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MINISTRY OF COMMERCE OF THE PEOPLE'S REPUBLIC OF CHINA



Foreign Affairs and
International Trade Canada

Affaires étrangères et
Commerce international Canada

Canada-China Economic Complementarities Study

Economic Partnership Working Group

May 2012

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Executive Summary

Following the June 2010 meeting between Canadian Prime Minister Stephen Harper and Chinese President Hu Jintao in Canada, officials from both countries jointly undertook a study to provide an analytical basis to evaluate potential bilateral economic complementarities in a selected range of sectors. Economic complementarities are defined as the interests and requirements of one country that can be matched with a capacity to supply in the other country.

The study's completion helps to set the stage for the two countries to launch exploratory discussions on further deepening our trade and economic relations, as announced by the two leaders during Prime Minister Harper's most recent visit to China in February 2012.

Canada and China are strong trading nations. For both, external trade is integral to past and future economic growth. Today, China is Canada's second-largest trading partner,¹ while Canada ranks 13th among China's trading partners.² In addition to increasing two-way trade in goods, services and investment, people-to-people ties have never been stronger, with substantial annual increases in the number of visitors and students to each other's country. Extensive government-to-government cooperation is also reflected across a broad range of priority areas.

The study covers seven sectors—reflecting specific interests on one side or the other—in which growth opportunities appear to be strong. While not exhaustive in scope, the study provides a broad basis of analysis on bilateral economic complementarities. As with any comprehensive trading relationship, Canada-China trade and investment relations can be enhanced. The study therefore also examines barriers and challenges to growth in these sectors.

Key findings of the study are:

Agriculture and agri-food (including fish and seafood)

Canada and China are both significant producers and exporters of agriculture and agri-food products, with distinct supply and demand profiles. Growth opportunities extend well beyond two-way trade in goods and investment. Government and industry on both sides are increasingly cooperating on technical and scientific exchanges to assist China in addressing domestic challenges and to advance third-market opportunities for both countries. On the challenges side, trade barriers include tariffs, regulatory measures (e.g. sanitary and

¹ Goods only. According to Canadian statistics.

² Goods only. According to Chinese statistics, and includes the European Union (EU) and Association of Southeast Asian Nations (ASEAN) as a trading bloc.

phytosanitary measures) and delays in resolving market access issues arising from administrative capacity constraints.

Clean technology and environmental goods and services

The clean technology sector is an innovative and rapidly growing sector globally. The Canadian side is dominated by small and medium-sized enterprises (SMEs), which, despite their technological innovations and commercially viable solutions, often face challenges related to their relatively small size, such as access to capital and concerns regarding intellectual property rights protection. China has a keen interest in this sector, highlighting in its most recent Five Year Plan the role of clean technology in addressing growing domestic environmental challenges. In addition to bilateral trade in clean technology goods and services, Canadian and Chinese partnerships could help meet the increasing worldwide demand for cleantech solutions.

Machinery and equipment

Two-way trade in this sector has exhibited strong growth over the last decade. Canadian technology and know-how complements Chinese production needs and demand, especially in the area of agricultural and mining equipment as well as related services. Advancing cooperation in this sector would offer Canadian companies increased export opportunities. Concerns about intellectual property protection, standards and certification requirements, and remaining applied tariffs may be hindering growth in bilateral trade in this sector.

Natural resources and derived products

Canada and China have abundant natural resources and are leading global traders in this sector. China is facing supply-side pressures when it comes to certain commodities, making it difficult to meet the demands of its rapidly growing economy. Canada is well positioned as a reliable supplier to meet China's needs and to provide innovative solutions for the sustainable use and efficient management of China's natural resources. In Canada, China's growing interest in natural resources is adding to the diversity of investment sources available to develop capital-intensive Canadian natural resources projects. To take advantage of complementarities in this sector, further improvements could be made to the clarity, efficiency and predictability of inward investment-related regulations, the compatibility of certification systems and the expediency of approval processes on goods such as equipment.

Services

Services are an important and growing component of the Canadian and Chinese economies. They represent an essential source of growth in a competitive, knowledge-based world market. While the scope of services trade between the two countries is significant, there is potential for this relationship to grow even further. China's steady economic growth and projected infrastructure expansion will likely lead to strong demand for key services sectors in which Canada has leading expertise. China's services sector is growing rapidly, and Canada is able to export best practices that would be helpful to such a developing industry. Furthermore, the people-to-people connections that already exist between Canada and China will further facilitate bilateral trade in services.

Textiles and related products

Canadian textile and apparel manufacturers are increasingly focusing on high value-added products and depend on sales to export markets to remain viable. China has made significant advancements in the textile and apparel industries over recent years, becoming a world leader in some subsectors. China's current Five Year Plan highlights the importance of continued textile industry development. Canada and China have complementary capacities in textiles, each producing goods for different market segments. Specifically, Canada's strength in engineered textiles can be incorporated into China's value chains to serve both its domestic market and global markets, while Canadian branded and technical apparel product offerings can serve China's increasingly discerning customers. Similarly, China's wide variety of textiles and apparel can be used to meet Canadian demand in sectors where there are no longer Canadian manufacturers.

Transportation infrastructure and aerospace

These two sectors occupy a strategic place in the two countries' economies, not least because of the critical role they play in facilitating the movement of goods and people. Opportunities exist for Canada and China to collaborate on the development of safer systems for China's growing transportation infrastructure networks. Given their complementary expertise, Canada and China could also cooperate on infrastructure projects in third-country markets. Canada is a world leader in aerospace technology and research and development capacity. These strengths, combined with the Canadian industry's diversified manufacturing and internationally recognized regulations, are assets that can complement Chinese needs and goals to develop world-class aerospace products.

Conclusion

Since Prime Minister Stephen Harper and President Hu Jintao met in June 2010, the bilateral economic relationship has continued to gain momentum, with trade and investment expanding rapidly. Robust growth in bilateral merchandise trade was sustained throughout the recent global economic crisis. The stock of foreign direct investment into Canada from China reached approximately US\$10.7 billion at the end of 2011, representing a 36-fold increase in the last 10 years. Chinese statistics put the stock of Canadian foreign direct investment in China at approximately US\$8.3 billion in 2011.

Notwithstanding these impressive gains, bilateral trade and investment represent a surprisingly small proportion of each country's total international activity. There is room for much growth. This study provides a starting point for bilateral discussions on getting there.

2. Introduction

2.1 Overview

Canada and China have a long-standing and healthy bilateral relationship. The two countries have a shared interest in strengthening the bilateral economic relationship through increased two-way trade in goods and services, investment, and people-to-people and cultural exchanges. During Canadian Prime Minister Stephen Harper's first visit to China in 2009, the two governments issued a joint statement highlighting the strong trade and economic complementarities between the two countries. The leaders further agreed to enhance cooperation in order to increase bilateral trade and investment.

Since that visit, Chinese President Hu Jintao visited Canada in June 2010 and Prime Minister Stephen Harper returned to China for a second visit in February 2012. In between, over 30 ministerial-level bilateral visits took place, supporting closer ties in key trade and investment portfolios. The Canadian and Chinese economies have both been exceptionally resilient in the face of the recent global financial crisis. These strengths have prompted closer mutual attention to the benefits of deepening trade and investment ties between the two countries.

Canadian and Chinese officials collaborate regularly through a variety of bilateral trade and investment mechanisms, notably the annual Joint Economic and Trade Commission (JETC), which is a long-standing Deputy Minister/Vice Minister-level forum to discuss key Canadian and Chinese trade and investment issues. A more recent mechanism (2005), the Strategic Working Group, brings together Canada's Deputy Ministers of Foreign Affairs, International Trade and Natural Resources, and China's Vice Ministers of Foreign Affairs, Commerce and the National Development and Reform Commission, to discuss cross-cutting economic and political priorities. Both forums met in Ottawa in 2011.

In June 2010, Canadian Prime Minister Stephen Harper and Chinese President Hu Jintao instructed officials to explore means of deepening the Canada-China economic relations by establishing a working group under the JETC. Once established, the Economic Partnership Working Group launched a joint study to examine in greater depth bilateral trade and investment complementarities and potential.

2.2 Objectives and Structure of the Study

The economic complementarities study represents an important step toward strengthening Canada-China economic relations. By examining the current status of bilateral trade and investment relations in selected sectors, the study provides an analytical basis for discussions on how to deepen the relationship. The study analyzes seven sectors, examining the complementarities between various aspects of the Canadian and Chinese economies. The seven sectors included in this study are:

- agriculture and agri-food (including fish and seafood);
- clean technology and environmental goods and services;
- machinery and equipment;
- natural resources and derived products;
- services;
- textiles and related products; and
- transportation infrastructure and aerospace.

The first part of the study provides: (i) an overview of the structure and key characteristics of the Chinese and Canadian economies; (ii) a description of trade and economic cooperation; and (iii) a description and assessment of historical and recent patterns in bilateral trade and investment and likely future trends. The second part of the study analyzes the seven different sectors. Each sectoral analysis includes an overview of the sector in each country, a description of bilateral trade patterns, highlights of ongoing cooperation, a discussion of challenges, and a review of complementarities and opportunities for growth.

2.3 Methodology

2.3.1 BILATERAL TRADE AND INVESTMENT STATISTICS

Data that describe Canada-China trade and investment flows in this study are quoted in U.S. dollars, the most widely used currency for the settlement of international payments, to draw a comparative statistical analysis. National currencies have been converted using annual average exchange rates provided by domestic central banks over the relevant time period as described below:

TABLE 1: EXCHANGE RATES USED IN THE STUDY (AGAINST US DOLLAR)

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Canadian Dollar	1.548	1.570	1.401	1.301	1.211	1.134	1.074	1.066	1.141	1.029	0.989
Chinese RMB	8.277	8.277	8.277	8.276	8.193	7.972	7.605	6.947	6.830	6.769	6.463

Source: Bank of Canada and People's Bank of China

It is common to observe differences in the level of trade each country reports in the context of bilateral trade statistics. Canadian and Chinese statistics are no exception in this regard. A number of factors account for the observed differences, including the shipment of goods to the trading partner via third economies and differing customs valuation methods. For the purposes of this study, imports from each country will be used to characterize Canada-China bilateral trade wherever possible. In line with this methodology, the import statistics of each country will be summed up when identifying the value of two-way trade. As for stocks of foreign direct investment (FDI), inward investment data will be sourced from the destination country.

Unless otherwise noted, merchandise trade statistics have been sourced from the Global Trade Atlas and reference data submitted by Statistics Canada and the General Administration of Customs of China.

2.3.2 DOMESTIC STATISTICS

Values describing domestic sector features (i.e. output, sales) are quoted in the national currency of the country to which these statistics relate. These statistics are sourced from the leading national statistical agencies of each country.

3. Economic Overview

3.1 A Foundation for Deeper Economic Ties³

Canada and China are important trading partners and economic players in the Asia-Pacific region as well as in the global marketplace. China is the world's second-largest economy and most populous country, with 1.34 billion people. Canada is the world's 10th-largest economy, with a population of 34.5 million. With a combined gross domestic product (GDP) reaching US\$9.0 trillion in 2011, the economic weight and relevance of both countries in the global economy is indisputable. For a snapshot of the Canadian and Chinese economies, see Annex 1.

Canada and China are open and dynamic economies that depend on international trade and investment to stimulate growth. With trade-to-GDP ratios of 70.3% and 57.0% respectively, Canada and China view trade expansion as a key priority.⁴ The trade relationship between the two countries has grown significantly over the past decade, largely reflecting comparative economic strengths and an expanding investment relationship.

3.2 Canadian and Chinese Economies at a Glance

3.2.1 THE CANADIAN ECONOMY

Canada's economy has shown steady growth, expanding at an average rate of 1.8% annually over the last 10 years. During the recent global economic crisis, the Canadian economy was among the most resilient, fully recovering the output lost during the crisis by the third quarter of 2010. The International Monetary Fund forecasts that Canada will continue to be a leader among major industrial economies in terms of average growth in the coming years, due mainly to its strong financial system and institutions, low inflation, sound fiscal management, and investments in knowledge and infrastructure. While Canada continues to have a strong manufacturing base, representing 12.8% of real GDP, the share of services has risen steadily over the past decades, reaching 71.6% of real GDP in 2011. A distinctive feature of the Canadian economy lies in the importance of its primary sector, particularly in terms of its contribution to the country's total exports. Agriculture and agri-food, energy, forestry and mining account for over 50% of Canada's total exports.

³ Data in this section are sourced from Statistics Canada and the National Bureau of Statistics of China.

⁴ Ratio calculated over the 2001-2010 period.

3.2.2 THE CHINESE ECONOMY

Over the last decade, the expansion of China's economy has been particularly remarkable, at an average annual rate of 10.5% from 2001 to 2010. This growth has been fuelled in part by the strengthening of its manufacturing base and exports and has been accompanied by accelerated urbanization, rapid infrastructure development and rising per capita income levels. Going forward, China's economy will be driven increasingly by domestic consumption, which will be bolstered by supportive labour market conditions and other policy efforts to raise household disposable income. While manufacturing will remain the largest sector of the Chinese economy over the coming years, the country is committed to furthering the development of its services sector.

3.3 Canada-China Trade and Economic Cooperation

Canada and China have a long-standing and healthy bilateral relationship. The modern bilateral trade relationship began in the 1960s with sales of Canadian wheat to China. Following the establishment of diplomatic relations in 1970, the first step in formalizing economic and trade cooperation came with the signing of the 1973 Trade Agreement between the Government of the People's Republic of China and the Government of Canada. This agreement sought to enhance trade in goods by, among other things, granting each other most-favoured-nation treatment. In 1979, Canada added China to the list of countries eligible for its General Preferential Tariff, a unilateral tariff treatment that specifies lower than most-favoured-nation rates on a range of products in order to help promote developing country economic growth and export diversification.

With China's accession to the World Trade Organization (WTO) in 2001, the two countries' commitment to a strong multilateral trading system and to their respective rights and obligations under the WTO has represented a further enhancement in the institutional basis for the commercial relationship. As founding members of the Asia-Pacific Economic Cooperation (APEC) forum, Canada and China have endeavoured to improve the operating environment for business by reducing the cost of cross-border trade, improving access to trade information, and simplifying regulatory and administrative processes.

Canada and China cooperate extensively under a wide range of bilateral agreements and memorandums of understanding in the fields of science and technology, energy, forestry, cleantech, agricultural development, life sciences, maritime transport, and many more (see Annex 2). Furthermore, education is an active area of economic cooperation between the two countries. Education and skills transfers emerge across different sectors as an important complementarity. China is Canada's top source country for international students, with more

than 68,000 Chinese students already studying in Canadian institutions. During Prime Minister Stephen Harper's February 2012 visit to China, Canada and China agreed to elevate education as a new strategic priority and explore additional means to expand two-way academic mobility, aspiring to reach a combined goal of 100,000 students studying in each other's countries within five years.

Among the most noteworthy bilateral achievements in recent years was the conclusion of the substantive negotiations toward a Canada-China Foreign Investment Promotion and Protection Agreement (FIPA), which will facilitate investment flows between the two countries going forward. The FIPA, along with regular high-level contacts, an expanding range of official dialogues (both formal and informal), and healthy and diversifying trade and economic flows in both directions, has elevated the relationship to a strategic partnership of major importance to both countries.

3.4 Bilateral Trade and Investment Relationship

3.4.1 TWO-WAY MERCHANDISE TRADE

Over the last decade, the Canada-China commercial relationship has grown substantially, so that China is now Canada's second-largest trading partner, while Canada is China's 13th-largest trading partner.⁵ The rapid growth in bilateral merchandise trade was even sustained throughout the recent global economic crisis, as evidenced in the Canadian and Chinese statistics presented in Tables 2 and 3.

It is common to observe differences in the level of trade each country reports in the context of bilateral trade statistics. Canadian and Chinese statistics are no exception in that regard. A number of factors account for the observed differences, including the shipment of goods to the trading partner via third economies and differing customs valuation methods. In Tables 2 and 3, below, each country's statistics are presented separately, while in the remainder of this study, imports from each country will be used to characterize Canada-China bilateral trade, wherever possible. In line with this methodology, the import statistics of each country will be summed up when identifying levels of two-way trade.

⁵ According to Chinese statistics, includes the EU and ASEAN as a trading bloc.

TABLE 2: CANADA-CHINA MERCHANDISE TRADE (US\$ Billions)

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Canada Exports (China Imports)	2.7	2.6	3.4	5.2	6.0	6.9	8.9	9.9	9.7	12.9	17.0
Canada Imports (China Exports)	8.2	10.2	13.3	18.6	24.4	30.5	35.9	39.9	35.0	43.2	48.6
Total Trade	11.0	12.8	16.7	23.8	30.4	37.3	44.8	49.8	44.7	56.1	65.6

Source: Global Trade Atlas (Canadian statistics)

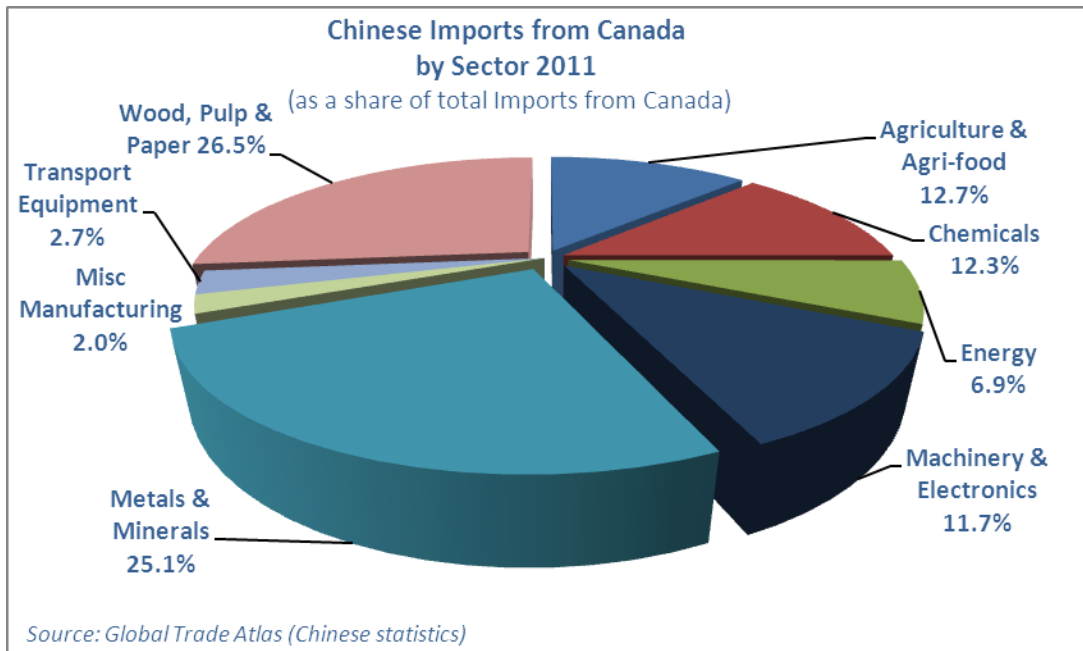
TABLE 3: CANADA-CHINA MERCHANDISE TRADE (US\$ Billions)

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
China Exports (Canada Imports)	3.3	4.3	5.6	8.2	11.7	15.5	19.4	21.8	17.7	22.2	25.2
China Imports (Canada Exports)	4.0	3.6	4.4	7.3	7.5	7.7	11.0	12.8	11.9	14.8	21.6
Total Trade	7.4	7.9	10.0	15.5	19.2	23.2	30.3	34.6	29.6	37.0	46.8

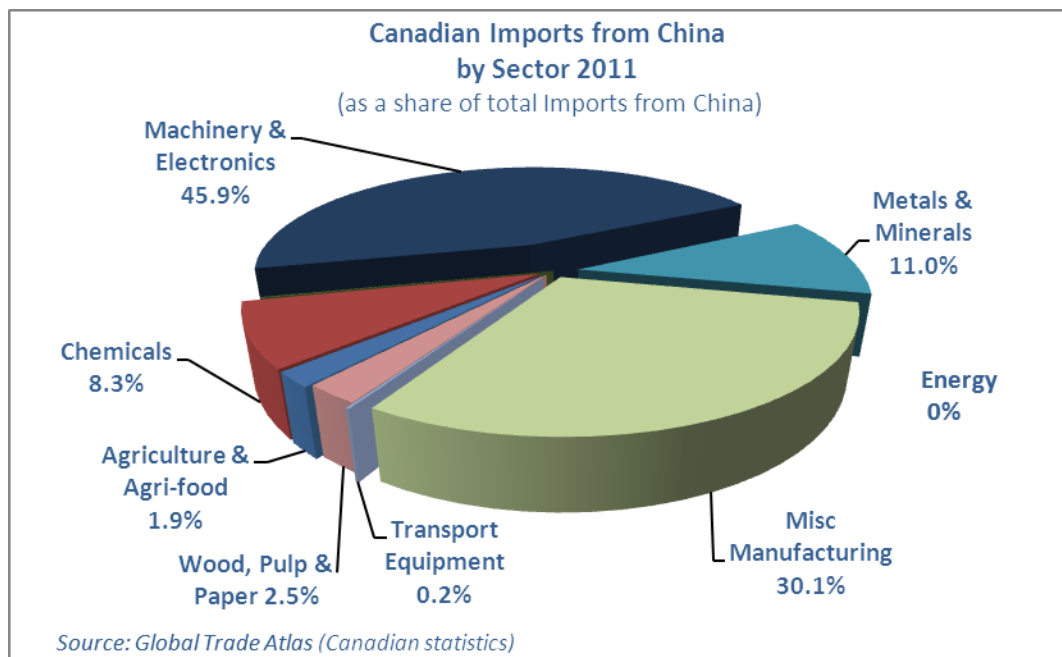
Source: Global Trade Atlas (Chinese statistics)

Despite recent growth trends, bilateral trade currently still represents a relatively small percentage of each country's total international trade. It is clear that there is huge untapped potential to increase trade between China and Canada.

In terms of merchandise trade, China is the third-largest importer of Canadian products, with imports of US\$21.6 billion in 2011. Resource-related goods such as wood products, pulp and paper, metals and minerals account for the majority of China's imports from Canada. China's agricultural imports from Canada are also substantial, particularly oilseeds, fish and seafood. While there have been upward trends in some sectors, notably in high value-added manufacturing exports such as machinery and equipment, aircraft and medical instruments, China's demand for resource-related goods remains the primary driver of trade even as Canada looks to broaden its product offerings to an increasingly diversified Chinese economy.



Canada's merchandise imports from China have grown very rapidly over the past decade to reach US\$48.6 billion in 2011. China has become the second-largest supplier of merchandise to Canada, after the United States. Canada's imports from China have been concentrated in consumer goods such as textiles and apparel, bags, footwear, toys and furniture. Growing product segments of Canada's imports from China include electronics, machinery and plastics.



3.4.2 TWO-WAY TRADE IN SERVICES

Services trade is an important element of the Canada-China relationship. All economic sectors contain significant services elements, and technological advances have expanded the range of services that can be traded across borders. Trade in services is also a key element of value chains, both within an economy and globally.

There is significant room for growth in services trade between Canada and China. Canada is one of the most open services economies in the world. China has committed to opening up 62.5% of its total service sector, covering 10 out of 12 service categories of the General Agreement on Trade in Services.

Trade in services is difficult to accurately quantify, as official statistics are not fully disaggregated by subsector and/or modes of supply. However, Canadian and Chinese data indicate that bilateral services trade has grown rapidly over the past decade. According to Canadian statistics, bilateral trade in services more than doubled in the last 10 years to reach US\$2.2 billion in 2009.⁶ Chinese statistics indicate that bilateral trade in services more than doubled in the last five years and was estimated at US\$5.4 billion in 2010.

Travel services are China's leading service imports from Canada, accounting for 33% of total imports of Canadian services in 2009.⁷ There is potential for further growth in this area since China's granting of Approved Destination Status (ADS) to Canada in 2010. Canada welcomed 248,887 travellers from China in 2011, injecting nearly C\$390 million into the Canadian economy. Industry experts have forecast that ADS could boost the yearly rate of travel to Canada from China by up to 50% by 2015. China also sources financial, engineering, communications and management services from Canada.

Even though China is running a deficit in services trade, it has expanded its share of the global services market. Canada's imports of Chinese services almost doubled over the 2004-2009 period. Transportation services represent half of Canada's services imports from China, with commercial and engineering services also showing strong growth. Travel services account for a third of Canada's imports of Chinese services. In 2010, Canadians made approximately 320,000 outbound trips to China.

⁶ Latest year of data available from Statistics Canada.

⁷ Only Canadian statistics were used for data on services trade by category, as Chinese statistics were unavailable.

3.4.3 TWO-WAY INVESTMENT

Investment is a key area of the economic relationship between Canada and China. The bilateral investment relationship started in the early 1980s and has been strengthening steadily ever since. While two-way investment has experienced rapid growth in recent years, it remains modest compared to the level of investment each country receives from the rest of the world. This suggests there remains great potential for expansion.

Chinese direct investment in Canada has recorded notable growth over the past decade. China represents an important source of capital that can complement other sources of funds for the development of infrastructure projects and new technologies. According to Canadian statistics, the stock of FDI into Canada from China reached approximately US\$10.7 billion at the end of 2011, representing a 36-fold increase in the last 10 years. Chinese firms are actively investing abroad and have expressed a strong interest in investing in Canada. Sectors of interest include primarily natural resources, but also renewable energy, information and communication technologies, food processing, pharmaceuticals and natural medicine, and advanced manufacturing. In 2010, Canada was the eighth most important destination for Chinese direct investment abroad. Chinese investment in Canada also supports China's industrial policy to climb the value chain, facilitating hands-on training in new technologies, ways of doing business and innovation partnerships. Canada is interested in seeking a greater percentage of Chinese investments in key sectors beyond natural resources.

According to Chinese statistics, over 12,110 direct investment projects made up the stock of Canadian FDI in China, which was valued at approximately US\$8.3 billion in 2011.⁸ Canadian investment in China covers a broad range of sectors, including transportation, biotechnology, education, finance, information technology, manufacturing and natural resources. As China's economic importance continues to grow, it will remain a priority market for Canada. The United Nations Conference on Trade and Development (UNCTAD) Inward FDI Potential Index consistently ranks China as having a high potential for future direct investment.

Both countries have adopted recent initiatives in an effort to further facilitate two-way investment flows. The most significant of these initiatives was the conclusion of substantive negotiations of the Canada-China FIPA in 2012. The FIPA will ensure greater protection to foreign investors against discriminatory and arbitrary practices and enhance the predictability of investment policy. The FIPA will preserve the right of both Canada and China to regulate in the public interest. In addition to the FIPA, the China Banking Regulatory Commission recently designated Canada as a destination for Chinese wealth management under China's Qualified

⁸ Statistics Canada estimates the stock of Canadian FDI in China to be valued at US\$4.4 billion.

Domestic Institutional Investor program, which allows approved institutional investors in China, including banks, to invest in Canadian funds pooled from Chinese clients. While not directly impacting FDI flows, this latest decision by Chinese authorities will have positive implications for portfolio investment flows from China to Canada. In contrast, the Chinese market remains largely closed to foreign portfolio investment, save for a relatively small quota (recently raised from US\$30 billion to US\$80 billion) allocated to qualified foreign institutional investors.

ROLE OF GLOBAL VALUE CHAINS IN THE CANADA-CHINA TRADE RELATIONSHIP

When business activities to create a product or service (i.e. manufacturing, design, marketing, sales) are fragmented and scattered internationally among different firms (or a single firm), a global value chain (GVC) exists. Supply chains are increasingly global and complex, as companies aspire to support a variety of strategies, such as entering new markets, increasing speed of delivery to customers, and lowering costs.

As supply chains become ever more fragmented, the services sector becomes a key enabler of transactions across a number of interlinked firms, both domestically and globally. Examples of the role of services in value chains are the design of products and equipment, the transportation of components and people, the training of personnel, financial services (credit required to make and receive payment; export financing; structured finance), accounting, auditing, taxes, management consulting, marketing, and support services.

The increase in GVC activities globally has created more country specialization and economies of scope and scale, fostered more trade and investment opportunities, expanded production capacity and generated greater efficiency gains. While multinational firms are considered the primary drivers of this trend, small and medium-sized enterprises are increasingly making use of global value chains to both source inputs and gain access to foreign markets.

The role of Canada and China in developing and participating in global value chains has been accelerating over the last decade. While a great deal of attention has been given to offshoring and outsourcing activities over this period, recent studies have shown that value chains are not a one-way outflow for Canadian firms.* The level of *inshoring* activities often balance out *offshoring* activities, a trend that supports a more circular movement of global business activities.

CANADA

When globalizing business processes, important drivers for Canadian firms include the ability to access new markets, inputs and skills. For instance, Canadian firms benefit from China's geographical proximity to East Asian markets, which source an array of inputs through China's export-focused value chains. Canadian services exports benefit from this trend as a number of services are needed to facilitate the multiple facets of the value chains. From 1992 to 2007, Chinese imports (from Canada) that are further processed for exports grew by close to 29% annually, more than double Canada's overall export growth to China.

Canadian goods are increasingly being sold indirectly via a foreign-located subsidiary of a Canadian company, with the product being brought to market or its ultimate end-user through the foreign country's value chains. This is becoming an important avenue by which Canadian firms engage in global commerce.

CHINA

China's influence on GVC activities is profound, and it has galvanized its integration into the global economy. In the past, China's economic integration in global production networks was largely driven by its comparative advantage in labour intensive goods. And while this dynamic continues, it is beginning to change as China develops trade relationships that move beyond low-cost sourcing for multinational enterprises. Companies tie their production networks in with China due to its geographic location and its tightly integrated supplier base.

Compared to other East Asian countries, China has an experienced supplier base (i.e. electronic industry size, number of component manufacturers and plants, size and skill of labour force), a proximity to Asian customers, modern facilities and infrastructure as well as a qualified services industry exemplified by its logistics capacity. Production networks centred in East Asia consider China's proximity to suppliers in the East Asian region to be a driving factor of their offshoring decisions. Conversely, production networks in the West deem China's vicinity to East Asian markets as a main determinant of their offshoring decision.

* D. Boileau and A. Sydor, "Global Value Chains in Canada," in Sydor (ed.), *Global Value Chains: Impacts and Implications*, (Ottawa: Foreign Affairs and International Trade Canada, 2011).

Section 4: Sector Analysis

a. Agriculture and Agri-Food (Including Fish and Seafood)

The agriculture and agri-food sector is defined as all industries whose primary role is to produce agricultural and food products. It encompasses both primary agriculture and food and beverage processors, including fish and seafood. In recent decades, Canada and China have built a strong agricultural trade relationship based on extensive complementarities. Nonetheless, great opportunities exist to deepen two-way agricultural and food trade and investment.

The Canadian Sector

The Canadian agriculture and agri-food sector is a modern, dynamic and constantly evolving part of the economy. In 2011, the output of primary agriculture and food and beverage producers accounted for 3.8% of Canada's GDP and employed more than 3% of the workforce. The sector is very diverse and is made up of competitive world-class enterprises operating at home and abroad. With about 45% of agricultural production destined for foreign markets, Canada is a net agriculture and food exporter and one of the world's largest exporters.

In 2011, total sales of the Canadian primary agriculture sector were valued at C\$46 billion, representing an average annual growth of 3.6% during the last decade. Over the same period, grain and oilseeds' share in total sales rose substantially to 35.6%, while the importance of red meats decreased to 22.9%. Dairy (12.7%), poultry and eggs (7.4%), fruits and vegetables (8.8%), special crops and other farm commodities accounted for the remainder of agricultural sales in 2011.

The Canadian food and beverage processing sector reached sales of C\$92.9 billion in 2011, 32% higher than 10 years ago. The largest food and beverage processing industry is meat (C\$24.3 billion), followed by dairy (C\$13.7 billion) and beverage (C\$9.2 billion). Grain and oilseed products (C\$8.5 billion) and processed meat experienced the largest expansion over 2001-2011, and the sale of seafood products rose considerably in the last two years to reach C\$4.3 billion in 2011. Some food and beverage processing industries are particularly trade-oriented: for instance, 57.3% of seafood processing shipments and 47.1% of grain and oilseed milling shipments were exported in 2010.

The Canadian agriculture and agri-food sector is characterized by innovation and invests in the latest technologies and production practices. This has helped the sector maintain its competitive edge and has increased its ability to meet evolving consumer demands (e.g. the production of safer, high-quality food with specific attributes, functional foods, innovative bio-products, and new non-food applications). For example, the widespread adoption of new

oilseed varieties, such as canola and soybeans, has led to substantial growth in production and area seeded, and has opened new export market opportunities.

As a global player, the Canadian agriculture and agri-food market will face a variety of challenges over the coming years. But these also present new opportunities. Increasing global competition from lower cost competitors, rising pressure on land and water resources, growing consumer expectations, and changes to market access dynamics, including the adoption of biotechnology, will demand continued competitiveness-enhancing innovation on the part of Canadian firms.

The Chinese Sector

As the world's largest agricultural economy, China is a leading importer and exporter of agricultural products and a consumer of a wide range of agricultural and agri-food products. The agricultural sector is a key part of the Chinese economy, accounting for 10.2% of GDP (RMB 4,050 billion or C\$616 billion) in 2010. During the same year, the output of the food and beverage industry represented 8.8% of total manufacturing production. Although its share is declining, agricultural production still employs 40% of China's workforce.

China's agricultural sector is transitioning from traditional, low-productivity agriculture toward a modern, industrialized production model. While small-scale production (240 million farming households) still dominates Chinese agriculture, accelerated industrialization and urbanization are challenging this model. It is now easier for farmers to sublease their small tracts of land, allowing for the consolidation necessary for larger-scale industrialization and farm management.

The priority placed on domestic food security has strongly influenced China's agriculture sector. Primary agriculture sector output has been increasing steadily in recent years, and the fisheries industry has shifted orientation from fishing to aquaculture. Going forward, crop cultivation will be adapted to meet evolving domestic demand. While the domestic supply of staple food grains, such as wheat and rice, meets China's current demand, the shift toward a higher-protein diet as a result of improving living standards has led to supply shortages of animal feed such as corn. China now imports over 70% of its soybeans; domestic production has decreased due to the competition of imported genetically modified soybeans for animal feed. Furthermore, other key agriculture inputs have not kept pace with the development of Chinese industry (e.g. cotton for textiles and sugar-bearing crops for food and beverages).

China is committed to developing its agricultural science and technology capacity and is vigorously promoting the adoption of new technologies. China has become one of the world's

fastest countries to adopt new technologies and innovation in agriculture. For example, Chinese farmers are increasingly purchasing their own agricultural machinery, contributing greatly to increased productivity. In the last 30 years, China has also cultivated as many as 1,500 new crop species and has improved primary crop yields through, for example, the successful cultivation of super rice and dwarf wheat.

Notwithstanding the significant modernization of China's agricultural production, the sector is facing challenges. Agricultural infrastructure has deteriorated with the rise in extreme weather conditions and remains vulnerable to natural disasters. Irrigation facilities remain limited and often lack effective management and proper maintenance. Urbanization has decreased the availability of quality arable land, while water loss, soil erosion, infertility, salinization, the overuse of fertilizers, and acidification have led to the loss of arable lands. Finally, ensuring the safety of agricultural products remains difficult due to the decentralization of the agricultural sector, extensive production, and low-technology solutions for preventing and controlling diseases and pests.

Bilateral Trade Patterns

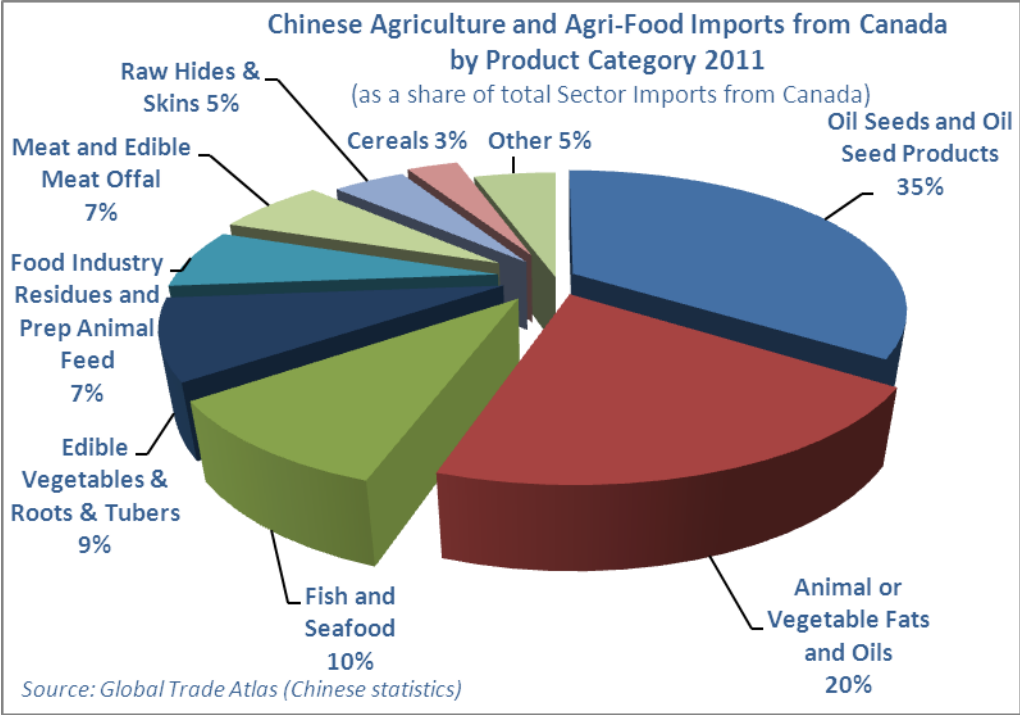
Canada and China are among the world's leading exporters and importers. Given its relatively small population and corresponding domestic consumption, along with its advantages in the production of agricultural commodities, Canada is naturally positioned to be a net exporter of agriculture and agri-food products. Canada currently ranks as the eighth-largest exporter of fish, seafood, and agricultural commodities and products worldwide, with total exports valued at US\$45.7 billion in 2011. In terms of products, Canada is a world top five exporter of wheat and canola and a large exporter of beef and pork.

China's agricultural trade has risen rapidly since its accession to the World Trade Organization in 2001, and the country has now become the third-largest destination for agricultural and agri-food products worldwide. In part due to rising domestic demand from a wealthier population, China has maintained an agricultural trade deficit with the world for the last eight years, which reached US\$34.4 billion in 2011. At the same time, China has overtaken Canada as the world's sixth-largest agriculture and agri-food exporter, with the main products including fruits and vegetables, poultry and fish products.

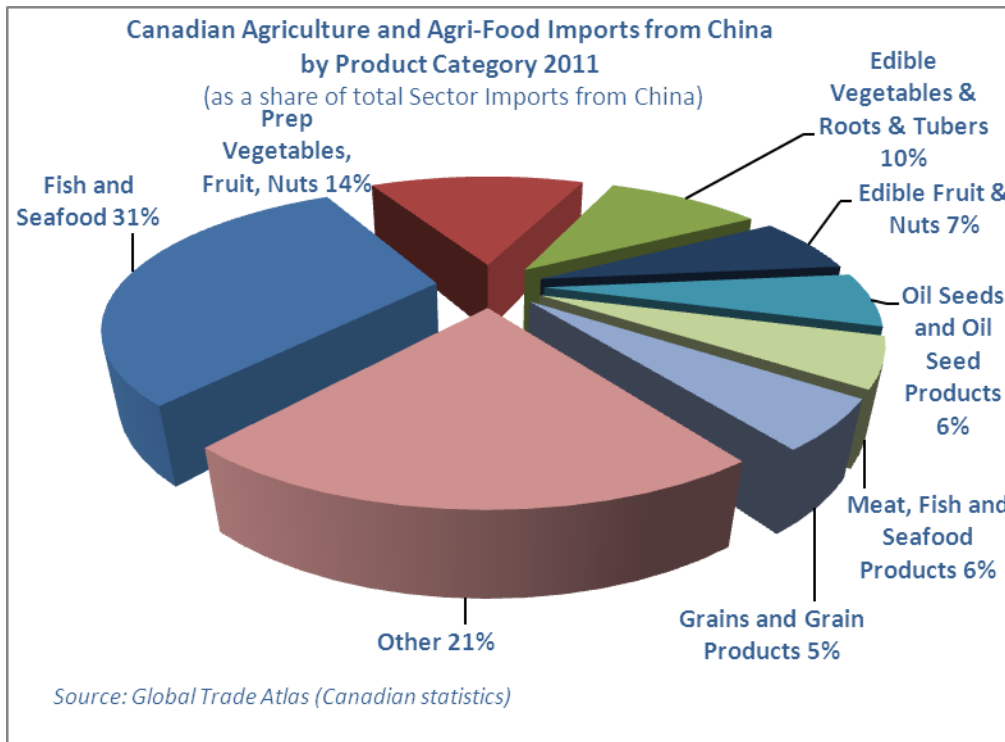
Total Canada-China agricultural trade has grown rapidly over the last decade, from US\$851.2 million in 2001 to US\$4.2 billion in 2011. However, bilateral trade represents only 2.7% of China's and 5.3% of Canada's trade in agriculture and agri-food products with the world. Given

the importance of agriculture and agri-food in both countries' trade, this suggests there remains room for further growth.

Canada is China's eighth-largest supplier of agricultural products, accounting for 3.3% of total Chinese imports in this sector. In 2011, Chinese agricultural imports from Canada reached US\$3.1 billion. These imports have been dominated by the grain and oilseed milling industry in recent years, particularly canola products. Meat, fish and seafood, and vegetables are other important agriculture products that China sources from Canada.



Canada's agriculture and agri-food imports from China stood at US\$1.1 billion in 2011, or 3.2% of Canada's total sector imports from the world. Fish and seafood products made up close to one third of total agricultural imports from China in value, while other major imports included vegetables, fruits and nuts, and processed fruit and vegetable products.



In terms of bilateral investment in the agriculture sector, a number of Canadian companies have invested in areas such as aquaculture research and development, viniculture, livestock genetics and processing (such as potatoes, seafood and oilseeds) in China. While Chinese outbound investment in agriculture is still at a preliminary stage, Chinese firms are investing in Canadian pork processing and grains and oilseeds processing. These investments have largely been made to secure a steady supply of important foodstuffs.

Ongoing Cooperation

Current bilateral cooperation in the agriculture and agri-food sector is strong and diverse. In addition to working together on issues of mutual interest in multilateral forums, such as the World Trade Organization and the Food and Agriculture Organization of the United Nations, Canada and China have developed a number of formal bilateral cooperation mechanisms. These far-reaching agreements cover a wide range of themes, from biotechnology and sustainable agriculture to food safety. Some key cooperative mechanisms have also been developed in the area of international development, with the Canadian International Development Agency having funded projects for technology adoption and training in the Chinese agriculture sector over the last 25 years. Chinese enterprises and farmers have welcomed these cooperation programs, as they have helped them adopt international production standards.

Scientific cooperation is also an important dimension of the bilateral cooperation relationship. Multiple joint research agreements have been reached between Canadian federal departments and agencies and China's central government, universities and regional governments. China has also forged ties with provincial governments in Canada, in particular the western provinces. Finally, several industry groups from both countries have developed meaningful partnerships and are cooperating on issues of mutual interest.

In addition to the bilateral dimension, Canada and China cooperate in the context of international research initiatives. Canada and China are founding members of the recently established Global Research Alliance on Agricultural Greenhouse Gases, whose goal is to increase international cooperation and investment in research and technology development aimed at reducing greenhouse gases and enhancing the productivity and resilience of farming systems. This forum could be an avenue for strengthening cooperation between Canada and China. Canada and China are also working together within the Group on Earth Observation (GEO) Agriculture Community of Practice in a global effort to harmonize national systems for agriculture monitoring and production forecasting in order to address food price volatility and increase agricultural production and productivity.

Bilateral Challenges

As with any strong broad-based trading relationship, agriculture and agri-food products exporters from both countries face barriers that limit their ability to seize opportunities in each other's market.

For example, both countries maintain tariffs on certain agricultural products. Since its World Trade Organization (WTO) accession, China's agricultural tariffs have been lowered to an average of 15.6%. Canada, an original WTO member, maintains average applied agricultural tariffs of 11.3%.

Stakeholders from both countries have also identified sanitary and phytosanitary measures as well as differing technical regulations and standards as other hindrances that delay or disrupt trade or make it less predictable. In particular, administrative capacity constraints that delay government certification of establishments for export or the completion of export protocols for new products create costly delays for exporters.

As Canada and China continue to strengthen their bilateral relationship and as challenges are successfully addressed, both countries will be better able to foster increased trade.

Complementarities and Opportunities for Growth

In coming years, China's growing population, increasing standard of living and changing consumption patterns will fuel a rise in demand for various agricultural and agri-food products, especially healthy and safe products. While China has attained self-sufficiency in a number of agricultural commodities, the increasing importance of imports highlights the growing gap between domestic production and consumption of certain commodities. Diversifying sources of imported agricultural products will help China secure a steady supply by avoiding the effects of possible supply shortage due to export constraints from countries on which China is highly dependent. As a globally recognized safe, reliable and affordable supplier of fish, seafood, and agricultural commodities and products, and the eighth-largest exporter worldwide, Canada is well positioned to meet China's future agricultural needs in some areas both for human and animal consumption, thereby helping to mitigate food supply and demand pressures. For example, Canada is the world's largest supplier of canola products and is able to respond to China's edible oil and animal feed needs in part. Canada is also able to partly meet the demands of increasingly sophisticated Chinese consumers seeking higher-end protein sources such as beef, pork, and fish and seafood products as well as functional foods. Growth in intermodal trade and expanded air service agreements provide new options and backhaul opportunities for expanding trade in these goods.

Canada's market also offers opportunities to Chinese exporters of agriculture and agri-food products. China is increasing production of commodities and products in areas where exports to Canada and the world are growing, including aquaculture and horticulture such as fresh temperate-climate fruits. Similarly, it is expected that imports of processed products from China will increase due to more competitive processing conditions. For example, Chinese fruit mixtures are increasingly making their way into the Canadian market. Canadian imports from China in this sector more than doubled over the past five years and there is room for further growth in the coming years.

Beyond trade in agricultural products, opportunities exist to build on existing robust collaboration in scientific research. Enhanced scientific collaboration between Canada and China may yield new solutions to food production, safety and sustainability challenges that will benefit both countries' agriculture and agri-food sectors.

In terms of agricultural technology, Canada has developed world-class expertise in areas that correspond to some of the domestic challenges facing China as it furthers modernization. Canada's considerable expertise in agricultural water management, in particular irrigation and drainage management and technology, and in the development of low-till and no-till agronomic

practices, can provide solutions for China to address the deterioration and loss of arable lands and to improve the development and management of its irrigation infrastructure.

Canada has also long been a leader in animal husbandry, plant breeding and crop selection and has experienced high rates of return from research and development in both its crop and livestock sectors. Joint partnerships and investments with China could foster innovations that more accurately reflect the needs and demands of consumers in both countries. In addition to new export opportunities, such collaboration would also support China's long-term goal to improve agriculture science and technology and to enhance skills in rural areas. In particular, China is looking to develop human capital in biological breeding innovation and in prevention and control of plant and animal diseases to increase productivity of its agricultural sector.

b. Clean Technology and Environmental Goods and Services

For the purposes of this study, the clean technology and environmental goods and services (“cleantech” hereafter) sector is defined as two broad areas and their subsectors: (1) renewable energy and energy efficiency (bioenergy, hydroelectricity generation, hydrogen and fuel cells, smart grid apparatus, solar, wind, marine energy, and energy efficient buildings and communities); and (2) environmental degradation mitigation (management of water and wastewater, sustainable urban planning, air pollution control and greenhouse gas mitigation and adaptation, waste management and soil remediation).

Recognizing the domestic and global challenges relating to the environment and our shared interest in addressing them, Canada and China have been collaborating through a number of joint initiatives.

The Canadian Sector

The cleantech sector comprises numerous subsectors and represents some of Canada’s leading technological advances, developed through decades of research and development (R&D) and innovation. Reflecting global environmental concerns, stronger regulations to mitigate environmental impacts, and evolving consumer demands, Canada’s cleantech firms have developed state-of-the-art commercial solutions in renewable energy and efficiency and environmental degradation mitigation solutions.

The Canadian cleantech industry is characterized by a high degree of integration of goods and services activities, with many firms combining both elements in their solutions. The sector also has a number of vertically integrated companies that undertake innovation through to commercialization. That said, small and medium-sized enterprises (SMEs) account for 93% of the 10,000 firms active in cleantech industries and employ a substantial share of the 680,000 employees in this sector.⁹ Their expertise helps explain why Canadian cleantech companies with proprietary technologies are nine times more likely to export than the average Canadian SME¹⁰ and are increasingly taking advantage of global value chains to access foreign markets, increase productivity and mitigate risk. Industry revenues grew at an average rate of 19% per year from 2008 to 2010, to reach C\$35 billion.¹¹

⁹ Due to definitional issues, it is difficult to paint a complete portrait of the cleantech sector. As an example, in economic data, it is difficult to distinguish between regular water infrastructure projects and those that use, in part or in whole, cleantech solutions. Employment figures from ECO Canada.

¹⁰ According to a 2011 Canadian Clean Technology Industry Report prepared by Analytica Advisors.

¹¹ Ibid.

Due to the preponderance of SMEs in this sector, the cleantech sector does not benefit from the economies of scale that would facilitate the commercialization of the solutions proposed. While these Canadian firms are inherently innovative and many hold proprietary technologies, their size sometimes proves to be an impediment to accessing the funding required for the commercialization of their novel technologies.

The Chinese Sector

Since the beginning of its 11th Five Year Plan (2006-2010), China has vigorously promoted energy and resource conservation, emission reductions and the development of a resource saving and environment-friendly society. This emphasis has catalyzed the rapid expansion of China's environmental protection industry, whose output reached an estimated RMB 1 trillion (C\$152 billion) in 2010. Of this, environmental degradation mitigation solutions equipment represented RMB 200 billion (C\$30.4 billion) in output, and the revenue of the environmental services industry accounted for RMB 150 billion (C\$22.8 billion). The industry consists of over 12,000 environmental services enterprises, research institutes and organizations, concentrated mainly in the coastal provinces and in the more economically developed areas along the Yangtze River and in the central region.

China's renewable energy and efficiency industry is increasingly technologically advanced. China is now the world's largest solar photovoltaic producer and the second-largest wind-energy user (after Germany). China is steadily increasing its engineering capacity in hydropower dam construction and has advanced its domestic hydroelectricity generation component manufacturing. The environmental degradation mitigation industry continues to expand in terms of both technological refinement and product variety. China has been able to independently design and construct large-scale urban sewage treatment plants, waste incineration power plants and large-scale thermal power plant flue gas desulphurization facilities. The environmental services sector has gone from offering mere technical services to the capacity to deliver a comprehensive range of services, including decision making, management, investment and financing, general contracting and operations. Expansion has been notable in the urban sewage and garbage disposal subsectors. Environmental services occupy a growing share of the environmental protection industry, rising from 6% in 2004 to about 15% in 2010.

China's clean energy resources such as hydro, solar and wind power are located mainly in the west, far from China's most technologically developed, energy-intensive industrial centres. The

government is trying to address this situation by promoting the development of such industries in these regions. Shortages of technical staff and a lack of funds add to this challenge. The development of the cleantech sector would be further enhanced by investments in proprietary technology.

Bilateral Trade Patterns

The Canadian cleantech industry is very export focused. Approximately 81% of firms are exporters and 53% of revenues come from exports. Canada exported US\$3.0 billion in architectural and engineering services globally in 2010, and a number of these projects involve cleantech or are supportive of elements of cleantech projects.

According to a definition used by the World Bank,¹² which represents an indicative subset of cleantech products, China's import of cleantech goods from Canada has grown nearly threefold in the last 10 years, from US\$19.9 million in 2001 to US\$63.1 million in 2011. Notable increases include imports of gear boxes to be used in wind generators and electrical control parts for smart grid apparatus (respectively a 251% and 158% increase since 2009).

With regard to Canada's imports of cleantech goods from China, the value of trade has grown at a faster rate than the rate of growth of our bilateral trading relationship. In 2001, Canada imported US\$51 million of cleantech goods, compared to US\$1,009 million in 2011. Imports of solar photovoltaic cells have been particularly pronounced in recent years, rising from US\$44.7 million in 2009 to reach US\$385 million in 2011.

Ongoing Cooperation

In recent years, Canada and China have worked cooperatively on multiple initiatives to advance mutually beneficial environmental protection goals. These mechanisms cover a wide range of cleantech sectors, including, among others, energy efficiency, pollution control, clean transportation, wastewater treatment and marine energy. Cooperation, at various levels of governments, higher education institutions, research bodies and companies, has taken the form of science and technology partnerships, demonstration projects and other initiatives designed to match Canadian capacity to Chinese environmental protection needs (see Annex 2 for a list of major bilateral mechanisms). Such arrangements are essential for harnessing our mutual strengths and help spearhead the commercialization of technologies and provide an

¹² Source: World Bank, *International Trade and Climate Change*, 2008.

avenue for the market application of leading cleantech projects still in the developmental stages.

Bilateral Challenges

Despite the growing cleantech market opportunities in China and known Canadian solutions, the number of Canadian companies operating in the Chinese market remains modest. This can be partly attributed to the fact that some challenges can be particularly difficult in an SME-dominated sector. For example, due to their size, SMEs are less likely to be able to offer the complete solution Chinese customers are seeking, especially on a scale commensurate with Chinese needs. Doing business in China requires investment in relationship building, which can limit the ability of resource-constrained SMEs to acquire the necessary knowledge of Chinese policies and market conditions to successfully promote their technologies. At the same time, Chinese customers may not be familiar with Canadian cleantech strengths. In addition, companies whose business is built on the development of niche technologies are reluctant to enter a market if they have concerns related to intellectual property protection. The Canada-China Joint Working Group on Environmental Protection and Energy Conservation under the Joint Economic and Trade Commission can be used to address some of these challenges.

Complementarities and Opportunities for Growth

Every major economy is competing for a portion of the global cleantech market. Some estimates anticipate that the global market will reach more than US\$3 trillion by 2020.¹³ The global cleantech market is growing at an annual rate of 4.5% in developed countries and over 10% in a number of emerging economies.

This trend is promising for Canadian firms with a track record for capitalizing on market opportunities. There are significant opportunities for Canadian cleantech companies involved in municipal and industrial wastewater treatment technologies, solid waste treatment, bioenergy, air and water monitoring equipment, and renewable energy and energy efficiency, including green building solutions. In addition to these commercially ready solutions, Canada has been investing in commercial-scale demonstration projects, notably in carbon capture and storage and in marine energy. These are areas where accelerated Canada-China cooperation would confer mutual environmental benefits and provide a platform for the commercialization of these innovative solutions in global markets.

¹³ Source: Roland Berger Strategy Consultants, commissioned by World Wildlife Fund, *Clean Economy, Living Planet—Building Strong Clean Energy Technology Industries*, 2009, page 8.

China's rapid economic growth has led to a dependence on fossil fuels such as coal and oil and to heightened environmental concerns. The Chinese government has established that by 2020, carbon dioxide emissions per unit of GDP should be reduced by 40% to 45% compared to 2005 levels. China's 12th Five Year Plan will bring significant opportunities in the clean energy industry, notably through the development planning of seven strategic emerging industries,¹⁴ including renewable energy, energy conservation/protection and renewable energy vehicles.

China's 12th Five Year Plan and other government strategies also specify targets in the following subsectors: solar, wind, bioenergy, hydroelectricity generation, hydrogen and fuel cells, smart grid construction, management of water and wastewater, energy efficient buildings and air pollution control. To stimulate the creation and installation of innovative solutions in these subsectors, plans were created to establish 100 clean energy cities, 200 clean energy counties, 1,000 clean energy demonstration zones, and 10,000 solar energy demonstration towns. In addition, Chinese companies are actively seeking partners to develop cleantech solutions, and the government is encouraging cooperation with countries that can offer such solutions.

Out of this need, Canada offers numerous commercially ready solutions to assist China in reaching its goal of reducing the environmental impact of its economic growth and its shift toward an urbanized society. There are a number of potential complementarities that exist where Canadian firms can partner with a Chinese company to integrate Canadian capacity and know-how with Chinese capabilities in manufacturing and adapting products to Chinese specificities. For example, in the vehicle manufacturing and transportation industries alone, Canada provides leading solutions in vehicle emission reduction, powertrain technologies and intelligent transportation systems that enhance traffic flow and reduce urban congestion. In instances like these, cleantech SMEs are suppliers of inputs that feed into the supply chains of original-equipment manufacturers with operations around the globe.

Hence, Canada's cleantech SMEs can prove to be complementary partners to serve not only Canadian and Chinese demand, but also the increasing demand for cleantech in third countries. Further complementarities exist where Canada and China could work together in identifying opportunities for technology incubators and venture capital exchange to promote cooperation in the area of cleantech, especially in areas in which SMEs are having issues with funding.

¹⁴ China's Seven Strategic Industries in the 12th Five Year Plan are energy conservation/environmental protection, renewable energy, renewable energy vehicles, next-generation informatics, biotech, high-end equipment manufacturing, and new materials.

c. Machinery and Equipment

Machinery and equipment are essential inputs in the production processes of most parts of the Canadian and Chinese economies. Accordingly this is a very diverse sector, with products ranging from general purpose machinery (e.g. pumps and valves) to mining equipment (e.g. rock drills). The sector in both countries is highly fragmented and dominated by small and medium-sized enterprises (SMEs) that rely on innovation to succeed in an increasingly competitive global market. Technology adoption underpinned by high levels of R&D investment is key to the integration of these firms into global value chain activities. Further bilateral cooperation in product development, including R&D, could allow both countries to share value chain strengths, which, in turn, could help facilitate more trade between the two countries.

The Canadian Sector

Canada is a large producer of machinery and equipment, with more than 7,600 machinery manufacturing establishments contributing close to C\$14 billion to Canada's GDP in 2011. More than half of all enterprises have fewer than 10 employees, and 94% have fewer than 100 employees, with the majority recording annual sales under \$100 million.¹⁵ A key reason is that many machinery products are specialized and serve only niche markets, where the industry is less capital intensive than the manufacturing industry as a whole. Hence, the barriers to entry are lower. The larger enterprises, though, are more common in the segments that make more technologically advanced and expensive products, such as those used in agriculture, construction and mining.

Canadian machinery firms have developed a range of capabilities integral to other important sectors of the Canadian economy, such as aerospace, agriculture, automotive, cleantech and natural resources. To better position themselves within the value chains of these sectors, Canadian firms have built strong industrial clusters specialized in one or more of the following fields: metal/plastic moulding machinery; general purpose machinery (e.g. pumps, valves, compressors); environmental systems (e.g. heating, ventilation, refrigeration, air conditioning, water treatment); mining, oil and gas machinery; construction equipment; and agricultural machinery. In 2010, approximately 80% of Canadian machinery manufacturing establishments operated within those subsectors, with close to 50% of establishments specializing in the production of metal/plastic moulding and general purpose machinery.

The Canadian machinery and equipment sector is characterized by its strong R&D focus. In 2010, R&D spending in the machinery manufacturing sector amounted to C\$520 million, the fourth-

¹⁵ The Conference Board of Canada, *Canada's Machinery Manufacturing Industry Profile*, Spring 2011.

largest sector in terms of manufacturing R&D spending after the communications equipment, aerospace and pharmaceutical sectors. Regarding product development, 43% of large machinery firms and 48% of small machinery firms focused on introducing new or significantly improved goods or services regularly as a strategic commercial objective of their enterprise.¹⁶

The Canadian machinery manufacturing sector is also highly export-oriented. Canada is a world-class supplier of a range of machinery and equipment, including precision welding and computer simulations for the agricultural sector, highly specialized mining equipment and mould injection machinery. Nonetheless, as firms in the Canadian sector operate in a highly competitive global market, they must rely on continued innovation and increased specialization, through customization or the development of niche markets, as a source of competitive advantage.

The Chinese Sector

China's machinery manufacturing sector has experienced rapid development over the last decade. Growth in machinery production and sales has been fuelled in part by the rise in investment activity across a number of areas of the Chinese economy. In 2010, China's machinery manufacturing sector contributed RMB 14.4 trillion (C\$2.2 trillion) to the Chinese economy, accounting for close to 36% of GDP. China's machinery manufacturing sector is highly fragmented with over 105,000 establishments, many of which are SMEs. Within the sector, oil drilling equipment, general machinery, agricultural equipment, and excavation/shovelling equipment experienced the strongest growth in 2010. In addition to being important suppliers to the domestic market, Chinese manufacturers are major players in the world market for low- and medium-technology machinery. The combined industrial output of the machinery sector in Guangdong, Jiangsu and Shanghai accounted for over 30% of the national total, and exports from these three areas accounted for over half of the sector's national exports.

China's machinery manufacturing sector is active in the development of new products, with production of new products reaching RMB 2.7 trillion (C\$410.7 billion) in 2010. A number of sectors—including engineering machinery, petrochemical machinery, power devices, basic machinery components, and food packaging machinery—showed increased product development growth in recent years. During the 12th Five Year Plan period (2011-2015), the Chinese machinery industry will focus on strengthening its current position in the segment of the industry, while also developing higher value-added products through innovation and the integration of new information technologies and green technologies.

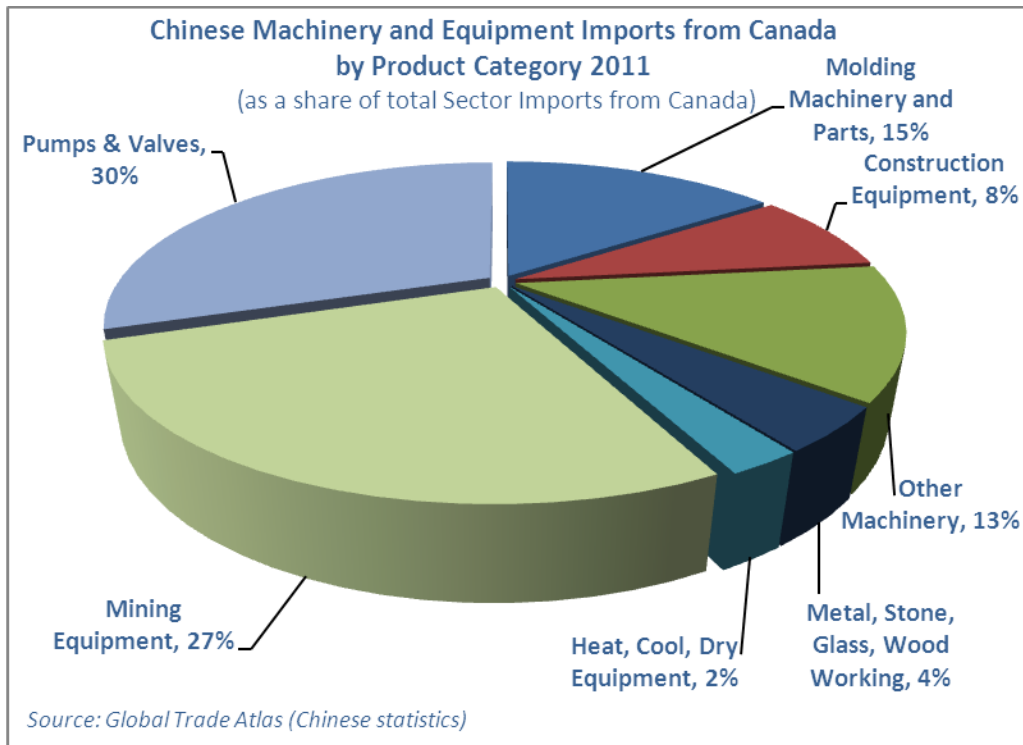
¹⁶ Statistics Canada, *Survey of Innovation and Business Strategy, 2009*.

While China has become a significant player in the global production and sale of industrial machinery, it still faces challenges that affect its overall competitiveness. Although this sector has exhibited strong growth during the last decade, most Chinese machinery products are in the lower end of the industrial chain where Chinese firms do not hold patent technologies. A considerable proportion of the technology used in the machinery industry originates from other countries; accordingly, China must rely to some extent on imported key components that are integrated during the production process. The bulk of China's trade surplus in the machine manufacturing industry originates from processing trade (processing and assembling for re-export), where the trade surplus was US\$49.5 billion in 2010.¹⁷

Bilateral Trade Patterns

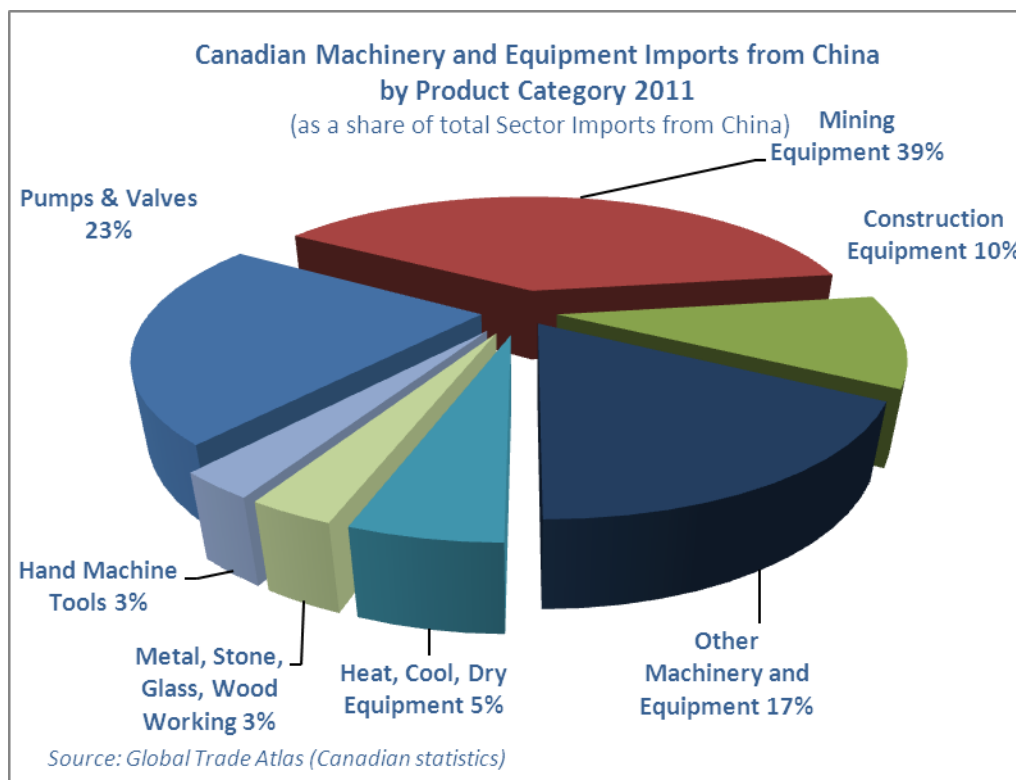
Globally, Canada is a net importer of machinery and equipment, although its domestic sector is highly export-oriented and export sales accounted for 71% of production in 2010. On the other hand, China is a net exporter of industrial machinery, as increases in domestic capacity have led manufacturers to increasingly pursue opportunities abroad. Exports of industrial machinery represent an important share of total exports for both Canada (4%) and China (6%). Bilateral trade in machinery manufacturing has grown considerably over the last decade, averaging an annual growth rate of 25%. With the exception of a minor dip during the global recession, the growth in two-way trade has remained constant, reaching US\$4.7 billion in 2011.

¹⁷ Processing trade refers to the business activity of enterprises importing all or part of the raw and auxiliary materials, parts, components, and packaging materials, and re-exporting the finished products after processing or assembly.



In 2011, China’s imports of machinery and equipment from Canada stood at US\$697 million, of which 89% originated from three product groups: pumps and valves, mining equipment, and plastic and rubber moulding machinery. The product groups generating the highest level of trade with China reflect Canada’s core competitive strengths, as evidenced by the presence of industrial clusters with numerous firms specializing in the development of machinery and equipment in the areas of mining, general purpose and moulding machinery. Over the past decade, China’s imports of these products grew on average by 23% annually. During this same period, China’s imports of food processing equipment and agricultural equipment also experienced rapid growth.

Canada’s machinery and equipment imports from China are concentrated in mining equipment, pumps and valves, and construction equipment, which together accounted for over 88% of Canada’s US\$3.1 billion in total imports of machinery equipment from China in 2011. Import growth in these three product groups averaged 25% annually over the last 10 years, but power generating machinery registered the strongest growth, with imports increasing, on average, by 37% annually over the period.



Canadian direct investment in the Chinese manufacturing sector has been growing, although data remain limited on the breadth of this investment. According to a survey of Canadian businesses, China was identified as one of the top three locations to invest by almost half of the large machinery manufacturers with international business activities and by more than a quarter of SMEs. For its part, Canada has been attracting foreign investment in the machinery manufacturing sector due to its skilled labour force, proximity to major markets, R&D incentives, and long-term plan to boost productivity via a competitive tax and tariff system, including the elimination of tariffs on machinery and equipment and manufacturing inputs. Chinese investors have begun to show greater interest, as 48% of Chinese companies with investment plans in Canada see economic opportunities in the manufacturing sector.¹⁸

Ongoing Cooperation

Canada and China's collaboration in the machinery equipment sector has largely focused on promotional events for trade and investment, led primarily by industry. In recent years, bilateral cooperation has increased in the area of R&D with projects sponsored by the China-Canada Joint Committee on Science and Technology, which was established in 2007. The Joint Committee's mandate focuses on many sectors, including agriculture, energy, cleantech, and

¹⁸ Asia Pacific Foundation of Canada, *China Goes Global 2011*.

health care. Bilateral R&D cooperation related to the healthcare machinery and equipment industry has been active, and potential for collaboration exists in agricultural mechanization. The Chinese Academy of Agricultural Mechanization Sciences actively participates in the Joint Committee meetings and facilitates collaboration in the agricultural sector. Beyond cooperation through the Joint Committee, a letter of intent between Agriculture and Agri-Food Canada and the Chinese Academy of Agricultural Mechanization Sciences was signed to facilitate science and technology cooperation in advanced processing technology for agri-food products. The letter recognizes, among other things, the potential cooperation in the fields of products development technology, food processing industry innovation, and processing engineering technology as well as student training and expert exchanges.

Bilateral Challenges

The bilateral relationship in the machinery manufacturing sector is faced with certain challenges. The sector is highly fragmented and competitive, and certain impediments to trade and investment prevent Canada and China from successfully deepening trade and investment ties.

Recent measures have been taken by both countries to improve market access to their respective economies. In 2009 and 2010, Canada eliminated all remaining tariffs on imported machinery and equipment and industrial inputs. For its part, China chose to exempt components or parts critical to the production of agricultural machinery (listed in the Catalogue of State-Supported Technical Equipment) from import tariffs and value-added tax. Reducing or eliminating remaining applied tariffs could further grow trade in this sector.

The protection of intellectual property rights (IPR) is essential in establishing an environment conducive to trade and cooperation. This is particularly important for machinery manufacturing, a sector in which businesses take on large R&D investments in order to remain competitive. Any real or perceived threat to the benefits of R&D investment serves as a trade deterrent, with smaller firms often having limited resources to pursue proper recourse to address IPR infringements. In addition, differences in standards and certification requirements, amongst others, act as a non-tariff barrier. As these challenges are addressed, two-way trade and investment could be substantially enhanced in the sector.

Complementarities and Opportunities for Growth

Bilateral trade in machinery manufacturing has been growing steadily over the last decade, but has yet to reach its full potential as commercial opportunities remain to be seized by both countries. Canada and China are both looking to increase their market share in all sectors, but complementarities are especially apparent in agricultural and mining equipment. Key value chain strengths of Canadian manufacturers include R&D in advanced materials, machinery and safety design, hybrid technologies, intelligent system design, and plant design. In addition, Canada offers product development strengths in forging and extrusion manufacturing. Chinese goods will continue to access Canada's machinery and equipment market in areas where it has a competitive advantage.

Canada's competitive strengths are well positioned to meet China's industrial policy priorities. Among the seven strategic emerging industries identified in China's 12th Five Year Plan, high-end equipment manufacturing and new energy vehicles figure prominently. Developments in machinery and equipment will also significantly impact China's other five strategic emerging industries (i.e. new-generation technology, advanced materials, environmental protection, alternative energy, and biotechnology) as advancement in these sectors will be underpinned by machinery and equipment, which will boost development and demand for these products.

China is currently in a mid-to-late stage of industrialization. Its fixed assets investment will continue to maintain rapid growth, and market demands will remain strong. According to the 12th Five Year Plan, machinery equipment will maintain a steady and healthy development: the industrial output value, industrial added value and core business income are projected to maintain an average annual growth rate of approximately 12% until 2015. As for high-end equipment, the growth rate should more than double to 24% over the 12th Five Year Plan period. The following products will be in high demand: parts in high-end equipment manufacturing (e.g. high-end hydraulic components, high-performance bearings, and cutting tools); internal combustion engines; engineering machinery; numerically controlled machine tool and its functional units; large-scale agricultural machinery as well as many high and new technologies (e.g. smart technology and new materials moulding technology).

Given China's growing mechanization in the agricultural sector and the Chinese government's renewed focus on safety and environmental pollution in many sectors, including mining, China's domestic suppliers do not have the inventory or the right product mix to meet domestic demand. Canada's reputation for cutting-edge technology and unique capabilities in safety standards, including training and environmental sustainability, are a match for Chinese interests. The challenge will be for Canadian SMEs to penetrate a market largely serviced by domestic

firms. Recent growth trends in Canadian exports are encouraging, but bilateral cooperation in the sector is limited. Increased cooperation in this sector would go a long way in bolstering trade flows and addressing trade barriers.

Services tied to industrial machinery offer high growth potential and profit margins beyond simply selling machines or their parts. Canadian machinery manufacturers have in-depth expertise in offering customized services in their home market and are looking to expand and customize their service offerings to international markets, such as China. It is estimated that China has the highest growth potential for service business in the Asia-Pacific region. Likewise, services will play a crucial role for Chinese manufacturers, especially as they enter Western markets, where after-sale services (training, maintenance, spare part supply, etc.) are essential for long-term customer relations.

Given its skilled workforce, the Canadian machinery and equipment industry is attracting international investment. Canada boasts the highest proportion of engineers in the G-8, proximity to major customers across North America, and R&D tax credits. The *China Goes Global 2011* report showed that manufacturing, particularly in the machinery equipment sector, remains a predominant focus for Chinese SMEs looking to invest overseas. While most Chinese SME overseas investments remain concentrated in Asia (41%), North America (27%) is increasingly perceived as offering a favourable climate in which to invest.

China's manufacturing sector is expected to continue to attract large numbers of investors in coming years. For Canadian investors, China's value proposition for its manufacturing sector is changing. China's rapid ascent up the economic ladder has created a focus on higher technologies, new industries, and other corporate functions. Canadian manufacturers are focused on serving China's growing market, including through further collaboration on product development.

d. Natural Resources and Derived Products

The natural resources and derived products sector as defined in this study focuses on the energy, forest and mining sectors. The energy sector comprises oil and gas extraction and related activities, transportation and distribution, and end uses of these resources, such as petroleum and coal products manufacturing. The forest sector encompasses forestry, logging and supporting activities, and the use of forest resources in wood product, pulp, and paper manufacturing. The mining sector includes mining activities, such as exploration and extraction of metals and minerals, as well as early stages of processing, including non-metallic mineral, primary metal and fabricated metal manufacturing.

Over the past decade, Canada and China have experienced a marked expansion of trade and investment in natural resources and related services. As a result of complementary interests, exports and imports of natural resources commodities and derived products now dominate Canada-China bilateral trade.

The Canadian Sector

Canada's well-established and globally competitive natural resources sector is highly innovative, with globally recognized expertise in areas such as enhanced oil recovery, geosciences, mining equipment and services, green mining, deep exploration and forest certification systems. Canada is also one of the world's largest producers of commodities, such as potash, uranium, oil, natural gas, nickel, aluminum, diamonds, lumber and wood pulp. The natural resources sector is an integral part of Canada's economy and accounted for 11.6% of GDP in 2011. In addition, the energy, mining and forest sectors were the largest positive contributors to Canada's trade balance, accounting for 35.5% of total trade in 2011.

The Canadian **energy** sector includes some of the world's leading publicly listed companies and represents the single largest recipient of the country's private capital investment. With a vast and diverse energy resource base, Canada is well positioned to grow its status as a politically stable, competitive and reliable energy supplier to the world. It is the second-largest global producer and exporter of uranium and one of the few members of the Organisation for Economic Co-operation and Development with growing oil production. Canada currently controls 12% of the world's established oil reserves (175 billion barrels) and exports close to 70% of its 2.9 million barrels of daily crude oil production. With established natural gas reserves representing 20% of the total North American supply, Canada ranks as the fourth-largest exporter worldwide.

Canada is home to 10% of the world's **forests** and ranks as the world's leading exporter of softwood lumber, newsprint and wood pulp. While these products will continue to play a large role going forward, the Canadian forest sector has been reinventing itself through transformative technologies, diversifying market opportunities, and improving its competitiveness. The sector is developing new and innovative products, including specialty pulps, cross laminated timber, bio-chemicals and improved use of by-products. As a leader in the field of sustainable forest management, Canada has developed a globally recognized forest certification system. To date, over 151 million hectares of Canada's forests have been certified according to the three globally recognized sustainable forest management certification programs in use in Canada. As a result, Canada now boasts 42% of the world's certified forest area.

The Canadian **mining** sector's global competitiveness is based on extensive science and technology networks, broad expertise in geosciences and all aspects of the mining cycle (from exploration to mining rehabilitation), and sophisticated financial and legal institutions. Canada ranks among the world's leading producers of key metals and minerals, including nickel, aluminum, diamonds, zinc, cobalt, gold, copper and silver, and is the world's single largest potash producer. In addition, proven coal reserves are equal to over 100 years of current production. The structure of Canada's minerals and metals sector is highly varied, ranging from small junior mineral exploration companies (not producing mines or revenues) to large world-class senior mining companies with mines and processing facilities in multiple countries. In 2010, Canadian exploration companies were responsible for some 39% of worldwide exploration.

The continued development of Canada's natural resources potential in terms of energy and mining will require massive investments over the coming decades. For example, upstream oil and gas development is projected to drive investments of C\$1.1 trillion over the next 25 years. The medium-term outlook for natural gas is for prices to remain low in North America, with supply currently at record levels. However, growing demand in Asian markets is driving prices up to four or five times those of the Canadian wholesale market. While Canada has an opportunity to diversify markets to Asia, including China, the current lack of infrastructure limits Canada's ability to seize these commercial opportunities. Infrastructure development would also increase the attractiveness of investment in Canadian natural resources. On the forestry side, the global forest sector is faced with increased competition from countries with large-scale natural and high-growth plantation forests. The Canadian sector has made significant efforts to consolidate and cut costs to maintain its competitiveness, and has been successful in attracting foreign capital investments.

The Chinese Sector

The Chinese natural resources sector is based on large and diverse domestic capacities: China is the world's largest coal producer and boasts world-leading reserves of several minerals and metals. The Chinese forest sector has developed rapidly to become one of the world's leading producers and exporters of forest products. Going forward, the development of China's natural resources sector will emphasize energy efficiency, environmental protection and the development of diversified energy sources.

As the world's largest coal producer and consumer, China is a major player in international **energy** markets. In terms of domestic energy resources, 98% of proven oil reserves in China are located in the north, close to 68% of coal reserves are located in the west, and two thirds of the relatively limited natural gas reserves are found in Sichuan province. China's total energy production has grown at an average annual rate of 8.2% over the past decade to reach 3.0 billion tonnes of coal equivalent (TCE) in 2010. Coal accounted for 76.5% of total energy production, followed by oil (9.8%) and natural gas (4.3%). In 2010, total industrial output of the oil and gas extraction industry was valued at RMB 991.7 billion (C\$150.8 billion), while coal mining industry output reached RMB 2.2 trillion (C\$334.6 billion). Despite China's growing production, the gap between energy production and consumption more than tripled in the last decade to reach 280.2 million TCE in 2010. China is largely self-sufficient in coal as an energy source, but relies in part on imported oil and natural gas to meet domestic demand. In 2009, the electric power, steel, building materials and chemical industries accounted for over 80% of coal consumption.

During the 11th Five Year Plan (2006-2010), China's **forest** sector experienced strong development in both domestic production and international trade. Total output value of the forest sector increased from only RMB 840 billion (C\$124.2 billion) in 2005 to an impressive RMB 2.8 trillion (C\$428.7 billion) in 2011. China now ranks as the world's second-largest importer and exporter of forest products and tops worldwide production of artificial board, wood bamboo and rattan furniture, and wood flooring. The Chinese government has established a forestry development strategy to foster the forest sector's sustainable development and has initiated key forestry projects that have helped grow China's forest area and forest reserves. According to the results of the Seventh National Forest Resources Census, the national forest coverage rate reached 20.4% and China's forest quality and functionality have been further improved. In addition to having large natural forest reserves, China leads the world in terms of forest plantations with 61.7 million hectares.

China's southern provinces are particularly rich in minerals and metals, with reserves of tungsten, tin, antimony, zinc, mercury and lead ranking first or second globally. Moreover,

rising **mining** exploration investments are leading to new discoveries and the mining of large metal and mineral deposits, including coal, iron ore, phosphorus ore, copper, zinc and lead. For example, China discovered 41 large deposits and 70 medium-size deposits in 2009, which can be directly developed and explored by mining enterprises. The gross industrial output value of these deposits is estimated in the trillions of RMB, with potential profits ranging in the hundreds of billions RMB. Building on its abundant reserves, China has developed a world-class metals and minerals manufacturing sector. In 2010, China's output of major non-ferrous metal products all ranked in the world's top five and accounted for a significant share of global production: copper concentrate (7.2% of global production), refined copper (23.8%), alumina (35.2%), electrolytic aluminum (39.8%) and refined nickel (25.6%).

China's continued rapid economic growth and the corresponding expansion of its manufacturing sector have led to supply shortages of energy, mineral and forest resources. Domestic oil supply, for example, is especially constrained and China increasingly relies on imports and other sources of energy to meet its needs. Although per capita energy consumption is low, the total national energy consumption level is very high. Moreover, China's energy efficiency is low by international standards and energy consumption is excessively dependent on coal. The use of large coal resources not only leads to low energy efficiency, but also causes severe environmental problems. Coal shipments from the resource-rich west to the industrial southern and eastern coasts are increasingly constrained by the domestic transport infrastructure, fuelling demand for imported coal.

Bilateral Trade Patterns

Canada and China have abundant natural resources and are world-leading exporters and importers of products and commodities. Canada's total natural resources trade was valued at US\$325.5 billion in 2011. As a world-class producer of natural resources, Canada maintains a large trade surplus and currently ranks as the world's third-largest exporter. The sector dominates Canada's trade with the world. For example, exports of energy (US\$105.3 billion), forest products (US\$26.7 billion), and metals and minerals (US\$83.4 billion) represented 47.6% of Canada's total exports in 2011. Top Canadian exports include crude oil, lumber, wood pulp, gold, nickel, aluminum, iron and steel, and copper.

China's total trade in natural resources has expanded at an average annual rate of 25.6% over the past decade to reach US\$798.4 billion in 2011. China is now the fifth-largest exporter and second-largest importer of natural resources products worldwide. Rapid economic growth and industrialization have fuelled China's demand for natural resources and have contributed to an increasing trade deficit with the world. In 2011, China's natural resources imports stood at

US\$597.9 billion and the trade deficit reached US\$397.4 billion. In terms of products, oil and gas, iron ore, copper, coal, wood pulp, logs and lumber accounted for over 80% of imported natural resources products, while China is a large exporter of iron and steel, aluminum, paper, plywood and other laminated wood products.

Over the past decade, Canada-China natural resources trade has grown at an annual average of 29.1%, a rate that surpassed each country's resources trade growth with the rest of the world. In 2011, bilateral natural resources trade reached an all-time high of US\$15.9 billion and represented 22.7% of total Canada-China merchandise trade. Nonetheless, Canada-China trade in natural resources still makes up only 4.3% of Canada's and 1.9% of China's global natural resources trade.

Canada is China's 16th-largest supplier of natural resources. In 2011, Chinese imports from Canada stood at US\$12.0 billion, or 2.0% of China's total sector imports from the world. Within natural resources, Canada's importance as a supplier to China varies considerably. Canada supplied less than 2% of China's total metals and minerals imports. Nonetheless, these represented half (US\$6.1 billion) of China's natural resources imports from Canada, with the main products including iron ore, nickel, sulphur, coal and copper. At a record high of US\$5.5 billion in 2011, forest products accounted for another 45.4% of total Chinese natural resources imports from Canada, led by wood pulp and softwood lumber. Canada is now the second-largest supplier of forest products to China. While Canada's energy resources, technologies and expertise are a source of competitive advantage and a basis for developing new Asian markets, the very limited value of Chinese imports from Canada (US\$508.4 million in 2011) is consistent with Canada's lack of pipeline infrastructure to transport energy to the Canadian west coast for overseas shipment.

China is the fifth-largest source of Canadian imports of natural resources, with a value of US\$3.9 billion in 2011, or 3.5% of Canada's sector imports from the world. Metals and minerals accounted for more than three quarters of the sector's imports from China (US\$3.0 billion), while forest products (US\$892.1 million) made up another 23.0%. China was Canada's second-largest supplier of forest products and its third-largest supplier of metals and minerals. Within these categories, imports were concentrated in iron and steel and related products, aluminum, magnesium, fibreboard and other wood products.

In terms of the Canada-China investment relationship in the natural resources sector, there has been significant expansion over the past decade. The majority of direct Chinese investment in Canada during that period focused on Canadian energy and mining projects, such as in oil sands,

natural gas and iron ore. Notable Canadian direct investments were also made in China's natural resources, such as in the mining exploration and pulp and paper sectors.

Ongoing Cooperation

Canada-China cooperation in the natural resources sector is extensive and operates at many levels. The two countries work together to address trade-related mutual interests relating to the sector in the context of multilateral forums, including the World Trade Organization and the Asia-Pacific Economic Cooperation forum, and to discuss environmental goals as per the United Nations Framework Convention on Climate Change.

At the bilateral level, Canada and China maintain a wide range of cooperation mechanisms to foster ongoing dialogue on natural resources. The primary vehicle for bilateral dialogue in the field of energy is the Canada-China Joint Working Group on Energy Cooperation. This forum was created in 2001 and is co-chaired by the Assistant Deputy Minister of Canada's Department of Natural Resources and the Vice Minister of China's National Energy Administration. In addition, a number of bilateral arrangements have been established over the last two decades as a means to enhance cooperation in targeted areas, including energy, metals and mineral resources, wood frame construction, clean energy, earth sciences and climate change, sustainable development of natural resources, science and technology, and nuclear energy. Similar cooperation has also been established at the provincial level and between research institutions of both countries.

Further, during Prime Minister Stephen Harper's second visit to China in February 2012, the two countries' leaders committed to stepping up cooperation in the areas of energy and other natural resources including oil and gas, nuclear energy, renewable energy, forest products and minerals. During the visit, the two countries announced bilateral agreements on Canadian exports of uranium, on science and technology in the area of sustainable development, and on matters related to protected areas.

Bilateral Challenges

Although the Canada-China trade and investment relationship in the natural resources sector has strengthened considerably over the past decades, certain obstacles limit the ability of both countries to reap the benefits of bilateral trade and investment.

Canadian and Chinese stakeholders have highlighted the need for increased regulatory clarity, efficiency and predictability in the context of direct investments in each other's countries. In

addition, differences in technical and phytosanitary certification requirements and lengthy approval processes on goods such as equipment and forest products have a negative impact on the competitiveness of both sides' exporters.

Resolution of these obstacles will be essential to improving market access and facilitating two-way trade and investment in the natural resources sector.

Complementarities and Opportunities for Growth

The complementary nature of Canadian and Chinese capabilities and interests in the natural resources and derived products sector points to significant opportunities for mutually beneficial growth in terms of trade and investment. There is also room for increased joint development of and cooperation in research and technologies.

Over the last 30 years, China's rapid economic development and industrialization have generated a sustained growth in its demand for natural resources and fostered the development of the domestic natural resources sector. Yet the growth in supply of energy, forest, and mineral and metal resources has lagged behind rapidly expanding consumption. As a result, China is now the second-largest importer of natural resources worldwide and the world's largest energy consumer. Moreover, China currently accounts for over 40% of global demand for copper, aluminum and iron ore. In the coming years, China's continued economic expansion will exacerbate the supply shortages in certain commodities and products and increase the country's reliance on imports.

Given its abundant and diversified reserves of natural resources and its relatively small domestic market, Canada has positioned itself as one of the world's leading exporters and is able to meet China's growing need for energy, mining and forest products. With Canada's national approach to Trade Gateways, integrated strategies have been adopted to improve the efficiency, reliability and performance of supply chains that transport these goods. At the same time, China has developed a globally competitive and export-oriented natural resources sector and has become an important source of Canadian imports in areas of complementary strength.

While China is relatively self-sufficient in coal production, the country is looking to diversify its **energy** mix to decrease reliance on low efficiency and highly polluting energy sources. With a vast energy resource endowment and growing oil production, Canada can strengthen its position as a reliable, politically stable and competitive energy supplier to China. For example, Canada's oil exports to China are currently limited due to infrastructure constraints, but the potential construction of pipelines to the Canadian west coast would open up the Chinese

market for Canadian oil and natural gas producers. In addition, the recently concluded negotiations in the field of nuclear energy cooperation will facilitate Canadian exports of uranium to China as the country continues to expand its nuclear energy capacities. China currently has 15 nuclear reactors in operation, and capacity is set to increase more than sixfold by the end of 2020.

In the **forest** products sector, Canada is one of the largest suppliers to China's fast-growing market for products such as lumber and wood pulp. New opportunities are also developing for Canadian-certified higher value-added wood products, as China is increasingly promoting the construction of earthquake-resistant structures using low carbon footprint and energy efficient materials. Canada is keen to broaden future collaboration with China to build safe and energy efficient structures utilizing Canada wood frame construction systems. The Canadian forest products sector can also meet China's demand for innovative non-traditional products and new by-products. For example, the growing Canadian production of dissolving pulp is providing an affordable alternative to cotton to feed China's rapidly growing textiles and apparel sector. Canada also benefits from consumption and use of products sourced from China's world-scale and globally competitive forest sector. For example, China is now the world's largest producer and a supplier to Canada of bamboo, rattan and related products. In addition, given the global nature and diversity of forest products markets, Canada and China will continue to trade in similar subsectors both bilaterally and with the world, while focusing on different market segments.

As for **metals and minerals**, continued growth in China's manufacturing sector and the increasing living standards of its population will fuel demand for Canadian products including diamonds, gold, metallurgical coal, aluminum, iron ore, potash fertilizer and nickel. On the other hand, the Chinese metals and minerals sector will continue to supply Canada with such products as aluminum products, iron and steel products, and certain base metals.

The multifaceted complementarities between Canada and China in natural resources extend well beyond traditional trade in commodities and products. Investment opportunities exist for both countries and the recently concluded substantive negotiations toward a Canada-China Foreign Investment Promotion and Protection Agreement will provide increased protection and predictability for Canadian and Chinese investors alike. Over the coming decades, massive investments will be required to further develop Canada's natural resources potential. China's growing investment interest in Canada's natural resources is adding to the diversity of domestic and foreign funding sources available to finance Canadian natural resources projects. Chinese investors are seeking solid investments that will lead to direct or indirect access to resources and to opportunities to benefit from the technology, operations and management expertise of

Canadian firms. Chinese investments in the natural resources sector have increased in recent years and there is potential for further growth. This is consistent with overall bilateral investment patterns, which, while increasing, still represent a relatively small share of the investment each country receives from the world. For example, China accounted for 1.8% of total foreign direct investment in Canada in 2011. Concurrently, opportunities for Canadian investment in China's natural resources also exist. For example, Canada's junior mining exploration industry has no equivalent in China and can contribute significantly to the development of the country's resource base, as well as to identification of development opportunities in third countries.

In terms of natural resources related technologies, the Canadian sector has developed a wide array of world-renowned expertise that can complement China's move toward more sustainable development of its natural resources. In the energy sector, Canada's experience in building reliable pipelines over long distances offers cooperation opportunities to expand China's oil and gas transportation infrastructure. In the mining sector, enhanced cooperation in green mining, deep exploration, mining technology and other areas in which Canada has extensive experience can assist China's mining industry in improving extraction rates and recovery ratios while developing land restoration and reclamation capabilities. There is also substantial potential for future cooperation in forest product technologies and practices, as China looks to develop modern forestry practices as well as improve forest protection and conservation in responding to climate change challenges.

e. Services

Usually defined as all non-goods producing economic activities, services are an important and growing component of both developed and developing countries' economies and represent an essential source of growth in competitive, knowledge-based economies. Services include a wide variety of activities that are economic drivers in their own right as well as inputs to the production of many goods. Although services were once considered largely outside the scope of international trade, technological advances have expanded the range of services that can be traded across borders. As the range of services is large, this section focuses on three important sectors: financial services, engineering services, and information and communication technologies (ICT).

The Canadian Sector

Services are significantly represented in every region of Canada and make up the largest component of the Canadian economy. Services producers generated more than two thirds of Canada's 2011 industry-based GDP. Financial services and computer and related services account for the highest number of jobs in the services sector. Engineering employs over 100,000 Canadians, and other sectors, such as environmental services and transportation services, have seen their job numbers grow consistently over the last decade.

Canada is a major global trader of services, with exports of C\$74.8 billion and imports of C\$99.5 billion in 2011. The services regime in Canada is relatively open to foreign participation compared to many countries, with few barriers to entry maintained. Canada's overall balance of trade in services is negative, and the United States remains Canada's largest trading partner for services by a large margin. Certain services in Canada, such as social services, education and health services, are for the most part publicly provided.

The majority of Canada's services exporters are small and medium-sized enterprises (SMEs); 74% of exporting firms in Canada employ fewer than 50 people. In addition, some of Canada's largest and most internationally active firms are services exporters, particularly in the financial services, engineering, architecture, mining and environmental services sectors. In Canada, while certain services are regulated at the federal level (e.g. financial, telecommunications and certain transport services), the majority are regulated at the provincial level. For instance, most professional services, such as engineering services, are regulated at the provincial level and are often organized into self-regulating, independent professional bodies.

Canada's financial services sector is characterized by considerable integration, with conglomerates offering a variety of financial products that cut across the core activities of the

four traditional pillars (banks, trust companies, insurers and securities dealers). This integration is particularly prevalent in the banking and life and health insurance sectors, where companies have established specialized subsidiaries to provide many different financial service products. Canada's financial sector contributed approximately C\$84.6 billion to the Canadian economy in 2011 and employed approximately 680,000 people. In terms of trade, insurance is the most significant financial services subsector.

Canada has a reputation for high-quality engineering services and is the world's third-largest exporter of engineering services. Canadian firms have garnered special recognition in resource extraction, energy, telecommunications, transportation and infrastructure engineering. SMEs account for the larger share of operating revenues for the sector. Canadian engineering firms' key strengths include a highly skilled and educated workforce and extensive practical experience in a wide variety of industries and project types. Overall, engineering consulting in Canada is a C\$21.8 billion per year industry.

The Canadian software industry develops and publishes packaged software, while the computer services subsector provides data processing, computer systems design, and other related information technology services. The ICT manufacturing subsector designs and manufactures computers and peripherals, communications equipment, audio and video equipment, electronic components, instruments, and various other types of ICT equipment. Canada is home to more than 28,000 ICT manufacturing, software and computer services firms reporting C\$66 billion in revenues in 2010 and employing nearly 373,000 workers. The ICT sector's reliance on global supply chains makes the separation of manufacturing and services difficult, and therefore they are treated together in this study.

The Chinese Sector

With the rapid growth of the national economy, China's industrial structure has experienced rapid development, including in the services sector. However, the services sector has not been growing at the same rate as the manufacturing sector. The services sector's share of GDP in China is lower than that of most developed countries, including the United States and Japan, as well as that of other emerging markets like Brazil and India. Traditional services subsectors in China, such as transportation, postal services, wholesale and retail trade, remain more developed and account for the largest share of services in the Chinese economy. Modern services, such as logistics, ICT services and financial services, are still at a relatively low level of development. As a means of economic diversification, China has emphasized its intent to develop its services economy. According to its 12th Five Year Plan, China aims to bring the service sector value-added output up to 47% of GDP, an increase of four percentage points.

Beyond the goals set out in the 12th Five Year Plan, China maintains policy goals at all levels of government to support the development of services. These include:

- building a fair and transparent market access standard;
- breaking sectoral fragmentation, regional blockades and industrial monopolies;
- expanding new segments of the service industry;
- attracting capital into the service industry;
- developing service enterprises with diversified forms of ownership; and
- establishing a unified, open, competitive and orderly services market.

These reforms will encounter challenges and resistance, and cannot be achieved overnight, but the Chinese government is firmly committed to their full implementation.

By the end of 2011, there were 3,800 financial institutions in China's banking industry, with total assets of RMB 110 trillion (C\$16.8 trillion), employing 3.2 million people. In 2011, commercial banks yielded a net profit of over RMB 1 trillion (C\$153.1 billion). The average return on assets was 1.3%, and the average return on capital was 20.4%. In recent years, China's insurance industry has developed rapidly. Although still at an early stage of development, the insurance industry has great potential. In 2011, income generated by insurance premiums amounted to RMB 1.4 trillion (C\$214.3 billion), while total assets of insurance companies reached RMB 5.9 trillion (C\$903.3 billion).

As of the end of 2011, China's overseas contracted engineering services totalled US\$539 billion, with an accumulative contract value of US\$841.7 billion. In 2011, China's engineering services overseas operations generated US\$103.4 billion.

By revenue, China's software industry accounted for more than 15% of the global software industry in 2011. During the 12th Five Year Plan period, the planning objectives of China's software industry are to develop a number of internationally competitive enterprises; to support a number of innovative SMEs; to create a number of well-known software products and services brands; and to develop over 10 software companies with an annual income of more than RMB 10 billion (C\$1.5 billion) and three to five software companies with an annual income of more than RMB 100 billion (C\$15.3 billion) by 2015.

Bilateral Trade Patterns

From 2006 to 2009, total trade in services between China and Canada fluctuated due to the global financial crisis, but generally maintained a rapid growth momentum. Bilateral trade in

services is mainly concentrated in transportation services, tourism, insurance services and consulting services.

In 2009, China was Canada's seventh-largest services export market, with exports of C\$1.1 billion. Principal exports included travel services (C\$569 million), transportation and government services (C\$323 million) and commercial services (e.g. architectural services, engineering services and financial services, totalling C\$249 million). That same year, China was Canada's 11th-largest source of imports of services, with imports reaching C\$1.4 billion. The most significant imports were in transportation and government services (C\$696 million) and travel (C\$455 million). Commercial services imports in 2009 reached C\$244 million.

In 2011, 219 Canadian enterprises established themselves in China's service industry (including banking, insurance and securities), up by 1.9% over 2010, with foreign investment capital of US\$157 million, up by 2.5% over 2009.

Ongoing Cooperation

Canada and China have not specifically addressed services in bilateral cooperation mechanisms, but there have been memorandums of understanding (MOUs) that provide a platform to cooperate and promote Canadian expertise, technologies and services in various areas, such as engineering and financial services. For example, the MOU signed in 2004 by the China Banking Regulatory Commission and the Canadian Office of the Superintendent of Financial Institutions created a framework for bilateral cooperation, which facilitates bilateral cross-border regulatory cooperation and information exchange. Many Canadian universities also provide business training for Chinese executives, including some programs that offer work programs with Canadian financial institutions. Additionally, Canadian and Chinese financial sector regulatory officials meet roughly every 18 months as part of Canada-China Financial Sector Policy Dialogues to discuss cooperation on regulatory issues.

Services are also integral to initiatives resulting from other types of bilateral agreements between Canada and China, such as the Canada-China Science and Technology Agreement. A number of Canadian scientific and technological enterprises have established close cooperative relations with Chinese counterparts. For example, at the Fifth China-Canada Trade and Economic Cooperation Forum in February 2012, a Chinese telecommunications equipment manufacturer signed a cooperation agreement with Canadian telecommunications companies to provide network equipment. A Canadian company signed an MOU with a Chinese telecommunications operator to develop a mobile network education market in China.

As members of the World Trade Organization, Canada and China have expressed strong support for, and worked to strengthen, the multilateral trade system. Canada and China are also members of the Asia-Pacific Economic Cooperation (APEC) forum, an organization that promotes sustainable economic growth in the Asia-Pacific region. Recognizing the importance of services within its members' economies, APEC has created a Services Action Plan that aims to provide a coherent strategy and work program in order to develop open and efficient services markets amongst APEC members.

Bilateral Challenges

Even though Canada and China currently enjoy a significant services trade relationship, challenges exist for both countries on several services issues, including facilitating the cross-border trade of services and commercial presence for services suppliers. Some impediments to trade include restrictions on market access, limitations on operating wholly foreign-owned services companies, minimum capital requirements, transparency and various regulatory requirements at different levels of government. Such challenges currently prevent the bilateral commercial relationship from reaching its full potential in this sector.

Complementarities and Opportunities for Growth

Services are an important and growing component of both Canada's and China's economies. They represent an essential source of growth in a competitive, knowledge-based world market. While the scope of services trade between the two countries is significant, there is undeniable potential for this relationship to grow even further. Canada has leading expertise in key services sectors such as financial services, engineering and ICT, as well as architectural, environmental and energy-related services. This expertise will likely be in strong demand in China over the coming years given China's steady economic growth and need to expand its infrastructure (buildings, transportation, telecommunications, wastewater treatment, etc.).

There are additional complementarities stemming from the fact that China's services sector is undergoing rapid growth, and Canada's services sector is able to export best practices that would be helpful to a developing industry. Furthermore, the people-to-people connections that already exist between Canada and China would enable Canadian service providers to make a significant contribution to developing a world-leading services sector in China. As globalization continues to deepen economic ties, Canada and China will likely become more interdependent, which can bring new opportunities to the Sino-Canadian relationship in services trade.

f. Textiles and Related Products

For the purposes of this study, textiles and related products refer to four main types of products: tops and yarns; fabrics; made-up textile products; and apparel. The textiles and apparel industries have played an important role in the development of the Canadian and Chinese economies. In recent decades, these industries have undergone a structural evolution as production processes have become increasingly fragmented across global value chains. During this period, the Canadian sector experienced numerous changes and has increasingly specialized in highly engineered textiles and specialty apparel that respond to a wide array of both industry- and consumer-led demands. In the last decade China's textile and apparel industries became some of the world's biggest suppliers of textiles and apparel as a result of large capital investments, increased technological capability and domestic innovation.

The Canadian Sector

The Canadian textile industry consists of fibres (naturally occurring, man-made from naturally existing materials, and man-made from basic organic or inorganic components), primary textiles, and textile products. The Canadian apparel industry consists of knit/crocheted and woven apparel. It is a value chain whereby the primary and artificial textile subsectors supply the textile products sector, as well as non-textile sectors (e.g. construction, medical, automotive and aerospace industries) and the apparel industry. The latter involves various activities from design and manufacturing to marketing and distribution. Canadian textile and apparel manufacturers are increasingly participating in global value chains and focusing on high value-added activities. Due to their ability to innovate and focus on niche areas, the Canadian industries have remained viable and competitive, notwithstanding important changes to the global textiles and apparel industrial structure.

As in other developed countries, the number of enterprises in the Canadian industries has decreased over time as they moved away from high-volume, low-margin operations. There are now some 5,000 firms employing roughly 65,000 workers (61% of these are in the apparel industry) that provide innovative solutions across all segments of the sector, from R&D of engineered textiles to the design of technical apparel (e.g. sporting apparel made with specialized fabrics). The industries are made up of mostly small and medium-sized enterprises (SMEs), with the provinces of Quebec and Ontario accounting for the vast majority of output and employment. While overall employment in the textile and apparel industries has decreased, the number of employees involved in R&D has increased in both relative and absolute terms, indicating that textile firms believe in the continued viability of innovation in their sector. R&D expenditures between 2006 and 2010 in the textile industry averaged C\$46.4 million per year.

Globalization, including competition from China and other low-cost exporters, has significantly lowered costs for consumers. It has also driven the contraction in the textile and apparel industries and served as a catalyst for improving competitiveness. In response, the industries have restructured by shifting production into higher value-added segments. The resulting industries are smaller, with greater manufacturing and innovation intensity. In recognition of this shift, in 2010 Canada announced the permanent elimination of tariffs on all industrial inputs, including yarns and fabrics. Most duties were removed immediately, while the rest will be phased out by no later than 2015.¹⁹ This will benefit both textile and apparel producers by reducing the cost of their production inputs. The Canadian textile and apparel industries remain heavily dependent on trade (approximately half of all production is exported), underscoring the fact that while the domestic market for apparel and textiles contracts, the sector remains competitive in the global market.

The Chinese Sector

The Chinese textile and apparel industries consist mainly of: cotton, wool, bast, silk and other natural fibre manufacturing, printing, dyeing and fine machining operations; chemical fibre manufacturing, printing, dyeing and fine machining; hosiery, knitting products and relevant product manufacturing. During the 11th Five Year Plan period (2006-2010), the Chinese textile industry made substantial technological progress, which helped improve its innovative capacity. These developments have turned China into one of the world's most advanced countries in the field of spinning technology and helped propel its production levels to such an extent that it now accounts for half of global capacity. As of 2011, the cumulative industrial output value of textile enterprises²⁰ was RMB 5.5 trillion (C\$842.1 billion), an increase of 26.8% over the same period the previous year. Given their scale, the Chinese textile and apparel industries play an important economic role, helping to ensure that China benefits from thriving consumer markets, both at home and abroad. Growth in domestic consumption has helped shield the Chinese textile and apparel industries from unstable global demand in the last few years.

During the 12th Five Year Plan period (2011-2015), China is focusing on increasing its strengths in textile science and technology as well as promoting sustainable production methods. In addition, China is striving to develop renowned brands and a skilled workforce in order to become an important global player. Industry clusters are mainly distributed in the economically developed coastal regions in the east, particularly around the Yangtze River Delta, Pearl River

¹⁹ Tariffs will remain on made-up textile products (e.g. finished textile goods such as carpets, table linens, packing bags and drapes).

²⁰ Enterprises with annual main business revenues of RMB 20 million and above, according to the National Bureau of Statistics of China.

Delta, West Taiwan Strait Region and Bohai Sea Delta. As the leaders in this industry, the provinces of Jiangsu, Zhejiang, Fujian, Shandong and Guangdong have been successful in creating distinctive textile industry clusters, and their combined exports accounted for about 80% of the country's total. By the end of 2011, there were over 36,000 enterprises²¹ employing 10.3 million people.

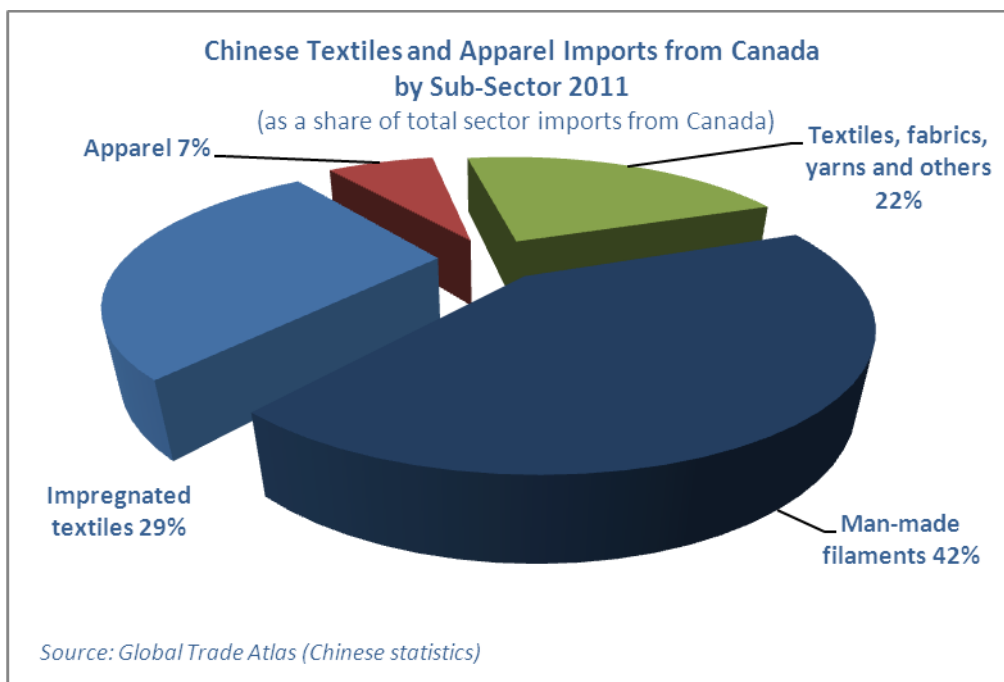
For high-capacity production technology and equipment, China continues to depend on imported machinery. A shortage of skilled workers in the Chinese textile and apparel sectors has implications for R&D. In addition, the rising cost of China's textiles products has caused foreign importers to increasingly source from other countries, forcing Chinese producers to adjust their profit margin. This is providing an impetus for industrial restructuring toward increasing the share of higher value-added product offerings.

Bilateral Trade Patterns

Canada-China trade in textiles and apparel grew in the second half of the 2000s, consistent with China's displacement of a number of other supplier countries worldwide. China has capitalized on its cost advantage in some segments and the termination in 2005 of the World Trade Organization Agreement on Textiles and Clothing and its associated import quotas. According to Chinese Customs statistics, in 2011 China's global textile and apparel exports reached US\$217.9 billion, a 21.2% increase over 2010 and an almost fivefold increase over 2001.

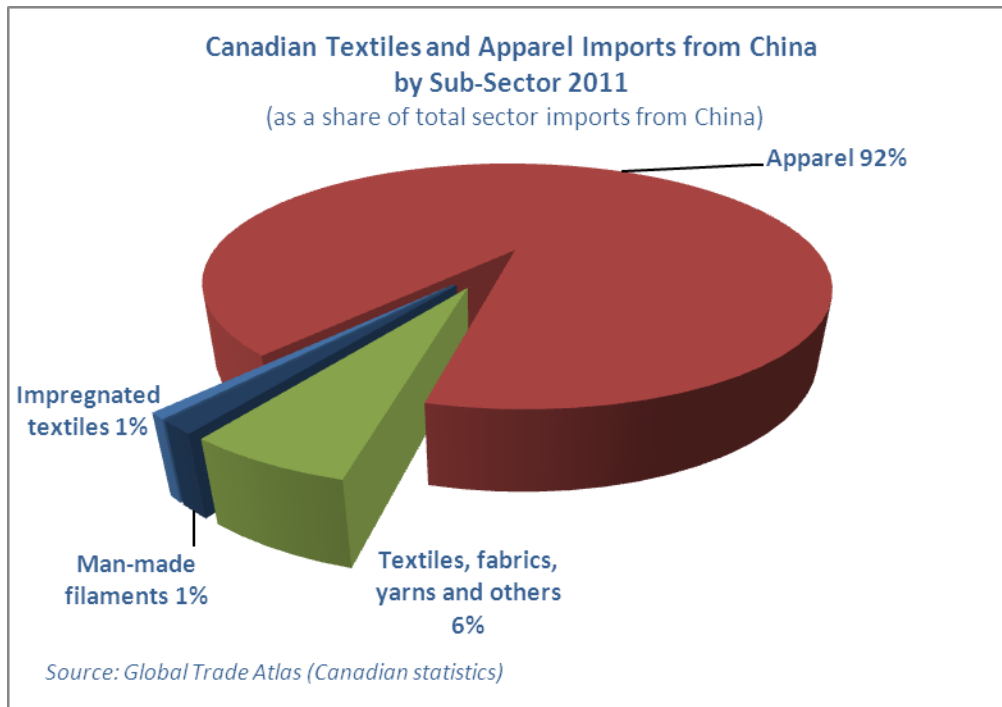
The composition of Canadian global exports reflects the industry's shift toward higher value-added niche textiles, as well as a continuing reliance on knit and woven apparel. The two largest export groups are man-made filaments and impregnated textile fabrics (such as treated textiles suitable for industrial use and technical apparel). During the 2005 to 2011 period, there was a discernible shift away from low value-added "commodity type" products (e.g. knit and cotton fabrics), the global demand for which is based largely on price considerations rather than value-added properties. By 2011, the make-up of Canadian total exports reflected an increased emphasis on advanced textiles primarily for the non-apparel market.

²¹ Enterprises with annual main business revenues of RMB 20 million and above, according to the National Bureau of Statistics of China



China's imports of textiles and apparel from Canada are a mixed picture. There was an overall contraction in value during the last decade (from US\$69.8 million in 2001 to US\$34.9 million in 2011) due to the decrease in imports of low value-added textiles. At the same time, imports of higher value-added products from Canada increased significantly. For example, as a percentage of total textile and apparel imports from Canada, China's imports of man-made filaments rose from 1.2% (US\$849,926) in 2001 to 41.8% (US\$14.6 million) in 2011, while imports of impregnated textiles increased from 1.9% (US\$1.4 million) to 28.6% (US\$9.9 million) during the same period.

The structure of China's global textiles and apparel exports has changed greatly during the last decade, partly as a reflection of China's gradual shift toward deep processing and large-scale manufacturing products. Compared to 2001, the proportion of fabric exports in 2011 declined by 6%, while the share of manufactured goods such as household textiles increased by 6%. For apparel, the proportion of knitted garments increased from 12.8% in 2001 to 29.6% in 2011, while the proportion of woven garments decreased from 42.2% in 2001 to 33.2% in 2011.



Canada’s imports of Chinese textiles and apparel exhibited large and consecutive annual increases in both share and total value between 2005 and 2011 (with the exception of 2009). In 2011, China’s share of imported apparel and textiles into Canada was 38.8 % (US\$4.7 billion), up from 29.7% in 2005 (US\$2.7 billion). While the value of imports has grown substantially, the composition (share of textiles vs. apparel) has remained broadly similar to 2005 levels.

Ongoing Cooperation

Several examples of ongoing cooperation illustrate the increased bilateral commercial activity in textiles and apparel. Such collaborative activities have involved the participation of the public and private sectors from both sides. The Government of Canada has also been a direct participant in textile and apparel trade missions to China. Since 2004, four such missions have taken place and included representatives from government departments and various companies who met with the Chinese government, companies and industry associations. These missions—which included site visits and discussions on opportunities for marketing, partnerships and strategic alliances—were productive in providing opportunities for Canadian and Chinese textile and apparel producers to gain a better understanding of each other’s markets and to seek out opportunities for joint ventures.

Bilateral Challenges

In both countries, remaining tariffs are generally higher than those found in other industrial sectors, reflecting domestic sensitivities. Canada's current average applied tariffs for textiles and apparel are 2.9% and 16.3%, respectively. China's current average applied tariffs are 9.7% for textiles and 16% for apparel.

Complementarities and Opportunities for Growth

Globalization and the fragmentation of value chains has changed the traditional design, production and marketing processes in a historically highly vertically integrated industry.

At the production stage, Canadian apparel manufacturers have embraced the just-in-time model, whereby rapidly evolving fashion styles, design innovations and short production runs are a new reality. In the face of intense competition from foreign-based suppliers, Canadian firms have developed expertise in product life-cycle management, which is useful for apparel manufacturers who need to respond to new fashion trends quickly or collaborate closely with customers, retailers and suppliers in order to remain competitive. Many Canadian manufacturing facilities are now integrated with distribution centres via advanced computer systems technology and real-time data transfer. Intelligent, self-adjusting machines and automatic data and software transfer across equipment allow for real-time monitoring of manufacturing processes.

Textile manufacturers in Canada are increasingly focusing on the development of new material weaves and textures, dyeing and finishing methods, material finishing and production process innovation. These technical textiles, such as barrier textiles for protection against the elements, have applications in several end-user markets (e.g. defence, medical, marine and industrial fields). Various other innovative textiles, such as nano-textiles, plasma textiles (an alternative textile treatment method) and environmentally sustainable textiles (that can be used and recycled over multiple life cycles), are also being developed in Canada and are finding their way into Chinese value chains as that country seeks to broaden its product offering toward higher value-added end products. On the apparel front, key innovative elements developed by Canadian manufacturers include technical drawings and three-dimensional and computer-aided design to create new concepts and samples. In turn, the development of innovative textiles, such as those with anti-microbial, anti-wetness/anti-fungal properties, or "shape memory," contributes to innovation in apparel products.

China's advancements in the textiles industry in the 12th Five Year Plan are centred mainly on breakthroughs in the development of key technology, the wide promotion and utilization of

modern production techniques and equipment, workforce training and a comprehensive improvement of production efficiency. These initiatives are in step with China's strategic objectives for its textiles industry. The intent of these objectives is to increase value-added and technological dispersion from the coastal regions while improving the sustainability of production processes.

In response to the dramatically rising pressures in cost, labour shortages, profit margins and the sector's environmental impact, China is increasingly conscious of the need to promote higher value-added production. China is also promoting the development of indigenous brands reflecting innovation, high quality standards and rapid response to shifting consumer demands while operating in a socially responsible manner. Similar to Canadian textile and apparel producers, an increasing number of Chinese textile and apparel enterprises are increasing R&D investment, advocating green (low-carbon) production, and focusing on corporate social responsibility, while pursuing professional management techniques to aid competitiveness. These trends will enable China to cater to different price segments and to respond to diversified consumption trends, an essential requirement for mastering new markets and addressing the needs of an increasingly affluent domestic middle class. Some trading companies have already begun to penetrate into upstream manufacturing enterprises through mergers and acquisitions, so as to reduce logistical issues and costs and improve management to better address the needs of foreign markets.

Having undergone significant changes in the last decades, the Canadian textile sector is increasingly focused on highly engineered textiles that serve both the apparel and industrial subsectors in China and that can be used for domestic markets or as high value-added inputs for export of finished goods to global markets. On the apparel front, Canadian producers can offer technical apparel and branded wear catering to China's increasingly affluent consumers. Having developed an expansive textile industry, China offers Canada an array of textiles for use in the domestic textile and apparel industries, as well as apparel to complement Canada's product offering.

g. Transportation Infrastructure and Aerospace

The infrastructure sector spans a wide array of subsectors ranging from residential and commercial structures to the design, engineering and construction of infrastructure supporting the environmental, energy, transportation, and information and communications technology industries. For the purposes of this complementarities study, the focus of transportation infrastructure will be narrowed to the following subsectors: road, rail and port engineering and construction services; urban transit equipment (i.e. rolling stock); and intelligent transport services.

Canadian companies have a long history of providing solutions to enable the movement of goods and people over large distances. Canada's reputation for excellence in this sector is exemplified by its continued success in providing innovative products and services to local and international customers. China invests more than any other country in transportation infrastructure. Large-scale investments in the sector have been required in recent years to keep up with robust economic growth, rapid urbanization and increased motorization. Also benefiting from large investment flows and an increasingly affluent middle class, China's aerospace manufacturing industry and air services industry have grown at an impressive rate, with the latter becoming the world's second-largest market in just over 10 years.

The Canadian Sector

At 4.7%, Canada's **transportation infrastructure** sector accounts for a considerable share of Canada's GDP. The sector experienced 20% growth over the last decade and represented C\$60 billion in 2011. The Canadian transportation infrastructure sector includes firms of all sizes, from small niche players to multinational enterprises, providing a wide range of product and service expertise. Some 4,300 Canadian firms are involved in infrastructure exports and investments internationally. The rail and urban transit industry alone supports 60,000 high-tech and manufacturing jobs and, in 2011, contributed close to C\$12 billion to Canada's economy.

Canada's competitive strengths in engineering services²² support all transportation infrastructure subsectors. Canadian firms are recognized for their globally competitive expertise in four key areas: high-level project management; specialized technical skills, including design; advanced levels of experience; and familiarity with, and access to, proprietary technologies. One example is Canada's expertise in designing, developing and implementing intelligent transportation services, advanced information and communications technologies used in

²² For additional information, please see the Services sector profile.

transportation infrastructure to manage and monitor safety standards, transportation time and fuel consumption.

Aerospace is a leading Canadian manufacturing industry, generating C\$22.1 billion in revenues in 2011 (70% from manufacturing and 30% from maintenance, repair and overhaul services). Canada is home to close to 700 aerospace firms employing nearly 69,000 skilled professionals. In 2011, the aerospace manufacturing sector invested more than C\$1.6 billion in research and development. The Canadian aerospace industry is largely export-focused and spans the entire production chain, from original equipment manufacturers (OEMs) to specialized services companies. Canadian companies have long-standing and demonstrated expertise in aircraft and helicopter assembly; engine and aircraft parts manufacturing; maintenance repair and overhaul; avionics; landing gear; advanced composite structures and components; robotics; and unmanned vehicle systems. In 2009, Canada had significant market share in many segments of the global aerospace sector, including business aircraft (28% market share); regional jets (40%); small gas turbine engines (43%); commercial flight simulators (81%); and environmental control systems (60%). Canada is also a major supplier of landing gear (30%). Canada's competitive strengths have made Montréal the world's third-largest aerospace cluster after Seattle and Toulouse.

Canadian small and medium-sized enterprises (SMEs) play an important role in the transportation infrastructure and aerospace sectors. SMEs offer new product ideas, low overhead costs and specialized knowledge that help multinational enterprises increase overall productivity, mitigate risks abroad and gain access to new global markets through their integration in global value chains.

The Chinese Sector

China's rapid development and urbanization has led to unprecedented levels of investment in **transportation infrastructure**. In the 11th Five Year Plan (2006-2010), the central government planned to invest in the development of the transportation infrastructure, such as railway lines, highways, airports, maritime shipping, and the building of light trains and subway systems in megacities. In 2010, highway and waterway transportation fixed asset investment reached RMB 1.32 trillion (C\$201 billion), accounting for 4.75% of total fixed assets investment that year. Highway construction investment in 2010 amounted to RMB 1.15 trillion (C\$175 billion), of which RMB 686.22 billion (C\$104 billion) was invested in express highway construction, and RMB 192.38 billion (C\$29 billion) was invested in rural highway construction. By the end of 2010, total highway mileage had reached 4.008 million km, which included 74,100 km of express highway. National operational railway mileage totaled 91,000 km, ranking second in the

world. While the 12th Five Year Plan does not identify transportation infrastructure as a strategic sector, its development will play a pivotal role in supporting other Five Year Plan goals, including reducing pollution; meeting new transport demand from the continued shift of business development to western China; adjusting to new movements of raw materials brought about by planned housing improvements; and supporting a new pattern of movement of people and finished goods as more emphasis is placed on consumption and the renewed focus on hi-tech and service sectors.

China's **aerospace** sector employed over one million people in 2010. Aviation Industry Corporation of China (AVIC), a newly merged state-owned enterprise, is China's largest aerospace manufacturing employer and has the stated objective to make RMB 1 trillion (C\$153.1 billion) in revenue by 2017. China is engaged in a wide variety of partnerships with foreign aerospace OEMs that range from parts manufacturing on a subcontracting basis to final assembly of foreign aircraft and joint development of aircraft and aircraft parts for the domestic market and global exports. As part of the 11th Five Year Plan, which called for the development of a large aircraft, China undertook a major reorganization of its aerospace manufacturing sector. Right now, China is gradually promoting the opening of its low-altitude airspace by creating opportunities for general aviation aircraft, such as helicopters, turboprops and business jets. While production for regional and long-haul aircraft takes place in China, domestic manufacturers have yet to develop or scale manufacture the subsystems to these aircraft, and therefore currently rely heavily on U.S. and EU-based suppliers. Import and introduction of aircraft are subject to government approval.

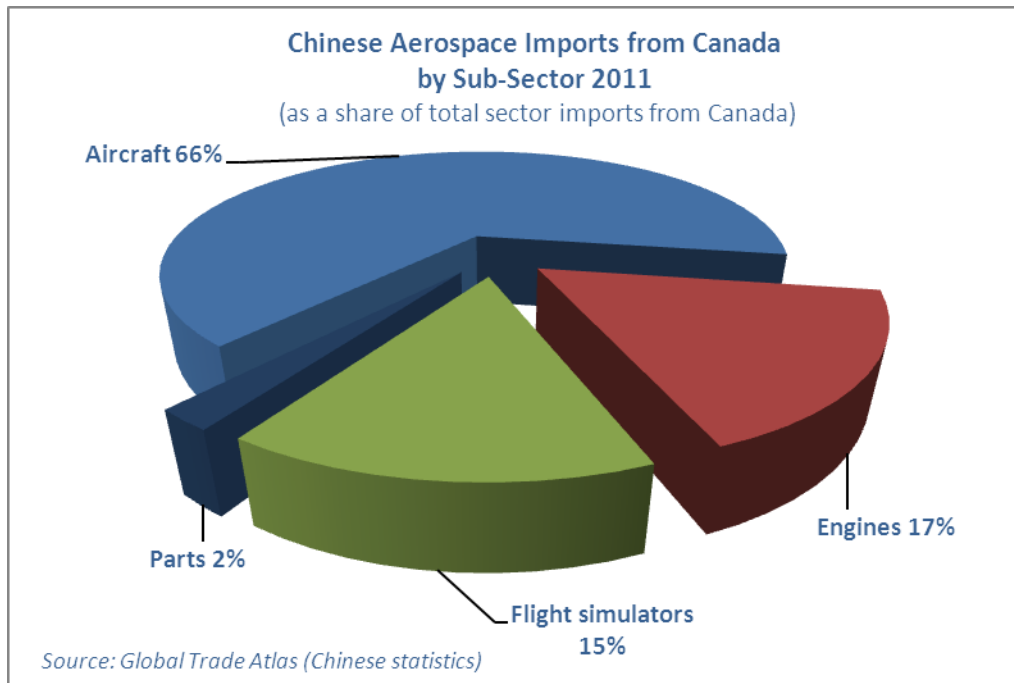
Bilateral Trade Patterns

From the commodities and equipment used in the construction process to the architectural, engineering and construction services required to plan, design and build a project, **transportation infrastructure** development has important and positive implications for goods and services trade and investment flows. The correlation between China's large-scale investment in infrastructure and Canada's export of commodities, machinery equipment and construction-related services (including engineering) is positive. This has led not only to an increase in export volumes, but also to higher prices, since increased Chinese demand has affected commodity prices worldwide. Canadian infrastructure projects have also sourced machinery and attracted investment from China, albeit on a smaller scale. However, the complexity of global value chains and the integrative nature of commercial flows in this sector make it difficult to accurately measure the level of trade and investment.

For the purposes of this study, the significance of trade flows in goods (i.e. commodities, machinery) will be primarily addressed in sectors in which these goods originate (i.e. natural resources and manufacturing). Infrastructure-related services are also covered in the Services sector profile, but a special mention here is warranted, as complementarities exist. Two-way trade in architectural and engineering services has grown in recent years, a reflection of Canada's strength in engineering services. For its part, China offers engineering services on partnership infrastructure projects undertaken in Canada.

Experts agree that investments in trade-related infrastructure are essential to growing trade and attracting foreign direct investment. Canada has adopted an integrated approach to these investments with a national plan on strategic gateways and trade corridors. Designed to improve the efficiency and reliability of transportation systems that serve Canada's most important opportunities in global commerce, the Asia-Pacific Gateway and Corridor Initiative in particular has a distinct focus on trade with the Asia-Pacific region. These horizontal strategies will help facilitate new trade opportunities for both Canada and China.

With regard to **aerospace**, Canada exported US\$12.9 billion worth of regional and business planes, helicopters and parts globally in 2011, making Canada the world's fifth-largest exporter in this subsector, after the United States, France, Germany and the United Kingdom. China's imports of aerospace goods from Canada in 2011 totalled US\$661 million and varied highly during the last decade—a reflection of the cyclical nature of the industry—averaging US\$217 million annually during that period. In 2011, China imported US\$438.2 million in aircraft, US\$96 million in flight simulation equipment and US\$104.7 million in engines from Canada, the latter representing more than an 11-fold increase over the last decade.



Canada’s imports from China in the aerospace sector are confined to parts. Since 2001, imports have steadily increased from US\$11.4 million to reach US\$128.2 million in 2011. The majority of imports are parts for turbo jets and turboprop engines.

Ongoing Cooperation

Aerospace and infrastructure have attracted high-level bilateral engagement and cooperation in recent years. In 2008, Canada and China signed an MOU on cooperation in infrastructure development that promotes two-way exchanges of information on several topics, including investment and engineering opportunities in Canada, China and other markets. The MOU is particularly focused on facilitating investment in, and development of, sustainable, efficient trade gateways and corridors across the Pacific. The MOU established a joint working group on infrastructure to promote communication and cooperation between enterprises of the two countries through seminars and visits. One of these events was the China-Canada Forum on Infrastructure held in Vancouver in 2010, which hosted nearly 70 companies from both countries.

As for the **aerospace** sector, the two countries signed an MOU in 2009 to promote cooperation on civil aviation projects, investment, and trade and technical exchanges. Building on this renewed level of cooperation, 2011 saw Ministerial-level engagement on the promotion of cooperation in civil aviation and, under the auspices of the Canada-China Joint Committee on Science and Technology, civil aviation representatives from both countries met for the first time

to discuss collaboration in R&D and facilitate links between Canadian firms and Chinese organizations. In addition to government initiatives, a number of Canadian and Chinese firms have signed MOUs on long-term strategic cooperation.

Bilateral Challenges

Transportation infrastructure projects often generate large trade flows in goods, given the complexity and scale of business activities. No major trade barriers exist between Canada and China for the goods typically in high demand for projects in the sector (e.g. commodities). However, SMEs that commercialize machinery and technologies have concerns pertaining to intellectual property rights, which would require further bilateral cooperation to be addressed. Another challenge exists for Canada and China in finding common ground on engineering services, including facilitating the cross-border trade of services and commercial presence issues. Challenges exist at the regulatory level with inconsistent professional licensing requirements in China from project to project, and limitations on operating wholly foreign-owned services companies. These barriers currently prevent the bilateral commercial relationship from reaching its full potential for both consumers and exporters.

In **aerospace**, there are two specific measures that limit the trade in aircraft and parts. One is tariffs and the uneven application of value-added tax (which when added together can be significant) on imported regional aircraft. The other is limits on the type of business agreements available to foreigners wanting to participate in some aerospace programs, especially in high-technology areas such as advanced materials and flight control systems. These limitations may narrow the commercial terms under which companies can operate effectively in this sector and create concerns among firms that are uncomfortable with requirements to share their intellectual property.

In addition, the ability of aircraft producers to penetrate foreign markets relies heavily on the trust and confidence between aviation authorities to readily accept or recognize each other's approvals through safety agreements that facilitate the import and export of products and services. In light of the cooperation required on joint projects to sell aircraft to domestic and third-country markets, a noted area of growth, continued dialogue can help ensure that future aircraft deliveries are supported by both the Canadian and Chinese safety regulatory agencies.

Complementarities and Opportunities for Growth

Canada and China are already cooperating in the **aerospace** and **transportation infrastructure** sectors and offer each other complementarities that could enable both to benefit from increased engagement. For transportation infrastructure, three areas of mutual interest stand

out: (1) safer transportation systems; (2) third-market opportunities; and (3) development of gateways and corridors, and particularly Canada's Asia-Pacific Gateway and Corridor.

China's State Council recently identified safety and quality of transportation infrastructure as a top priority for the country's major upcoming projects, with a focus on adopting high-tech equipment to assist with the management of railway operations. According to the State Council, a strict mechanism for transport safety supervision and quality management will be established in coordination with the 12th Five Year Plan. Canada's expertise and reputation in intelligent transport services could serve China's growing demand for related technologies and services. Canada has over 185 firms operating in the intelligent transport services subsector that could provide innovative solutions.

There is a growing market for engineering services in both Canada and China. Opportunities exist to increase bilateral engineering services trade in each other's markets, especially if some of the regulatory challenges are addressed. Moreover, engineers from Canada and China could also explore further collaboration on transportation infrastructure projects in third markets. Recent commitments by governments in Organisation for Economic Co-operation and Development countries and other emerging markets to invest heavily in infrastructure development suggest that the international market will be a major source of demand for Canadian and Chinese firms. China's experience in East Asia and other emerging markets, together with Canada's technology and services, could form the basis of a strong partnership for the development of transportation infrastructure worldwide.

In terms of **transportation infrastructure** development, Canada's Asia-Pacific Gateway and Corridor presents opportunities to boost commerce and facilitate global supply chains between North America and Asia. This initiative is advancing measures to increase Canada's share of North America-bound container imports from China, reduce transportation costs for Chinese exporters to the North American market, and improve the efficiency and reliability of the Gateway for Canadian and North American exports to China and other Asian markets. Additional routing capability is available through Canada's Atlantic Gateway and Trade Corridor, where Halifax is the closest North American port to Suez and onward to Asia.

The **aerospace** sector is expected to see strong global growth over the coming years. The International Air Transport Association anticipates that the number of air travellers will grow to 3.3 billion by 2014, a 32% increase over 2009. Thousands of aircraft will be needed in the coming decades to meet rising demand, replace fleets of aging and inefficient aircraft, and respond to increasing environmental concerns. This global expansion represents significant opportunities for Canada's export-oriented aerospace industry, especially in the areas of

regional and business aircraft, helicopters, parts (engines, landing gear, structural assemblies and avionics), and services (training as well as maintenance, repair and overhaul (MRO)).

China is currently increasing the capacity of its air travel system to meet the needs of its expanding economy and increasingly affluent and urban middle-class population. Air travel is expected to grow by nearly 8% per annum through 2028, and during that period China will have to purchase close to 3,800 aircraft and 3,000 civil helicopters. As it expands its fleet and continues to maintain its aging aircraft, there will also be increased demand for MRO. The Civil Aviation Administration of China predicts that between now and 2020 China will need around 2,500 new pilots each year. On the manufacturing side, China aims to move from an OEM manufacturing hub to a higher-end industry leader by 2020.

With its world-leading technology, research and development capacity, diversified manufacturing, global marketing and service networks, and sophisticated education and flight training, Canada is well positioned to benefit from these opportunities, while China offers the Canadian aerospace industry access to an array of quality inputs and logistical channels to serve the burgeoning Asian aerospace sector. Additionally, since China's regulatory system is still developing, Canada's internationally recognized regulation can be of use to China as it seeks to establish a system commensurate with the size of its aerospace sector.

Section 5: Conclusions

Conclusions

Following the June 2010 meeting between Canadian Prime Minister Stephen Harper and Chinese President Hu Jintao, officials from both countries jointly undertook a study to provide an analytical basis on which to evaluate potential economic complementarities in a selected range of sectors. The study's completion helps to set the stage for the two countries to take the next step: the launch of exploratory discussions on further deepening our trade and economic relations, as announced by the two leaders during Prime Minister Harper's most recent visit to China in February 2012.

This study demonstrates that international trade is a key contributor to the prosperity of the Canadian and Chinese economies. Yet trade and investment flows between the two countries represent a relatively small proportion of each nation's overall international economic activity. This is an important indication of the untapped potential for further growth in the relationship.

In examining the two countries' production and export strengths, demand and import characteristics, growth opportunities and bilateral challenges in seven sectors of interest, the study identifies a number of important complementarities. It also points out the need to address certain challenges to best take advantage of these complementarities.

Natural resources and agricultural production are two particularly notable areas in this regard. Canada is rich in both sectors, including in key commodities essential to China's future growth and development. While China also has considerable natural resource and agricultural wealth, domestic resources cannot meet the needs of its 1.34 billion people and rapidly expanding economy. China therefore offers Canadian exporters a large and rapidly growing market. As a reliable source of high-quality production, Canadian supply can help to mitigate inflation pressures in key areas such as food, thus enhancing the quality of life of the Chinese people. Canadian businesses can also contribute new technologies and expertise to support the sustainable development of Chinese resources and agriculture. At the same time, China is an increasingly important source of investment capital for further developing Canada's abundant resources, and is itself a competitive agricultural exporter.

While these traditional areas of mutual interest will continue to be important, emerging sectors also have great potential for expansion. These new areas are evident in China's plans to aggressively pursue clean energy options and address environmental and social challenges, while developing key manufacturing, transportation and aerospace services sectors. In each of

these areas, Canadian businesses can provide advanced technology and leading product and services solutions. For its part, China can provide inputs for advanced materials and equipment that will help Canadian producers remain competitive.

As both traditional and emerging areas of mutual interest become increasingly connected through global value chains, Canada and China will also be well placed to pursue opportunities in third markets together.

Taking advantage of economic complementarities also entails addressing impediments to trade. As with any strong and growing trading relationship, challenges and barriers exist. The study identifies some important areas for potential improvement, including the clarity and predictability of the Chinese and Canadian regulatory environments; complex sanitary and phytosanitary measures; differences in national standards, and in technical and certification requirements; the application of tariffs; and the protection of intellectual property rights, which is especially relevant for small and medium-sized enterprises. It is important to acknowledge that China's intellectual property protection framework has advanced greatly since the country's World Trade Organization accession in 2001. Further improvements in this and the above-mentioned areas would enhance business opportunities in both economies.

Since the leaders met in June 2010, the bilateral trade and investment relationship has continued to gain momentum, with trade and investment expanding rapidly and the Chinese and Canadian governments taking steps to facilitate this growth through government-to-government agreements and dialogue. During a return visit by Prime Minister Harper to China in February 2012, the two sides set the foundation for an even stronger investment relationship by announcing the conclusion of substantive negotiations of the Canada-China Foreign Investment Promotion and Protection Agreement (FIPA). The leaders also reached an agreement to facilitate the export of Canadian uranium to China, greatly supporting clean energy development. These and other efforts to support and manage our bilateral economic relations are examples of the leadership required to build a rules-based economic environment in which our businesses and citizens can prosper.

Although this complementarity study is limited to several key economic sectors, it speaks to the enormous growth in bilateral trade and investment in recent years, and to our countries' increasing potential to maximize our economic development. The Canadian and Chinese governments should continue to deepen and strengthen our bilateral trade and investment ties through appropriate bilateral instruments to ensure that Chinese and Canadian citizens can continue to build a prosperous and sustainable future.

Section 6 & 7: Annexes

Annex 1: Snapshot of the Canadian and Chinese Economies (2011, US\$ billion where applicable)

	Canada	China
Population (million)	34.5	1,340.9*
GDP (billion, current prices)	1,737.8	7,296.4
Real GDP Growth (2001-2011 average annual, %)	1.8	10.5**
Per Capita GDP (current prices)	50,392.7	4,640.6*
Primary Agriculture (% share of GDP)	1.8	10.1
Manufacturing (% share of GDP)	12.8	40.1
Services (% share of GDP)	71.6	43.1
Total Merchandise Exports (with the world)	452.7	1,899.3
Total Merchandise Imports (with the world)	451.0	1,741.4
Total Services Exports (with the world)	74.8	171.2*
Total Services Imports (with the world)	99.6	193.3*
Trade to GDP Ratio (2001-2010 average, %)	70.3	58.3
Direct Investment Abroad (Stock)(all countries)	673.1	382.3
Foreign Direct Investment (Stock) (all countries)	597.4	1167.1
Current Account Balance	-48.3	305.4*
Average Agricultural Tariff (%)***	11.3	15.6
Average Non-Agricultural Tariff (%)***	2.6	8.7

Sources: Statistics Canada, National Bureau of Statistics of China, Global Trade Atlas, United Nations Conference on Trade and Development, World Trade Organization.

*2010

** 2001-2010 average

*** Simple average of MFN (most-favoured-nation) applied tariffs, 2010

	Canada	China
Top five merchandise exports to the world (2009-2011)	<ol style="list-style-type: none"> 1. Mineral fuel and oil (HS27) 2. Motor vehicle (HS87) 3. Nuclear reactors, boilers and machinery (HS84) 4. Precious stones, metal and jewellery (HS71) 5. Electric machinery (HS85) 	<ol style="list-style-type: none"> 1. Electric machinery (HS85) 2. Nuclear reactors, boilers and machinery (HS84) 3. Apparel articles and accessories (HS61-62) 4. Optical and medical equipment (HS90) 5. Furniture (HS94)
Top five merchandise imports from the world (2009-2011)	<ol style="list-style-type: none"> 1. Nuclear reactors, boilers and machinery (HS84) 2. Motor vehicle (HS87) 3. Mineral fuel and oil (HS27) 4. Electric machinery (HS85) 5. Plastics and articles thereof (HS39) 	<ol style="list-style-type: none"> 1. Electric machinery (HS85) 2. Mineral fuel and oil (HS27) 3. Nuclear reactors, boilers and machinery (HS84) 4. Ores, slag and ash (HS26) 5. Optical and medical equipment (HS90)

Source: Global Trade Atlas (Canadian and Chinese statistics).

Annex 2: Canada-China Trade, Investment and Related Consultative and Cooperative Mechanisms

Joint Committees, Working Groups and Dialogues

- Canada-China Strategic Working Group
- Canada-China Joint Economic and Trade Commission (1973), which oversees four working groups:
 - Trade Remedies Working Group;
 - Joint Working Group on Cooperation in Infrastructure Development;
 - Joint Working Group on Environmental Protection and Energy Conservation; and
 - Economic Partnership Working Group.
- Canada-China Climate Change Working Group
- Canada-China Cooperation in Industrial Relations and Labour Standards
- Canada-China Cultural Dialogue
- Canada-China Financial Sector Policy Dialogue
- Canada-China Forestry Cooperation Joint Working Group
- Canada-China Joint Agriculture Committee
- Canada-China Joint Committee on Environmental Cooperation
- Canada-China Joint Science and Technology Committee
- Canada-China Joint Working Group on Energy Cooperation
- Canada-China Mineral Resources Cooperation Dialogue
- Canada-China Nuclear Energy Cooperation Dialogue
- Canada-China Policy Committee on Health
- Canada-China Trade and Economic Cooperation Forum

Agreements, Memorandums of Understanding and Other Arrangements

2012

- Supplementary Protocol to the Nuclear Cooperation Agreement and the Protocol Administrative Arrangement
- Canada-China Foreign Investment Promotion and Protection Agreement: conclusion of the substantive negotiations
- Canada-China Scholars' Exchange Program (1973, renewed in 2012)
- Memorandum of Understanding between Parks Canada and the People's Republic of China's State Forestry Administration on Protected Areas and Parks

- Memorandum of Understanding between the Department of Natural Resources of Canada and the Academy of Sciences of the People’s Republic of China Concerning Cooperation in Sustainable Development of Natural Resources
- Memorandum of Understanding between the Department of Natural Resources of Canada and the National Energy Administration of the People’s Republic of China Concerning Cooperation in the Field of Energy (2001, renewed in 2006 and 2012)
- Memorandum of Understanding between the Department of Natural Resources of Canada and the National Development and Reform Commission of the People’s Republic of China on Building the Dialogue Mechanism for Cooperation on Mineral Resources (2009, renewed in 2012)
- Memorandum of Understanding between the Department of Natural Resources of Canada and the Ministry of Housing and Urban-Rural Development of the People’s Republic of China on Cooperation in the Technology Development of Eco-Cities in China

2011

- Agreement between the Government of Canada and the Government of the People’s Republic of China on Air Transport (2005, expanded in 2011)

2010

- Agreement between the Canadian Securities Regulators, the China Banking Regulatory Commission, the China Insurance Regulatory Commission and the China Securities Regulatory Commission under the People’s Republic of China’s Qualified Institutional Investor Program
- Canada-China Approved Destination Status designation
- Memorandum of Understanding between the Department of the Environment of Canada and the Ministry of Environmental Protection of the People’s Republic of China on Environmental Cooperation
- Memorandum of Understanding between the Department of Natural Resources of Canada, the Government of British Columbia and the Ministry of Housing and Urban-Rural Development of China to Promote Wood-Frame Construction as a Means of Improving Energy Efficiency in China’s Construction Sector
- Memorandum of Understanding between the Ministry of Agriculture and Agri-Food of Canada and the Ministry of Agriculture of the People’s Republic of China on Cooperation in the Field of Agriculture and Allied Sectors

2009

- Memorandum of Understanding between the Department of Agriculture and Agri-Food of Canada and the Ministry of Education of the People’s Republic of China on Scientific and Technical Cooperation and Personnel Training
- Memorandum of Understanding between the Department of the Environment, the Department of Foreign Affairs and International Trade and the Department of Natural Resources of Canada and the National Development and Reform Commission of the People’s Republic of China on Climate Change Cooperation

- Memorandum of Understanding between the Department of Foreign Affairs and International Trade of Canada and the National Department and Reform Commission of the People’s Republic of China on Collaboration in Civil Aviation and Cooperation in Trade Logistics
- Memorandum of Understanding between the Department of Natural Resources of Canada and the State Forestry Administration of the People’s Republic of China on Collaboration in the Field of Forestry (1998, renewed in 2009)
- Memorandum of Understanding on Cultural Cooperation
- Protocol Amending the Agreement between the Government of Canada and the Government of the People’s Republic of China on Maritime Transport
- Memorandum of Understanding between Transport Canada and the National Development and Reform Commission of the People’s Republic of China on Trade Logistics Cooperation

2008

- Memorandum of Understanding between the Ministry of Commerce of the Government of the People’s Republic of China and the Department of Foreign Affairs and International Trade of Canada on Cooperation in Infrastructure Development

2007

- Agreement for Scientific and Technical Cooperation between the Government of Canada and the Government of the People’s Republic of China
- Memorandum of Understanding between the Department of Transport of Canada and the Ministry of Communications of the People’s Republic of China on Technical Cooperation in Highway and Waterway Transportation