WASHINGTON — President-elect Barack Obama has selected his top energy and environmental advisers, including a Nobel Prize-winning physicist and the former head of the Environmental Protection Agency, presidential transition officials said Wednesday.

Collectively, they will have the task of carrying out Obama's stated intent to curb global warming emissions drastically while fashioning a more efficient national energy system. And they will be able to work with strong allies in Congress who are interested in developing climate-change legislation, despite fierce economic headwinds that will amplify objections from manufacturers and energy producers.

The officials said Obama would name Steven Chu, the director of the Lawrence Berkeley National Laboratory, as his energy secretary, and Nancy Sutley, deputy mayor of Los Angeles for energy and environment, as head of the White House Council on Environmental Quality. Obama also appears ready to name Carol Browner, the EPA administrator under President Bill Clinton, as the top White House official on climate and energy policy and Lisa Jackson, New Jersey's commissioner of environmental protection, as the head of the EPA.

Aides cautioned that while Obama appeared to favor Browner for the new White House post, there were still issues to be resolved before the appointment was formalized. Obama plans to name the environmental team next week in Chicago, aides said.

If named to the White House climate post, Browner, an acolyte of former Vice
President Al Gore, will have forceful support in the new Congress, including Speaker Nancy Pelosi, Representative Henry Waxman of California, who will be the new chairman of the House Energy and Commerce Committee, and Senator Barbara Boxer of California, who is returning as chairwoman of the Senate Environment and Public Works Committee. Opposing their efforts will be many Republicans and some Democrats, as well as manufacturers, utilities, oil companies and coal producers who will bear the brunt of the costs of any steps to reduce carbon dioxide emissions, the main culprit in global warming.

In the coming months, the administration will also have to devise a strategy for dealing with global talks to address climate change, which are already under way.

In addition, both Browner and Jackson, who have strong reputations for regulating industry, will be under pressure to revisit and overturn many of the clean-air rules and other regulations imposed during the Bush administration over the objections of environmentalists.

Obama has promised to spend liberally to finance infrastructure projects and support so-called green technologies that will create jobs while benefiting the environment. These officials will work with Obama's economic advisers to try to find — and finance — projects that accomplish these goals.

It was not immediately clear how responsibilities for managing climate change, technological innovation and huge energy infrastructure spending will be divided among them.

Chu will be taking on one of the most challenging jobs in government at the Department of Energy. He will be responsible for the maintenance and development of the nation's nuclear weapons stockpile, as well as for modernizing the nation's electrical power delivery system.

He will also play a central role in directing the research and development of alternative energy sources needed to replace fossil fuels in a era of constrained carbon emissions. Chu shared a Nobel Prize in physics in 1977 for work on supercooled atoms.
At the Lawrence Berkeley laboratory, he has sponsored research into biofuels and solar energy and has been a strong advocate of controlling greenhouse gas emissions.

Scott Segal, director of the Electric Reliability Coordinating Council, an industry group, said he was pleased that Chu had the technical expertise to realistically assess future energy technologies.

"His experience seems to dovetail perfectly with the president-elect's commitment to bringing new energy technology to market in a timely fashion," Segal said. "An understanding of the art of the possible in energy technology will be critical to the development of a cost-effective climate change policy."

Although the scope of Browner's job at the White House is still under discussion, aides said that if appointed she would coordinate administration policy across departmental lines and advocate for Obama's energy and environmental policies on Capitol Hill. It was not clear on Wednesday whether her office would carry the bureaucratic clout of the National Security Council or the National Economic Council.

Before coming to Washington to head Clinton's EPA, Browner was Florida's top environmental officer. Since leaving government at the end of the Clinton administration, she has been a partner in an international consulting business with Madeleine Albright, Clinton's second-term secretary of state. Among her clients at the Albright Group was a Dubai-based port operator that sought a contract to manage American ports. The deal fell apart amid heated congressional criticism.

Browner, a lawyer, is well known in Washington and around the country as a forceful environmental advocate and experienced capital player. She is married to Tom Downey, a former New York congressman.

"She was a really strong administrator in really tough times," said Dan Becker, director of the Safe Climate Campaign, an environmental group.

Jackson has been the head of New Jersey's Department of Environmental Protection since 2006, but in October, Governor Jon Corzine announced that she would become his chief of staff starting this month. She has a master's degree in
chemical engineering from Princeton and spent 16 years at the federal EPA as a top enforcement officer in Washington and New York.

She has led the Obama transition team at EPA and knows the agency inside and out, according to associates.

S. William Becker, executive director of the National Association of Clean Air Agencies, which represents state environmental bodies, said Jackson was among the most respected state environmental officials.

"Her state experience allows her to know what works and what doesn't work on the ground," said Becker, who is not related to Dan Becker. "I also am glad to see they chose an engineer to run EPA The typical choice is an attorney."

Sutley, who will direct the Council on Environmental Quality, is now the top environmental adviser to the mayor of Los Angeles, Antonio Villaraigosa. She has years of experience in managing water supplies and water quality in California and has also worked on energy-saving construction rules for the City of Los Angeles.

She was a special assistant to Browner at the EPA.