Aol Energy.

Technology

Through Innovation and Investment, the U.S. Can Lead in Next-Generation Energy, Nuclear Fusion

August 3, 2012

By **Nick Cunningham** and **Andrew Holland**

The U.S. innovation system has a rich history of developing transformational technologies that usher in new eras of economic growth. The ultimate success of all energy technologies – whether coal, natural gas, oil, hydropower, nuclear, solar, or wind – has depended upon a tradition of public support during their research and development stage.

Consistent R&D support allowed new technologies to move through the stages of innovation – from basic and applied research, to prototyping, demonstration, commercialization, until they are finally market competitive. This process often takes decades, so returns are uncertain and dispersed, meanwhile, costs are certain, immediate, and focused, - so the private sector underinvests in R&D. Since the private market is not designed to address these problems, there is a clear role for smart government policy.

However, right now America's energy policy is hampered because politicians only plan around four-year cycles. While today's energy policy debates in Congress focused on which tax credit will get a one year extension and which will not, we are missing opportunities to develop energy technologies for the next generation. Most troubling is a push by Congress and the Administration to cut the federal R&D budget, crippling investments in critical new technologies. The consequences of these cuts will be felt immediately – and will last for decades. One striking example is the proposed budget cuts for fusion energy. Research in fusion has been going on for decades, and significant progress has been made. By fusing together two hydrogen isotopes – deuterium and tritium – enormous amounts of energy can be produced. Since deuterium comes from ocean water, and tritium can be produced from lithium, fusion holds the promise of providing a nearly inexhaustible supply of energy. Even better, no pollutants or greenhouse gases are emitted, and there is no threat of a nuclear meltdown like there is with the nuclear fission reactors of today. We know that fusion works, it is already being done in labs around the world. Here in the United States, the three major experiments for research into magnetically-confined fusion (which uses powerful

magnets to confine the superheated plasma) are the Princeton Plasma Physics Laboratory, the Plasma Science and Fusion Center at the Massachusetts Institute for Technology (MIT), and the DIII-D Research Program at General Atomics' Fusion Energy Research Lab in San Diego. These experiments are supported by major scientific research institutions like Oak Ridge National Laboratory in Tennessee and by a range of businesses, contractors, and researchers in every corner of the country.

1 | 2 NEXT PAGE »