Funding A Greener Grid: How Obama plans to spend billions on modernizing the U.S. electrical network

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A map showing the locations of awards from the $3.4 billion in grants that are part of the American Reinvestment and Recovery Act. Credit: U.S. Department of Energy

President Barack Obama announced on Tuesday that his administration plans to spend $3.4 billion on producing a safer, more efficient electrical grid. Obama underscored the need to find clean forms of energy by making his announcement at a solar energy facility in Arcadia, Fla.

This government infusion of funds -- part of the $878 billion stimulus package approved by Congress earlier in the year -- represents the largest modernization in the nation's electrical infrastructure. The $3.4 billion in federal money will be matched by contributions from private companies,

resulting in a total grid-improvement package estimated to be about $8 billion.

Of the federal money, about $1 billion will be directed at helping consumers use less energy or use energy more wisely. This could mean subsidies for buying more efficient appliances or incentives for using electricity at different times of the day. About $2 billion will be targeted at making the outlying components of the grid more reliable. This requires the deployment of more sensors and automatic turn-off mechanisms that operate during emergencies. About $400 million will be invested in streamlining the bulk movement of power across high-voltage power lines. A better effort will be made to integrate renewable sources of energy into the grid, sources such as wind or solar power.

The modernization scheme -- which aims to spur the creation of thousands of new jobs and benefit companies or communities in 49 states -- is generally referred to as the smart energy grid. But "smart" can mean several things. New smart technology can improve the operating efficiency and reliability of the grid itself -- the network of high-voltage lines, which deliver power to customers from electrical generators (where energy is converted from one form, such as coal, into electricity). "Smart" in this case refers to the grid's ability to protect itself or vital components, such as transformers, in times of crisis.

Many experts believe that the grid needs to respond more quickly to emergencies, either to reroute energy along new paths when obstructions occur, or, as a last resort, to switch off certain sectors of the grid as a way of containing blackouts that would otherwise envelope large areas. Some of the allocations announced today will go toward making the grid more robust by making transformers and substations more sensitive to possible emergencies as they unfold -- avoiding another blackout like the one in 2003, which cut power to more than 50 million people in the U.S. and Canada.

"Smart grid" can also refer to the meters that customers use at the receiving end, either in homes or factories. The cost of electrical power can be much greater at 5 p.m. than 5 a.m. If a homeowner knew this, he or she would have a greater motivation to run a dishwasher late at night rather than during the late afternoon. A smart meter could also eventually be used to selectively turn off certain appliances during times of power scarcity. Turning off a water heater for a few hours would be little noticed in a home.

In Senate testimony on Tuesday, Energy Secretary Steven Chu reflected on the issue of smart energy, especially as it relates to renewable energy. He pointed the fact that almost all of the batteries used in hybrid cars driven in the U.S. are made in Japan and that the percentage of solar cells made in the U.S. had fallen from 40 percent in the 1990s to the current level of 7 percent.

More information: Smart Grid Info | Details | Interactive Map

Source: Inside Science News Service