guiding Principles for HPSB by FY15	Moderate
Divert at least 50% of non-hazardous, non-C&D, solid waste by FY 2015	Low
Divert at least 50% of construction and demolition waste by FY 2015.	Moderate

Other Federal Sustainability Goals

Meeting or expect to meet by target date:

- Cool roofs, unless uneconomical, for roof replacements
- Procurements meet sustainability requirements and include sustainable acquisition clause (95% each year)
- All data centers are metered to measure a monthly Power Utilization Effectiveness (PUE) by FY 2015
- Maximum annual weighted average PUE of 1.4 by FY 2015
- Electronic Stewardship – 100% of eligible PCs, laptops, and monitors with power management activity implemented and in use by FY 2012



Dashboard Summary

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Key Questions	Dashboard Indicator	Comments
Impact on budget for activity/cleanup	✓	Some impact, should not be significant
Impact on employment/economic development	X	
Affect on agreements	X	
Impact on safety and environment	✓	Lowers environmental impacts
Impact on cleanup DOE-wide	X	

- Integrated across contractors and DOE secretarial offices
- Making progress to meeting sustainability goals
- Low electricity cost, site conditions, and capital funding present challenges to attaining some goals
- High level of attention at all levels of DOE
- DOE committed to attainment of sustainability goals