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Getting a Handle on the Environmental Goods and Services Industry

In January 2012 the Business Council published an Environment and Energy Bulletin piece entitled, How Big (And What Is) the Green Economy? The Challenge of Counting "Green Jobs" in BC. The overall conclusion was that somewhere in the vicinity of 4% of all jobs in BC might be classified as "green," with the actual quantum likely closer to 3% given various definitional and measurement challenges. The paper did not seek to estimate the percentage of total economic activity attributable to the production of environmental goods and services. In a later Business Council paper, Should We "Green" Gross Domestic Product?, we discussed the current system for tracking economic performance (i.e., the System of National Accounts, the SNA) and its evolution over time to capture activities related to sustainability. Both papers were concerned with the criteria and tools that can shed light on how green jobs and other environment-related activities contribute to the economy. This paper is another piece in the exploration of that topic. Here, we adopt a somewhat narrower focus by looking at "the environmental goods and services producing sector" of the economy.

Some Definitions

Let's start with a review of some definitions of "environmental goods and services" (EGS). We will look at four sources: the United Nations, EuroStat, the World Trade Organization, and the US Bureau of Labor Statistics.

Arriving at a common definition of EGS is not easy, partly because no matter how it is defined, the sector is made up of a heterogeneous set of activities and physical products that serve multiple markets and functions. For example, water and wastewater treatment has always been included in traditional national accounting as part of utilities or infrastructure spending by governments, but it also fits within the scope of EGS as it involves environmental protection (see below). Further, it can be argued that technologies designed to improve vehicle fuel efficiency or to reduce emissions from power plants are already accounted for in calculations of gross domestic product by industry – as part of manufacturing and utilities – but they can also be classified as activities that support environmental protection.

Therein lies perhaps the most significant challenge – much of what we are trying to measure in looking at the EGS sector is *already embedded within the national accounting systems used by statistical agencies* in Canada and other countries. EGS is not really a new sector but rather is one that has always existed. It is evolving in response to new environmental legislation and regulations, or growing organically as a result of shifts in consumer demand and tastes. By highlighting EGS, we are choosing to count the sector's contributions to economic activity in a different way than government statistical agencies usually do. As a result, estimating the size of the EGS sector entails a reclassification of certain traditional economic activities as well as careful attention to the risk of double counting.

1. United Nations System of Economic Environmental Accounting

The first source of reference material is found in the United Nations' System of Economic Environmental Accounting (SEEA). Globally, the SEEA represents frontier thinking around concepts, definitions, classifications, and accounting rules for generating internationally

comparable statistics on economy-environment relationships.[1]

The most recent version of the SEEA framework was published in February 2014, and it marked a significant change from the previous version. The UN now explicitly recognizes only two economic-environment activities: (a) environmental protection activities, and (b) resource management activities, where the primary purposes are to reduce or eliminate pressures on the environment, and to make more efficient use of natural resources, respectively. Importantly, the SEEA no longer includes activities related to natural resource use and the management/minimization of natural hazards. This would eliminate from the counting process activities involving the extraction, harvesting, and consumption of natural resources (e.g., mining, fishing, agriculture, etc.), but not necessarily technology innovations that support the efficient use of those resources. It would also leave out activities related to emergency planning and responses to extreme weather, for example.

Environmental protection activities, the first SEEA category, are activities whose primary purpose is the prevention, reduction and elimination of pollution and other forms of degradation of the environment. They include but are not limited to:

- prevention, reduction or treatment of waste and wastewater;
- prevention, reduction or elimination of air emissions;
- treatment and disposal of contaminated soil and groundwater;
- prevention or reduction of noise and vibration levels;
- protection of biodiversity and landscapes, including of their ecological functions;
- monitoring of the quality of the natural environment (air, water, soil and groundwater);
- research and development on environmental protection; and,
- general administration, training and teaching activities oriented towards environmental protection.

Resource management activities are activities whose primary purpose is preserving and maintaining the stock of natural resources and safeguarding against depletion, including but not limited to:

- reducing withdrawals of natural resources (including through the recovery, reuse, recycling and substitution of natural resources);
- restoring natural resource stocks (increases or recharges of natural resource stocks);
- general management of natural resources (including monitoring, control, surveillance and data collection); and,
- production of goods and services used to manage or conserve natural resources.

2. European Union - EuroStat

The second definitional source examined comes from EuroStat, the entity that gathers and publishes statistics on behalf of European Union members. As it happens, the European Union codified and updated its environmental accounts in 2011. At that time they included accounts for air emissions, environmental taxes and material flows. In 2013, three additional accounts were recommended for adoption: environmental protection expenditure, the environmental goods and services sector and energy flow accounts.[2] By 2017, all EU counties will be obliged to report on all of the above noted accounts.

[1] System of Environmental-Economic Accounting 2012, Central Framework, February 2014 - http://unstats.un.org/unsd/envaccounting/seeaRev/SEEA_CF_Final_en.pdf.

[2] 21st Meeting of the European Statistical System Committee, May 2014, http://epp.eurostat.ec.europa.eu/portal/page/portal/environmental_accounts/documents/ESSC_2014_21_EN_24_EuropeanStrategy_env.pdf.

The EU's definitions[3] are broadly compatible with the SEEA's and involve activities that:

- Measure, control, restore, prevent, treat, minimise, research and sensitise environmental damages to air, water and soil as well as problems related to waste, noise, biodiversity and landscapes. This includes "clean" technologies, i.e., goods and services that prevent or minimise pollution.
- Measure, control, restore, prevent, minimise, research and sensitise resource depletion. This captures resource-efficient technologies, i.e., goods and services that minimise the use of natural resources.

As well, EuroStat counts, as part of the EGS sector, administrative activities, education, training, information and communication activities and research and development from both public and private entities that support environmental protection. Interestingly, some 2/3 of environmental protection expenditures in the European Union (this includes activities by public and private producers of environmental services that specialize in waste collection and waste water treatment)[4] comes from traditional, already accounted for activities.

3. World Trade Organization

A third definition is provided by the World Trade Organization[5] (WTO), the organization that sets the rules for ensuring the free flow of goods and services between countries and oversees multilateral negotiations and trade agreements. Some 40 countries have accepted the relatively narrow WTO definition of environmental services as activities that include sewage services, refuse disposal, sanitation and similar services, reducing vehicle emissions, noise abatement services, and nature and landscape protection services.[6] The WTO notes that 80% of environmental services - sewage, waste and sanitation - are delivered largely via public sector expenditures. This is more or less consistent with Eurostat's assessment.

In 2011, the WTO started to expand the number and type of products and activities that could be considered in multilateral negotiations and agreements to reduce barriers to trade in EGS.[7] In July 2014, 14 countries signed a new WTO-brokered Environmental Goods Agreement (EGA), which captures 86% of the value of global trade in environmental goods. Eventually there will be more robust and integrated trade related data published on the EGS sector as a whole.

The list of eligible goods in the EGA begins with and will build on the 54 items already included in a previous agreement among Asia-Pacific Economic Cooperation countries.[8] The latter have committed to reduce tariffs by 5% by 2015 on goods that fall within the following categories:

- Renewable and clean energy generation (such as solar panels, and gas and wind turbines);
- Wastewater treatment (such as filters and ultraviolet disinfection equipment);
- Air pollution control goods (such as soot removers and catalytic converters);
- Solid and hazardous waste treatment (such as waste incinerators, and crushing and sorting machinery), and;

[3] The environmental goods and services sector, Eurostat Methodologies and Working Papers, 2009.
[4] http://epp.eurostat.ec.europa.eu/statistics_explained/index.php/Environmental_protection_expenditure.
[5] Regulatory Principles for Environmental Services and the General Agreement on Trade in Services, ICTSD Programme on Trade in Services and Sustainable Development, Massimo Geloso Grosso, 2007.
[6] http://www.wto.org/english/tratop_e/serv_e/environment_e/environment_e.htm.
[7] Harnessing trade for sustainable development and a green economy, World Trade Organization, 2011.
[8] http://www.apec.org/Meeting-Papers/Leaders-Declarations/2012/2012_aelm/2012_aelm_annexC.aspx.

- Environmental monitoring and assessment (such as air and water quality monitors), among others.

4. North America

In North America, the effort to define and assemble EGS data is not particularly advanced. The US Bureau of Labor Statistics made an initial foray into the collection of employment-related EGS information a few years ago, obtaining data on 325 North American Industry Classification System (NAICS) industries.[9] It published one set of results for 2010. Unfortunately, funding for the Bureau's EGS data program was cancelled. The categories of data that were collected were broadly similar to those tracked by SEEA and EuroStat, and featured energy from renewable sources, energy efficiency, pollution reduction and removal, greenhouse gas reduction, recycling and reuse, natural resource conservation, environmental compliance, education and training, and public awareness activities.[10]

Not to be left out, Statistics Canada has also made some tentative steps in the collection of data on EGS. However, the definitions and methods for data collection are still a work in progress. Any conclusions about the scope and size of the EGS sector in Canada must rest on very rough and ready statistical information.[11]

Parsing the Data

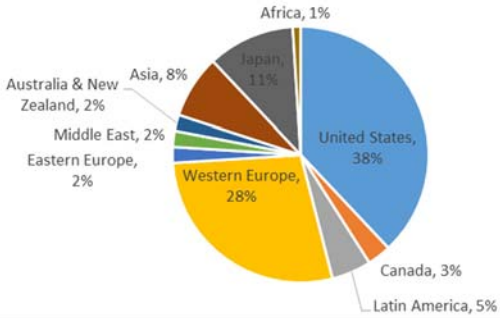
Given ongoing definitional challenges, it is difficult to find one coherent measure of the EGS sector in terms of Gross Domestic Product (GDP) or trade. The following discussion, drawing on different sources, tries to paint a high-level picture of the economic value of the EGS sector.

US Trade Data

In 2013, the US International Trade Commission estimated the 2010 revenues from global trade in environmental services (i.e., water and wastewater services industry, the solid and hazardous waste services industry, and the remediation) as in the vicinity of US$500 billion. (Note that this figure does not include trade in environmental goods.) The $500 billion is divided among activities and countries/regions as shown in the two figures below. Revenues for these services are growing at roughly 2.5% per year (a cumulative jump of 13% between 2005 and 2010).[12] As shown, Canada's share of these global trade revenues is 3%. This translates into about $15 billion of $500 billion in international trade in environmental services.

Figure 1: Percent of Global Revenue from Trade by Type of Environnental Service

Figure 2: Percent of Global Environmental Service Revenues by Country/Region



[9] http://www.bls.gov/ggs/naics_2012.pdf.
[10] http://www.bls.gov/ggs/ggsoverview.htm#definition.
[11] http://www5.statcan.gc.ca/cansim/a05?searchTypeByValue=1&lang=eng&id=1530052&pattern=1530052.
[12] http://www.usitc.gov/publications/332/pub4389.pdf.

Organisation for Economic Co-operation and Development

To get a sense of EGS as a portion of GDP, a 2011 OECD report entitled Towards Green Growth[13] concluded that pinning down statistics for the sector is difficult. However, it notes that "as a share of GDP or employment, the environmentally-related goods and services [sector]… is comparatively small." The OECD did not provide a definition or number but instead referenced US Department of Commerce information that suggests a ballpark figure of between 1% and 2% of American GDP that can be attributed to the EGS sector in 2010.

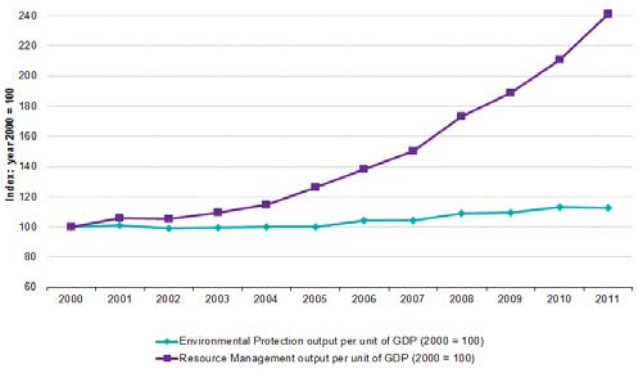
Table 1: Estimate of Environmental Goods and Services as a Percent of GDP for Canada and BC

	GDP 2013 (millions $)	BC as a % of Canada GDP	EGS 1% (millions $)	EGS 2% (millions $)
Canada	$1,893,759		$18,938	$37,875
BC	$229,685	12%	$2,273	$4,545

By extension, and making some assumptions for Canada, it is reasonable to conclude that between 1% and 2% of Canada's GDP can be attributed to the EGS sector. From there we have derived the contribution of EGS to GDP for BC in 2013. The value attributed to BC is based on the fact that the province represents 12% of Canada's GDP. Therefore, in Canada the EGS sector contributes roughly between $19 billion and $38 billion in GDP, whereas in BC the range is between $2 billion and $5 billion.

The OECD emphasizes that there is significant global growth potential in EGS. As shown in Figure 3 below, EuroStat data supports this notion. Historical data indicates that for the EU there was an increase of the value of EGS output per unit of total GDP of between ~2% and ~6% between 2000 and 2011. On the low end, growth in the sector is consistent with overall increases in GDP, which makes sense given that between 2/3 and 4/5 of contributions from the sector come from existing economic activities in traditional industries. At the high end, the EU measurement period parallels the timeframe for definition development and data re-orientation. It is unlikely that there would have been be a significant jump in the size of the EGS sector relative to total GDP from 2000 to 2011, but a pattern of small, incremental increases makes sense. The main issue for Canada in understanding both the size and growth of the EGS sector is the lack of clear definitions that can facilitate robust and reliable data collection and comparisons over time.

Figure 3: EuroStat Trends in Environmental Protection and Resource Output



[13] http://www.oecd.org/greengrowth/48224539.pdf.

Conclusion

Regardless of country or region, a majority of relevant economic activity stemming from the production of environmental goods and services will remain in the more traditional EGS sector, which includes primary activities in water, wastewater and sanitation type infrastructure, plus related services. Canada excels and has considerable expertise in some of these areas, particularly water and wastewater treatment, waste management (especially hazardous wastes), hydrogeology and recycling. We also have solid expertise and lots of companies in environmental consulting, engineering, environmental technologies, biotechnologies, site remediation and energy conservation. All of these are growth areas, especially in developing countries where industrialization is continuing apace and expanding middle class populations are demanding improvements in air quality, water quality, food safety, and waste management. Canada has valuable contributions to make and opportunities to sell environment-related goods, services, and expertise in the global market. By extension, and given our natural resource wealth, BC also has much to offer in a world where the demand for EGS is expected to increase steadily.

As a ballpark estimate, the size of Canada's EGS sector is likely in the range of 1% to 2% of GDP. The heterogeneity of products and services and the absence of a widely used and credible global definition of EGS present significant issues for establishing a firm measure of the sector's size in relation to the larger economy. However, much evidence and commentary by international agencies indicates that EGS is becoming a more important part of most national economies. While it is expanding mainly because of changes in government policies and regulatory requirements, to some extent its growth is also organic in response to social pressures and shifts in consumer expectations and demands.

Looking ahead, how quickly the EGS sector grows will depend in part on whether the focus moves from end-of-pipe equipment and clean-up services to integrated clean technologies, environmentally-sensitive procurement choices by the public and private sectors, ongoing funding and support for research, innovation, design, consulting and other services, as opposed to simply clean-up and remediation goods and services. It would be helpful to have a common global definition of the EGS sector to assist in collecting and analyzing data on the sector's composition and its contributions to the wider economy.

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Denise Mullen
Director, Environment
and Sustainability