

Use of Nuclear Energy for the Production of Process Heat

The American Nuclear Society endorses the use of nuclear reactors for the production of process heat.

Heat for industrial processes and for space heating, together with fuel for transportation, account for more than 60% of the primary energy consumption in industrial societies. Burning large quantities of fossil fuels is currently necessary to produce most of this energy. However, it is expected that projected climate changes will require a shift toward energy technologies that generate less carbon dioxide and other greenhouse gases. Furthermore, future energy systems will have to meet considerably stricter requirements with regard to atmospheric pollution and other aspects of environmental degradation (such as the emission of sulfur oxides, nitrogen oxides, mercury, heavy metals, and particulates). Nuclear reactors can meet these requirements in many locations at a lower or competitive cost.

Fossil fuel resources are finite and have appropriate and essential uses such as feedstock for the production of chemicals. They should, therefore, be used sparingly as fuel. The use of these valuable resources should be minimized in a future globally sustainable regime and gradually replaced by clean energy sources that are either renewable or have a very large supply base, including uranium.

Currently, the use of nuclear reactors—for other than for electricity generation—is limited primarily to small desalination projects and other heat applications such as space heating for close-in towns and villages as well as for fishery farms and agricultural greenhouses. To achieve the objective of a higher contribution by clean energy sources, it is essential that the use of nuclear reactors for producing heat be increased and extended to a wider spectrum of industrial applications. (The application of nuclear energy for the generation of hydrogen is addressed in Position Statement 60, “Nuclear Energy for Hydrogen Generation,” issued in June 2003.) Hydrogen and hydrogen-rich fuels are expected to become valuable energy carriers with applications in industry and transportation. Expanding the use of nuclear reactors for desalination projects will also become increasingly important in view of the growing world population and already existing local shortages of fresh water. The use of nuclear energy for industrial purposes will greatly reduce atmospheric pollution.

Nuclear reactors can provide heat—in addition to electricity—for multiple uses in a safe manner and with minimum environmental impacts.