Renewable Energy in Canada

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Can you imagine the future without energy? Probably, this idea has never passed through your mind, but the lack of energy might happen if some changes in energy exploration do not happen soon. Alternative energy is the solution for many of the problems that we are facing now. Due to an unstable scenario of fossil energy production, renewable energy is the best solution to solve the problems caused by power plants because it does not pollute the environment, is convenient to the Canadian economy, and has great advantages for the future.

Many countries, nowadays, are becoming industrialized and problems as pollution start to appear. Thus, acid rain, carbon effects, and quality of the air are getting attention and discussions about these are increasingly common. Sulfur burning, for example, results in sulfur dioxide, a gas whose presence in the atmosphere is mainly responsible for the formation of acid rain. When there are pollutants, originating mainly from burning fossil fuels (coal, oil, petroleum), they form clouds and then rain. When rain falls, these acids degrade the plants, soil, statues, and monuments. Acid rain can disrupt of ecosystems, pollute rivers and water sources, and harm the health of humans and animals as well. Thus, industrial power generation processes are the major causes of the introduction of pollutants into the atmosphere. Air pollution is defined as a form of matter or energy intensity, concentration, time or characteristics that may make inappropriate, harmful or offensive air health, and inconvenience to the people welfare. According to Renneboog (2014) combustion of each atom of carbon removes two atoms of oxygen from the air, forming a molecule of carbon dioxide. Therefore, three tonnes of oxygen from the atmosphere are removed by each tonne of coal burned, so 1.5 million

tonnes of coal burned each year by each thousand megawatt coal-burning power plant subsequently removes 4.5 million tonnes of oxygen. In summary, the oxygen lost is forever removed from its role in supporting life (para. 15).

Greenhouse effect should be natural and normal; however, it changed and became strong and harmful. It is important to know what greenhouse effect is, which gases contribute, and what are strategies possible strategies for reducing concentration of these gases. Greenhouse effect is a process that occurs when a portion of the infrared radiation emitted by Earth's surface is absorbed by certain gases in the atmosphere, so part of the heat is irradiated to the surface and is not released into the space. Greenhouse effect is essential since it serves to keep the planet warm and existence of life on the Earth. Unfortunately, “The danger lies in the rapid increase of carbon dioxide and other greenhouse gases that intensify this natural greenhouse effect” (Suzuki, n.d., para. 2). There are six gases considered to be greenhouse gases: carbon dioxide (CO_2), nitrous oxide (N_2O), methane (CH_4), chlorofluorocarbons (CFCs), hydrofluorocarbons (HFCs), and sulfur hexafluoride (SF_6), that, also, are responsible for contributing to global warming and global climate change. Thus, in accordance with Renneboog (2014), the main harmful gas is carbon dioxide, and is unacceptable if industries still ejecting more carbon dioxide into the atmosphere (para. 12). On the other hand, it is possible to create strategies for reducing concentration of greenhouse gas in the atmosphere with improved energy efficiency through the use of renewable energy. Using renewable energy will avoid pollution gases emission since energy exploration as hydropower and wind power comes from natural resources which are inexhaustible.

Environmental impacts caused by burning of fossil fuels are visible in the 21st century. High temperatures because of global warming and greenhouse effect, changing ecosystems and soil degradation are some of the most noted indicators that the planet needs help. Diminished oceanic ice and increased sea level are a result of the rising temperatures. Oceanic ice "extent has diminished from about 7 million square km in the 1990s to less than 5 million square km in five of the past seven years, with a record minimum of 3.6 million square km being set in 2012" (Amos, 2014, para. 5). Impacts on ecosystems begins with water because it could change its temperature on river and oceans, then fishes may not adapt; also, the oxygen level may not be enough, so life underwater will be threatened. Moreover, the plants do not adapt easily, compromising all of fauna and flora, so the effects on ecosystems could be devastating. In addition, soil degradation due to fossil fuel exploration is another existent problem because the toxic organic compounds such as hydrocarbons (petroleum), for example, also contribute to soil contamination. These compounds are hardly degraded, and they stay in the environment for a long time, and the issue of soil likely related to other natural resources such as water, waste, and biodiversity.

Canada is already an important leader in the renewable energy sector, and it should keep expanding its alternative energy production to guarantee its position in the future. Nowadays, most of electricity generation of Canada is produced by non-emitting energy sources. In fact, more than 75% of all energy produced in the country came from alternative energy, especially hydropower (Canadian Electricity Association, 2014, p. 3). Canada is an example in the world scenario of renewable energy and many investors from all different countries are choosing Canada to invest in new ways of energy

production, mainly in solar power and wind energy. If we take a quick look in the energy sector of Canada now, we will see that Canada is working hard producing clean energy and it is one of the few countries in the world that do not have much dependence on fossil fuels. The future of Canada seems to be successful when the topic is clean energy production.

The future generations depend on the acts that we do now, and Canadians have to embrace the alternative energy sources and try using less fossil fuel. The Canadian electricity industry has the dude of leaving a reliable and a well-done system to our children and future generations (Canadian Electricity Association, 2014, p. 4). Our government should make right choices because the decisions that we are making now will reflect in the future. In addition, Canada cannot putt effort in power generation because it is unstable, and it does not have a predicted future. For example, during the blackouts that occurred in Ohio in 2003, “Altogether 508 generating units at 265 power plants across Canada and the United States shutdown during the outage” (Canadian Electricity Association, 2014, p. 8). Canada has to diversify its energy production using more alternative energy such as wind and solar power. These sources, wind and solar, are not using in large scale in Canada nether in the rest of the world. So, if Canada increases its investments in these kinds of energies, it will become a pioneer in the world.

Hydropower has the most important significance in the Canadian energy production, and it is one of the best ways to produce energy because it is inexpensive and clean. Hydroelectric plants have relatively low operational and maintenance costs. In fact, a hydroelectric plant can operate for more than a hundred years without big changes or adaptations. A good example is the hydroelectric DeCew Falls Generating Station, in

Ontario, that is operating from 1898 to nowadays (Canadian Electricity Association, 2014, p. 7). Canada should choose invest more in hydroelectric power because the water is abundant, the technology used in the Canadian hydroelectric is efficient, the service life of stations is long, the cost is competitive with fossil fuel power plants, and the electricity produced is renewable and clean (Canadian Hydropower Association, 2008, p. 8). Also, hydropower is one of the most efficient sources of energy in the world because it can convert more than 95% of the water mechanical energy into electrical energy (Canadian Hydropower Association, 2008, p. 10). In addition, hydropower does not produce air pollutants or any toxic waste, and it produces almost no greenhouse gas emissions (Canadian Hydropower Association, 2008, p. 22).

Wind energy and solar power are also good options to invest among the alternative energy sources because they have a competitive cost. While nuclear power continues to rise, wind and solar energy are going in the opposite way with the cost decreasing over time (Canadian Wind Energy Association, 2013, p. 7). In fact, wind power production is cheaper than power plants and nuclear power. Also, its cost is very competitive with hydroelectric energy production. Another reason why Canada should give priority to wind energy and solar energy is because this source is not susceptible to the risks of price fluctuation of fossil fuels (Robert, 2014, para. 3). According to Canadian Wind Energy Association, the “installation costs for wind energy will remain relatively stable or even decline in the years ahead as wind turbine supply catches up to demand and wind turbine technology continues to improve” (Canadian Wind Energy Association, 2013, p. 7). Furthermore, as time goes by, electrical grids are becoming more connected and new techniques are being developed that contribute to lower the cost

of wind energy and solar power in the future (Canadian Wind Energy Association, 2013, p. 11). These facts prove not only the low-cost of these sources energy production, but also show the stable and promising future that is expected for wind power and solar energy.

One of the most known advantages of renewable energy sources is the fact that they are eco-friendly, and wind and solar power are a real example that proves that we can produce electrical energy without polluting the environment. There are no doubts that our society needs to pollute the planet less, and wind and solar energy are good solutions to reduce pollution. The reasons are because the production of these energies does not use water, and does not produce nuclear waste (Canadian Wind Energy Association, 2013, p. 8). Another big advantage of wind and solar energy is because they do not have greenhouse gas emissions (Canadian Electricity Association, 2006, p. 17). In fact, the environmental impacts of a wind and solar farm are almost zero (Canadian Wind Energy Association, 2013, p. 8). If Canada chooses to invest in wind and solar energy, it would have more than 20% of its electricity from wind power by 2025 (Canadian Wind Energy Association, 2013, p. 10).

Wind energy together with solar energy will be responsible for creating many high quality jobs, and to increase the Canadian economy. The Global Wind Energy Council has predicted that the global wind market will grow 120% in 5 years (CANMET Energy Technology Centre, 2008, p. 5). Just to have an idea of numbers, this represents more than $1 trillion of investments in wind energy from 2008 to 2020 (Canadian Wind Energy Association, 2013, p. 13). Canada should act now to try to get part of these investments. The good wind conditions and the high solar intensity of Canada are

attracting many foreign investors not only in the wind energy field, but in the solar energy as well. In addition, many jobs would be created with the new wind and solar farms. The Worldwatch Institute predicts there will be a need to create more than two million jobs for wind power industry in the world by 2030 (Worldwatch Institute, 2008, para. 15). Wind power and solar energy production bring benefits to rural areas and small communities too. For example, remote communities that are isolated from electricity grids could use wind or solar power instead of diesel generators to produce energy (Canadian Wind Energy Association, 2013, p. 14).

In the current scenario, that many countries are embracing renewable energy, the Canadian government should join them and develop the alternative energy sector to become a reference in the world. Using more renewable energy sources is a good and healthy way to solve many of problems. Wind energy, solar power and hydropower are the best options to invest because it is clean, they have a low and competitive cost, and they can help to grow the Canadian economy. Not only the government, but society as well should embrace the cause of alternative energy because it is an excellent way to produce energy without polluting the planet, provide economic advantages, and it has many benefits for the future.

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