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I. Introduction

The Canada-Korea Free Trade Agreement (CKFTA) negotiations were launched on July 15, 2005. After 13 rounds of negotiations within the first 3 years, in 2008 the talks reached an impasse. Following a period of active re-engagement, starting in 2012, Canada and Korea formally resumed negotiations with Round 14 taking place in November 2013. The conclusion of negotiations was announced in Seoul by Prime Minister Stephen Harper and Korean President Park Geun-hye on March 11, 2014.

This landmark agreement constitutes Canada's first FTA in the dynamic Asia-Pacific region and will provide new access for Canadian businesses and workers to the world's 15th-largest economy and the 4th-largest in Asia. The CKFTA is projected to boost Canada's economy by \$1.7 billion and increase Canadian exports to Korea by 32 percent annually by the time the agreement is fully implemented. Korea is a priority market within the Government's Global Markets Action Plan, a key gateway to the Asia-Pacific region, and a major G-20 economy. It is Canada's 7th-largest merchandise trading partner, and 3rd-largest in Asia after China and Japan, with two-way trade valued at \$10.8 billion in 2013. The stock of Korean foreign direct investment in Canada was \$5.0 billion in 2013, while the stock of Canadian direct investment in Korea reached \$534 million.

The CKFTA will secure Canada's position in the Korean market, where competitors like the United States and the European Union are already benefiting from preferential access due to the U.S.-Korea FTA (KORUS) and the EU-Korea FTA. Without this Agreement, Canadian businesses would continue to face a disadvantage in areas ranging from industrial goods to agriculture and agri-food products, fish and seafood products, forestry and value-added wood products, services and investment. In fact, Canada's exports to Korea dropped by nearly one-third, or \$1.5 billion, in the first year after the KORUS deal was implemented in March 2012. The CKFTA is critical for Canada to restore a level playing field in this important market. Looking ahead, Canada and Korea have agreed to prioritize the implementation of the Agreement, with a view to having it enter into force as expeditiously as possible.

Canada is committed to achieving a mutually supportive relationship between trade and the environment. There is a strong correlation between open markets, economic development and enhanced environmental protection. Liberalized rules-based trade and efficiently regulated markets are key building blocks for economic growth and development. In turn, public support for measures to protect the environment generally increases as incomes rise, and wealthier countries are better able to implement effective environmental policies than are poorer countries. Open markets also help to foster the development of new, more environmentally friendly technologies, and liberalized trade and investment help to create the conditions for technology transfer.

Canada's broad environmental objectives in negotiating trade agreements are to preserve Canada's ability to protect the environment, to ensure mutually supportive relationships between trade agreements and multilateral environmental agreements, to stimulate improved allocative efficiency of resources to generate positive environmental impacts, to strengthen the environmental management capacities of Canada's trading partners, and to use this strengthened capacity to combat transboundary pollutants and invasive species that directly affect Canada's environment, economy and health. In order to ensure that Canada's environmental quality is strengthened through liberalized trade, Canada includes trade-related environmental provisions in appropriate sections of the FTA (i.e. preamble, initial provisions, investment, general exceptions). For the first time, Canada has incorporated into the CKFTA a landmark Environment chapter that commits both parties to foster good environmental governance through robust provisions to effectively enforce domestic environmental laws and prohibit the waiving or derogating from such laws to promote trade or investment. Moreover, environmental impacts

could be mitigated by the provisions in place in the Environment Chapter.

II. The Environmental Assessment (EA) Process

FTA negotiations are subject to the 2001 *Framework for Conducting Environmental Assessments of Trade Negotiations*. This process focuses on the likely economic effects of trade negotiations, as well as their likely environmental impacts in Canada. Three phases are involved in the assessment process: the Initial EA, the Draft EA and the Final EA. The middle phase, known as the Draft EA, is not undertaken when the FTA is not expected to result in a high level of environmental impacts in Canada. Accordingly, in the case of the CKFTA negotiations, a Draft EA was not carried out as the Initial EA anticipated only minor environment impacts on Canada.

The primary purpose of the Initial EA is to identify the main environmental issues likely to arise as a result of a proposed agreement. This assessment focuses on potential economic and environmental impacts in Canada which would result from an FTA, by exploring the links between the environment and increased market access for goods, services, and investment. This assessment considers the effects of new trade and investment in Canada that may result directly from an FTA, as well as potential impacts on the Canadian environment. As such, the Initial EA estimates possible environmental impacts using informed judgment based on any potential changes in economic activity brought about as a result of an FTA, once implemented.

An Initial EA of the CKFTA negotiations was completed in 2007 and the Chief Negotiator and officials responsible for each negotiating area were made aware of the findings, which served to inform their negotiations. An interdepartmental EA committee¹ was established with officials responsible for each negotiating area. This EA committee was established to draft and review the Initial EA of the CKFTA. Consultation was also open to other government departments and agencies, including provincial and territorial governments, the Environmental Assessment Advisory Group (EAAG) composed of individuals from academia, business and non-governmental organizations (NGOs). Public input was also sought on the Initial EA. This collaborative approach facilitated the development of a more comprehensive assessment.

This Final EA updates the findings of the Initial EA and builds on the previous analyses conducted on the potential environmental impacts of the CKFTA. It incorporates information gathered through consultations. The latest data available at the time of the drafting has been used as a baseline for the economic analysis.

III. Conclusions of the Initial EA

The Initial EA concluded that a CKFTA would likely have only minor environmental impacts on Canada, because while the economic effects from a CKFTA would likely be important, these would be modest relative to Canada's overall economic activity. For further information, please see the following link to the Initial EA report:

<http://www.international.gc.ca/trade-agreements-accords-commerciaux/agr-acc/korea-coree/ea-korea-coree.aspx>

IV. Results of the Consultations Process

Following consultations with the Federal/Provincial/Territorial Committee on Trade and the Environmental Assessment Advisory Group (EAAG), an Initial EA of the CKFTA negotiations was released on the DFATD website in September 2007. An overview of comments received in response to the Initial EA of the CKFTA is provided below:

- Potential environmental effects of expanded resource extraction, including agriculture, minerals and forestry products;
- Questions associated with the availability of data on economic and environmental impacts as well as the need for accurate data models;
- Concerns regarding Canada's bilateral trade deficit with Korea;
- Concern that a CKFTA could reinforce Canada's status as a resource supplier;
- Perceived risks of adverse effects on air quality as a result of changes in import patterns of motor vehicles and parts;
- The possibility of Canada eliminating its current prohibition on used motor vehicles imports and potential resulting negative impacts of a CKFTA on Canada's auto industry and on the environment;
- Perceived risks to future employment and production opportunities in high-value manufacturing industries, including electronics, machinery, automotive assembly and parts, textile and apparel and other sectors;
- The need for participation of environmental organizations and NGOs in the environmental assessment of trade agreements; and
- Expected time for concluding negotiations and implementation of the CKFTA.

Those comments were taken into account during the CKFTA negotiations and have been addressed in the Final EA.

V. Updated Expected Economic Impacts of the CKFTA

Trade in Goods

This section is divided into two parts, which deal first with the expected economic impacts of goods exported to Korea, and second, with Korean goods imported to Canada. Korea is Canada's third-largest trading partner in Asia with total merchandise trade between the two countries totalling \$10.8 billion in 2013. That same year Canadian merchandise exports to Korea were valued at \$3.5 billion, led by mineral fuels and oils (coal), agriculture and fish products, mineral ores (non-ferrous metals), woodpulp, machinery and wood and related products.

The Canada-Korea Free Trade Agreement is projected to boost Canada's economy by \$1.7 billion, increase Canadian exports to Korea by 32 percent, and create new opportunities for Canadian industries and manufacturers by eliminating tariffs and discipline restrictive non-tariff measures. In numerical terms, Korea will remove tariffs on 82 percent of tariff lines upon entry into force, and over 98 percent once the agreement is fully implemented. This includes all industrial products, such as industrial machinery, chemicals, auto parts, cosmetics, pharmaceuticals, medical devices, aluminum, and aerospace equipment. Canada will remove duties on 76.4 percent of tariff lines upon entry into force, and will ultimately remove tariffs on 98 percent of tariff lines once the agreement is fully implemented. The Agreement also contains strong provisions to address non-tariff measures, backed by fast and effective dispute settlement to ensure that market access gains are not undermined by unjustified trade barriers.

In 2013, Canada imported \$7.3 billion in goods from Korea, with motor vehicles being the largest single product category. Other major imports include consumer electronics such as cell phones, computers, televisions and appliances. Imports from Korea represent only 1.5 percent of Canada's total merchandise imports, however.

1. Exports

As the Initial EA indicated, lowering tariffs and increasing market access is expected to lead to an increase in both exports and imports between Canada and Korea. It should, however, be noted that in some cases increases in exports to Korea, may reduce exports to other less profitable destinations. In such cases, there would be no environmental impact in Canada associated with an increase in exports.

a. Agriculture

Two-way agriculture and agri-food trade between Canada and Korea totalled \$731 million on average between 2011 and 2013. Canada's top agriculture exports to Korea between 2011 and 2013 were wheat (35 percent of total agriculture exports) and pork (20 percent of total agriculture exports). Prior to the discovery of a domestic cow with bovine spongiform encephalopathy (BSE) in 2003, Canada exported \$49.7 million worth of beef and offal to Korea in 2002 and as much as \$84.3 million worth of beef and offal in 2000.

The following product categories have significantly high tariff rates in Korea (as indicated), the elimination of which, may lead to an increase in exports and related changes in economic activity in Canada.

- Meat and meat products (beef and pork): generally 22.5 percent to 40 percent, but as high as 72 percent;
- Grains and processed grain products (wheat, malting barley, oats, flour and bakery products): generally 0 percent to 8 percent, but as high as 800 percent;
- Oils and oilseeds (canola, soybean): generally 5 percent to 8 percent, but as high as 487% or 956 won/kg, whichever is the greater;
- Horticulture products (apples, potatoes): generally 18 percent to 50 percent.

b. Fish and seafood products

Fish and seafood products are one of Canada's largest exports to the world, including key markets in Asia such as Korea, which is Canada's 10th largest export destination. Between 2011 and 2013, Canada exported an average of \$49 million in fish and seafood products to Korea. These exports represent both "wild capture" and aquaculture fisheries.

Korea currently applies high tariffs on imported fish and seafood products (up to 47 percent) and Canada could expect an increase in exports of fish and seafood products to Korea as a result of the CKFTA. For example, opportunities exist for increased exports of salmon, trout, char, shrimp, crab, lobster, whelk and other species.

c. Wood and wood products

This product group represents Canada's third-largest export to Korea in 2013. Exports of wood pulp, sawn and rough wood and kraft paper, building products, plywood and other forestry products amounted to \$493 million in 2013. With the elimination of tariff barriers currently facing forestry products—such as on softwood lumber and particle board—Canadian exporters will benefit from improved market access opportunities in a growing economy.

d. Industrial Goods

Canadian exports of all other industrial goods to Korea reached \$2.8 billion in 2013. Many of these goods face no or low tariffs but selected goods face tariffs of up to 50 percent. Elimination of tariffs is likely to lead to increased exports.

Automotive products

The automotive products sector is comprised of vehicle manufacturers and the various automotive parts suppliers that make up the value chain. In 2013, Korea imported \$40-million worth of motor vehicles with engine sizes over 1.0 L (1,537 vehicles) and \$11-million worth of automotive parts from Canada.

The CKFTA's automotive provisions feature robust outcomes across many areas of the Agreement. In addition to tariff elimination, the Agreement includes provisions that address non-tariff measures and provide for faster dispute settlement procedures, as well as safeguards to protect Canadian auto manufacturers against any surges of imported vehicles.

Aerospace

Canada's aerospace exports to Korea were worth an average of \$68 million annually between 2011 and 2013. Over the same period, Korea's global aerospace imports were worth an average of approximately \$3.9 billion annually.

Information and communications technology

In 2013, Canada's ICT exports to Korea were worth \$125 million, representing 3.7 percent of Canada's total exports to Korea. Upon entry into force, the CKFTA will eliminate tariffs on all Canadian exports in the sector of information and communications technology. For instance, upon the Agreement's entry into force, certain cameras, transmission apparatus parts, electrical conductors—with current duties of up to 13 percent—will be duty-free.

Metals and minerals

Currently, minerals represent Canada's largest exports to Korea. Canada exported an average of \$2.1 billion worth of metals and mineral products between 2011 and 2013. Bituminous coal was Canada's single-largest export to Korea between 2011 and 2013, accounting for 1.2 billion in exports. While some products, including coal, already enter the Korean market duty free, others will benefit from removal of tariffs (including aluminum, iron, steel, nickel, non-ferrous metals, precious gems and metals), which could lead to increased exports into the market.

2. Imports

In 2013, Canada imported \$7.2 billion in industrial goods (excluding forestry products) from Korea, accounting for 98 percent of Canada's total imports from Korea. Imports of automotive goods (i.e. light vehicles and automotive parts) from Korea were valued at \$2.8 billion (or 38 percent of Canada's total imports from Korea) during the same period. Other imports from Korea included cell phones, integrated circuits, petroleum oils, processors and controllers, and washing machines. Canada's relatively low average tariffs of 2.4 percent on non-agricultural goods have not proved a significant barrier to Korean exports but removal could lead increased imports from Korea, which could take the form of some increase in consumption in Canada or displacement of imports from other countries.

Trade in Services

There has been a notable increase in trade in services between Canada and Korea since Korea started to liberalise its services sector in 1995 with the entry into force of its GATS commitments. Between 1995 and 2011, Canada's imports from Korea increased from \$309 million to \$358 million. During the same period, Canada's services exports to Korea increased from \$438 million to \$764 million. This represents a 74% increase in Canada's exports to Korea and there is still much potential for growth in many sectors, including transportation services, travel services and commercial services such as financial, management, engineering and other professional services.

The CKFTA improves legal certainty and transparency for services exporting companies through the listing of non-conforming measures to the obligations of the cross-border trade in services chapter and provides increased market access for areas of key export interests such as professional services (e.g. foreign legal consultancy services, commercial education and training, research and development), environmental services and business services. The agreement improves exporting conditions for services suppliers in both countries and provides a foundation for strengthened opportunities in areas such as financial services, telecommunications, and e-commerce.

Investment

At the end of 2013, the stock of Foreign Direct Investment (FDI) from Korea into Canada was valued at \$5.0 billion, while the stock of Canadian direct investment in Korea was valued at \$534 million. As indicated in the Initial EA, Canada is relatively open in terms of foreign investment. The CKFTA will result in an improved bilateral investment framework but is not expected to result in large-scale changes in investment patterns. Korean investments in Canada are mainly in the oil and gas, mining, electronics, and auto parts and equipment sectors.

a. Energy (oil, gas, uranium, renewable energy)

Korean companies have major interests in the Canadian energy sector. Notable investments include Korea National Oil Corporation's (KNOC) acquisition of Harvest Energy Trust for \$4.1 billion in 2009, KNOC's acquisition of all of Hunt Oil's Canadian oil and gas assets for \$525 million in 2010, and Korea Gas Corporation's (KOGAS) \$1.1 billion investment in EnCana's natural gas fields in British Columbia in 2010. KOGAS is part of the LNG Canada consortium, which plans to develop a liquefied natural gas (LNG) export facility in Kitimat, BC. Korean companies are also large players in the renewable energy market. Samsung C&T Corporation, through its Green Energy Investment Agreement with the Government of Ontario, is leading a consortium that plans to spend \$5 billion over 20 years to build and operate a series of wind and solar power clusters in Ontario. Korean companies also have numerous interests in the uranium sector in Saskatchewan.

b. Mining

Korean companies are active in the mining and metals sector in Canada. Several large and medium-sized Korean companies have interests in iron ore, coal, zinc, copper, nickel, lithium and molybdenum mines throughout Canada. POSCO, Korea's largest steelmaker, is a stakeholder in a number of Canadian iron ore and coal mines, with acquisitions totalling more than \$1 billion. This increased activity demonstrates a shift among Korean companies, many of which rely heavily on raw materials (such as coking coal for steelmaking), to secure more core resource assets as opposed to simply purchasing the resources as they did in the past.

c. Manufacturing, Trade, Retail, Transport and Warehousing

Several large Korean conglomerates, such as Samsung, LG, Hyundai and Hanwha Group, have established sales offices and warehousing operations in Canada. Samsung Electronics Co., Ltd. has made numerous investments, including its first Canadian R&D facility set up in Vancouver in 2013. Korean companies are also active in the automotive and auto parts sector. For example, Hyundai Heavy Industries has partnered with Magna Corp. to build an electric vehicle battery plant in Ontario, and Hankook Tire Co. and Kumho Tires have established distribution centres in Canada. Korean pharmaceutical companies, such as Kuhnle Pharmaceuticals and Green Cross, have also made notable investments in Quebec. Green Cross announced in 2014 its plans to spend \$170 million over five years to construct a biologics manufacturing facility in Montreal, QC.

Government Procurement

Since the completion of the Initial EA of the Canada-Korea FTA in September 2007, Canada and Korea have expanded the commitments that they had made under the WTO Agreement on Government Procurement (GPA). The revised GPA entered into force in April 2014 for all parties that have ratified it, including Canada. Once Korea ratifies the revised GPA, it will apply between Canada and Korea. The CKFTA Government Procurement Chapter reaffirms both Parties' commitments under the Revised GPA and provides incremental enhanced market access for Korean and Canadian enterprises in each other's central government procurement market, by lowering the threshold for the application of obligations to \$100,000 (as compared to the approximately \$210,000 in the GPA). This will provide Canadian companies with increased opportunities in sectors such as clean technology, environmental services and construction services, including engineering. Given that the GP commitments under the CKFTA build upon the commitments Canada and Korea have under the GPA and that both procurement markets are already relatively open, the overall increase in trade as a result of the government procurement commitments in the CKFTA is expected to be relatively modest at the outset.

VI. Quantitative Economic Analysis of Environmental Impacts

Overview of Quantitative Findings

This quantitative economic and environmental analysis assesses the anticipated environmental impact in Canada resulting from increasing trade and economic cooperation between Canada and Korea under the CKFTA. The assessment was carried out based on the estimated economic impact from the Computable General Equilibrium (CGE) modelling. Specifically, the estimated output changes from the CGE-based economic analysis are linked to Statistics Canada's *Canadian System of Environmental and Resources Accounts*² and *Environment Canada's National GHG Inventory*³ to track the environmental change in Canada resulting from increasing trade and economic cooperation under the CKFTA.

The environmental impact of the CKFTA is expressed in three broad categories of environmental indicators: greenhouse gas (GHG) emissions, energy use and water use. Each indicator is broken down into three components: the scale, composition and technique effects. The scale effect relates the expansion in economic activities under the CKFTA to environmental outcomes. The composition effect captures the environmental effects resulting from the structural shifts under the agreement. The technique effect represents ongoing improvements to environmental quality in Canada independent of the CKFTA, which result from the adoption of new environmental technology and better enforcement of environmental regulation during the implementation period of the CKFTA.

According to the economic modelling, Canada's GDP (net value added) is expected to increase by \$1.7 billion as a result of increasing trade and investment under the CKFTA. This expansion of economic activities is expected to generate new demand for Canada's natural capital, which could affect environmental quality in Canada. It is important to understand the extent of such an environmental impact in Canada and to identify appropriate measures to mitigate such an impact.

Based on the estimated measures of scale and composition effects, the implementation of the CKFTA would marginally increase Canada's GHG emissions, and lower its energy use and water use. Overall, GHG emissions are projected to increase by 44 kilo tonnes. Compared to Canada's annual greenhouse gas emissions of 704,426 kilo tonnes of CO₂ equivalent in 2008⁴, the net increase in emissions represents only 0.006 percent of total greenhouse gas emission in Canada in that year.

Total energy consumption is expected to decrease by 1,909 terajoules or a decline by 0.018 percent of Canada's energy use of 10,612,484 terajoules in 2008. This is a result of an estimated expansion of less-energy intensive sectors and a reduction in economic activities in other energy-intensive sectors.

Similarly, water use is expected to decrease by 7 million m³, a decrease of 0.018 percent in Canada's total water use of 38,801.3 million m³ in 2009. The increase in water use in the agricultural sector is more than offset by a decline in water use in other sectors.

Further, during the CKFTA implementation period, progress in adopting new environmental technology and enforcement of environmental regulations, which is independent of the trade agreement, is expected to further reduce GHG emissions by 13 percent and energy usage by 12 percent via the technique effect. The technique effect for water use is not available due to a lack of projected data for future years.

Overall, the analysis concludes that the net impact of increased bilateral trade with Korea on Canada's environment would be characterized by only minor increase in GHG emissions, and lower energy and water use. The overall effect of the agreement

on Canada's environment is therefore negligible. Further, in terms of the effect on GHG emissions in Canada, the increase in emissions is almost at par with the pace of production expansion under the CKFTA, which indicates that the agreement is not expected to lead to a shift toward an economic structure with high levels of emissions. Thus, this quantitative assessment concludes that there is little likelihood of major environmental impacts in Canada as a result of the implementation of the CKFTA.

Table 1: Summary of Environmental Impacts of the Canada-Korea FTA

	Scale Effect	Composition Effect	Total CKFTA-Induced Effect	Total CKFTA-Induced Effect (%)	Technique Effect (%)
GHG Emissions (kilo tonnes)	35.8	8.4	44.2	0.006	-13.4
Energy Use (terajoules)	530.8	-2,439.5	-2,439.5	-0.018	-11.8
Water Use (millions of m ³)	1.9	-8.9	-7.0	-0.018	N/A

A. Framework for the Quantitative Assessment

The assessment is carried out based on the estimated economic impact derived from economic modelling. The estimated economic impact is linked to the data from Statistics Canada's Canadian System of Environment and Resources Accounts and Environment Canada's National GHG Inventory to track the environmental changes in Canada resulting from expanding trade and investment under the CKFTA.

The CGE model

A quantitative analysis of the economic effect that would be derived from a CKFTA was conducted using a computable general equilibrium (CGE) model of global trade. The type of CGE model used for this analysis is the Global Trade Analysis Project (GTAP) model developed and supported by Purdue University, USA⁵. This model, which is publicly available, runs on a data set that integrates data on bilateral trade flows, trade protection and domestic support, together with national input-output tables that describe the inter-industrial linkages in each economy. This allows the model to generate estimates of the impact of trade policy changes, such as preferential tariff elimination under free trade agreements (FTAs), on trade flows, the level of national economic output (gross domestic product), and economic welfare.

The dataset for the model is drawn from the GTAP database Version 8, which contains bilateral trade flows, transport, tariff protections including the ad valorem equivalent of specific tariffs and the tariff equivalent of tariff rate quotas (TRQs), and the structure of the world economy benchmarked in 2007. The estimated GDP and trade gains for the CKFTA derived from modelling are then scaled up to the 2012 level⁶.

Since Canada's key trading partners, the US and the EU, have already concluded and started to implement the Korea-US (KORUS) and Korea-EU (KOREU) FTAs respectively in the absence of the CKFTA, the CKFTA modelling exercise needs to take into account of this policy reality in assessing the size of potential economic gains from the CKFTA. Thus, two scenarios have been proposed for comparisons to determine the size of economic benefits of the CKFTA:

1. assume that both Korea-US (KORUS) and Korea-EU (KOREU) FTAs are fully implemented **without** an offsetting CKFTA;
2. assume that both KORUS and KOREU FTAs are fully implemented **with** an offsetting CKFTA.

The comparisons of these two scenarios will suggest to what extent the CKFTA would offset the losses derived from KORUS and KOREU FTAs and yield additional gains.

The simulations were conducted with the global economy disaggregated into 12 regions: Canada and Korea; Canada's NAFTA partners, the United States and Mexico; the European Union; within Asia-Pacific, China, Japan, Oceania, and South East Asia; South Asia; Latin America; and the rest of the world.

The Environmental Indicators

The environmental indicators used for the analysis include GHG emissions, fossil fuel energy use and water use. The analysis examines the impact of liberalized trade and expanded economic cooperation between Canada and Korea under the CKFTA on these environmental indicators within Canada based on the direct intensity coefficients for GHG emissions and energy use in 2008 and water use in 2009 obtained from Statistics Canada and Environment Canada. All these intensity coefficients have been converted into the GTAP sector categories used in the modelling.

With respect to GHG emissions, the analysis considers both the 2008 level and direct intensity of 3 main GHGs: carbon dioxide (CO₂), methane (CH₄) and nitrous oxide (N₂O). The measured level of emissions is in kilo tonnes of carbon dioxide equivalent (kt CO₂ eq.) and the intensity is measured in kilo tonnes of carbon dioxide equivalent per million dollars of output (kt CO₂ eq./\$1,000,000). The emissions sources consist of 10 different fuel types: coal, natural gas (excl. liquefied), motor gasoline, aviation fuel, diesel oil, light fuel oil, heavy fuel oil, liquid petroleum gases (incl. natural gas), electric power and

coke.

Concerning energy use, the analysis is based on both the 2008 level and direct intensity of energy use associated with the production of a group of products including coal, natural gas (excluding liquefied), motor gasoline, aviation fuel, diesel oil, light fuel oil, heavy fuel oil, liquid petroleum gases (incl. natural gas), electric power, and coke. Energy has been measured in terajoules (TJ), and the intensity is measured in terajoules per million dollars of output (TJ/\$1,000,000).

In terms of water use, the basis is the volume of water use in 2009, which is the latest information currently available, measured in thousands of cubic metres. Water use intensity is measured in cubic metres per dollar of output with the latest data available in 2007.

Evaluation Methods

Three separate mechanisms are used to assess how a change in trade policy can affect the level of pollution and the rate of depletion of natural resources: scale, composition and technique effects.

The **scale effect** occurs if there is an expansion of economic activity and if the nature of that activity remains unchanged, the total level of air contamination as well as water and energy uses must increase.

A **composition effect** captures the change in emissions and depletion resulting from the shifts in the industrial structure of the economy as a result of change in trade policy. When trade is liberalized, countries concentrate their activities to a greater extent in the sectors in which they enjoy comparative advantages and specialization. The net effect of the structural adjustment on the levels of pollution, water use, and energy use depends on whether pollution-intensive, water-intensive and energy-intensive activities expand or contract. Thus, the composition effect on the environment resulting from trade policy change is ambiguous and can only be assessed empirically.

Finally, a **technique effect** is measured because output may not be produced by exactly the same methods subsequent to trade liberalization as it was prior to liberalization. In order to be fully assessed, the environmental impact of the FTA needs to be examined not only on the basis of the environmental technologies and regulations in existence, but also on the basis of the technological evolution that will have occurred when the agreement is fully implemented. For example, emissions per unit of production output can decrease for the following reasons:

- Higher energy prices induce an adoption of energy efficiency and conservation measures;
- New capital formation during the FTA implementation period would result in a lower emission level than the existing capital stock as new capital is typically cleaner and more efficient than existing capital stock;
- Increased trade will also facilitate the transfer of modern and clean technologies among trading partners, which will reduce the cost of such technologies and increase their availability. This would help to reduce harmful emissions and improve energy and water conservation; and
- The development of more stringent pollution standards and greater enforcement of existing anti-pollution laws and regulations may also lead to better environmental outcomes.

Overall, the net impact of an FTA on the environment is determined by these three competing mechanisms, with each having its own unique value: the scale effect (negative impact), the composition effect (ambiguous impact), and the technique effect (positive impact). The scale and technique effects tend to work in opposite directions, while the composition effect depends on whether emission-intensive sectors expand or shrink. The overall impact of trade will depend on the magnitude or strength of each of these three effects.

Limitations on Economic and Environmental Modelling

The modelling results should be considered in the context of both the advantages and limitations of the model. Several cautionary notes are provided concerning the interpretation of the reported environmental impacts.

Quantitative assessment of the environmental impact of the CKFTA is undertaken based on Canada's estimated economic impacts. Consequently, the environmental assessment conducted in this report inherits the limitations of the economic modelling.

1. The analysis mainly considers the impact of tariff elimination on merchandise trade and only partial liberation in services⁷. The existing modelling framework cannot adequately take into account the breadth of changes resulting from modern FTAs. For example, the concluded Agreement covers a wide range of issues, including trade in goods, rules of origin, customs procedures, trade facilitation, non-tariff measures, cross-border trade in services, financial services, temporary entry, investment, government procurement, competition, intellectual property, e-commerce, labour and environment, dispute settlement and institutional provisions. Quantification of many of these policy changes is not currently possible for the purposes of this study.
2. In addition to direct economic impacts of tariff reduction, the additional features of FTAs such as investment and trade facilitation among others should have an impact on trade in goods, over and above that resulting from tariff elimination. For example, trade facilitation reduces non-tariff costs of market access. Similarly, given complementarities between investment and goods trade, measures to liberalize investment should induce a stronger response of goods trade to an FTA than tariff considerations alone would indicate.
3. FTAs have been suggested to have galvanizing effects on business behaviour; that is, the political commitment and the non-tariff facilitative aspects of an FTA can provide extra inducement to business to commit the resources to take advantage of the new market opportunities⁸.

4. The CGE model can reflect only the expansion of trade in products already traded in the bilateral relationship, and cannot predict the creation of trade in new products areas, which is particularly important when the existing trade relationships is relatively shallow, as in the case between Canada and Korea.

In light of these limits to the modelling exercise, the estimated increase in bilateral merchandise trade cannot fully capture the estimated impacts. As a result, the estimates provided by this analysis should be seen as an approximation of potential gains from this trade agreement.

With respect to the environmental modelling, there are a few cautionary notes concerning the interpretation of estimation results. These cautionary notes are similar to those noted in past environmental modelling exercises.

1. The report provides an assessment of the environmental impact resulting from increasing economic activities under the FTA, but it fails to capture direct emissions in Canadian households resulting from changes in the consumption pattern as a result of the FTA. The report reflects the changes in the production pattern only.
2. This study separates economic modelling from environmental modelling. The shortfall of this approach is that it fails to take into account the change in emission intensity (emission per unit of output) that could result from the implementation of the FTA. The pre- and post-FTA emission intensity may not be the same. The removal of barriers could affect firms' choices of production inputs (domestic vs. foreign or less fuel efficient vs. more fuel-efficient), resulting in different emission intensity.
3. The technique effect reported in this study represents the on-going progress of environmental quality in Canada independent of the FTA. This technique effect is different from the feedback effect (sometimes also called "the technical effect" in the environmental assessment literature) in the sense that the improvement in income as a result of the FTA could translate into greater demand for environmental quality, leading to lower emission intensity. However, there is no compelling reason to believe that such a "technical effect" (or feedback effect) would be significant given the limited income gains under the FTA relative to the size of the Canadian economy.
4. The results of the environmental modelling reflect the impacts based on the three indicators used in the analysis, and does not capture the breadth of environmental issues that could occur as a result of an FTA.

B. The Simulation Results of the Economic Modelling

B1. GDP impacts

The KORUS and KOREU FTAs came into force in 2012 and 2011, respectively. Our analysis shows that in the absence of an offsetting CKFTA to put Canadian producers on an equal footing with their EU and US competitors, these two agreements would continue to significantly erode Canada's competitive position in the Korean market. Specifically:

- Canada's GDP losses as a result of the KORUS and KOREU FTAs are estimated at \$1.6 billion.

An offsetting CKFTA would put Canadian producers on an equal footing in the Korean market:

- The total GDP gains associated with an offsetting FTA with Korea would be \$1.7 billion. Therefore, a CKFTA would allow Canada to recoup all the GDP losses and yield additional GDP gains of \$118 million.

B2. Trade impacts

The model projects that without an offsetting CKFTA, Canada's trade with all three markets (Korea, the EU and the US) declines following the implementation of the KORUS and KOREU FTAs. The expansion of EU-Korea and US-Korea trade would result in a displacement of US and EU trade with Canada, with the US market effect being the most significant. In particular, Canadian auto exports to the US would decline as increased US auto imports from Korea displace imports from Canada.

An offsetting CKFTA, once implemented, would also offset Canada's export losses in the Korean market and transform the net losses in exports into net gains. Canadian exports to Korea would increase by \$1.7 billion, or 32 percent, while imports from Korea would increase by \$1.4 billion, or 21 percent.

Two-way bilateral trade of goods and services is expected to expand by \$3.2 billion, or 25 percent; of which \$2.4 billion comes from an increase in merchandise trade and US\$0.8 billion comes from an increase in services trade.

B3. Output Impact

The prospective shift in the trade pattern under the CKFTA would give rise to a reallocation of resources across sectors according to each country's comparative advantages and specialization. It is those changes in output at the sector level that serve as a basis for the CKFTA's environmental impact assessment presented below.

Using the 2008 output data from Statistics Canada, the analysis applied the percent changes in output to obtain the post-liberalization output for each sector of the Canadian economy. Overall, total Canadian production or output is projected to increase by 0.005 percent.

C. Results of the Environmental Assessment

This section reports the results of the environmental assessment based on the estimated output changes from the economic modelling and the intensity coefficients for GHG emissions, fossil fuel energy use, and water use in Canada provided by

Statistics Canada and Environment Canada.

C1. Greenhouse Gas (GHG) Emissions

To determine the GHG emissions that result from the CKFTA, the actual 2008 direct intensity of carbon dioxide (CO₂) equivalent was applied to the changes in Canadian output between the pre- and post-FTA periods for 5 Canadian sectors. In terms of GHG emission intensity, the extraction sectors have the highest emissions per million dollars of production output of all 5 sectors, followed by agriculture, and fishery & forestry. The final outcome of emissions in Canada as a result of the CKFTA would be a mixed result of changes in the industrial composition (the composition effect) and an expansion of economic activities (the scale effect).

The scale effect is calculated by comparing the differences in GHG emissions between pre- and post-FTA periods holding the structure of the Canadian economy at the pre-FTA level. The estimated results show that the expansion of economic activities in Canada under the CKFTA leads to a net increase in CO₂-equivalent emissions by only 36 kilo tonnes via the scale effect, which is extremely small considering Canada's annual greenhouse gas emissions of 704,426 kilo tonnes.

The composition effect is calculated by comparing the differences in GHG emissions between the pre- and post-FTA periods holding the level of economic activities at the pre-FTA level. The agricultural sector is singled out to have the most significant increase in emissions of 229 kilo tonnes; however, the increased emissions in agriculture would be largely offset by the decline in emissions in other sectors. As a result, the net composition effect of the CKFTA is only 8 kilo tonnes. This increases the total GHG emissions from 36 kilo tonnes (based on the scale effect calculation) to 44 kilo tonnes. Compared to Canada's annual GHG emissions of 704,426 kilo tonnes of CO₂ equivalent in 2008, the increase in emissions under the FTA represents only 0.006 percent of total GHG emissions in Canada. Therefore, the potential negative impact arising from the Canada-Korea FTA on Canada's overall environment is minor.

Finally, it is important to consider the technique effect that represents a general upward trend of environmental quality in Canada, which is independent of the CKFTA, resulting from an adoption of better environmental technology and better enforcement of environmental regulation and increase in trade in environmentally friendly products and technologies over the implementation period of the CKFTA. It is expected that the emission intensity measured by the amount of pollution generated per unit of output would decrease as a result of this technique effect. A failure to take into account the technique effect would overstate the environmental impact of the CKFTA.

The projected GHG intensity provided by Environment Canada from 2008 to 2020 was used to determine how the technique effect could mitigate the potential negative impact of the CKFTA on the environment in Canada.⁹ The projected emission intensities in 2008-20 are from Environment Canada's Energy-Economy-Environment Model for Canada (E3MC).¹⁰ Using the projected emission intensity to estimate the technique effect, it can be seen that this effect has a positive impact on the environment in Canada by decreasing GHG emissions by 13.4 percent. The most significant improvements come from the sectors of manufacturing (-16.8 percent), and services (-13.7 percent).

Overall, the three effects, considered separately, bring about the following impacts on GHG emissions in Canada: a CKFTA induced scale effect of 0.005 percent, a CKFTA induced composition effect of 0.001 percent, and a technique effect of -13.38 percent that represents the on-going reduction in intensity that is independent of the CKFTA.

C2. Energy Use

In terms of the intensity of energy use, the extraction sector has the highest terajoule use per million dollars of production, followed by manufacturing and fishery & forestry. The increase in economic activity resulting from the CKFTA would increase Canada's total energy use as outlined in Table 2 (Appendix B).

The total energy use in Canada as a result of the implementation of the CKFTA would increase by 531 terajoules via the scale effect.

As trade between Canada and Korea becomes freer, the Canadian production pattern shifts, which, in turn, has an effect on the energy use in Canada (via the composition effect). The sector that is expected to increase the energy use is the agriculture sector. This sector would increase the energy use by 1,088 terajoules. However, the increase in the energy use in agriculture would be completely offset by the decline in energy use in other sectors. Overall, the structural shift under the CKFTA is favourable for energy conservation in Canada, resulting in a decrease in energy use by 2,440 terajoules. As a result, the total energy use under the CKFTA would decline by 1,909 terajoules. This represents a 0.018 percent reduction in Canada's total energy usage of 10,612,484 terajoules in 2008.

This study used the data provided by Environment Canada from 2008 and 2020¹¹ to determine the technique effect that would accrue from the expanded economic activities under the CKFTA.

The estimation shows that technological improvements in energy conservation would give rise to a decrease in energy usage of 11.8 percent in the overall economy. Most energy saving comes from services (-14.6 percent) and manufacturing (-13.1 percent), while the extraction sector would be the only sector that is expected to increase the energy use by 22.6 percent.

Overall, the three effects, considered separately, bring about the following impacts on energy use in Canada: a CKFTA induced scale effect of 0.009 percent, a CKFTA induced composition effect of -0.03 percent and a technique effect of -11.8 percent on top of the scale and composition effects.

C3. Water Use

For water use, the key data sources come from Statistics Canada's 'Water use in Canada, by sector' that provide measures of water use required for per unit of economic output. Here, water use refers to the water use for agricultural, industrial and municipal purposes including irrigation in agriculture, rain in agriculture and forestry and hydroelectric power generation. The sectors found to be water-intensive were services, manufacturing and agriculture. The data for water use in fishery & forestry is currently unavailable.

The total water use for the Canadian economy would increase by 1.9 million m³ via the scale effect as a result of the CKFTA.

Further, the shift in the economic structure in Canada as a result of the CKFTA could result in lower water use. The increase in water use in agriculture would be offset by the decline in water use in other sectors. Overall, the increased water use results in a net decrease in water usage of 8.9 million m³ via the composition effect.

Overall, the increasing economic activities resulting from the CKFTA would reduce Canada's total annual water use by 7.0 million m³. This represents a 0.018 percent decline of Canada's annual water use of 38.8 billion m³ in 2009.

The technique effect for water use could not be estimated due to the absence of projected data. The water use for the whole economy is thus characterized by a scale effect of 0.005 percent and a composition effect of -0.023 percent for a total overall decrease of 0.018 percent (-7 million m³).

D. Conclusion of the Quantitative Analysis

The analysis concludes that the net impact of increased bilateral trade with Korea on Canada's environment would be characterized by only minor increases in GHG emissions, and lower energy and water use. The overall effect on Canadian greenhouse gas emissions is projected to be negligible. Further, the projected increase in emissions is on par with the pace of production expansion under the CKFTA, which indicates that the CKFTA is not expected to lead to a shift toward a structure with higher levels of emissions. Thus, this quantitative assessment concludes that there is little likelihood of major environmental impacts on Canada as a result of the CKFTA. Moreover, environmental impacts could be mitigated by the provisions in place in the Environment Chapter.

VII. Updated Qualitative Analysis of Environmental Impacts

Korea is Canada's 7th-largest trade partner; thus an increase in trade flows between the two nations would have a certain amount of economic impact as indicated in the previous section. As a result of increased trade, the likely environmental impacts of such changes and their effect are approximated and assessed in this section as to their significance. This study uses the following scale in relation to the criteria outlined above to describe significance: none, minor, moderate, high and extreme. Canada maintains a strong regulatory framework with sophisticated federal, provincial and territorial environmental oversight regimes, which can serve as a mitigating factor to potential increases in production or consumption. Canada has in place numerous policy initiatives (highlighted in Section VIII) that monitor or track environmental impacts. Under the CKFTA, Canada, as it has done in all previous FTAs, fully maintains its right to regulate in the public interest in sectors such as health, public education, social services and culture, and its right to protect the Canadian environment. Accordingly, the implementation of the CKFTA will not impact Canada's ability to maintain its robust environmental management framework. Moreover, environmental impacts can be mitigated by the provisions in place in the Environment Chapter. (This will be discussed in the next section: Enhancement and Mitigation Options.)

As evidenced through the Initial EA, Canada's policy is to negotiate environment provisions which aim to ensure that liberalised trade, protection and conservation of the environment are mutually supportive. The Environment Chapter negotiated under the CKFTA includes provisions which aim to maintain high levels of environmental protection, by effectively enforcing environmental laws and not waiving or derogating from such laws to promote trade or investment; ensuring transparency and public participation in the making of such laws; and, establishing a framework for cooperation in areas of mutual interest.

For the purpose of this EA, "environment" refers to the components of the Earth, including land, water, air, including all layers of the atmosphere, all organic and inorganic matter and living organisms and the interacting natural systems that include components of the foregoing. This section is intended to highlight the anticipated incremental environmental impacts in Canada as a result of the CKFTA. Table 2 below presents the findings of the scoping exercise for each issue area (and corresponding FTA chapter) that were identified as not requiring in-depth analysis for the purposes of this Final EA. A more detailed analysis of trade in goods, services, investment and government procurement is then provided. Within each category, possible environmental impacts of the CKFTA are identified.

Table 2: Results of the Final EA Analysis

CKFTA Chapter	Negotiated outcome	Estimated environmental implications
Preamble	The Preamble includes aspirational (non-binding) statements that summarize the overall spirit of the Agreement and refer to the Parties' ongoing commitment to sustainable development, the	By underscoring the Parties' commitments to environmental stewardship, these statements may have indirect positive effects.

	effective enforcement of environmental laws and cooperation on environmental matters.	There are no foreseen direct environmental impacts on Canada.
Initial Provisions and General Definitions	<p>This chapter includes provisions regarding the establishment of the free trade area; the relation to other agreements, including multilateral environmental agreements (MEAs); the extent of obligations; cultural cooperation; and, general and country-specific definitions.</p> <p>The provision on the relationship between the CKFTA's obligations and MEAs ensures that Parties are able to fulfill MEA obligations without facing trade challenges.</p>	<p>By underscoring the Parties' commitments to MEAs, these provisions may have indirect positive effects.</p> <p>The provisions do not require changes to Canada's domestic policy, and therefore no direct environmental impacts are expected.</p>
Transparency	This chapter sets out obligations for transparency and procedural due process in administering the rules of the CKFTA. In the chapter, the Parties also agree to cooperate to promote transparency.	There are no foreseen environmental impacts as a result of these commitments
Institutional Provisions and Administration	This chapter provides a framework for the overall management of the CKFTA, including the establishment of a joint commission that oversees and facilitates the implementation and application of the Agreement.	There are no foreseen environmental impacts as a result of these commitments.
Exceptions	<p>This chapter sets out exceptions to the commitments of the CKFTA to ensure that Parties maintain the right to take measures necessary to ensure the protection of national security, human, animal, plant life or health, or relating to the conservation of natural resources.</p> <p>It also includes exceptions for measures related to cultural industries and taxation.</p>	<p>By underscoring Parties' already existing rights and obligations, including those relating to the protection of the environment, these provisions may have an indirect positive effect.</p> <p>There are no foreseen direct environmental impacts as a result of these provisions.</p>
Final Provisions	This chapter sets out the final provisions of the CKFTA, including provisions regarding entry into force, amendment and termination and withdrawal.	There are no foreseen environmental impacts as a result of these commitments.
Rules of Origin (ROO)	<p>This chapter provides ROO that are clear, as simple as possible, and leave little room for administrative discretion.</p> <p>The ROO are sufficiently robust to ensure that only to goods qualifying as originating in the territory of either or both countries may benefit from FTA tariff concessions.</p>	<p>Robust ROO and related administration can deliver commercial and environmental benefits by reducing costs and delays to traders, while minimizing the environmental impacts relating to the movement of goods through increased transportation efficiencies, promotion of paperless environments, and other mitigating factors.</p> <p>As the ROO serve to ensure that only goods qualifying as originating benefit from the FTA, production and consumption changes resulting from the trade of such goods will be captured in the Trade in Goods section below, along with their corresponding environmental impacts.</p>
Origin Procedures	Origin Procedures: The objective of such	The Origin Procedures and Trade

and Trade Facilitation	<p>procedures is to ensure that the rules of origin are administered in a fair and transparent manner by the customs administrations and to provide the trading community with the means in which to take advantage of the preferential tariff treatment afforded under the trade agreement.</p> <p>Trade Facilitation: The objective of these measures is to reduce transaction costs through the modernization, simplification and standardization of trade procedures.</p>	<p>Facilitation chapter outlines administrative procedures that Canada Border Services Agency and the Korean Customs Service will make use of. Their aim is to reduce transaction costs for traders through the modernization, simplification and standardization of trade procedures and to streamline the procedures required to verify whether the goods meet the applicable Rules of Origin.</p> <p>There are no foreseen environmental impacts as a result of these commitments.</p>
Sanitary and phytosanitary measures (SPS)	<p>This chapter affirms the Parties rights and obligations under the WTO <i>Agreement on the Application of Sanitary and Phytosanitary Measures</i> (SPS Agreement) and provides for the continued use of the WTO dispute settlement procedures for any formal disputes that arise between the Parties regarding SPS measures. In addition, the Chapter establishes an SPS Committee with the objectives of enhancing each Party's implementation of the SPS Agreement, enhancing cooperation and consultation on SPS matters, and minimizing negative effects on trade between the Parties, in order to avoid disputes.</p>	<p>As provided in the WTO SPS Agreement, both Parties maintain the right to adopt SPS measures necessary for the protection of human, animal or plant life or health, provided that such measures are not inconsistent with the provisions of the Agreement. As also provided in the WTO SPS Agreement, both Parties are required to ensure that any SPS measures are applied only to the extent necessary to protect human, animal or plant life or health, are based on scientific principles, and are not maintained without scientific evidence except as otherwise provided for in the Agreement.</p> <p>As the CKFTA SPS Chapter establishes no new rights and obligations beyond what Canada has already agreed to under the existing WTO SPS Agreement, there are no foreseen environmental impacts as a result of these commitments.</p>
Standards related measures	<p>This chapter incorporates the key commitments made under the WTO Technical Barriers to Trade Agreement (TBT Agreement); promotes greater cooperation in the field of standards-related measures; addresses horizontal transparency issues, including notifications and participation in consultation processes; sets out commitments relating to automobile standards, including Korean acceptance of Canadian vehicles built to key US and EU standards; and establishes a mechanism to provide direction on identification, management, and resolution of standards-related measures issues to avoid disputes.</p>	<p>The chapter aims to eliminate technical barriers to trade by improving cooperation and transparency.</p> <p>The CKFTA standards-related provisions aim to ensure unjustified non-tariff measures do not hinder market access gains and will facilitate our exports. As such, they aim to contribute to an environment where companies can benefit from the FTA.</p> <p>These provisions will enhance market access, but are not likely to have a significant impact on the environment.</p>
Trade Remedies	<p>This chapter seeks to protect domestic producers from difficulties associated with unfair trade and sudden surges in imports.</p> <p>No significant changes to production or consumption are expected as a result of this chapter.</p>	<p>There are no foreseen environmental impacts as a result of these commitments.</p>
Financial services	<p>The financial services provisions of the CKFTA will help protect existing investments and encourage further competition in the financial sector. However, it also recognizes the critical role that financial</p>	<p>The CKFTA Financial Services Chapter contains rights and obligations in line with what Canada has already agreed to under past FTAs. There are no significant</p>

	institutions play in the economy. The agreement, therefore, includes special dispute settlement rules for financial services and protects governments' right to take prudential measures to protect the stability and integrity of the financial system.	foreseen environmental impacts as a result of these commitments.
Cross Border Trade in Services (CBTS)	This chapter includes rules that provide for improved market access, transparency and predictability for Canadian service providers.	The CKFTA CBTS Chapter contains rights and obligations that are in line with Canada's current FTAs and reflect existing regulatory practices. Any environmental impacts (e.g., increased energy use and electronic waste) caused by increased trade in services would be indirect and minor, and are expected to be mitigated by increases in environmentally sustainable practices in the services sector.
Telecommunications	This chapter includes rules to ensure that the terms and conditions for access to and use of public telecommunications transport networks and services do not impede the parties' market access commitments under the FTA, and to an open and competitive regulatory regime for telecommunications services.	The CKFTA Telecommunications Chapter contains rights and obligations in line with existing regulatory practices. There are no significant foreseen environmental impacts as a result of these commitments.
Temporary entry	The CKFTA's temporary entry provisions provide new, preferential access to the Korean market, facilitating movement between Canada and Korea for Business Visitors, Traders and Investors, Intra-Company Transferees, Professionals (Contract Service Suppliers (CSS) & Independent Professionals (IP)) and Spouses. The outcome in these negotiations does not significantly change production and consumption patterns in Canada.	There are no foreseen environmental impacts resulting from the normal operation of an office or service facility, including the travel and temporary stay of business persons from Korea to Canada to carry out their work. To the extent that temporary entry and stay of Korean business persons is facilitated, this will not affect how Canadian environmental regulations are developed or implemented or how environmental objectives are set. Moreover, Korean business persons and Korean owned enterprises operating in Canada must adhere to domestic environmental laws and regulations. As such, there are no significant foreseen environmental impacts as a result of these commitments.
Electronic commerce	This chapter includes rules to provide a predictable environment for the conduct of electronic commerce, while preserving the government's flexibility to pursue cultural and other social policy objectives, including the environment.	The CKFTA Electronic Commerce Chapter contains rights and obligations in line with existing regulatory practices. Some minor positive environmental impacts could indirectly result from this chapter as it would facilitate greater use of cross-border communications technologies.
Competition policy	This chapter contains provisions against anti-competitive business conduct, as well as enhanced	There are no foreseen environmental impacts as a result of these commitments.

	cooperation between Canadian and Korean competition agencies.	
Monopolies and state enterprises	This chapter establishes rules disciplining the behaviour of monopolies and state enterprises to ensure that they operate in a non-discriminatory manner and in accordance with commercial considerations. Parties maintain their ability to designate or maintain a monopoly or state enterprise.	The CKFTA Monopolies and state enterprises Chapter contains rights and obligations in line with what Canada has already agreed to under past FTAs. There are no foreseen environmental impacts as a result of these commitments.
Intellectual property	The Intellectual Property (IP) Chapter contains provisions that aim to protect and enforce the rights of IP rights holders. The IP provisions are all consistent with Canadian law and policy.	There are no significant foreseen environmental impacts as a result of these commitments.
Dispute settlement	This chapter includes a state-to-state dispute resolution procedures with Korea based on the dispute settlement provisions of the NAFTA, but simplified and improved where possible. This Chapter also includes an accelerated dispute settlement procedure for automobiles.	There are no foreseen environmental impacts as a result of these commitments.
Labour	<p>This chapter commits Canada and Korea to effectively enforce their domestic labour laws that must in turn reflect international labour standards, including those found in the International Labour Organization (ILO) 1998 Declaration on Fundamental Principles and Rights at Work; and minimum employment standards, prevention and compensation for occupational health and safety, and non-discrimination in respect to migrant workers.</p> <p>The above-mentioned obligations can be taken through the dispute resolution mechanism provided for in the chapter to ensure compliance. Such mechanism may result in the obligation for the non-compliant country to pay financial penalties.</p>	There are no foreseen environmental impacts as a result of these commitments.
Environment	<p>Provisions of the Environment Chapter underscore the Parties' commitment to pursue policies that promote sustainable development and sound environmental management. Consistent with Canada's usual FTA approach, the provisions reinforce the mutual supportiveness of trade and environment policies by including commitments to foster good environmental governance.</p> <p>Provisions aim to maintain high levels of environmental protection, by effectively enforcing environmental laws and not waiving or derogating from such laws to promote trade or investment; ensure transparency and public participation in the making of such laws; and establish a framework for cooperation in areas of mutual interest. The Environment Chapter also includes provisions affirming commitments to Multilateral Environment Agreements (MEAs) Canada and Korea have ratified, as well as promoting trade and investment in environmental goods and services. Furthermore, the Parties commit to respond, in a timely manner, to inquiries from the public on matters respecting the</p>	<p>These commitments will ensure, inter alia, that Parties maintain their ability to set their own environmental priorities, to establish their own domestic levels of environmental protection and to adopt or modify relevant environmental laws and policies.</p> <p>There may be positive environmental impacts as a result of these commitments.</p>

implementation of the Chapter.

The Agreement establishes an Environmental Affairs Council responsible for implementing environment obligations and includes an environment chapter-specific dispute resolution process to address any questions regarding compliance, including review by an independent panel of experts whose recommendations will be made publicly available.

Trade in Goods

1. Exports

(a) Agriculture

The Initial EA identified that the most significant changes in agricultural production are: changes that affect land use (e.g. crop-land under summerfallow, use of marginal lands), and changes in livestock numbers. Whereas, there could potentially be some impact on groundwater aquifers and surface waters, depending on the location and the scope of change in agricultural activity, Canada has in place many laws and regulations at various levels of government to protect water from pollution from many sources, including agriculture. In addition, Canada has several programs underway directly targeted at further promoting an environmentally responsible agriculture sector (details on this activity are available under the "mitigation" section of this document).

Agricultural production is expected to increase only marginally given that, overall, the CKFTA will eliminate agricultural tariff lines in a gradual manner. It is also likely that such increases would occur primarily in regions where production is currently focused, i.e. in the Prairie region for crops and Alberta, Ontario and Quebec for livestock. Canada's agricultural production is of relatively low intensity and thus, a slight increase in the domestic production in order to supply the Korean market would not cause significant environmental impact.

(b) Fish and seafood products

While tariff elimination could encourage more exports, Canada's fisheries resources would continue to be subject to a robust fisheries management regime, which encompasses, among other conservation measures, limits in the form of Total Allowable Catches for fisheries, the use of a precautionary approach, and sound science, all of which would continue to inform fisheries management decisions and ensure that fisheries resources are harvested at sustainable levels. Accordingly, the CKFTA is not expected to have a significant impact on Canada's fish stocks.

(c) Wood, wood products and paper products

The forest products industry, which includes forestry, wood products and pulp and paper products, contributes to greenhouse gas (GHG) emissions, air pollutants, and water effluents and those releases are controlled through regulations. Canada has developed risk management instruments in order to minimize or eliminate the risk associated with the manufacturing of goods from the sector.

The elimination of restrictive tariff barriers for softwood lumber (wood products) and other wood building materials may increase Canadian exports. It is expected that increasing forest product manufacturing would have limited environmental impacts due to the efficiency of the mitigation measures in places; and due to the possibility that some existing exports to other countries could be diverted to Korea.

Canadian pulp and paper products already enter Korea duty free so an FTA is not expected to increase exports.

(d) Industrial Goods

The manufacturing of industrial goods may have an impact on the environment through the use of energy and hazardous substances and generation of waste, wastewater and airborne pollutants. Possible negative impacts on the environment include the potential to disturb sensitive ecosystems, pollute the local water and air; and contaminate soils. However, with proper environmental protection and planning mechanisms, adverse impacts on the environment can be minimized. In addition, positive impacts may occur by improving access to environmental goods and technologies that advance the objectives of sustainable development in certain industries.

Metals and minerals

Extraction of metal and mineral products, which make up a large portion of Canada's exports to Korea, is an intensive type of land use with potential for environmental impact over a limited area. That being said, current Korean duties on metals and minerals are already relatively low and non-tariff barriers are not impeding market access for Canadian exports. Given the current low tariff rates on these products, while there may be an increase in demand for minerals exports, it is unlikely that substantially increased mining activity would result.

2. Imports

(a) Consumer electronics and consumer durables

In general, consumer electronic products do not pose risks to consumers when used properly. However, Environment Canada recognizes that end-of-life electronic equipment is a growing domestic and global waste concern as e-waste may contain toxic and hazardous substances (such as mercury, lead and brominated flame retardants) that could pose risks to human health and the environment, if managed or disposed of improperly. Canada imported an average of over 290 thousand units of consumer electronics goods between 2011 and 2013.

According to a report prepared for Environment Canada by RIS International in 2003, e-waste accounts for less than 1 percent of the Canadian waste stream. The report projected that approximately 224,000 tonnes of e-waste was generated in 2010. According to the Statistics Canada 2010 Waste Management Industry Survey: Business and Government Sectors, companies and local waste management organizations reported that 24,367 tonnes of electronic waste was prepared and sent for recycling across Canada in 2008 (up 47 percent from 2006). The amount of Canadian e-waste recovered for recycling is expected to increase as provincial and territorial extended producer responsibility and stewardship programs for e-waste emerge and/or mature. Electronics Product Stewardship Canada reported in 2013 that Canada's provincial electronics stewardship programs have diverted roughly 360,000 tonnes of electronics from landfill since their inception.

The CKFTA is not likely to increase Canadian consumption of consumer electronics. A decrease in the price of Korean goods might displace imports from other countries and/or lead to a modest downward pressure on price for consumer goods in general. In either case we would not expect to see a measurable increase in Canadian consumption of consumer electronics. In the unlikely event that an increase does occur, systems are in place to ensure responsible waste management. It is therefore estimated that even if there were an increase in the volume of consumer electronics waste, it would be mitigated by appropriate mechanisms that already exist.

(b) Motor Vehicles

The impact of the agreement on motor vehicle sales and use is likewise expected to be minimal. While tariff elimination is likely to lead to some increase in sales of Korean vehicles in Canada, most are expected to displace other imports rather than increase the volume of cars on Canadian roads. Therefore, it is expected that this will have very little impact on the environment.

Vehicles imported into Canada from Korea would continue to be subject to the same federal vehicle air pollutant and GHG emission standards as vehicles imported from other countries and vehicles manufactured in Canada for sale in Canada. From this perspective, any potential increase of Korean imports resulting from the FTA is unlikely to impact the overall emission performance of new vehicles offered for sale in Canada. It should also be noted that the increase in Korean imports is expected to displace other imports in the same class that have a comparable emission performance, which also contributes to the expected minimal effect, if any, on air emissions.

(c) Other Industrial

As with other sectors, increases in imports of other industrial goods from Korea are likely to displace imports from other sources rather than raising the level of consumption within Canada. As a result, very little incremental impacts on the environment are expected.

Trade in Services

No changes to Canada's services regulatory regime will result from the entry into force of the CKFTA. It is difficult to segregate any changes in services imports from Korea as a result of the agreement from other factors, such as autonomous liberalization. The CKFTA will however provide Canadian service suppliers with greater and more predictable access to the dynamic Korean market, which will support continued growth of trade in services between the two countries.

Any environmental impacts that could result from increased trade in services (both positive and negative) would likely be indirect. For example, any growth in the services industry as a result of the CKFTA could increase the demand for the goods essential to this industry (such as paper and computers) and the consumption of energy for heating, lighting and equipment use. In addition, most cross-border services that would benefit from the CKFTA would likely be in virtual areas (i.e. those without a physical component, such as professional advice), with less likelihood of negative environmental impacts. In sectors such as telecommunications services and e-commerce, positive environmental impacts may be achieved as more environmentally sustainable goods and services are adopted. For example, in sectors such as telecommunications services and electronic commerce, positive environmental impacts can be anticipated through greater use of cross-border communications technologies (i.e. the internet/email, fax, teleconference, and videoconference) and by facilitating virtual transactions of goods and services. In any case, environmental impacts – whether positive or negative – are expected to be very minor.

Investment

The likelihood and significance of environmental impacts related to investment will depend on the degree of increase in investment, the sectors of the investment, and the measures in place to protect the environment in relation to those activities. The inclusion of an Investment chapter is not expected to have a significant environmental impact.

As noted above, Korea's stock of investments in Canada is modest relative to total investment. While over the long term the investment provisions will contribute to a favourable business climate conducive to growth of two-way investments, increases

in investment will depend on, inter alia, investors' individual assessments of the opportunities and risks. The CKFTA will result in an improved bilateral investment framework, but large changes in investment patterns are not expected to result from the FTA. Therefore, it is expected that the environmental effects of the investment chapter of the CKFTA will be minimal.

In addition, in the Investment chapter, the Parties recognize that it is inappropriate to encourage investment by relaxing domestic health, safety or environmental measures. In the event that a Party offers such encouragement, the other Party may request consultations.

The following is based on existing information regarding potential environmental impacts associated with the mining, manufacturing, and trade, retail, transport and warehousing sectors, all sectors in which Korea has a demonstrated interest in investing in Canada.

a. Mineral Resources (Mining)

Each stage of the mineral production process (exploration, extraction, processing, closure, and abandonment) has the potential to have negative environmental impacts (e.g., air emissions, water contamination and sedimentation, soil contamination, and habitat destruction). The geographic scale of these impacts will vary from local (e.g. soil contamination, habitat destruction) to global (e.g. air emissions of greenhouse gases and transboundary air pollutants such as particulate matter, sulphur oxides and nitrogen oxides), and will depend on the mitigation and prevention measures that are used by the company.

b. Manufacturing (Oil and Gas)

Korea is one of the world's leading energy importers and relies on imports to meet 97% of its energy demand. Its oil refining industry is dependent on crude oil imports to supply its refineries. Korea is the second-largest importer of liquefied natural gas in the world. This presents new opportunities for Canada to become a more important supplier of energy to Korea, including crude oil and liquefied natural gas, and vis-à-vis possible new Korean investments. Korea, through its own state enterprises, is already participating in LNG projects. Moreover, foreign investors in Canada are bound by the same environmental regulations that govern the activities of domestic investors. Given these considerations, no significant environmental impacts are anticipated.

c. Trade, Retail, Transport and Warehousing

This important sector of the Canadian economy will grow with the implementation of the CKFTA and possible incoming Korean investment, but the environmental impact is expected to be minimal. The environmental impacts will be limited to a small increase on the daily operations and emission of handling of merchandise, which is a result of a light increase of Trade, Retail, Transport and Warehousing operations with Korea. As well, foreign investors in Canada are bound by the same environmental regulations that govern the activities of domestic investors.

Potential Regulatory Impacts

Foreign investors in Canada are bound by the same environmental regulations that govern the activities of domestic investors. Canada, as it has done in all previous investment agreements, fully maintains its right to regulate in the public interest in sectors such as health, public education, social services and culture, and its right to protect the Canadian environment. The Investment chapter does not require Canada to change its environmental standards and regulations. Therefore, no environmental impacts are foreseen as a result of these commitments.

Government Procurement

This chapter of the Agreement expanded on the commitments Parties made under the WTO Agreement on Government Procurement by providing enhanced market access to each other's central government procurement market. While the enhanced market access provided in the Canada-Korea FTA in the area of government procurement will generate additional opportunities for Canadian and Korean companies, any increase in participation by Korean firms in Canadian government procurement is expected to be modest. Moreover, the Chapter adopts rules set out in the newly revised WTO Government Procurement Agreement. Accordingly, the federal government is not required to modify any procurement procedure or practice as a result of the FTA. Government entities continue to be able to adopt and maintain procurement requirements and policies necessary to protect the environment. Given these factors, no significant environmental impacts are foreseen as a result of additional government procurement commitments.

VIII. Enhancement and Mitigation Options

Previous sections of this analysis have assessed potential environmental impacts on Canada of the FTA. This stage of the framework is intended to identify the policy options or actions to mitigate any negative impacts and to enhance positive impacts.

Canada has consistently demonstrated a high degree of concern for, and protection of the environment. Canada's FTAs do not compromise the environmental protection measures that Canada has implemented, and these measures do not exempt foreign service providers and foreign investors from Canadian laws and regulations.

Trade in Goods

(a) Agriculture

The Canadian agricultural industry operates under an elaborate system of risk assessments, financial incentives, federal, provincial and municipal regulations and other initiatives that reduce the environmental risks of increasing agricultural production. Agriculture and Agri-Food Canada (AAFC), in collaboration with provincial and territorial partners, provides research and programming under the *Growing Forward 2* policy framework, to support environmental farm plans and increase adoption of Beneficial Management Practices – practices that sustainably increase productivity and reduce farmer input costs and landscape-levels impacts.

AAFC's Agri-Innovation Program supports research and development that enhances economic growth, productivity, competitiveness, adaptability and sustainability of the Canadian agriculture, agri-food and agri-based products sector. The Program includes the Research Accelerating Innovation stream that consolidates several agri-environmental science initiatives. This stream addresses emerging science-based requirements by generating and providing access to scientific knowledge that helps the industry reduce risks to production, keep pace with sustainability considerations, improve productivity and capture opportunities.

In instances when an FTA results in lower tariffs for agricultural goods, there may be concern that increased trade could lead to increased exposure to agricultural chemicals. Health Canada and the Canadian Food Inspection Agency (CFIA) share responsibility for regulating the food industry to ensure that Canada's food supply is safe. Health Canada registers and regulates agricultural chemicals, including pest control products, veterinary drugs, and food additives. The CFIA is responsible for the monitoring, surveillance, and compliance of chemical hazards including chemical residues in foods and their adherence to the respective legislative framework. For more information on CFIA's surveillance program for chemical/microbiological residues in food, please refer to the following website (<http://inspection.gc.ca/food/chemical-residues-microbiology/eng/1331960432334/1331962151945>).

In addition, with the potential for increased imports from Korea, Canada must maintain its vigilance regarding the prevention of invasive alien species and diseases that could threaten sectors that closely interact with the environment, such as the agricultural sector. For more information on Canada's invasive alien species strategy and partnership program, please refer to the following website (<http://www.ec.gc.ca/eee-ias/Default.asp?lang=En&n=C4637128-1>).

(b) Fish and Seafood products

With regard to aquaculture, Canada's fish management systems and federal, provincial and territorial government measures have been put into place to ensure the sustainability of Canada's fisheries and the environmental integrity of its aquaculture operations so that any increased trade resulting from an FTA will have minimal environmental impact. Therefore, because there are effective environmental management systems and government measures in place, an increase in exports to Korea due to the FTA and tariff liberalization in fish products is not expected to result in a significant negative or positive impact on the sustainability of fish stocks, nor on Canada's marine or freshwater environment.

While various Acts and Regulations define the rules and regulations for both fish harvesting and aquaculture development in Canada, Fisheries and Oceans Canada's (DFO) *Sustainable Fisheries Framework* provides the basis of policy formulation for the conservation and environmental sustainability of Canadian fisheries. Fish stocks are managed through controls on the amount of fishing, with the use of a total allowable catch and effort limitations as the predominant control mechanisms, often complemented by restrictions on effort (e.g. limited entry, vessel and gear restrictions), and/or catch composition (e.g. size and age of fish). DFO develops and implements Integrated Fisheries Management Plans for many fisheries, which integrate conservation, management and scientific objectives for the stock(s) and detail the measures required to conserve and manage the fishery. Controls are subject to regulation and enforcement. Most new and expanded aquaculture sites in Canada are required to undergo an environmental assessment under the *Canadian Environmental Assessment Act*. This Act covers environmental, social and economic effects, all phases of operation, as well as cumulative effects. The Act requires identification of mitigation and monitoring strategies to ensure there are no significant residual negative effects.

Capture fisheries and aquaculture are two areas where environmental impacts are closely managed through federal, provincial, and territorial initiatives. The controls and regulations developed and used by DFO ensure that increased demand for fish and fish products in foreign markets does not automatically result in greater catch quotas, and that stock sustainability is taken into account in all decisions. In addition, provincial and territorial legislation and regulations serve to mitigate certain environmental effects that might otherwise result from increased market access.

Canada adheres to international instruments such as the *United Nations Fisheries Agreement* (UNFA) and the *Convention on International Trade in Endangered Species of Wild Fauna and Flora* (CITES), is a member of regional fisheries management organizations, and is a party to several agreements which collectively serve to manage, conserve and protect fish stocks, and mitigate potential negative environmental impacts.

The overriding goal of fisheries management in Canada is to protect fish stocks by ensuring long-term sustainable use based on sound scientific advice. This is achieved in most fisheries in Canada by setting conservative target levels of fishing mortality (i.e. a percentage of the total stock that may be caught), limiting the capture of fish below a minimum target size, and/or by ensuring that a minimum number of fish escape to spawn. These targets are based on the best scientific advice available and are achieved through regulation and enforcement on the Total Allowable Catch and effort controls (i.e. limits on the number of fishing operations, fishing days and vessel and gear restrictions), as well as the catch composition (i.e. fish

size and age) through some mix of regulations aimed at mesh or hook size, fish length, closed areas and seasons. In the case of Pacific salmon, regulations centre on spawning escapement targets, and for lobster the controls focus primarily on minimum carapace size, supplemented by limited entry (i.e. number of lobster-trapping operations).

With regard to fishing on the high seas, there is currently significant international momentum aimed at strengthening existing regional fisheries management organizations and broadening their mandates to include a wider range of species and ecosystem considerations. This includes the creation of new organizations, where necessary, to cover previously unregulated areas or species, and through support for developing countries in their effort to improve domestic fisheries management and to permit them to become more engaged in international fisheries governance issues. Canada has taken a lead role in this global effort to achieve international ocean governance reform, including through an international conference on high seas governance in May 2005, hosted by Canada.

(c) Wood and wood products

Forestry products are a renewable resource. Forests regenerate, both naturally and through silviculture. Canadian governments at the federal, provincial and territorial levels have taken steps to ensure that our forests are managed in accordance with sustainable development principles. Canada's commercial forest resources are largely managed by the provinces through forest management tenure agreements that strictly regulate harvesting, silviculture and forestry practices. These policies provide for regulatory and audit mechanisms based on sustainable development principles to ensure that timber is not harvested at rates exceeding a forest's capacity to regenerate. Any marginal increase in production in those products on which a tariff would be lowered could be easily accommodated within current forest management programs.

The wood product and pulp & paper manufacturing industries consistently comply with provincial and federal environmental regulatory instruments requirements. Air pollutants from the forest products industry are regulated federally under *Canadian Environmental Protection Act, 1999* and by the provinces generally through permitting process. A wide range of air emission control devices are commonly used in order to meet air quality standards. Water effluents are regulated federally through the *Canadian Fisheries Act* and through the provinces and/or municipal regulation. All Canadian pulp and paper manufacturing facilities are using secondary treatment prior to releasing effluents into the environment. The use of chemical substances by the sector is also subject to Canada's Chemical Management Plan.

At all levels of government, forest policies within this framework ensure that forests are managed in accordance with sustainable development principles. Canada's commercial forest resources are largely managed by the provinces using *forest management tenure agreements* that strictly regulate harvesting, silviculture and forestry practices. These policies further provide for regulatory and audit mechanisms based on sustainable development practices, to ensure that timber is not harvested at rates exceeding a forest's capacity to regenerate. As part of sustainable forest management, less than 1 percent of the managed forest is harvested in any given year in Canada.

(d) Industrial Goods

Consumer Electronics and Consumer Durables

In Canada, the management of waste and recyclable material is a shared responsibility. The federal government regulates international and interprovincial/territorial movements of hazardous wastes and hazardous recyclables. Provincial/territorial governments regulate movements within their own jurisdiction. Provinces and territories are also responsible for establishing controls for licensing waste and recycling generators, carriers and treatment facilities. Collection, diversion (e.g. recycling) and disposal operations for municipal solid waste are generally handled by municipal governments.

Governments across Canada have made commitments supporting extended producer responsibility for e-waste through the Canadian Council of Ministers of the Environment. Currently all provinces have regulations and programs in place to ensure that e-waste is collected for recycling at facilities that undertake sound environmental, health and safety practices. Some companies are also administering voluntary national programs to collect and recycle cell phones (e.g. under the Canadian Wireless Telecommunications Association and Rechargeable Battery Recycling Corporation).

The Government of Canada has recently proposed enhanced controls applicable to e-waste under new and existing regulations, and is working internationally to encourage and establish technical guidance concerning the environmentally sound management of e-waste. As a signatory to the Basel Convention on the Control of Transboundary Movement of Hazardous Waste and Their Disposal, Canada also prohibits the shipment of e-waste considered to be "hazardous" under the Convention across international borders without the prior informed consent of the importing jurisdiction and a permit issued under the Canadian Environmental Protection Act, 1999 and related regulations: the *Export and Import of Hazardous Waste and Hazardous Recyclable Material Regulations*. The Government of Canada also established a strategy to ensure that federal government surplus electronic and electrical equipment undergoes environmentally sound management.

While environmentally sound refurbishing and recycling operations are preferred options over disposing of e-waste in landfills, most licensed landfills across Canada are designed to monitor, collect and treat leachate in such a manner as to protect the environment and human health.

Industry has also responded to the e-waste issue by developing and adopting industry-led approaches and standards related to the environmental performance and impacts of electronics. In Canada, Electronics Product Stewardship Canada publishes an annual report 'Design for Environment' which summarizes a range of such initiatives. The 2013 report, available at epsc.ca, "examines electronics end-of-life issues, including how design changes are impacting recycling, what happens to

the valuable materials they contain, and how those materials are changing.” ¹²

Metals and minerals

In Canada, environmental protection is an important element in modern mining, oriented toward the safe and sustainable development of mineral resources, while at the same time ensuring that adverse environmental impacts are minimized. Canada has a rigorous environmental assessment process for all proposed resource development projects. This includes all mining operations in Canada, which are subject to rigorous requirements. For instance, the *Metals and Minerals Policy of the Government of Canada: Partnerships for Sustainable Development* integrates policies, programs and legislation that ensure the continued use of Canada's natural resource endowment within a sustainable development framework. Furthermore, Natural Resources Canada's (NRCan's) Minerals and Metals Sector has developed activities and partnerships that demonstrate Canadian expertise in a wide range of issues-areas related to sustainable development. These include the safe use of minerals and metals, life-cycle assessment, product stewardship, science-based decision-making, and advances in science and technology related to mining technology, the mitigation of environmental impacts of mineral and metal development, and mine decommissioning and site reclamation. If increased export activity does occur as a result of a CKFTA, federal, provincial and territorial laws and regulations on both mineral development and environmental assessment would help ensure that any increased production occurring in Canada would be carried out in an environmentally acceptable and responsible manner.

In addition, before mining activities commence, a company must submit a mine plan and an environmental impact assessment identifying all activities that may impact upon the mine site environment and the actions that will mitigate these environmental impacts. No mine facility is granted operating permits until territorial/provincial and federal governments are satisfied with the actions proposed under the assessment plan. The company must also include a plan for decommissioning the facility and reclaiming the lands.

Trade in Services

While increased trade between Canada and Korea could lead to increased transportation activity, it is expected that the majority of any negative impacts would be offset by Canada's regulatory system. The Canada Shipping Act, 2001 and the port state control program (as set out here: <http://www.tc.gc.ca/eng/marinesafety/oep-inspection-psc-framework-920.htm>) are the primary tools Canada uses to help to mitigate negative impacts of maritime transport services on the environment. Specifically, this regime incorporates the International Maritime Organization (IMO)'s International Convention for the Prevention of Pollution from Ships (MARPOL), which is effectively reducing ships' overall energy consumption and emissions per unit of output, and will be controlling sulphur content in fuels from January 1, 2015, and nitrogen oxides emissions from January 1, 2016, for all vessels within the North American Emission Control Area.

Services sectors tend to be heavily regulated. Governments at different levels, as well as professional associations that have been delegated self-regulating authority have implemented and maintained regulations governing the provision of services. Generally, such regulations establish and maintain a legal framework to serve various public-policy purposes, including the protection of the environment.

With respect to specific service sectors, changes and improvements in procedures, equipment and technology lessen possible impacts, as do environmental legislation and industry awareness of environmental issues. For example, in the oil and gas sector, changes in procedures and technology include: using directional and horizontal well-drilling that reduces the number of roads, power lines and pipelines needed for a site, and using low-impact seismic technologies in environmentally sensitive terrain. New procedures and technologies can also help prevent potential accidents and thereby avert serious environmental impacts.

In the tourism sector, environmental damage can be limited by controlling access to ecologically-sensitive sites and limiting the number of visitors in certain areas based on capacity to accommodate, without pollution, loss of wildlife habitat, or other damage. With respect to transport services, there is an extensive range of environmental guidelines, codes of practice and international standards in place to reduce environmental impacts. In the construction sector there is a wide range of environmental protection guidelines, tools, and techniques applicable to engineering works. These include facility design and site selection measures, energy conservation measures, and on-site measures to control soil erosion, manage wastes, and control pollutants. For example, the *Super E*® strategic initiative is a new housing standard which utilizes state of the art construction techniques that promote energy conservation, environmentally responsible construction and healthy housing.

Private sector mitigation options include paper conservation within the office, greater use of cross-border trade facilitating means (i.e. the internet/email, fax, teleconference, and videoconference), recycling of various materials, and corporate policies on "sustainable procurement." While these activities are within the scope of the private sector, government policy can lead in the adoption of such practices, specifically through the greening of government procurement strategies.

Investment

The CKFTA does not impact Canada's ability to develop and implement environmental policies and regulations, and all investments in Canada will continue to be subject to Canada's environmental management legislation.

Government Procurement

The Canada-Korea government procurement chapter will not have a negative effect on Canada's ability to develop and implement environmental policies and regulations. Canada will safeguard its ability to maintain and expand the current

framework of policies, regulations, and legislation for the protection of the environment in a manner consistent with its domestic and international obligations. For instance, the federal government currently has in place a *Policy on Green Procurement*¹³ which aims to integrate environmental performance considerations into the procurement decision-making process in the context of value for money and life-cycle approach management. All departments and federal agencies listed in the *Financial Administration Act (FAA)* are required to implement the *Policy on Green Procurement*. The Department of Public Works and Government Services Canada¹⁴ (PWGSC) has also developed a green procurement tool kit to assist federal departments and agencies with the integration of environmental performance considerations in their procurements. CKFTA Government Procurement Chapter does not prevent Canada from maintain this policy or adopting additional, similar policies.

Other

The Federal Sustainable Development Strategy (FSDS) is the government's overall sustainable development strategy. The environmental assessment of this trade negotiation takes into account FSDS goals and targets.

The FSDS provides Canadians with a whole-of-government picture of federal goals, targets, and specific actions (implementation strategies) to achieve environmental sustainability, organized under four themes: Addressing Climate Change and Air Quality; Maintaining Water Quality and Availability; Protecting Nature and Canadians; and Shrinking the Environmental Footprint – Beginning with Government. The strategy's objective, as defined by the *Federal Sustainable Development Act*, is to make environmental decision making more transparent and accountable to Parliament.

For more information on the FSDS, please refer to the following website (<http://www.ec.gc.ca/dd-sd/default.asp?lang=En&n=F93CD795-1>).

Additionally, the CKFTA will not have any effect on Canada's ability to develop and implement environmental policies and regulations. Canada will safeguard its ability to maintain and expand the current framework of policies, regulations and legislation for the protection and conservation of the environment.

Overview of other monitoring in Canada

Along with federal, provincial and territorial legislation related to protecting the environment, Canada tracks its performance on key environmental sustainability issues including climate change and air quality, water quality and availability, and protecting nature as outlined in the FSDS. The environmental indicators (referenced earlier in this document) are based on objective and comprehensive information and convey environmental trends in a straightforward and transparent manner.

These indicators provide valuable data and information for tracking Canada's performance on key environmental sustainability issues. They ensure that international, national, regional, and local trends are readily accessible and transparently presented to all Canadians, and will continue to be used to track sustainability when the CKFTA is implemented.

Monitoring and follow-up activities can be undertaken anytime during the implementation of a concluded trade agreement in order to gauge the performance of its provisions from an environmental perspective. Accordingly, following the conclusion of the Final Environmental Assessment report, follow-up and monitoring could, as warranted, be undertaken in order to review any mitigation or enhancement measure.

As well, the federal government also works on monitoring of environmental issues, such as waste management, in support of sustainability. Areas of focus include:

(a) Biodiversity

Conserving biodiversity and using biological resources in a sustainable manner are essential parts of Canada's effort to achieve sustainable development. The *Canadian Biodiversity Strategy* reaffirms that governments in Canada must create the policy and research conditions that will lead to the conservation of biodiversity and the sustainable use of biological resources. The *Canadian Biodiversity Strategy*, along with the complementary *Biodiversity Outcomes Framework*, guide action at all levels that will enhance the ability to ensure the productivity, diversity and integrity of natural systems and, as a result, the ability as a nation to develop sustainably.

(b) Air Contaminants

Air pollution is a broad term applied to any chemical, physical, or biological agent that modifies the natural characteristics of the atmosphere. Examples include particulate matter and ground-level ozone. Air pollutants fall into four main categories: criteria air contaminants (e.g. SO₂, NO_x, volatile organic compounds), persistent organic pollutants (e.g. dioxins and furans), heavy metals (e.g. mercury) and toxins (e.g. benzene).

The federal government, along with other levels of government, industry, non-government organizations, and individuals have taken action to reduce emissions of harmful air pollutants from human sources.

The Canadian Council of Ministers of the Environment (CCME) serves as a principal forum for collaboration on environmental strategies, norms, and guidelines. The recently approved Air Quality Management System (AQMS) is a comprehensive approach to reducing air pollution in Canada. It is the product of close collaboration by the federal, provincial, and territorial governments and stakeholders. The AQMS includes new Canadian Ambient Air Quality Standards, local air quality management by provinces in air zones, coordination of regional and transboundary issues through air sheds, and industrial emissions requirements for key sectors and equipment groups. It is currently in the implementation stage.

(c) Greenhouse Gases

The federal government is taking a sector-by-sector regulatory approach to reducing industrial GHG emissions. The Government is aligning efforts with the United States where appropriate, given the integrated nature of our economies. Regulations are already in place for the transportation and coal-fired electricity sectors.

In the transportation sector, final regulations establishing progressively more stringent GHG emission standards for light duty vehicles of the 2011-16 model years were published in October 2010. Draft regulations to establish even more stringent GHG standards for light duty vehicle of the 2017 and later model years were published in December 2012. The final regulations are scheduled to be published later in 2014. Regulations have also been finalized to reduce GHG emissions from new on-road heavy-duty vehicles and engines for model years 2014 and beyond.

In September 2012 the Government of Canada released final regulations to reduce emissions from the coal-fired electricity sector. These will impose stringent standards on new coal-fired generation units and on units that have reached the end of their economic life. They come into effect on July 1, 2015 and will encourage the phase-out of traditional coal-fired generation and transition towards lower- or non-emitting types of generation.

The Government of Canada continues to work with other levels of government, industry and stakeholders to develop GHG regulations for the oil and gas sector, and other major-emitting industries. The federal government is focused on a realistic approach to GHG regulations that will reduce emissions while continuing to create jobs and encouraging the growth of the Canadian economy.

(d) Waste

The principal method of waste disposal in Canada is landfilling complemented by a few municipal and hazardous waste incinerators and waste-to-energy facilities. Most waste in Canada is disposed of in engineered landfills with leachate collection systems, many of which capture, flare and/or utilise the landfill gas. Canada's recycling rate has been on the rise since 2000 supported by a growing number of voluntary and regulated extended-producer responsibility programs covering products such as electronics, tires, used oils, pharmaceuticals, paints, pesticide containers, packaging, batteries, beverage containers, automotive products, etc. The management of organic waste (e.g. food waste, leaf and yard waste) in large-scale facilities, using composting and anaerobic digestion technologies, is a new area of focus to reach higher diversion rates from landfills.

In Canada, the responsibility for managing and reducing waste is shared among the federal, provincial, territorial and municipal governments. The federal government, in particular, administers controls on the transboundary movements of hazardous wastes and hazardous recyclable materials in accordance with the Basel Convention and relevant OECD decisions on wastes. It also establishes best practices and implements measures, as needed, to manage the potential release of toxic substances during their life-cycle, including from end-of-life products and waste management activities.

The CCME, as indicated earlier, is a forum where provincial, territorial and federal environmental authorities work together to develop policies, guidance and tools to advance the environmentally sound management of wastes in Canada and encourage waste minimization. For example, under the CCME, members have adopted the Canada-wide Action Plan on Extended Producer Responsibility, the Sustainable Packaging Strategy and guidelines for hazardous waste landfills. Together they continue exploring opportunities for collaborative solutions related to waste management.

(e) Chemicals

Chemical substances are widely used to improve the quality of our lives and their presence can be observed in the environment and in living organisms.

The Government of Canada has in place a number of laws and a regulatory framework which protect human health and the environment from the risks of harmful chemicals. The primary legal authority for assessing and managing harmful chemical substances is *the Canadian Environmental Protection Act 1999*. Other legislation which may be used includes the *Canadian Consumer Product Safety Act*, the *Food and Drugs Act*, and the *Pest Control Products Act*. The Government of Canada's *Chemicals Management Plan (CMP)*, enables decision-making processes and coordination under the "best placed act" initiative, to ensure that the most appropriate authorities and suite of legislative, regulatory and other tools available under these various acts are used to protect human health and the environment from hazardous chemicals. The CMP, launched in 2006, is jointly managed by Environment Canada and Health Canada in order to:

- take action on new and existing chemicals;
- integrate chemical management activities across the government; and
- provide predictability for business and expand public trust through transparent work plans.

For further information on Canada's Chemicals Management Plan, please refer to:

<http://www.chemicalsubstanceschimiques.gc.ca/plan/index-eng.php>

National Monitoring and Tracking Programs

In addition to the initiatives outlined in specific areas above, Canada has established several ongoing monitoring programs for the environment. Ongoing monitoring and tracking programs provide valuable data and information about Canada's performance on key environmental sustainability issues.

These include, but are not limited to:

- *Canadian Environmental Sustainability Indicators (CESI)*¹⁵ – This program provides data and information to track Canada's performance on key environmental sustainability issues including climate change and air quality, water quality and availability, and protected nature. The environmental indicators are based on objective and comprehensive information and convey environmental trends in a straightforward and transparent manner. Indicators are added and updated throughout the year as new data become available.

These initiatives provide valuable data and information for tracking Canada's performance on key environmental sustainability issues. They ensure that international, national, regional, and local trends are readily accessible and transparently presented to all Canadians.

CESI Nature Indicators:

<http://www.ec.gc.ca/indicateurs-indicators/default.asp?lang=En&n=DC4B459E-1>

CESI Air and Climate Indicators

<http://www.ec.gc.ca/indicateurs-indicators/default.asp?lang=En&n=03603FB3-1>

CESI Water Indicators

<http://www.ec.gc.ca/indicateurs-indicators/default.asp?lang=En&n=13307B2E-1>

- Monitoring and surveillance activities under Canada's *Chemicals Management Plan*. A key element of the *Chemicals Management Plan* is the monitoring and surveillance of levels of harmful chemicals in Canadians and their environment. Environmental and human biomonitoring and surveillance are essential to identify and track exposure to hazards in the environment and associated health implications.
- *National Pollutant Release Inventory (NPRI)*. The NPRI is Canada's legislated, publicly accessible inventory of pollutant releases (to air, water and land), disposals and transfers for recycling.
- *Canadian Environmental Quality Guidelines*. These guidelines were established by the CCME to provide nationally endorsed science based goals for the quality of atmospheric, aquatic, and terrestrial ecosystems.

IX. Environmental Provisions in the CKFTA

With a view to ensuring that trade liberalization does not lead to environmental degradation, the CKFTA contains an Environment Chapter. Provisions of the Environment Chapter underscore the Parties' commitment to pursue policies that promote sustainable development and sound environmental management. Consistent with Canada's usual FTA approach, the provisions reinforce the mutual supportiveness of trade and environment policies by including commitments to foster good environmental governance.

Provisions aim to: seek to maintain high levels of environmental protection, by effectively enforcing environmental laws and not waiving or derogating from such laws to promote trade or investment; ensure transparency and public participation in the making of such laws; ensure that domestic remedies are available for violations of such laws; and, establish a framework for cooperation in areas of mutual interest. The Environment Chapter also includes provisions affirming commitments to Multilateral Environment Agreements (MEAs) that both Canada and Korea have ratified, as well as promoting the trade and investment in environmental goods and services. Furthermore, the Parties commit to respond, in a timely manner, to inquiries from the public on matters respecting the implementation of the Chapter.

The Agreement establishes an Environmental Affairs Council responsible for implementing environment obligations and includes an environment chapter-specific dispute resolution process to address any questions regarding compliance, including, if necessary, review by an independent panel of experts whose recommendations would be made publicly available.

X. Conclusion

Undertaking EAs is an effective way to address potential problems and to protect the environment by improving overall policy coherence at the national level and by assisting decision-makers in understanding environmental implications of trade policy. This EA concludes that the CKFTA is expected to have only minor environmental impacts in Canada. While the economic impact of the Agreement will likely be important, these will be modest relative to Canada's overall economic activity. These conclusions are consistent with the findings of the Initial EA and are backed by a quantitative analysis which concluded that the net impact of increased bilateral trade with Korea on Canada's environment would be characterized by only minor increases in GHG emissions, and lower energy and water use.

Canada has a range of policies and programs in place to mitigate negative environmental impacts and enhance positive ones. The CKFTA does not compromise the environmental protection measures that Canada has implemented, nor does it constrain Canada's ability to put in place additional policies and programs in this area. Moreover, the CKFTA does not exempt foreign service providers and foreign investors from Canadian laws and regulations.

Feedback on the Final Environmental Assessment of the CKFTA can be submitted by email, mail, or fax to:

E-mail: EAconsultationsEE@international.gc.ca

Fax: 613-944-0757

Mail: Canada-Korea FTA Environmental Assessment

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Comments received will be circulated to the EA Committee, the lead negotiator and the EA Secretariat to inform future EAs of trade negotiations and other related policy development and decision-making processes.

Appendix A: Acronyms

ASEAN - Association of Southeast Asian Nations
 ATC - WTO Agreement on Textiles and Clothing
 CA4 - Central American Four (i.e., El Salvador, Guatemala, Honduras and Nicaragua)
 CARICOM - Caribbean Community and Common Market
 CDE - Constant difference of elasticities
 CEPII - Centre d'Etudes Prospectives et d'Informations Internationales
 CES - Constant elasticity of substitution
 CGE - Computable general equilibrium
 CKFTA - Canada-Korea Free Trade Agreement
 DFATD - Foreign Affairs, Trade and Development Canada
 EFTA - European Free Trade Association
 FDI - Foreign direct investment
 FSDS - Federal Sustainable Development Strategy
 FTA - Free trade agreement
 GATS - General Agreement on Trade in Services
 GDP - Gross domestic product
 GNI - Gross national income
 GTAP - Global trade analysis project
 IMF - International Monetary Fund
 IP - Intellectual Property
 ITC - International Trade Centre
 MERCOSUR - Southern Cone Common Market
 NAFTA - North American Free Trade Agreement
 OECD - Organisation for Economic Co-operation and Development
 ROW - Rest of world
 SACU - South African Customs Union
 TRQ - Tariff rate quota
 WTO - World Trade Organization

Appendix B: Economic and Environmental Analysis Tables

Table 1: Changes in GHG Emissions under the CKFTA

	2008 Direct GHG intensity (kt/Million\$)	Pre-CEPA GHG emissions (kilo tonnes)	Post-CEPA GHG emissions (kilo tonnes)	Scale Effect (kilo tonnes)	Composition effect (kilo tonnes)	CKFTA induced change in GHG emissions (kilo tonnes)	Technique Effect (%)
Agriculture	0.57	71,825.3	72,057.8	3.6	228.8	-37.9	-12.44
Fishery and Forestry	0.32	5,984.5	5,982.5	0.3	-2.3	-2.0	-8.91
Extraction	0.62	106,248.9	106,213.4	5.3	-40.8	-35.5	1.82
Manufacturing	0.23	139,365.5	139,233.1	7.0	-139.4	-132.4	-16.76
Services	0.19	391,962.6	392,087.3	19.6	-37.9	-18.3	-13.73
Total	0.24	715,386.8	715,430.9	35.8	8.4	44.2	-13.38

Note: The scale and composition effects are measured using the 2008 GHG direct intensities from Statistics Canada. The technique effect is measured using the 2008 and 2020 GHG direct intensities provided by Environment Canada.

Table 2: Changes in Energy Use under the CKFTA

	2008 Direct Energy intensity (tj/)	Pre-CEPA Energy use (terajoules)	Post-CEPA Energy use (terajoules)	Scale Effect (terajoules)	Composition effect (terajoules)	CKFTA induced Change in Energy use	Technique Effect (%)
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	Million \$)					(terajoules)	
Agriculture	2.16	270,957.7	272,058.8	13.6	1,087.5	1,101.6	-6.91
Fishery and Forestry	3.40	63,462.3	6,347.7	3.2	-17.8	-14.6	-6.24
Extraction	6.61	1,129,949.8	1,129,570.7	56.5	-435.6	-379.1	22.61
Manufacturing	4.28	2,652,495.2	2,649,984.6	132.7	-2,643.3	-2,510.7	-13.05
Services	3.14	6,493,933.5	6,493,828.0	324.9	-430.3	-105.4	-14.65
Total	3.54	10,610,798.5	10,615,132.3	530.8	-2,439.5	-1,908.7	-11.82

Note: The technique effect is measured using the 2008 and 2020 Energy direct intensities provided by Environment Canada whereas both the scale and composition effects are measured using the 2008 energy data from Statistics Canada

Table 3: Changes in Water Use under the CKFTA

	2007 Direct water use intensity (m ³ /\$)	Pre-simulation water use (millions of m ³)	Post-simulation water use (millions of m ³)	Scale effect (millions of m ³)	Composition effect (millions of m ³)	CKFTA induced Change in water use (millions of m ³)
Agriculture	0.0056	704.0	712.2	0.04	8.03	8.07
Fishery and Forestry	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Extraction	0.0040	678.0	678.4	0.03	-0.27	-0.23
Manufacturing	0.0089	5,508.4	5,503.6	0.28	-5.09	-4.81
Services	0.0152	31,518.8	31,508.8	1.58	-11.56	-9.98
Total	0.0128	38,409.4	38,403.0	1.92	-8.88	-6.96

Note 1: Data from Statistics Canada were not available for some sectors.

Note 2: The technique effect could not be calculated since there are no data on water use projected to the year 2020. Both the scale and composition effects are measured using the 2007 water use data from Statistics Canada

- 1** The EA Committee was comprised of representatives from Foreign Affairs, Trade and Development, Environment Canada, Canadian Environmental Assessment Agency as well as other federal government departments and agencies such as Agriculture and Agri-Food Canada and Finance Canada.
- 2** *Canadian System of Environmental and Resources Accounts*: <http://www.statcan.gc.ca/imdb-bmdi/5115-eng.htm>
- 3** *Canada's GHG Inventory*: <http://www.ec.gc.ca/ges-ghg/default.asp?lang=En&n=83A34A7A-1>
- 4** The 2008 data is the latest information available from Statistics Canada.
- 5** <http://www.gtap.agecon.purdue.edu/>
- 6** The 2012 GDP and bilateral trade figures are sourced from IMF and national statistical agencies.
- 7** Francois, J., B. Joekman and J. Woerz (2007) "Does Gravity Apply to Intangibles? Measuring Openness in Services" memo.
- 8** The recent study on the effect of the Canada-Chile FTA shows that the agreement generated benefits beyond the traditional benefits associated with tariff elimination, as a substantial portion of new exports and new trade came from duty-free categories of products. The announcement effects of the agreement along with the measures such as liberalization in investment and services, improvement in custom facilitation could have a significant effect on two-way trade in goods over and beyond the effect induced by lower tariffs (http://www.international.gc.ca/economist-economiste/analysis-analyse/studies-etudes/canada_chile-canada_chili/econo_impact_toc-tdm.aspx?lang=eng)

- 9** The scope of emission measurements from Environment Canada is broader than that by Statistics Canada. Environment Canada's emission indicators include 6 GHGs: carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), sulphur hexafluoride (SF₆), perfluorocarbons (PFCs), and hydrofluorocarbons (HFC), while Statistics Canada GHG indicators include only the first three. Further, emission intensity reported by Statistics Canada is higher than those reported by Environment Canada. This is because transportation-related emissions in each sector are included in the specific individual industrial sectors, while Environment Canada's data groups them all in the transportation sector; thus, this could explain the large difference in emission intensities.
- 10** Environment Canada's *Greenhouse Gas Emissions Forecasting*: <http://www.ec.gc.ca/default.asp?lang=En&n=3B8552D4-1&xml=3B8552D4-3B91-4EE0-863B-C5D72EB83F42&offset=4&toc=show>
- 11** Represents forecast based on historical data.
- 12** Electronics Product Stewardship Canada: Design for Environment Report 2013, pg. 2. <http://epsc.ca>
- 13** The policy is available on the PWGSC's website: <http://www.tpsgc-pwgsc.gc.ca/ecologisation-greening/achats-procurement/politique-policy-eng.html>.
- 14** PWGSC's green procurement tool kit is available at: <http://www.tpsgc-pwgsc.gc.ca/ecologisation-greening/achats-procurement/trousse-toolkit/index-eng.html>
- 15** <http://ec.gc.ca/indicateurs-indicators/default.asp?lang=En>
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