



Canadian and foreign buyers of the CANDU system place critical importance on the degree of AECL's commitment to research and development. To be economically attractive, a nuclear plant must have a continuous high capacity factor for 30-40 years. A purchasing utility must, therefore, be convinced that the vendor will have the capability to back up the technology over its full operating lifetime.

With AECL's continued (and enhanced) capabilities in these areas, CANDU technology and the Canadian nuclear industry will have the tools to prosper in the 21st century. Federal government support for the CNF should be viewed in the context of the substantial levels of direct and indirect government support that are provided to competing light-water reactor technologies in the U.S., France, Japan and Germany. Building the CNF is a key component of a successful ongoing industry, and ensures a future CANDU option for Canada—clean electricity supporting the Kyoto Protocol on Climate Change.

## **The Importance of Materials Research for Universities and Industry**

Neutron beams can provide unique information that is key to the understanding and control of advanced materials. Neutron beam research provides scientists and engineers with valuable information about materials that affect our daily lives. The results of neutron beam research include improvements in everyday products, such as jet aircraft, high-speed trains, plastics, pharmaceuticals and magnetic devices such as computer disks, pocket calculators and lightweight magnets in automobiles. As well, neutron research improves industrial products and materials, such as polymers, metals and ceramics, gas pipelines, railsteel, welded structures, CANDU pressure tubes, high-

temperature superconductors, biological materials, and synthetic nanostructures.

For the future, much more needs to be known about biological materials and polymers. The CNF will provide an entirely new capability for Canada in these rapidly growing areas. It will provide copious beams of neutrons whose wavelengths match the larger-scale structures of importance in the life sciences and in new soft materials. Larger wavelengths are produced by cooling neutrons to low energies. These cold neutrons from the CNF will open the door to many new fields of science and technology and will create applications for neutron beams that were