

specifically directed toward the development of materials for mining equipment and all modes of transportation. This includes developing superior steel for ships' hulls, offshore structures and pipelines, new alloys for ships' propellers, and special forging and casting of metals and ceramics for the automotive and aircraft industry.

The branch operates pilot scale facilities and special research instruments that are beyond the normal requirements of individual companies for day-to-day use but which are made available to companies on a cost-recovery basis. These special facilities include a rolling mill, an experimental foundry, a mineral processing plant, mobile coal preparation plants, special analytical equipment and the largest rock press in Canada.

**Canada Centre for Remote Sensing (CCRS)**, a branch of the department, co-ordinates a remote sensing program in co-operation with federal and provincial departments, private industry and universities. The program develops and demonstrates systems, methods and instruments to deal with remote sensing data from satellites and aircraft, to develop an information system for Canada's land and ocean resource managers. It concentrates on satellite remote sensing, airborne remote sensing and an application program. Its analysis facilities are made available to scientists and users of remote sensing data and techniques. An aircraft carrying a number of state-of-the-art sensors, such as a synthetic aperture radar, is available to users across Canada on a cost-recovery basis.

CCRS is the federal agency responsible for R&D in remote sensing by optical, infra-red and radar methods, both active and passive. After the branch acquires remotely sensed data from satellites such as SPOT and aircraft, it processes the data to provide information relating to mineral resources, agriculture, forestry, land use and Arctic navigation. CCRS also fosters Canadian industrial capability in ground receiving stations for satellite data reception and the development of remote sensing technology.

**Explosives Branch.** The department controls, under the Canada Explosives Act, the authorization, manufacture, storage, sale and importation of explosives. Responsibility for control of road transportation of explosives still rests partly with the department but is being transferred to the Department of Transport.

### 10.9.2 Earth sciences

This sector assists the oil, gas and mineral industries through the Geological Survey of Canada, the Surveys and Mapping Branch and the Polar Continental Shelf Project.

The **Geological Survey of Canada** provides geological, geophysical and geochemical knowledge, technology and expertise of the Canadian landmass including the underlying solid earth and offshore areas. These activities are required for the effective exploitation of mineral and energy resources, the estimation of the resource base of Canada, the public safety and security of Canadians and the formulation of policies. Systematic geological studies, and magnetic, radiometric and geochemical surveys are carried out to define geological settings favourable to mineral and fuel occurrences of interest to industry. A network of seismological observatories provide data to assess earthquake risk and hazards. Gravity, seismic and electromagnetic surveys provide data to study the structure of the earth's crust. Together with data from geomagnetic observatories, reference fields and forecasts of geomagnetic disturbance are also provided. The Geological Survey provides information on land resources, terrain performance and geological hazards, derived from studies of earth and rock materials, land forms and associated dynamic processes. Part of the geological investigation deals with Canada's offshore regions including non-renewable resources and coastal and seabed conditions.

The **Surveys and Mapping Branch** has completed topographical mapping of Canada. Through a basic network of survey control points across Canada, the branch provides precise figures of latitude, longitude and elevation above sea level. The branch also produces multicoloured maps for other government agencies, aeronautical charts and atlases. A national air photo library has on file over 4 million aerial photographs, both black and white and colour, taken over the last half century from aircraft and more recently from space satellites.

The **Polar Continental Shelf Project** co-ordinates and provides logistics support for all field work undertaken in the Canadian Arctic by government, and many non-government scientific researchers.

### 10.9.3 The energy sector

This is a policy recommending group. Some responsibilities relate directly to the mining industry and many other parts of the economy. It assesses individual projects in relation to each energy source and the interrelationships of the several sources. It appraises trends in oil and gas exploration and production, transportation, processing and marketing in Canada and abroad, and informs federal agencies, industry and the public on oil and gas developments. In the