Future Energy Institutes

THE LANDMARK ENERGY BILL WENDING ITS WAY THROUGH CONGRESS THIS SUMMER SEeks to reduce emissions of carbon dioxide and other greenhouse gases and supports the development of alternative energies, including solar and wind power. It’s a bill that aims to create both a “green” U.S. economy and a sustainable environment. At this critical juncture, America must take an equally sustainable view toward investing in the brainpower required to confront the world’s complex energy issues.

Three-quarters of students in the United States attend the country’s public colleges and universities, but very few of these institutions have vigorous education, research, and outreach programs focused on energy and climate change. Without a major restructuring of these powerful institutions, we forego the intellectual power and entrepreneurial spirit that they could tap to solve the energy and climate problems we face. We propose the creation of a public “energy-grant university system” devoted to energy education and research. This new system would be modeled on the U.S. land-grant university system established in 1862 in the midst of the Civil War to promote public education in agriculture and the mechanical arts. In the 20th century, the 78 land-grant institutions became a major source of intellectual wealth for the production of food, fiber, and basic scientific knowledge. Federal appropriations for this system in 2009 were nearly $1 billion, multiplied many-fold by matching state appropriations.

Federal investments in an energy-grant university system could build on the existing infrastructure and framework embedded in the nation’s comprehensive public research universities. In some cases, this could lead to expanding the mission of existing land-grant universities; in other cases, different comprehensive public research institutions or a consortium of such universities may be more appropriate. Support for at least one such institution in each state would provide, as it did for agriculture, new scientific knowledge and an extension service capable of advising every town on how best to reduce carbon footprints, increase energy efficiency, and promote sustainable economic growth.

To harness a vast untapped intellectual pool to drive the new green revolution, Congress should enact legislation that provides long-term funding through the Department of Energy to support research and extension services focused on energy issues at specific universities selected through a competitive process. A one-time investment of $5 billion could fund the construction of new buildings and facilities, and a $30 billion endowment would generate $1.5 billion in federal funding per year to support programs on energy research. As with the land-grant program, federal funding should be contingent on co-funding by each state, and it should provide strong incentives for corporate support from the energy industry. The new energy-grant institutions would become impartial advisers to local, state, and national policy-makers, and they would engage the country in building strong, science-based programs that focus on energy and climate, as their predecessors focused on agriculture over a century ago.

Developing global sustainable and scalable energy resources today is as critical to the future as strategically investing in agriculture once was to securing the national food system. Congressional action on the energy bill signals a new level of commitment to U.S. energy security. The 4-year America’s Energy Future study launched by the U.S. National Academies in 2007, and the recent Brookings Institution proposal of a complementary network of “discovery-innovation institutes” to move breakthrough inventions to the marketplace, demonstrate broad high-level support for finding sustainable solutions.

The energy-grant university proposal thrusts the intellectual might of public research institutions into the national conversation about solving global energy and climate challenges. Energy and climate change aren’t simply environmental issues; they’re also social, economic, and political problems. The next generation of leaders must confront these issues. It’s up to colleges and universities to lay the foundation for their success.

— Paul G. Falkowski and Robert M. Goodman

10.1126/science.1176998