- desulphuring equipment;
- switching equipment;
- large capacity transformers; and
- nuclear reactors

Constraints

The overriding constraints currently facing many Canadian equipment exporters involve the recent balancing of China's demand and supply for electric power, coupled with strong and growing local capabilities for most conventional equipment.

Action Plan

The objectives of the action plan for this sector are as follows:

- to identify specific opportunities for Canadian companies, and convince Chinese counterparts of Canadian capabilities;
- to strongly support individual Canadian companies or groups of companies in their pursuit of specific niche project opportunities;
- to support Canadian efforts to remain active in the Chinese market through strategic development of JVs and technology transfer initiatives;
- to provide frequent reports to the National Electricity Roundtable for dissemination, with an emphasis on regulatory developments and market intelligence;
- to address market access issues through bilateral and multilateral means;
- to actively promote the environmental advantages of Canadian technology, including pollution abatement for fossil fuels and nuclear energy; and
- to maintain regular contact with senior management of CLP and HEC to identify upcoming business opportunities.

Environment

Business Environment

Mainland China

Environment degradation is a difficult and costly problem in China. It is estimated that the cost of energy degradation and resource scarcity amounts to approximately 8 to 12 percent of China's GDP, or about US$77 billion; while 1998 spending on environmental protection accounted for only 1.02 percent of its GDP (or US$9.6 billion). In recent years, there has been a real shift in public attitudes to environmental protection. That, combined with the high economic cost of environmental degradation, has prompted Chinese leaders to address the problem on a case-by-case approach. Commonly known as the 3-3-2-1 policy, this forms part of China's economic development policy under the Ninth Five-Year Plan (1996 to 2000), and centres around China's efforts to clean up three lakes (Tai, Chao and Dianchi), three rivers (Huai, Hai and Liao), two acid rain control zones and one city (Beijing). Increasingly, the government is also encouraging further development of the interior regions, which contain many of China's worst polluted areas.

The regulatory framework for environmental protection is fairly complete, with legislation covering water, air, solid waste, noise and marine pollution, along with a wide range of other regulations enacted in the 1980s and 1990s. However, enforcement of these regulations remains problematic, as laws established by the central agency are enforced by local governments, which often are reluctant to shut down, or by fine industries from which they earn a profit.

The World Bank estimates that China will need $100 billion infrastructure investment in water conservation, treatment and sanitation between 1995 and 2005.

IFIs such as the World Bank (WB), the Asian Development Bank (AsDB) and various United Nations (UN) agencies commit significant funding each year to help China maintain sustainable growth. Bilateral development assistance, such as Japan's Overseas Economic Co-operation Fund (OECF), also contributes to helping China clean up its environment. China estimates that it will receive approximately US$2.86 billion from WB, AsDB and OECF in 1999 and 2000. However, even the magnitude of these multilateral and bilateral loans is not sufficient to address China's need. Consequently, it will have to turn increasingly to the private sector to meet capital costs.

Hong Kong

The rapid increase in the population, intense economic activity and massive infrastructure development have resulted in serious environmental degradation in Hong Kong. Every day, Hong Kong generates about 40 000 tonnes of general municipal and construction waste, 2 million tonnes of sewage and industrial wastewater, a high level of air pollution generated mainly from diesel vehicle emissions, and other waste generated by industrial, commercial and domestic activities.

In his 1997 policy address, the Chief Executive of Hong Kong reiterated that "improving the quality of the environment is as vital as economic growth." The government has moved rapidly and invested large sums of money to make Hong Kong a cleaner city. A pilot scheme has been undertaken to convert the taxi fleet from diesel to liquefied petroleum gas (LPG). A $211 million 10-year plan is in place for waste reduction, reuse and recycling. Over $2.3 billion will be spent on sewage programs over the next five years.

While Hong Kong represents a potential market for providers of environmental expertise and equipment in its own right, it is also an important entry point to the enormous mainland market for environmental infrastructure projects. Canadian companies, however, face strong competition from the United Kingdom, the United States, Europe and Australia. To be successful in this market, Canadian companies must maintain a continuous local presence by working closely with local companies, either in the role of subcontractors or overseas partners (in the case of consultants), or by using local distributors or dealers (in the case of equipment suppliers). Increasingly, the ability to negotiate and offer a financing package for a large project is essential.

Market Opportunities

Public authorities continue to be the main end users of environmental protection equipment and services in China, followed by state-owned enterprises, JV companies and foreign aid recipients from such sources as the WB, the AsDB, the UN and other bilateral institutions.

Water: Eighty percent of wastewater discharged in China is not treated, and consequently, 82 percent of China's rivers are polluted. Of the 668 cities in China, 300 lack sufficient water supply, while 120 are classified as having a serious water shortage. Sixty million people cannot get enough clean water for daily use. Since only 153 cities have any type of wastewater treatment plants, the treatment rate was only 11 percent in 1996, of which over 70 percent was industrial effluence. Opportunities exist for Canadian companies with appropriate technology to address municipal and industrial wastewater treatment equipment, with the latter focussing on pollutant-specific technology in such areas as paper mills, and chemical, dye and paint factories. Demands for environmental monitoring and analytical instruments are also expected to increase. In addition, opportunities for SMEs exist in new housing and hotel construction projects that purchase their own water-treatment facilities.

Air: China relies on high-sulphur coal for its energy, with coal-fired power plants accounting for about 80 percent of the nation's electricity generation. The power sector and industrial coal-fired boilers are the first- and second-largest polluters respectively. Consequently, China is the biggest producer of sulphur dioxide in the world. At the same time, industrial particulate discharge has also increased dramatically, and vehicle emissions are becoming a major source of air pollution in more developed cities such as Beijing, Shanghai, Guangzhou and Tianjin. China recognizes the need to improve its air quality, and has adopted various measures including widespread use of flue gas desulphurization equipment in power generation plants; electrostatic precipitators; cleaner coal technology; and environmental monitoring equipment.

Reduction of vehicle emissions is another focus of China's plan to control air pollution. All new vehicles must use unleaded gasoline by 2000 and all existing vehicles must install emission control devices. In particular, automotive technologies dealing with alternative fuel vehicles are greatly sought after by cities such as Beijing, Shanghai, Chongqing, and the provinces of Guangdong, Sichuan and Fujian.