the 21st century with an emphasis on broadband technology. Given the relative weakness of domestic suppliers, government infrastructure expansion projects depend heavily on foreign equipment purchases, especially fibre-optic networking. Opportunities for foreign companies also exist in satellite communications and VSAT (very small aperture terminal) technology.

New opportunities for Canadian companies should also emerge from the recent decision by China to implement Code Division Multiple Access (CDMA) cellular phone technology as a competing technology to the existing dominant GSM network. To date, Unicom appears to have inherited the mandate to develop the CDMA network, and has announced ambitious plans to establish a network with a capacity of 10 million subscribers by the end of 2000.

Constraints

The telecommunications equipment market in China is extremely competitive. While actively supporting domestic manufacturers who enjoy an increasing market share for high-volume equipment such as switching, the government is also placing increasing pressure on foreign suppliers to localize their production in China. China lacks a telecommunications law, and its policy and regulatory frameworks are nebulous and in constant evolution. The confusion is temporarily accentuated by the fact that China is currently pursuing the process of separating the regulator (the recently created MII) from operation and manufacturing functions. The complexity of China's business environment is exacerbated by the government restructuring currently taking place in all sectors.

One of the impacts of the recent changes is the increased transition to a more decentralized decision-making structure, in which provincial entities and end users play an increasing role. Although telecommunications has received much attention from the government, it is no longer the top priority on the agenda and, therefore, financing issues have become unavoidable. Due to ineffectively protected intellectual property rights, fraudulent manufacturers are also in a position to seriously threaten foreign suppliers. Finally, although indirect investment by foreign companies in mobile communications projects put forward by China Unicom (the second carrier) have been authorized in the past, the Chinese government has recently shifted policy and decided to enforce its ban more stringently on foreign involvement in ownership or operation of a telecom network. China will eventually open this sector up for foreign competition. With increased overtures to enter the WTO, and other signs in the market, this opening is expected to occur in the short to medium term.

2. Computers and Software

Business Environment

Computers: The computer market in China is driven by a 30 percent annual increase in demand for personal computers (PCs). Any opportunities arising from the rapid growth in this industry are quickly extinguished by intense competition and falling margins. Only the biggest players, including several extremely competitive domestic suppliers, that benefit from economies of scale and the ability to diversify into higher-margin areas will survive in the PC market.

In 1998, close to 4 million computers were sold in China, making its PC industry the sixth-largest in the world. Sales of computers are driven by increasing demand in government and large organizations, especially banks, with over 70 percent of commercial PC sales going to government-related customers. Individual sales are mainly driven by urban families interested in the Internet and the education of their children. Forecasts indicate that PC sales are expected to reach 10.5 million units by 2002. China claims that local companies are now developing top-level, high-capacity computers, and domestic market share in this sector is growing.

Software: Software sales in 1998 increased by over 30 percent, and the estimated annual market growth for 1999 is 20 percent. China is the largest emerging software market in the world. By 2000, demand is expected to be over 30 billion RMB ($5.4 billion). The domestic market share for software and information services is only about 20 percent. Chinese software enterprises are relatively small and lack product variety, increasing the demand for software produced by foreign companies.

Market Opportunities

Opportunities for Canadian companies mainly lie within the software sector and computer networking. The national information infrastructure development plan "Golden Projects" has caused growth in demand for application software by government organizations. Niche market opportunities for Canadian software companies lie in specialized application software targeting specific end-users such as GIS, including Radarsat data applications.

Constraints

Pressures on foreign companies to establish joint ventures and allow technology transfer are high in the computer and software sector. The underdeveloped software industry in China makes it difficult to identify the right distribution channels. Also, a 96 percent piracy rate in the software market leads to an annual loss of 10 billion RMB ($1.8 billion). Regulatory constraints and obscure government procedures and policies make it difficult for foreign companies to obtain certification for certain products or to receive licences for domestic distribution services. In most cases, Canadian software must be localized and tailored to meet the needs of the Chinese market.

Action Plan

Specific objectives of the action plan for this sector include:

- promoting Canadian capabilities and enhancing Canadian companies' presence in China in the software sector, and encouraging Chinese participation in Softworld, held each November in Canada;
- pursuing trade policy issues within and outside the framework of the discussions on China's accession to the WTO, to resolve current difficulties facing Canadian investment in the telecom services sector;
- working in partnership with Industry Canada to enhance Canada's position as a key source of Internet Protocol (IP) infrastructure and applications, including e-commerce solutions. This will be achieved through joint policy research with the MII, as well as through trade promotion activities;
- producing and updating market profiles on information technology subsectors, building on the existing list of recent reports on telecommunications, software, internet and e-commerce/network security; and
- providing regular market information on the information technology sector via the IT newsletter.

High-Tech Events

Softworld, held in November every year in Canada, promotes financial and other IT products to Hong Kong software companies. City location varies from year to year. Check http://www.softworld.org for details.

Techworld, held in March every year in Hong Kong, promotes venture capital investment in hi-tech projects in Hong Kong and Mainland China. Check http://www.hkitc.org.hk for details.

For a complete schedule of events, refer to the missions' Commercial Calendar at http://www.canada.org.hk

Hong Kong

Business Environment

In 1998 Canada exported approximately $250 million of Information and Communications Technologies (ICT) products to Hong Kong. A further $75 million was re-exported through Hong Kong to China. Most of Canada's major ICT firms have either regional headquarters or substantial marketing operations in Hong Kong.

In 1998, Canada signed an MOU on ICT co-operation with Hong Kong. The primary objective of the MOU is to promote and facilitate the formation of business and technology partnerships. Under the MOU, reciprocal ICT trade missions were organized in September 1998 and February-March 1999.

Telecommunications: Hong Kong has one of the most advanced telecommunications infrastructures in Asia. It is a regional communications hub and a gateway to Mainland China, the world's largest telecommunications market.