

U. S. Department of Energy



Hurricane Sandy Response Actions

20 March 2013
APEC EWG 45th Meeting

Hurricane Sandy



U.S. Department of Energy

Information	Sandy
U.S. Landfall Date	October 29, 2012
U.S. Landfall Location	Atlantic City, NJ
Strength at U.S. Landfall	Post-Tropical Cyclone
Sustained Winds at U.S. Landfall	80 miles per hour
Extent of Tropical Storm Force Winds (from Center)	500 miles
Affected Coastal States	North Carolina to Maine
Flooding	
Battery in New York City	13.9 feet
Delaware River in Philadelphia	10.6 feet
Property Damages*	Est. \$20 billion (would rank 4 th)
Deaths*	110 (ranks 4 th)



Source: NOAA

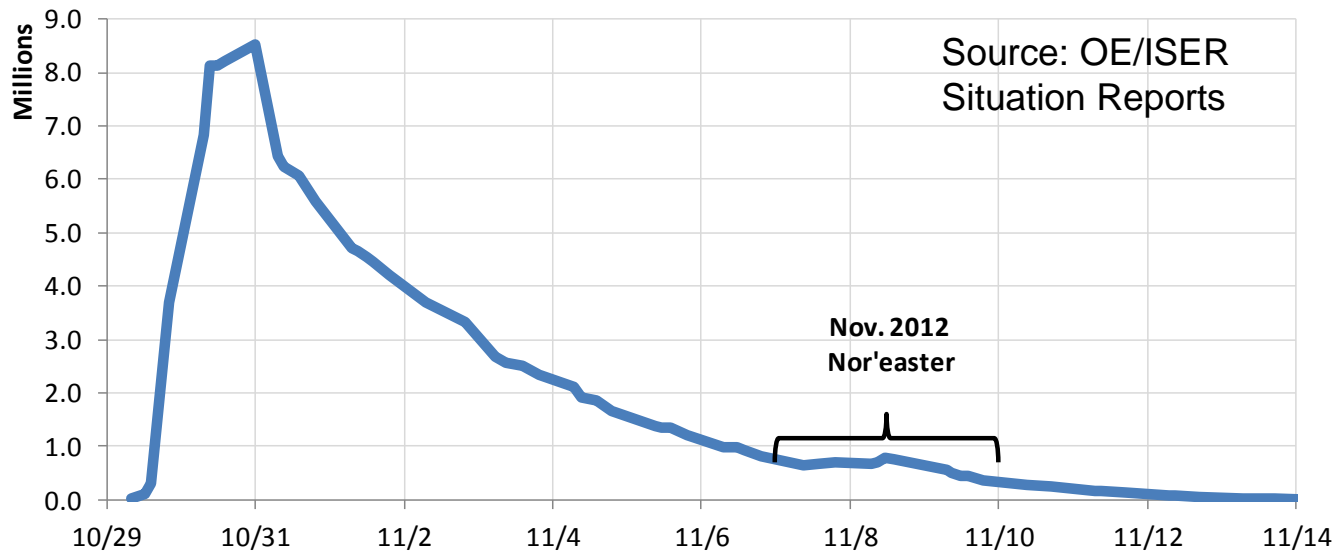
*Ranked among other hurricane/tropical storm events in NOAA records

Sources: NOAA , EQUENET, press

Electricity Outages



Hurricane Sandy and Nov. 2012 Nor'easter Outages



Select States	Total Customers (Millions)	Worst Day Outages (Millions)	Worst Day Percent Out
Connecticut	1.6	0.8	49%
New Jersey	4.0	2.6	66%
New York	8.0	2.1	26%
Pennsylvania	6.0	1.3	21%

Note: 20 States and the District of Columbia experienced power outages during Sandy, affecting 8.5 million customers.

Energy Infrastructure Outages



U.S. Department of Energy

Infrastructure	Total	Worst Day Outages
Refineries*		
Number	6	2
Capacity (thousand barrels per day)	1,170	308 (26% of Capacity in Path of Sandy)
Pipelines		
Products		Buckeye, Colonial, Plantation
Crude		None
Natural Gas		New Jersey Natural Gas
Ports		Hampton Roads, Baltimore, Delaware Bay, New York, Long Island, Southeastern New England, Boston
Petroleum Terminals		57
Nuclear Power Reactors	30**	3 shut down, 2 reduced

*Includes only refineries in the path of Hurricane Sandy

**There are 26 nuclear power reactors at 17 different sites in NRC Region 1 (Northeast) and 4 reactors at 2 different sites in Virginia.

Source: OE/ISER Situation Reports, NRC

Situational Awareness



DOE-ISER provided situational awareness of energy infrastructure outages and restoration activities for federal, state, and local stakeholders.

Emergency Situation Reports:

- Power outages and status of restoration activities.
- Status of petroleum refineries, pipelines, and storage terminals.
- Status of natural gas pipelines
- Status of nuclear power plants.

Visualization and Mapping:

- Regional maps with county-level power outage data

Situation Report

U.S. Department of Energy
Office of Electricity Delivery & Energy Reliability

Hurricane Sandy Situation Report # 10
November 2, 2012 (10:00 AM EDT)
http://www.ee.usel.doe.gov/emergency_sit_rpt.aspx

Highlights:

- At 8:00 pm EDT October 29, the National Hurricane Center reported Sandy made landfall near Atlantic City, NJ as a post tropical cyclone.
- As of 9:00 am EDT November 2 there are 3,628,739 customers without power in the affected States. This is a decrease from the 4,454,650 customers without power reported in Situation Report #9. Restoration estimates and efforts by electric utilities are reported below.

Summary

Electric Outages by State

Impacted State	Current Customer Outages	Percentage of Customers Without Power	Peak Outages Reported in DOE SitReps	Customers Restored Since Peak
Connecticut	238,871	12%	626,599	387,688
Maryland	18,608	< 1%	311,020	292,412
Massachusetts	1,660	< 1%	298,072	296,412
Michigan	10,003	< 1%	120,637	110,634
New Jersey	1,587,584	39%	2,615,291	1,027,707
New York	1,268,803	14%	2,097,933	829,130
Ohio	68,710	1%	267,323	198,613
Pennsylvania	324,747	5%	1,267,512	942,265
Rhode Island	7,539	2%	116,592	109,053
Virginia	1,910	< 1%	182,811	180,901
West Virginia	100,304	10%	271,765	171,461
TOTAL:	3,628,739		9,175,515	4,546,776

Note: States with fewer than 1,000 outages are not included in the table. Due to a large number of service providers, including investor owned utilities and cooperatives, the number of customer outages reported may not be comprehensive.
Sources: Outages obtained from company web sites and DOE communications. Total State customers are based on 2010 EIA Customer Data.

- On November 1, the US Environmental Protection Agency (EPA), in consultation with the US Department of Energy, expanded the emergency waiver of the Ultra Low Sulfur Diesel (ULSD) fuel specifications to allow the use of high-sulfur heating oil in diesel-powered highway and nonroad equipment in addition to nonroad vehicles in New Jersey. The waiver will be in effect through November 20.

Hurricane Sandy/Nor'easter 2012: Counties with Outages in New Jersey, New York and Pennsylvania

Outage data shown is the maximum number of outages between 0900 and 1000 EST 08 November 2012

For Official Use Only

Situation Report

(NRCC) in Washington, DC; in Boston, MA; the FEMA Emergency Operations Center MA Region III NRCC in

Situation Report

the below

11/2/12		
(B/D)	Reduced	Normal
ing		
		X
		X
	X	
0	335,000	527,200

is completed the

commercial vessel transits with , and Butternick Channels, range and Anchorage 21-A, B, George Washington Bridge, an approved facility berth or will be reviewed on a case-by-case basis affected by Sandy.

rejuven, NJ terminal. The

Hurricane Sandy.

Date Stamp
10/31/12
10/30/12

energy | 2012-08-06-7517

ility 3

on to 95% of its

turning good

y. The company g CL&P personnel s have needed to

will be restored ounty, which

hat the vast restoration may e has been

out-of-state cludes more than hama, Florida, ico, North

majority of its customers who were affected by Hurricane 1). The remaining less than one percent will receive service

Secretary | ISER | Department of Energy | 2012-08-06-7517

Department of Energy
ity Delivery & Energy Reliability

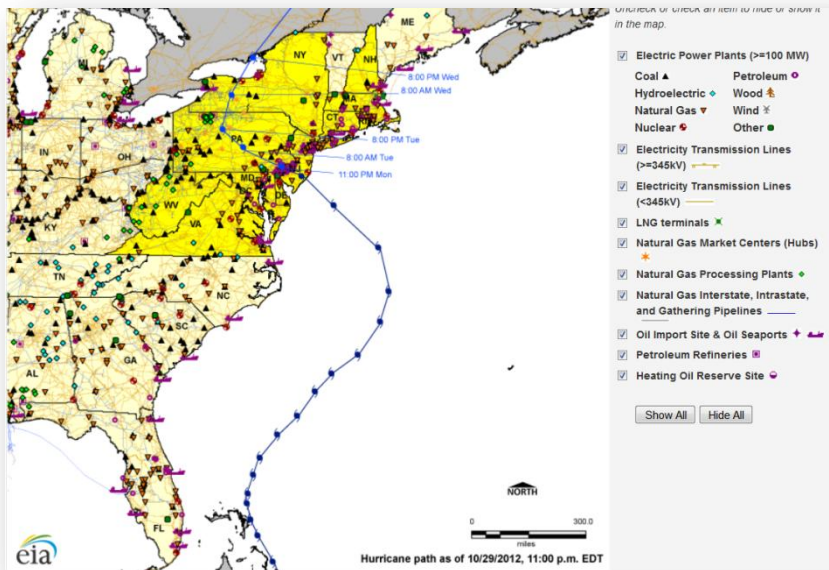
Informational Resources



U.S. Department of Energy

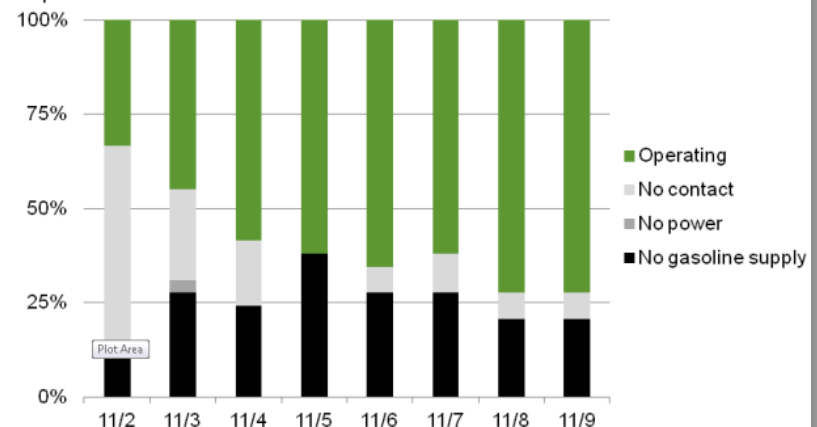
The EIA provided informational resources on energy infrastructure in the path of Hurricane Sandy.

- Interactive Infrastructure Map
 - The interactive map displayed the track of Hurricane Sandy over energy infrastructure
- New York City Metropolitan Area Retail Motor Gasoline Supply Report
 - Emergency survey summarized status of area fueling stations.



Availability of gasoline in the New York City metropolitan area

Percentage of Sampled Stations



Source: EIA emergency survey

Informational Resources



U.S. Department of Energy

The DOE utilized new information technologies to address fuel issues

- **Tech Solutions:** DOE CIO reached out to the White House and Federal Chief Technology Officer Todd Park to engage 18 Presidential Innovation Fellows to leverage their technical and operational skills, along with their deep contacts in the private tech sector to augment efforts to solve fuel-related problems, as well as other problems caused by the storm.
- **Google Crisis Maps:** DOE partnered with Google to promote use of a real-time online platform that tracked the status of fuel availability at gas stations in the storm-affected area.



A screenshot of the ENERGY.GOV website showing a "Hurricane Sandy-Nor'easter Situation Report #7". The page features a large satellite-style map of the Northeastern United States with red lines indicating the storm's path. The report title is "Hurricane Sandy-Nor'easter Situation Report #7" and it includes a "READ MORE" button. Below the map, there are sections for "BLOG" (dated November 11, 2012), "ENERGY SAVER TOPICS" (listing Tax Credits, Rebates, and Savings; Appliances & Electronics; Heating & Cooling; Lighting; Home Energy Audits), and "NEWS" (dated November 12, 2012, titled "New Titan Supercomputer Named Fastest in the World"). A "PHOTO OF THE WEEK" section is also visible. On the right side, there is a "SAVINGS" section with links to "Residential Renewable Energy Tax Credit", "Energy-Efficient Commercial Buildings Tax Deduction", and "Business Energy Investment Tax Credit (ITC)". At the bottom right, there is a "HOW MUCH DO YOU SPEND?" section with a map of the United States and a link to "Compare your state's per capita annual energy costs in a state-by-state map of average energy".

Assisting Power Restoration



U.S. Department of Energy

DOE, in partnership with FEMA and other federal agencies, worked around the clock to support the impacted States and utilities.

- **Utility Calls:** Daily conference calls between utility executives and Secretary Chu.
- **Interagency Taskforce:** DOE participated in an interagency taskforce on power restoration and fuel availability at the FEMA National Response Coordination Center.
 - Focused on eliminating any bureaucratic roadblocks - help to get power back up as quickly as possible.
 - Facilitated the movement of utility workers by working with U.S. DOT to issue the appropriate permits for utility trucks crossing state lines.
 - At peak ~70,000 workers from around the country were working to restore power in affected areas.
- **“Boots on the Ground” support:** 35 DOE Personnel Deployed.



Assisting Power Restoration (Cont'd)



U.S. Department of Energy

Power Marketing Administrations and Other Assistance.

- 235 personnel and equipment from the Energy Department's Power Marketing Administration (PMA) offices in Western States were involved in the restoration efforts. This was the first time WAPA or SWAPA engaged in mutual aid with an investor-owned utility.
- WAPA flew two of its helicopters to New Jersey to perform aerial damage assessment of the electric infrastructure in JCP&L's service area.
- U.S. Army Corp of Engineers deployed water pumps to a flooded Con Edison power substation in New York to help clear out the water. Diesel Generators were used to energize substations.



Addressing Fuel Shortages



U.S. Department of Energy

- **Jones Act Waiver:** DHS issued, in coordination with DOE, the Maritime Administration and the DOD, a waiver of the Jones Act allowing foreign vessels to ship petroleum products from the Gulf of Mexico to Northeastern ports.
- **Fuel Flexibility Waivers:** The EPA in coordination with DOE issued a number of waivers that allow for fuel flexibility in the use of a variety of fuel products.
 - Reformulated Gasoline (RFG) waiver.
 - Ultra Low Sulfur Diesel (ULSD) waiver for emergency response vehicles and equipment in NY, NJ, and PA.
 - Non Action Assurance allowing fuel loading and unloading without the use of vapor recovery systems.
- **Accessing Reserves:** For the first time, diesel fuel from the Northeast Home Heating Oil Reserve was released for use by emergency responders, generators and emergency equipment and buildings, as well as to alleviate fuel shortages in Connecticut.
- **Additional Efforts included : Opening Ports, Generators to Gas Stations and Fuel to First Responders.**



Looking Forward



U.S. Department of Energy

Plans for near and long-term recovery:

- Collaborate with various government agencies on long-term restoration and recovery
- Conduct “Hotwash” and prepare After Action Report for improved DOE federal response
- Coordinate with electricity suppliers in rebuilding more resilient systems by implementing new technologies and best practices
- Examine the lessons learned from impacted States, localities and the energy sector
- Continue to closely monitor energy situations with State and industry officials

A satellite image of Earth showing a large, swirling cyclone or hurricane over the ocean. The cyclone is characterized by a dense, white, spiral cloud pattern. The surrounding ocean is a deep blue, and the landmasses are visible in shades of green and brown. The text "Thank You!" is overlaid in the center of the image.

Thank You!