

# Defining the Clean Economy

There have been numerous studies over the last several years that have tried to describe, define, measure, and quantify the green or clean economy and related employment. Most, however, have failed to accurately define the bigger picture. The words “green” and “clean” are somewhat abstract in nature and are often used interchangeably. This, in part, has fuelled some of the confusion and misconceptions.

The “green” economy is often passed off as a sector or subset of the rest of the economy. More correctly, the focus should be on the “greening” of all industries and all sectors, a more broad-based approach that is essential to accelerated investment attraction and job growth.

To that end, there are occupations in every business and industry sector throughout the economy that are increasingly incorporating specialized skills and working with new technologies to improve processes and, in turn, to reduce the environmental impacts, increase efficiencies, and lessen the consumption of scarce natural resources in their operations. This is essentially a “greening” of the entire economy.

The Environmental Careers Organization (ECO), Canada’s national sector council for environmental occupations, has defined “green jobs” as those that work directly with information, technologies, or materials that minimize environmental impact, and also require specialized skills, knowledge, training, or experience related to these areas<sup>1</sup>.

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<sup>1</sup> See: <http://www.eco.ca/pdf/Defining-the-Green-Economy-2010.pdf>



## 1. Clean Energy Supply

- Biofuels/Biomass
- Geothermal
- Hydropower
- Wind
- Solar Photovoltaic
- Solar Thermal
- Waste-to-Energy
- Wave/Ocean Power
- Renewable Energy Services
- Smart Grid

## 2. Energy Efficiency & Green Building

- Energy-saving Consumer Products
- HVAC & Building Control Systems
- Lighting
- Energy-saving Building Materials
- Green Architecture & Construction Services
- Green Building Materials
- Professional Energy Services

## 3. Clean Transportation

- Public Mass Transit & Rail
- Fuel Cells
- Electric Vehicle Technologies
- Battery Technologies
- Natural Gas Vehicles
- Non-motorized Transport

## 4. Environmental Protection & Resource Management

- Air & Water Purification Technologies
- Carbon Storage & Management
- Pollution Reduction
- Professional Environmental Services
- Recycled-Content Products
- Recycling & Reuse
- Remediation
- Waste Management & Treatment
- Water Efficient Products
- Conservation
- Organic Food & Sustainable Farming
- Sustainable Forestry Products

## 5. Knowledge & Support

- Regulation & Compliance
- Education & Training



However, within the economy, there are specific sectors or segments that are directly responsible for supplying technologies, products, and services that have measurable environmental benefits in terms of their abilities to reduce GHG emissions and improve both energy and resource efficiency. These specific “clean” sectors can in fact be thought of as a subset of the larger economy. This smaller subset of sectors and segments is the focus of this report and is referred to collectively as the “clean economy” (as outlined in Figure 3).

Along the lines of what is described above, the US Bureau of Labor Statistics (US BLS) has developed a two-pronged definition for classifying green jobs.

### According to the US BLS, green jobs are either:

- A. *Production Jobs* – Jobs in businesses that produce goods or provide services that benefit the environment or conserve natural resources; or
- B. *Process Jobs* – Jobs in which workers’ duties involve making their establishment’s production processes more environmentally friendly or use fewer natural resources.<sup>2</sup>

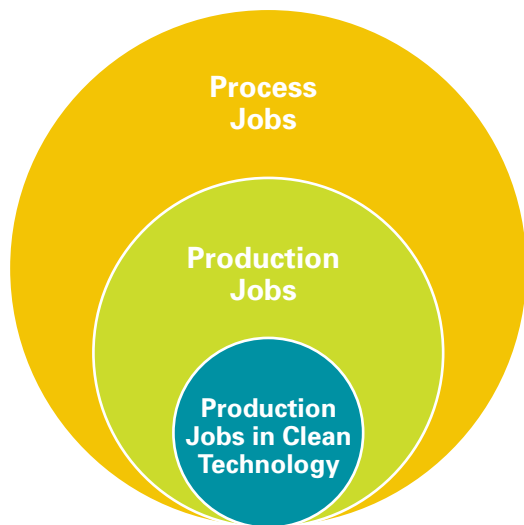
### To measure and quantify these jobs, the US BLS has described two approaches:

- 1) The *output approach*, which identifies establishments that produce green goods and services and counts the associated jobs; and
- 2) The *process approach*, which identifies establishments that use environmentally friendly production processes and practices.

**Figure 3:** Key market opportunity sectors and segments that define production-side activities of the West Coast region’s clean economy.

<sup>2</sup> See: <http://www.bls.gov/green>

## The focus should be on the “greening” of all industries and all sectors, a more broad-based approach that is essential to accelerated investment attraction and job growth.



**Figure 4:** Clean jobs in the economy can be considered as either “process” or “production” jobs.

Production jobs are related to producing a specific set of goods and services, and are in and of themselves not concerned with the environmental impact of the production process. These occupations, for example, include jobs in the clean technology design and manufacturing sector. Other examples of production jobs include wind farm technicians and electric vehicle engineers. The output approach alone, however, does not cover all activities and associated jobs that favorably impact the environment.

The process approach, on the other hand, is concerned with whether the business uses practices or technologies that have a favorable impact on the environment, regardless of the good or service produced. The process approach is relevant to any industry. An example of a process job would be a mining engineer who is working to lower energy consumption and the environmental impact of operations through the application of clean technologies.

By considering this two-pronged definition, we see that there are multiple, overlapping layers for the definition of clean economy (as illustrated in Figure 4). Each approach requires different measurement strategies and will tend to count different jobs, with some overlap in industries that produce clean economy goods and services.

For the purposes of this report, clean economy jobs were quantified using the methodology employed by the Brookings Institution in its 2011 *Sizing the U.S. Clean Economy* study which looks purely at “output” or “production-side” jobs as defined by the US BLS, rather than the “process” jobs which are larger in size and beyond the scope of this analysis (see the Methodology Document for more details).

The approach applied by the Brookings Institution was used as it attempts to overcome the shortfalls of quantifying job numbers using the North America Industry Classification System (NAICS), which fails to identify clean economy activities or environmental groupings of industries and occupations. It also allows for the comparison of baseline job numbers across the West Coast jurisdictions.

The sector framework presented in Figure 3 above that was developed to describe the clean economy for this project is unique to the West Coast region. While the five key sectors are arranged somewhat differently from the Brookings Institution study, the individual segments were kept in alignment to allow harmonization of results and to compare job numbers across the jurisdictions. Additional segments were added to this analysis in the Clean Transportation sector – including rail, natural gas, and non-motorized transportation, while segments related to nuclear energy and green chemical products were removed.

Overall, these sectors and segments represent areas of highest employment growth potential in the region (although the opportunities vary to different degrees by sector and by jurisdiction). They also are the areas that contribute the most to long-term sustainability and region-wide competitiveness.