

Emerging Energy Technologies

OBJECTIVE: Through Research, Examine the Potential for Adverse Effects on Human Health and the Environment from Emerging Energy Technologies.

It is the purpose of this Act . . . to advance the goals of restoring, protecting, and enhancing environmental quality and assuring public health and safety . . .

—Sec. 102, Public Law 95-91

The functions which the Secretary shall assign . . . shall include . . . conducting a comprehensive program of research and development on the environmental effects of energy technologies and programs.

—Sec. 203, Public Law 95-91

Thus the Department of Energy Organization Act continued the charter of a predecessor agency, the Energy Research and Development Administration. Aside from including all energy technologies, the new act identified, for the Department of Energy, responsibilities for the public health and safety which were virtually identical to those of the Atomic Energy Commission in its nuclear development and production programs. In all three charters the intent of Congress was clear: to foster a better understanding of the potentially adverse effects on human health and the environment of emerging energy technologies. The dramatic dislocations following the oil embargo of 1973 gave impetus to the development of the emerging technologies—synthetic and renewable fuels as well as nuclear—and thus added to the urgency of these responsibilities.

Identification and Evaluation of Human Health Effects

Nuclear Technology The formal inception of the health and environmental research program under the Atomic Energy Commission also provided its primary focus: the study of the health effects of radiation exposure. There was more than sufficient reason.

At the outset of the Second World War, it was apparent that radiation could have adverse effects on human health. It was known that living cells could be damaged by radiation, and this phenomenon was already under study in many universities and hospitals throughout the world. The two atomic bombs detonated in wartime provided ample and tragic proof of radiation damage. The study of long-term effects of radiation on the survivors provided a wide range of dose-effect information of direct benefit to the emerging peaceful uses of the atom, including nuclear medicine and power applications. But, as we will see, in a much larger sense the study also marked the beginnings of research of the most fundamental kind, that which today holds great promise of a better understanding of biological processes and of treatments and therapies for a number of human diseases. The survivor study became an integral part of a broadly based program of research on radiation and its effects, ranging from observing the health of workers in nuclear and related industries over their lifetimes to conducting basic research to understand the fundamental processes that occur when human cells are damaged by radiation.

This research program has provided the information essential to the public debate on nuclear power. It has also provided the basis for setting radiation protection standards which have undergone constant review since their initial formulation 33 years ago. Continuing studies have reaffirmed an awareness that exposure to all radiation should be kept low; over one million people, such as nuclear shipyard workers, are currently under observation to reduce uncertainties regarding low-level radiation effects. In addition to fulfilling its primary objective of providing the information necessary to protect the health of the public and of workers in radiation environments, the body of knowledge generated on radiation effects also finds practical use in court deliberations by providing a