

Exceptional service in the national interest



Energy, Climate, & Infrastructure Security (ECIS)

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Tribal Energy Program Lead



Sandia National Laboratories is a multi-program laboratory managed and operated by Sandia Corporation, a wholly owned subsidiary of Lockheed Martin Corporation, for the U.S. Department of Energy's National Nuclear Security Administration under contract DE-AC04-94AL85000. SAND2011-

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The Mission Has Evolved for Decades

1950s

1960s

1970s

1980s

1990s

2000s

Production
engineering &
manufacturing
engineering

Development
engineering

Multiprogram
laboratory

Research,
development and
production

Post-Cold War
transition

Broader national
security challenges

% NON-NW FUNDING

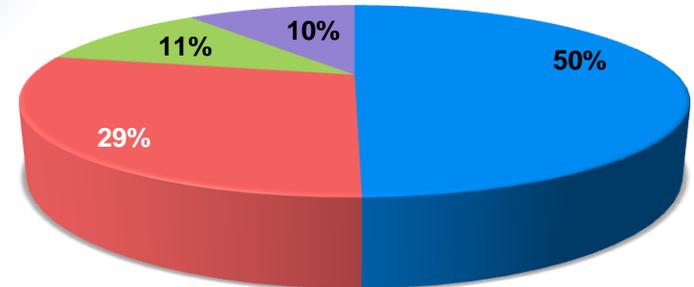
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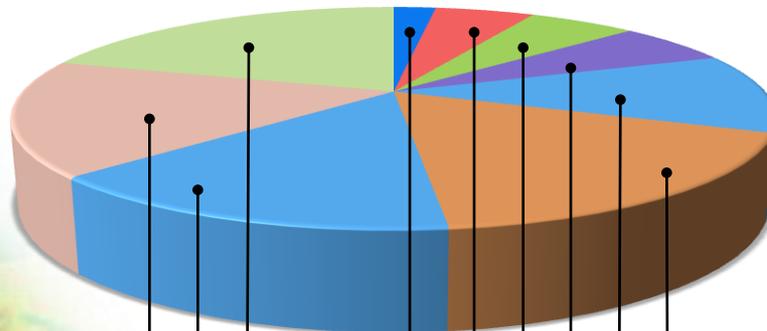
People and Budget (As of October 11, 2011)

- On-site workforce: 11,876
- Regular employees: 9,122
- Gross payroll: ~\$943 million

FY11 Operating Revenue
\$2.4 billion



Technical staff (4,557) by discipline

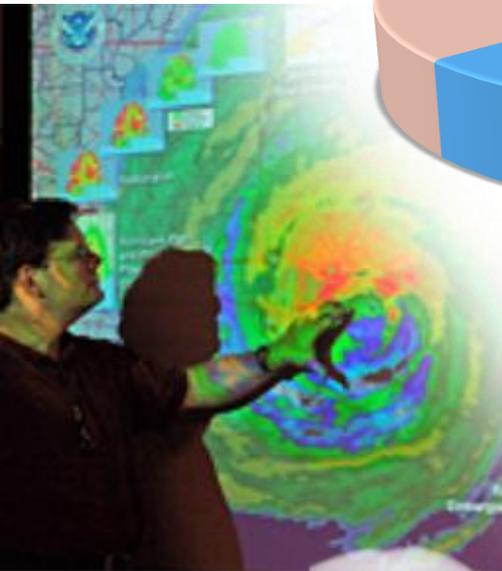


(Operating Budget)

- Nuclear Weapons
- Defense Systems & Assessments
- Energy, Climate & Infrastructure Security
- International, Homeland, and Nuclear Security

- Computing 17%
- Other fields 12%
- Other science 6%
- Physics 6%
- Chemistry 5%
- Math 2%

- Electrical engineering 20%
- Mechanical engineering 17%
- Other engineering 15%



Why is Sandia in the energy business?

National Security is intimately linked with Energy, Climate, & Infrastructure Security Challenges.

Prosperity



**“Without energy,
there is no economy.”**

National Security



**“Without energy and environment,
there is no security.”**

Environmental Stewardship



**“Without climate,
there is no
environment.”**

John Holdren

Director of the White House Office of
Science and Technology Policy

History of Sandia Energy Programs

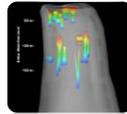


Sandia was born as a nuclear weapons engineering laboratory with deep science and engineering competencies



Energy crisis of the 1970s spawned the beginning of significant energy work

Strategic Petroleum Reserve -geologically characterizing salt domes to host oil storage caverns



DOE's Tech Transfer Initiative was established by Congress in 1991



Energy Policy Act of 2005

CRF & Cummins partner on their newest diesel engine



Joint BioEnergy Institute

1950

1960

1970

1980

1990

2000

2007

2010

Our core NW competencies enabled us to take on additional large national security challenges

Vertical access wind turbine

NRC cask certification studies & core melt studies



Solar Tower opens



Combustion Research Facility (CRF) opens to researchers



Power grid reliability study



SunCatcher™ partnership with Stirling Energy Systems

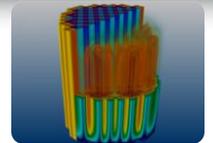


Distributed Energy Technology Laboratory (DETL) to integrate emerging energy technologies into new and existing electricity infrastructures



Sunshine to Petrol Pilot Test

Large-scale pool fire tests of liquefied natural gas (LNG) on water



Consortium for Advanced Simulation of Light Water Reactors (CASL)

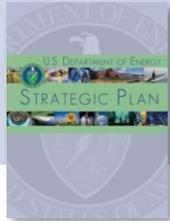
Climate study uncertainties to economies



Combustion Research Computation and Visualization (CRCV) opens

Energy, Climate, & Infrastructure Security Challenges

Department of Energy



**2006
Strategic Plan**

Department of Defense



**Quadrennial Defense
Review Report**

Department of Homeland Security



**2008 Strategic
Plan Protecting
Critical
Infrastructure**

GOALS

Diversify energy mix & reduce dependence on foreign petroleum

Reduce green house gas emissions & other environmental impacts

Create a more flexible, more reliable & higher capacity US energy infrastructure

Cost-effectively improve energy efficiency of US economy

Improve operational effectiveness

- Reduce energy demand
- Increase use of renewable energy supply

Increase energy efficiency & protect against energy price fluctuations

Reduce greenhouse gas emissions in support of US climate change initiatives

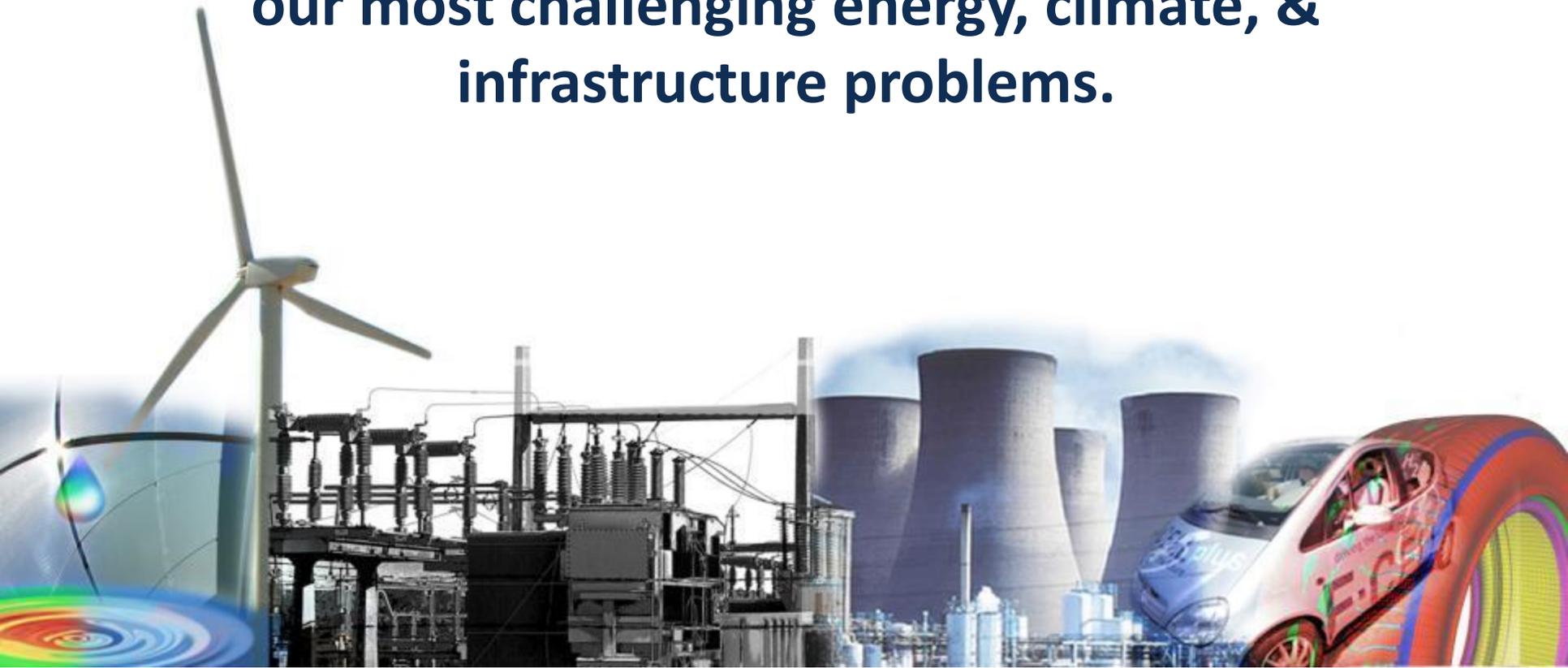
Decrease vulnerability of critical infrastructure to bad actors both physical & cyber

Improve national power grid mod/sim capability to address national scale threats

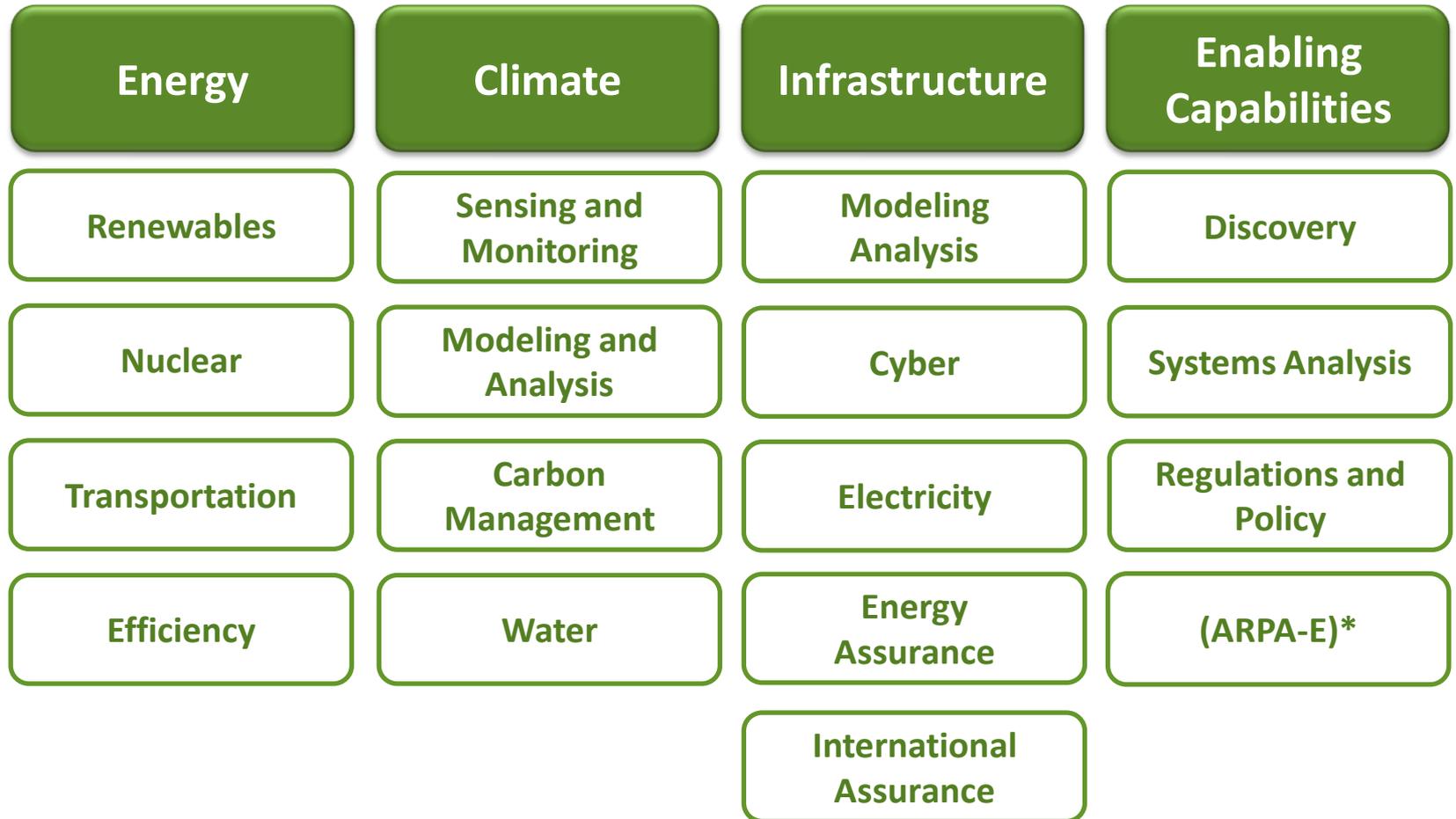
Improve port and coastal security – climate change impacts

DHS concerned with interdependencies: Transportation, Energy, Defense

Enhance the nation's security and prosperity through sustainable, transformative approaches to our most challenging energy, climate, & infrastructure problems.



Program Areas

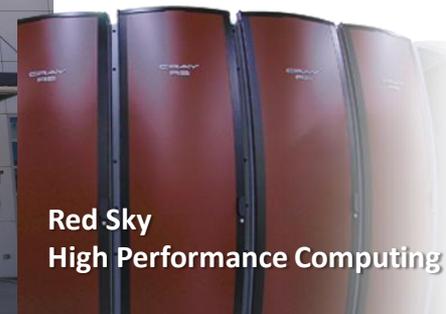
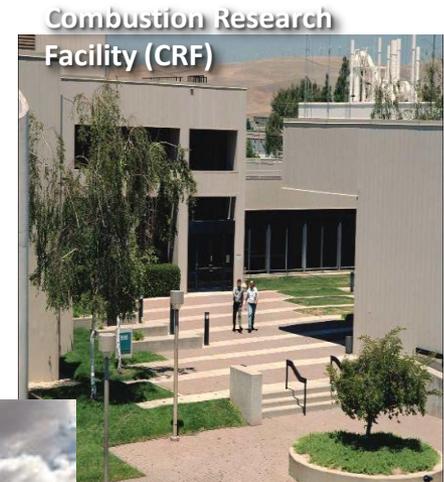


* Advanced Research Projects Agency-Energy

We Have Four Overarching Objectives

- Accelerate the ability of U.S. industries to be innovative, to develop, and to successfully deploy energy solutions to the nation's most challenging problems.
- Enable sound government energy policy decisions by providing timely and objective technology assessments and systems analyses.
- Steward enduring and relevant science, systems, and security competencies to support inherently government functions and services.
- Support U.S. leadership in global energy challenges through strategic international engagement.

Energy-Infrastructure Focused Facilities



Partnerships

- Energy, Climate, & Infrastructure Security has 19 active Cooperative Research and Development Agreements (CRADAs -- 9 umbrella, 9 standard, 1 USIC) and 54 active Non-Federal Entity (NFE) agreements.

- Large and/or strategic partnerships:

- BP
- Caterpillar
- Chevron
- ExxonMobil
- General Electric
- General Motors



- Notable partners:

- Bobcat Gas Storage, Conoco Phillips, Eagle Picher, Emcore, Intra Engineering, Ltd., Magnum Energy, RII North America, Singapore Public Utility and Energy Market Authority, Subsurface Technology