



# U.S. Department of Energy Sustainability Linkages

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U.S. DEPARTMENT OF  
**ENERGY**

# DOE's Sustainability Challenge

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- How to expand our thinking about risk and sustainability to best manage existing risks?
- How do we take a more comprehensive and integrated approach to balancing impact of addressing environmental contamination risk
  - Short-term and long-term impacts
  - Worker and community impacts
  - Local and global impacts?
- How do we factor end states and future use into consideration?

# Office of Environmental Management Mission

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**“Complete the safe cleanup of the environmental legacy brought about from five decades of nuclear weapons development, production, and Government-sponsored nuclear energy research.”**



- Largest environmental cleanup effort in the world, originally involving two million acres at 108 sites in 35 states
- Safely performing work in challenging environments
- Involving some of the most dangerous materials known to man
- Solving highly complex technical problems with first-of-a-kind technologies
- Operating in the world's most complex regulatory environment
- Supporting other continuing DOE missions and stakeholder partnerships

# EM Mission Areas

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- Constructing and operating facilities to treat radioactive liquid tank waste
- Securing and storing nuclear material and transporting and disposing of transuranic and low-level radioactive wastes
- Soil and ground water remediation
- Deactivating and decommissioning contaminated buildings

# Tank Waste Treatment

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- More than 50 million gallons of radioactive waste in tanks at the Hanford Site in Washington
- Waste Treatment Plant under construction to vitrify the tank waste
- Plan to begin operation in 2019
- About 70 megawatts electricity demand
- Will also require diesel fuel or natural gas for steam
- Might we consider less energy-intensive treatments for the low activity portion of the waste?

# Nuclear Material and Transuranic and Low-Level Radioactive Waste

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- Securing and storing nuclear material and transporting and disposing of transuranic and low-level wastes in a safe and cost-effective manner
- Minimize transportation distance and use energy-efficient transportation modes
- Balance risks to workers, communities and the environment

# Soil and Ground Water Remediation

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- 10,000 areas needing remediation of soil or ground water or both
- Take broader integrated view of risk and impact and consider water, energy consumption and greenhouse gas emissions
- Nurture and value soil as vibrant ecosystem and use it as low-impact way to reduce risk
- Find hydrological balance between avoidance of contaminant migration and fostering healthy soil ecosystem

# Building and Facility Deactivation and Decommissioning

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- More than 3,000 buildings to deactivate and decommission
- Estimated cost of \$30 billion
- New technologies and energy-efficient equipment can improve sustainability of efforts
- Can also rethink solutions taking broader, integrated view of risk and impacts
- In-situ-decommissioning (encapsulation) offers opportunities to reduce impacts to workers, transportation impacts, energy consumption and air emissions

# DOE Interest in Sustainability Study

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- Interagency cooperation on addressing social, economic and environmental impacts of addressing cold-war era legacy risks
- Interagency cooperation on communicating new and broader ways of thinking about risk and impacts of addressing risk
- Cross media integration of risk and impact analyses to address existing risk
- Interagency collaboration on taking life-cycle approach to balance and mitigate risks as we design, construct and operate facilities