Germany’s Energy Research Plan

LAST MONTH, GERMAN CHANCELLOR ANGELA MERKEL APPROVED A LONG-TERM STRATEGY TO PUSH renewable energies as a reliable, economical, and environmentally sound pillar of sustainable economic growth. The “Energiekonzept” (Energy Concept) foresees an end to the country’s dependence on fossil fuels and defines key milestones to achieve by 2050, including the reduction of greenhouse gas emissions by 80% (compared to 1990 levels), the modernization and insulation of buildings, and a decrease in electricity consumption by 25%. Innovations must contribute substantially to meet these objectives, and so energy research is an explicit part of the Energiekonzept. By spring 2011, the German government will present a detailed new Energy Research Program that outlines important research tasks to support these new goals.

Renewable energies will play the major role in restructuring Germany’s energy supply. These sources already generate about 16% of Germany’s energy, including wind and hydro-power, biomass, geothermal, and photovoltaic power. The country’s global leadership in Green Tech innovations is based on hefty and continuous investments in research and the dissemination of technologies. In 2010 alone, the German government will spend approximately 1 billion euros on energy and climate research.

The Energy Concept foresees that renewable energies will account for 18% of gross final energy consumption by 2020 (the goal agreed on by the European Union) and 60% by 2050. Renewables will provide 35% of gross electricity consumption in 2020 (80% in 2050). The use of wind power and photovoltaics as electricity sources is a priority that presents a challenge to the existing infrastructure. The considerable fluctuation in the performance of wind and solar systems calls for an overhaul of traditional power grids, which were not designed to cope with dominant shares of green electricity and large numbers of decentralized energy producers. Basic research must lay the foundation for new transmission lines, large-scale storage systems, backup power stations, and information technology–driven networks to balance volatile electricity production.

The German government will provide the finances needed to manage the economic and societal burden of this change. The Federal Ministry of Education and Research will address the challenges and contribute to the new Energy Research Program. But it will take time to complete a cost-efficient transition to a new energy supply system. In the meantime, it is critical that the existing energy supply system remain stable and reliable. Extending the lifetime of nuclear reactors by an average of 12 years is therefore a crucial, but contentious, part of the Energy Concept. Nuclear power accounts for a quarter of Germany’s total energy mix. If nuclear power were abandoned today, the German CO$_2$ output would increase by more than 100 million tons from current levels, which is not permissible. In the Energy Concept, a substantial share of the future profits of nuclear energy suppliers will fund energy research and expand renewable energy sources.

A main goal of the German Federal Ministry of Education and Research is the development of cities that are sustained by “green” services, energy-efficient economic activities, and new consumption models. This is a global challenge as well, and can only be realized through projects based on both national research efforts and an international exchange of experience in this field.

The Energy Concept and the Energy Research Program are vital for Germany’s future. They show the country’s dedication to the promises made internationally to address climate change, including the commitments made at last year’s United Nations Climate Change Conference in Copenhagen. Imponderables will surely arise and may well call for additional measures over the next 40 years. It is therefore important that energy research be defined to include a wide range of technological options, providing policy-makers with the broadest possible options for action. I am confident that the Energiekonzept will galvanize the European Union’s commitment to address climate change with long-lasting ambition.

— Annette Schavan

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