

**SEES Research Series**

**ESSAYS ON THE GREEN ECONOMY**

---

**The Green Economy and Energy**

Denise Simmons, MSc

This essay is reproduced from the SEES Research Series, which was originally published in 2013 through the School of Earth and Environmental Sciences, University of Guyana.

ISBN Number: 978-976-624-036-3

Publisher: Journal of Academic Research and Essays

© School of Earth and Environmental Sciences, University of Guyana

Copyright: All rights reserved. No part of this publication may be reproduced in any form or by any means without the permission of the author.

## The Green Economy and Energy

By Denise Simmons

---

In primary school we learn “energy is the ability to do work” (*Ministry of Education Curriculum Guide Science Grade I, 2003, p. 27*) and that there are different forms of energy, including light, heat, and sound. Everything that happens in the world involves energy. For instance, our bodies use energy from the food that we eat to regulate our temperature, breathe, move, see, talk, smell, and think. Energy in forms other than food is also essential for the growth and development of a country; energy is used to manufacture products, generate electricity, heat water, power vehicles and other forms of transport, and heat or cool homes. Additionally, energy enables food production and access to potable water. To obtain this energy, vast amounts of energy resources are extracted and burnt. In fact, worldwide consumption of energy has risen since the Industrial Revolution (Figure 1). The *BP Statistical Review of World Energy (2011)* indicates that the world’s primary energy consumption grew by 5.6% in 2010, the largest increase since 1973. This has been attributed to two factors: the rebound in industrial activity following the economic downturn; and the rapid economic growth in the developing world.

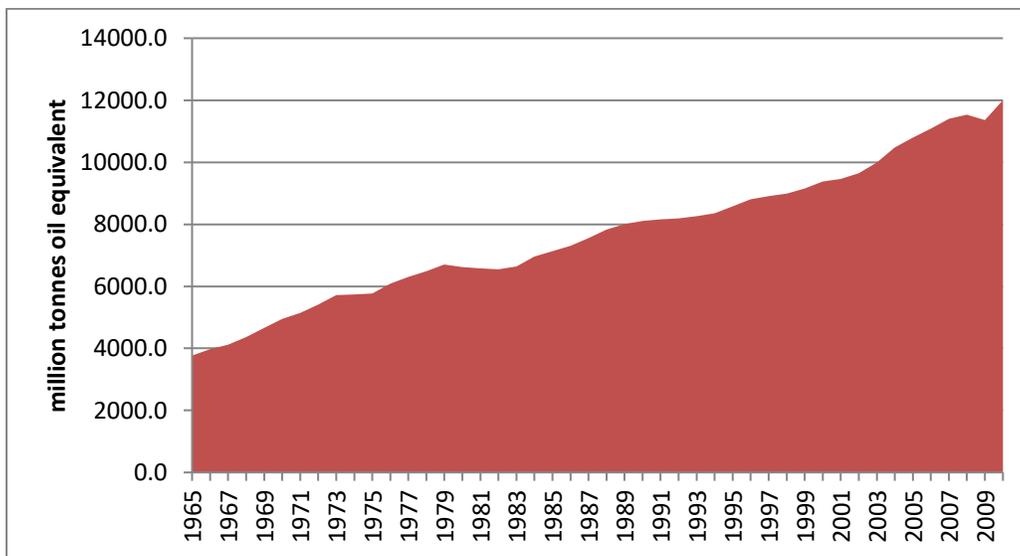


Figure 1: World Consumption of Primary Energy  
(Source: *BP Statistical Review of World Energy June 2011, 2011*)

Consumption varies by region (Figure 2); in 2010 the Asia Pacific region was the highest global energy consumer, accounting for 38.1% of the world consumption, followed by Europe and Eurasia (24.8%), and North America (23.1%). China surpassed the United States as the world's largest energy consumer in 2010.

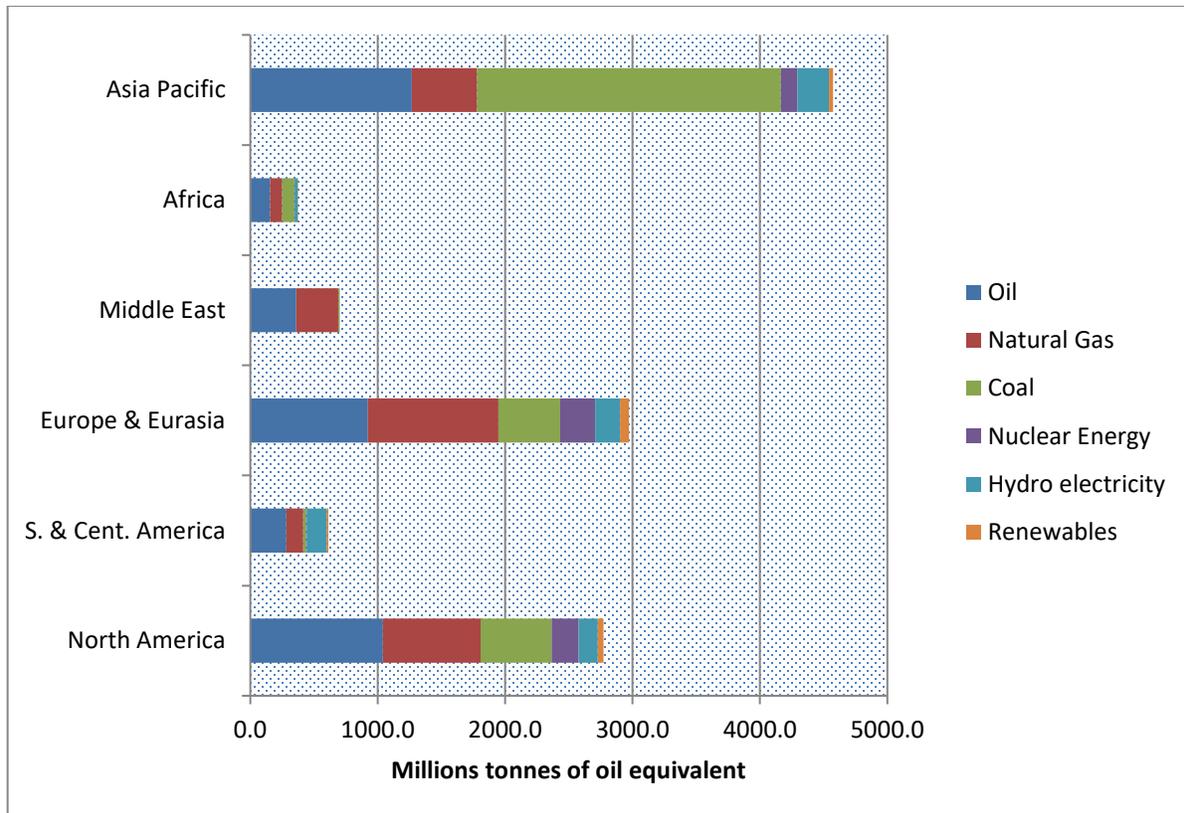


Figure 2: Regional Consumption of Primary Energy  
(Source: BP Statistical Review of World Energy June 2011, 2011)

Examining the energy supply by energy resource reveals that oil accounted for 33.6% of the total supply, followed by coal (29.6%), natural gas (23.8%), renewables<sup>1</sup> (7.8%), and nuclear (5.2%) in 2010 (Figure 3). Oil is the most dominant fuel consumed (although it lost share for 11 consecutive years), with the share of coal in the total energy consumption continuing to rise and the share of natural gas being the highest on record (BP Statistical Review of World Energy June 2011, 2011). Thus, the availability of energy in the current global framework relies extensively on the availability of oil, coal, and natural gas - these three resources constitute 87% of the world energy consumption.

<sup>1</sup> Renewables include hydroelectricity, wind, geothermal, solar, biomass and waste.

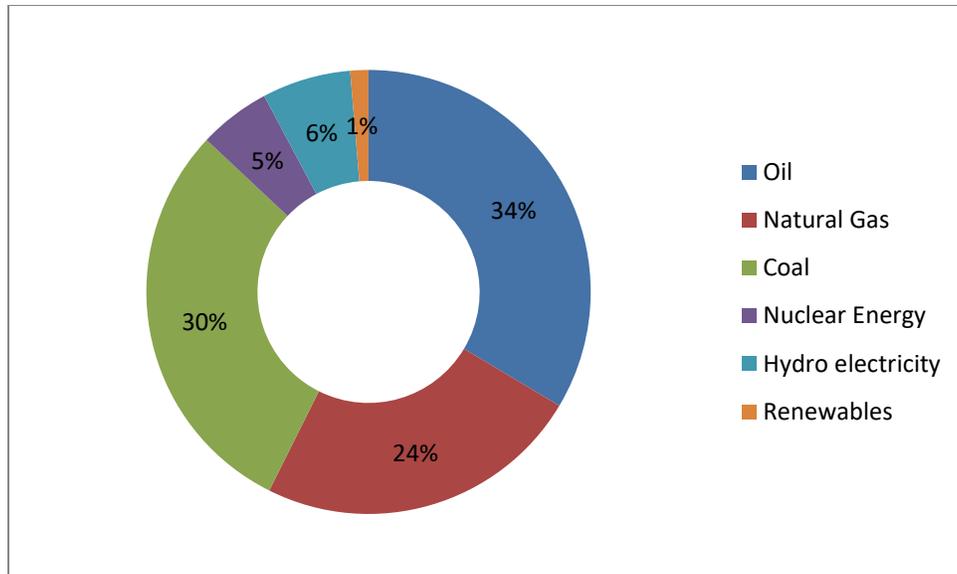


Figure 3: World Consumption of Primary Energy by Type in 2010  
 (Source: *BP Statistical Review of World Energy June 2011, 2011*)

So should we be concerned that the world's energy relies so heavily on oil, coal and natural gas? Yes we should; there are too many issues that should cause concern.

Oil, coal and natural gas are available in finite reserves. They were formed hundreds of millions of years ago as plant and animal matter decomposed and were converted under conditions of high temperature and pressure under the earth's surface into the hydrocarbon compounds that are called fossil fuels. While it is argued that these fuels are still being formed, the rate is negligible compared to the rate at which the world is consuming them. At the 2010 rate of production, 118 years of coal, 58.6 years of natural gas, and 46.2 years of oil are left globally (*BP Statistical Review of World Energy June 2011, 2011*). Additionally, the fact that these reserves are disproportionately distributed throughout the globe (for example, the Middle East has over 50% of the world's oil reserve) leads to issues of energy security.

Beyond the issue of availability of the resource is the unintended environmental consequence of the use of these fossil fuels. Upon combustion of oil, coal, and natural gas to obtain energy, carbon dioxide and other greenhouse gases (GHGs) are emitted into the atmosphere causing a warming of the planet, altering of our climate system, and jeopardising the well-being of humans and ecosystems. The *BP Statistical Review of World Energy (2011)* reveals that the global emissions of carbon dioxide from fossil fuels have been increasing and grew strongly in 2010 – by 5.8% (Figure 4).

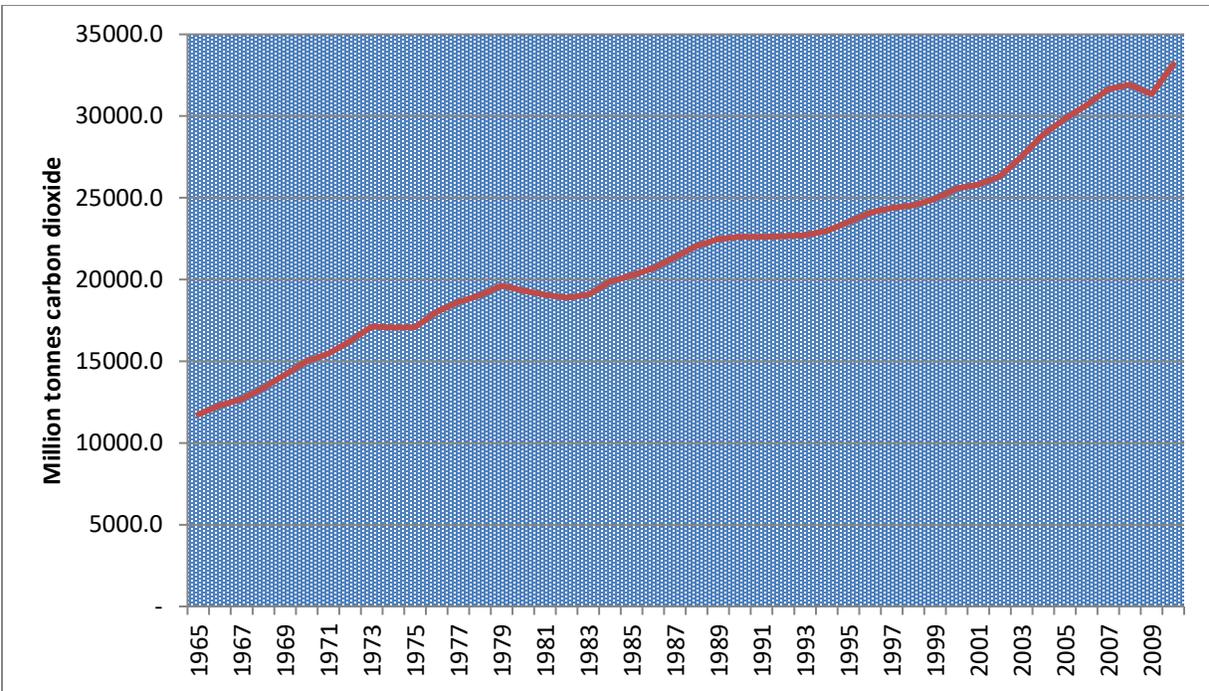


Figure 4: Carbon Dioxide Emissions (Source: *BP Statistical Review of World Energy June 2011*, 2011)

According to Sharma (2010), Guyana’s consumption of oil is only 0.012% of world oil consumption. Notwithstanding this, Guyana relies heavily on the importation of oil products, which account for about 70% of primary energy supply. In 2008, oil imports represented about 44% of Guyana’s official Gross Domestic Product (Sharma, 2010). In fact, while the total volume of oil products imported has increased by 34% over the period 1994 to 2010, the acquisition cost of these imports has risen by over 400% (Figure 5), which places a significant economic burden on the country. Noteworthy is that Guyana’s emissions of carbon dioxide are low. In reality, given the natural endowment of vast forest resource, Guyana is considered a net sink country in which the forest is responsible for the removal of carbon dioxide from the atmosphere (Government of Guyana, 2002).

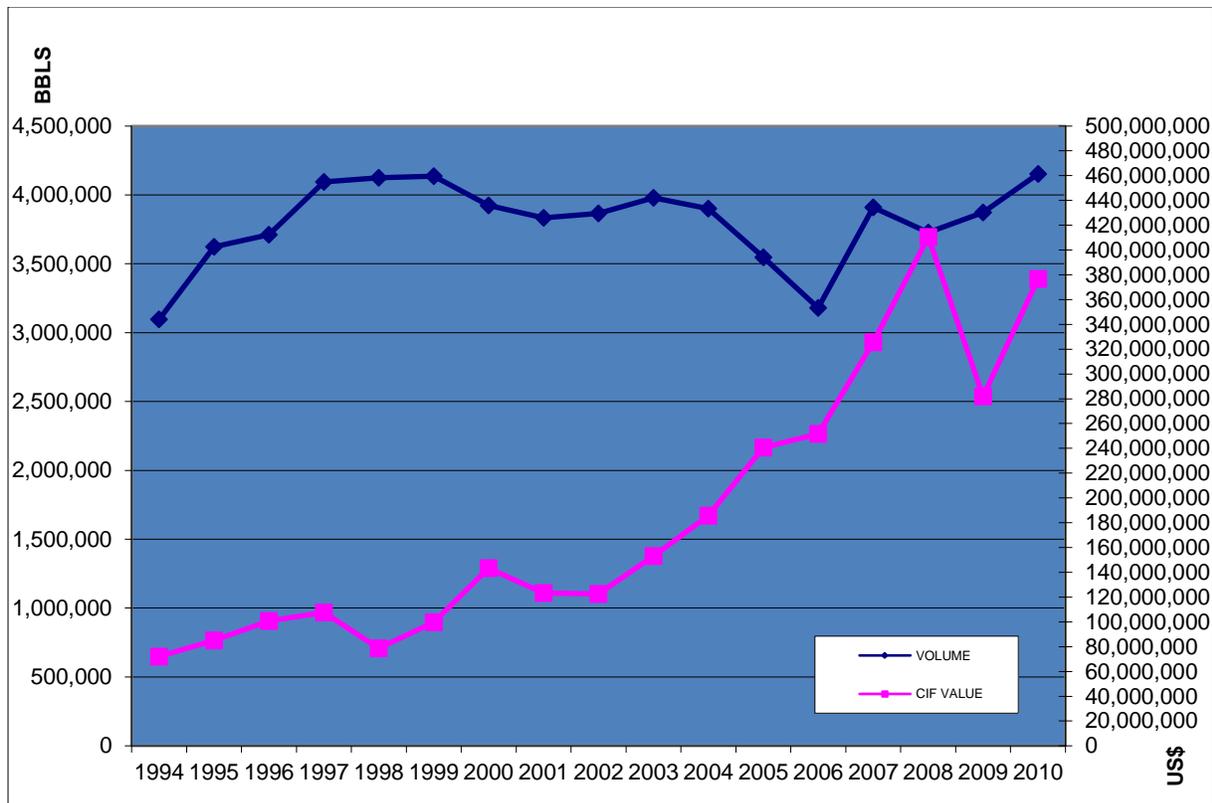


Figure 5: Total Volume and Cost of Importation of Oil Products into Guyana, 1994 to 2010  
(Source: Guyana Energy Agency, n.d.)

## Green Economy

Can we find solutions to these problems of resource depletion and environmental pollution? With a rapidly increasing world population and growing economic development across the world, these problems are gaining more prominence. Achieving solutions would not be easy, but they are imperative to improving energy security and averting further harm to the environment, while simultaneously ensuring development. It can be argued that “green economy” is a solution.

The United Nations Environment Programme (UNEP) describes a green economy as “one whose growth in income and employment is driven by public and private investments that reduce carbon emissions and pollution, enhance energy and resource efficiency, and prevent the loss of biodiversity and ecosystem services” (United Nations Environmental Programme, n.d. para. 2). Put simply, a green economy is one that has three pillars - it is low carbon, resource efficient, and socially inclusive. In this context, a green economy must be founded on a sustainable energy policy.

According to Prindle et al. (2007, p. 1):

*“Energy efficiency and renewable energy are the two pillars of sustainable energy policy. Both resources must be developed aggressively if we are to stabilize and reduce carbon emissions in our lifetimes. Efficiency is essential to slowing the growth of energy demand to a low enough rate that clean energy supply growth can make deep cuts in fossil fuel use. If energy demand grows too fast, renewable energy development will chase a receding target. Likewise, unless clean energy supplies come online in large measures, slowing demand growth will not reduce total emissions to needed levels.”*

Energy efficiency could result in large and highly cost-effective energy savings and emissions reduction. Renewable energy sources – including wind, wave, biomass, solar, geothermal and hydropower – generate electricity without producing GHGs or producing lower levels when compared with fossil fuels and provide the opportunity for a sustainable supply of energy (although it must be recognised that all renewable energy sources have both negative and positive environmental and social consequences).

Guyana, through its Low Carbon Development Strategy (LCDS) launched in 2009, proposes to maintain the majority of its forest, while investing the revenue from its ‘forest climate services’ into clean energy, social development, and low carbon sectors. For instance, regarding clean energy, the LCDS proposes to use a renewable energy source for electricity supply through the development of a hydropower project; provide solar panel arrays for local electricity generation for indigenous people who reside in the forested regions; use solar and wind power for water distribution in the hinterland; and enable the country to become a producer of bio-ethanol (Government of Guyana, 2010).

A green economy provides the opportunity to reduce global energy consumption of fossil fuels, improve energy security, and reduce emissions of carbon dioxide; while pursuing national development. It is worthy of note that a green economy would also require individual actions, since individual actions can also have a positive impact on reducing global energy consumption; for example:

- Replacing incandescent light bulbs with compact fluorescent lamps (CFLs) - CFLs last longer and use much less energy;
- Walking, biking, or car-pooling whenever possible;
- Turning off lights and electronic equipment when not in use; also removing the plugs from sockets since even in "standby" mode, electronics still consume energy;
- Buying high energy efficient cars and appliances; and
- Investing in renewable technologies, such as solar panels.

## References

- BP Statistical Review of World Energy June 2011. (2011). Retrieved from [http://www.bp.com/content/dam/bp-country/de\\_de/PDFs/brochures/statistical\\_review\\_of\\_world\\_energy\\_full\\_report\\_2011.pdf](http://www.bp.com/content/dam/bp-country/de_de/PDFs/brochures/statistical_review_of_world_energy_full_report_2011.pdf).
- Government of Guyana. (2002) *Guyana Initial National Communication: In response to its commitments to the UNFCCC*.
- Government of Guyana. (2010). *A Low Carbon Development Strategy: Transforming Guyana's Economy While Combating Climate Change, 3<sup>rd</sup> draft*. Guyana: Office of the President.
- Guyana Energy Agency. (n.d.). *Final Energy Information 1994 to 2010*. Retrieved April 26, 2012 from <http://www.gea.gov.gy/download>.
- Ministry of Education Curriculum Guide Science Grade 1. (2003).
- Prindle, B., Eldridge, M., Eckhardt, M., Frederick, A. (2007). *The Twin Pillars of Sustainable Energy: Synergies between Energy Efficiency and Renewable Energy Technology and Policy*. Washington, DC: American Council for an Energy-Efficient Economy, (ACEEE Report Number E074).
- Sharma, M. (2010). *Guyana's Energy Sector* [Powerpoint slides]. Presented at the University of Guyana and British High Commission, Georgetown Climate Change Lecture. Regency Suites/Hotel April 2010.
- United Nations Environmental Programme. (n.d.). *Green Economy About GEI: What is GEI?* Retrieved March 29, 2012 from <http://www.unep.org/greeneconomy/AboutGEI/WhatisGEI/tabid/29784/Default.aspx>.