

The Climate Action Plan



Secretary of Energy Advisory Board Meeting

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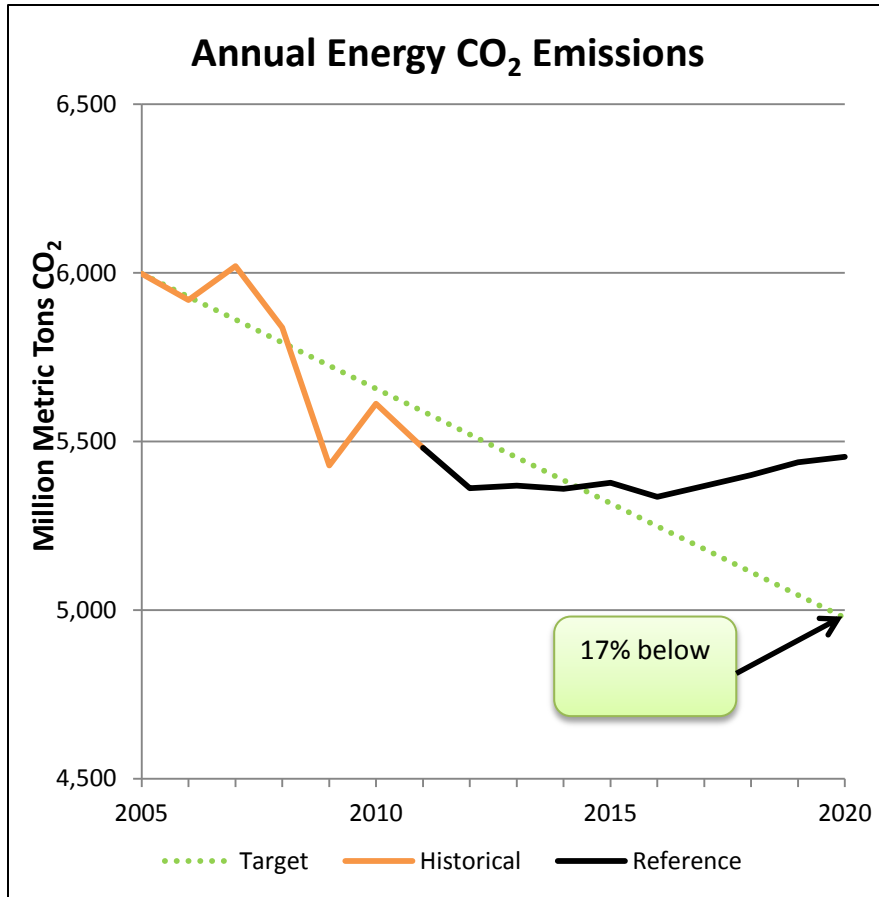
Components of the Climate Action Plan

- Cut Carbon Pollution in America
- Prepare the US for the Impacts of Climate Change
- Lead International Efforts to Address Global Climate Change

“We will respond to the threat of climate change knowing that the failure to do so would betray our children and future generations.”

- President Obama, Second Inaugural Address, January 2013

Progress to Date



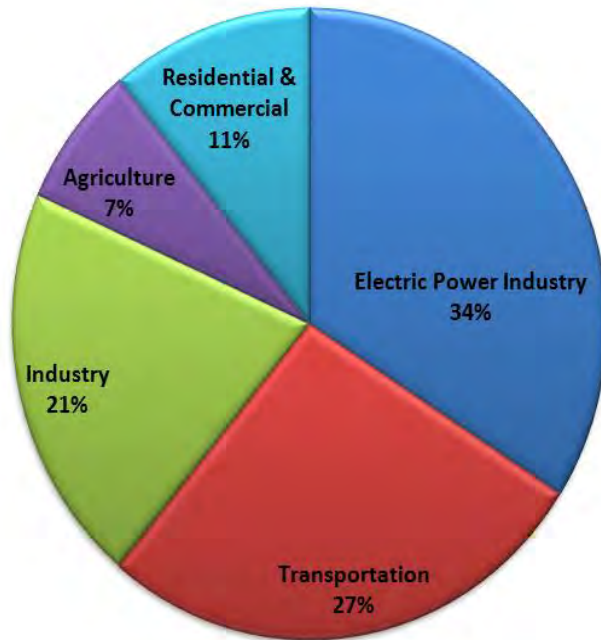
- In 2009, at UNFCCC meeting in Copenhagen, President pledges US will reduce emissions “in the range of 17% by 2020 below 2005 levels.”
- Substantial progress made; substantial additional effort still needed

Source: AEO 2013 reference scenario

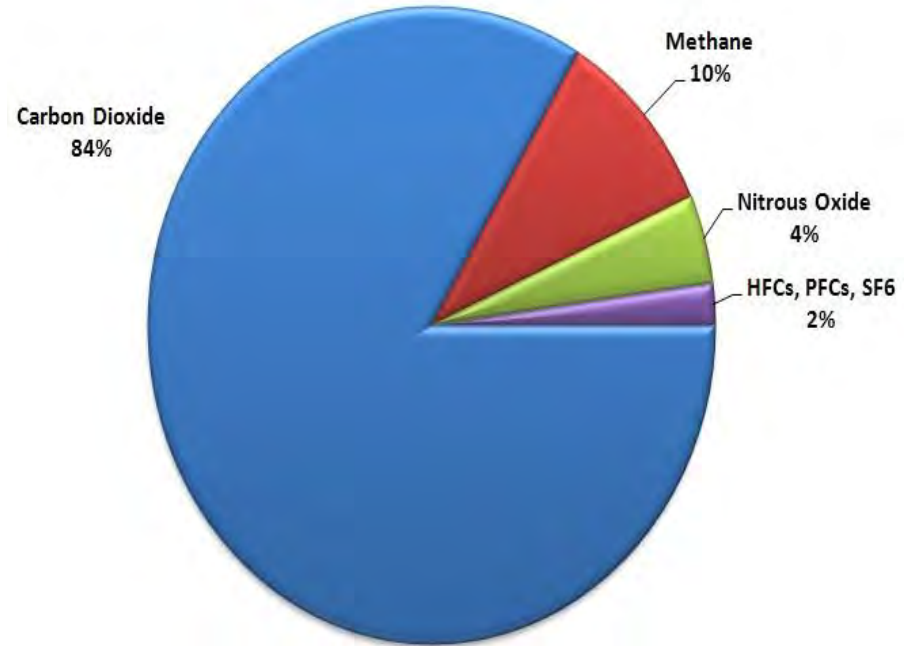
U.S. Emissions by Greenhouse Gas and Sector

~85% of emissions tied to energy

U.S. Greenhouse Gas Emissions by Sector 2010



U.S. Greenhouse Gas Emissions 2010



Source: EPA, 2012, Inventory of U.S. Greenhouse Gas Emissions and Sinks 1990-2010

Cutting emissions: Power plant rule

- Climate plan directs EPA to complete standards for both new and existing power plants
- Revised draft rules for new plants to be released September 20, 2013; existing plant rule to be issued June 1, 2014
- DOE Role:
 - Technical assistance
 - Modeling and analysis
 - Technology development

Cutting emissions: Long term investment in clean energy innovation

- Climate plan calls on DOE to issue an \$8bn solicitation in (self pay) loan guarantee authority for advanced fossil energy projects under its Section 1703 loan guarantee program
- Draft solicitation issued July 3, 2013
- Next steps:
 - Comment period concluded Sept 9, 2013
 - Issue final text of solicitation
 - Receive, evaluate and fund proposals

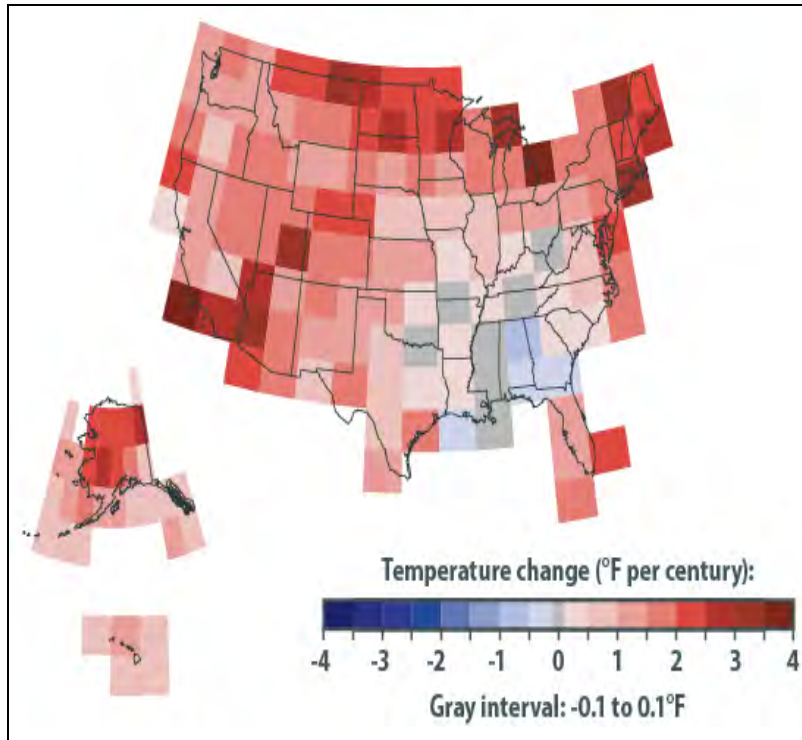
Cutting emissions: Reducing energy bills for American families and businesses

- Climate plan set a goal for DOE's combined first and second term new minimum appliance efficiency standards to reduce emissions by at least 3bn metric tons cumulatively by 2030
- Recent NOPR: commercial refrigeration; walk-in coolers and freezers; metal halide lamp fixtures
- Next steps:
 - Finalize rules according to statutory deadlines
 - Work to increase energy savings potential of new or amended standards by updating and finalizing more effective test procedures

Cutting emissions: Other elements

- Promote leadership in renewable energy: accelerate clean energy permitting and expand and modernize the grid
- Institute Quadrennial Energy Review
- Develop and deploy advanced vehicle technologies
- Reduce barriers to investment in energy efficiency, including through USDA, HUD and FHA programs, and expansion of the President's Better Buildings Challenge
- Reduce other GHG emissions, including HFCs, methane (with an interagency methane strategy) , and forest conservation and sustainable management
- Lead at the federal level (20 percent of federal electricity from renewables and \$2bn in performance based contracting)

Impacts: Increasing air and water temperatures



Rate of warming in the United States by region, 1901–2011
(EPA 2012a)

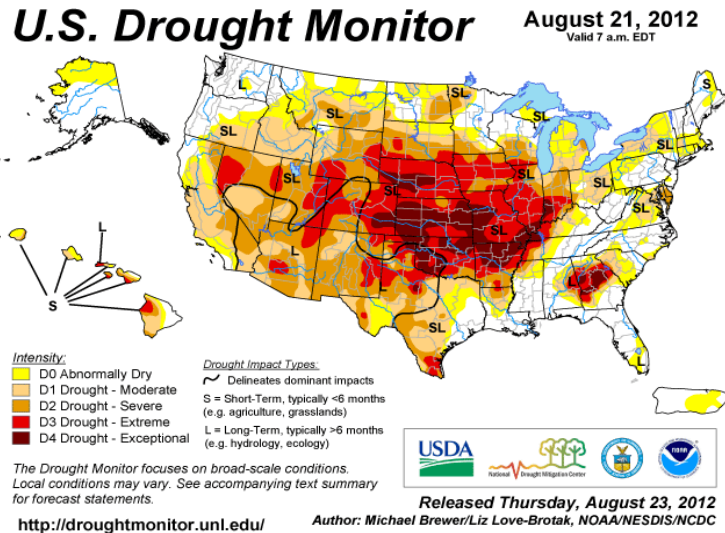
Climate Trends

- Average temperatures have increased
- Heat waves have become more frequent and intense
- Wildfire season and size of fires have increased
- Sea ice cover has decreased, permafrost has thawed
- Growing season has increased

Key Energy Sector Impacts

- Increasing temperatures increase electricity demand
- Thawing permafrost could damage Arctic oil and gas infrastructure
- Severe wildfires increase the risk of physical damage

Impacts: Decreasing water availability



Climate Trends

- Changing precipitation patterns cause more frequent and severe droughts
- Snowpack levels have decreased, resulting in lower summer streamflows
- Ground and surface water levels have declined

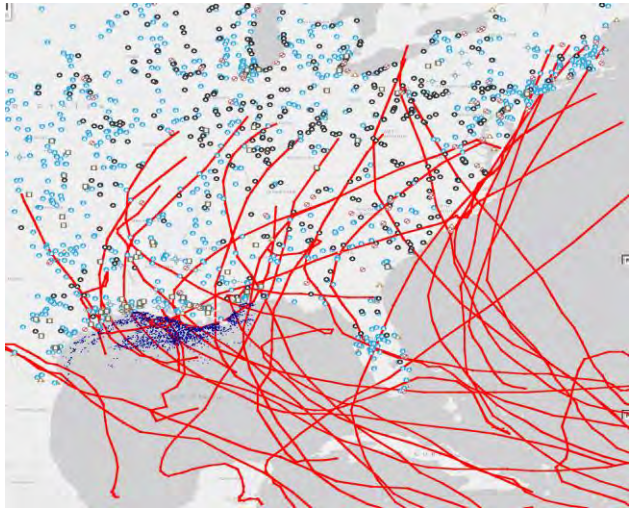
Key Energy Sector Impacts

- Decreasing water availability for cooling at thermoelectric facilities reduces generation capacity
- Decreasing water availability impacts oil and gas production
- Reductions in river levels impedes barge transport
- Changes in precipitation/decreasing snowpack could decrease available hydropower generation capacity



Water stress: Locations of the 100 most vulnerable coal-fired power plants (NETL 2010b)

Impacts: Increasing Storms, Flooding and Sea Level Rise



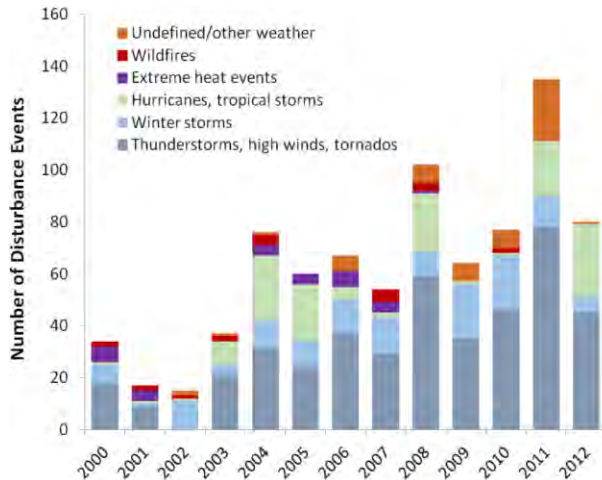
Hurricane storm paths and locations of U.S. energy infrastructure 1980-2012 (NOAA 2013a, NOAA 2013d, NOAA 2013h, EIA 2013b)

Climate Trends

- Relative sea levels rose more than 8 inches in some regions over past 50yrs
- Hurricanes and tropical storms have become more intense
- A larger fraction of precipitation falls during intense precipitation events, increasing floods

Key Energy Sector Impacts

- Increasing intensity of storms and sea level rise increase risk to coastal and offshore facilities
- Increasing intensity of storm events increases risk of damage to electric transmission and distribution
- Increasing intensity and frequency of flooding increases risk to thermoelectric facilities, and to rail and barge transport of crude oil, petroleum products, and coal



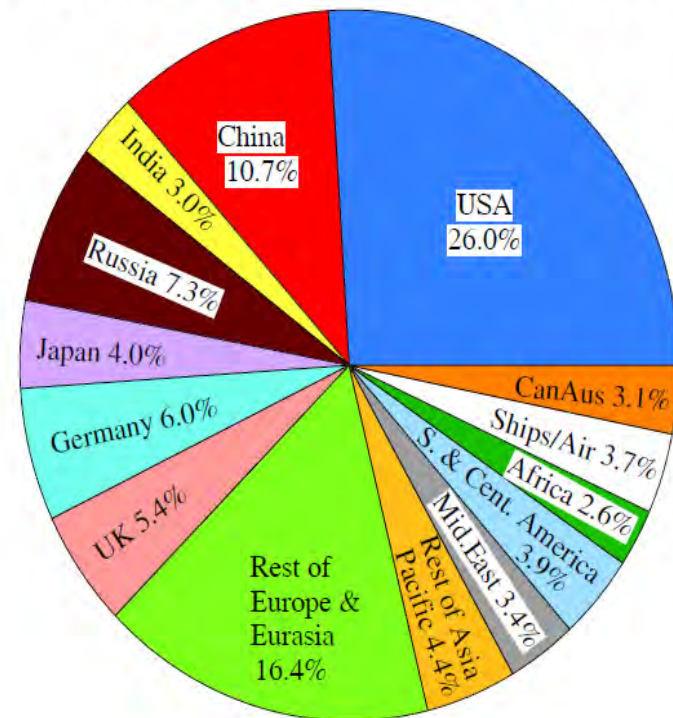
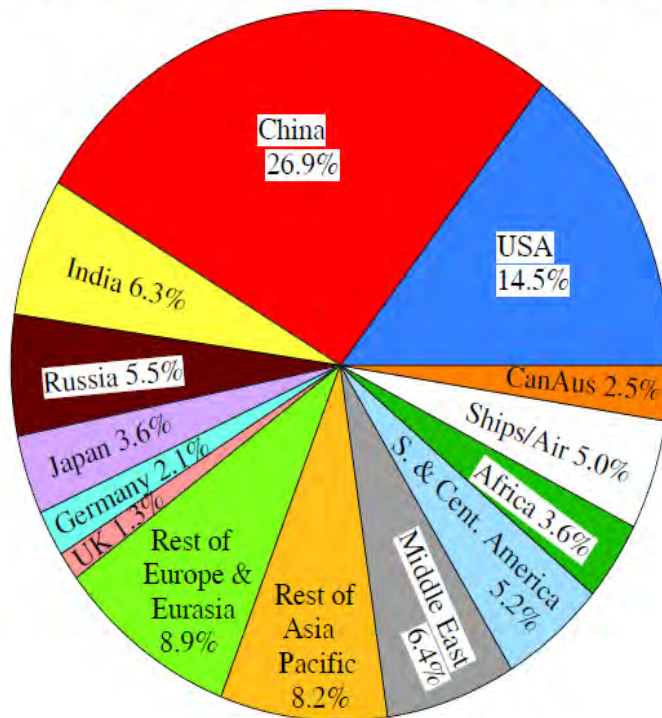
Weather-related grid disruptions, 2000–2012 (DOE2013b)

Preparing for Impacts

- Building stronger and safer communities and infrastructure (direct agencies to support climate resilient investment; establish state, local and tribal leaders task forces; support communities as they prepare for climate impacts; boost resilience of buildings and infrastructure; rebuilding and learning from Hurricane Sandy; etc)
- Protecting our economy and natural resources (preparing for future floods and managing droughts and wildfires, identifying vulnerabilities of key sectors to climate change, etc)
- Using sound science to manage climate impacts (Developing actionable climate science, launching a climate data initiative, providing a toolkit for climate resilience, etc)

The international pillar

(a) 2012 Annual Emissions (9.6 GtC/yr) (b) 1751–2012 Cumulative Emis. (384 GtC)



Source: Columbia University based on CDIAC and BP data

Lead International Efforts

- Expanding bilateral cooperation with major emerging economies (including the US-China Clean Energy Research Center, promoting gas, nuclear power, clean coal and energy efficiency)
- Enhance multilateral engagement with major economies (including the Major Economies Forum and the Clean Energy Ministerial, and negotiating global free trade in environmental goods and services)
- Combating short lived pollutants (Climate and Clean Air Coalition)
- Phasing out wasteful fossil fuel subsidies
- Leading global public financing towards cleaner energy
- Leading efforts through international negotiations

China builds *half* the world's new floor space each year.



Today, the United States has appr. 300 billion square feet of floor space.



China is projected to add appr. 300 billion square feet in the next **15-20 years.**

Clean Energy Ministerial

Participation in Clean Energy Ministerial Initiatives

January 2013

	AUSTRALIA	BRAZIL	CANADA	CHINA	DENMARK	EUROPEAN COMMISSION	FINLAND	FRANCE	GERMANY	INDIA	INDONESIA	ITALY	JAPAN	KOREA	MEXICO	NORWAY	RUSSIA	SOUTH AFRICA	SPAIN	SWEDEN	UNITED ARAB EMIRATES	UNITED KINGDOM	UNITED STATES
21ST CENTURY POWER					●		●		●										●				●
APPLIANCES (SEAD)	●	●	●			●		●	●	●			●	●	●		●	●		●	●	●	●
BIOENERGY		●			●							●								●			
BUILDINGS AND INDUSTRY (GSEP)	●		●		●	●	●	●		●			●	●	●		●	●		●			●
CARBON CAPTURE (CCUS)	●		●	●				●	●				●	●	●	●		●			●	●	●
CLEAN ENERGY POLICY	●							●		●		●	●		●			●		●	●		●
ELECTRIC VEHICLES (EVI)				●	●		●	●	●	●		●	●					●	●	●		●	●
ENERGY ACCESS (GLOBAL LEAP)												●											●
HYDROPOWER		●						●							●	●							●
SMART GRID (ISGAN)	●		●	●		●	●	●	●	●		●	●	●	●	●	●		●	●		●	●
SOLAR AND WIND	●	●			●	●		●	●				●	●	●	●		●	●		●	●	●
SUSTAINABLE CITIES (GSCN)				●	●		●													●	●		
WOMEN IN CLEAN ENERGY (C3E)	●				●										●	●		●		●	●	●	●

Non-CEM governments, nongovernmental organizations, and private businesses also participate in selected initiatives.

- I. Energy Efficiency**
 - Appliances
 - Buildings and Industry
 - Electric Vehicles
- II. Clean Energy Supply**
 - Solar and Wind
 - Hydropower
 - Bioenergy
 - Carbon Capture, Use & Storage
- III. Energy Access**
 - Off-Grid Appliances
- IV. Cross-Cutting**
 - Smart Grid
 - Power Partnership
 - Sustainable Cities
- V. Human Capacity**
 - Clean Energy Solutions Center
 - Women in Clean Energy

“...[T]he question is not whether we need to act. The overwhelming judgment of science -- of chemistry and physics and millions of measurements -- has put all that to rest.... [T]he question now is whether we will have the courage to act before it's too late. And how we answer will have a profound impact on the world that we leave behind not just to you, but to your children and to your grandchildren.”

- President Obama, Georgetown University, June 2013

What can SEAB do?

- Provide input on DOE policies and programs across all pillars (emission reductions, adaptation and international programs)
- Recommend areas needing priority focus – and identify gaps that need filling in policy, science and implementation
- Provide guidance on outreach/communication: requisite changes may be initiated through DOE efforts, but need implementation beyond government; facilitate links between key public and private sector actors
- Advise on how to integrate climate measures into other energy priorities