

Climate Change, Renewable Energy, and the Hong Kong Connection

In a literature review, 97% of climate scientists have concluded that anthropogenic climate change is happening. This April produced the record for the first month in human history with average carbon dioxide in Earth's atmosphere above 400 parts per million.¹ Climate change is affecting where and how Americans live and work as well as their health, and evidence is mounting that burning fossil fuels has made extreme weather such as heat waves and heavy precipitation much more likely in the USA, according to the National Climate Assessment (NCA), the largest, most comprehensive U.S.-focused climate change report ever produced.² As stated by S. Pacala and R. Scolow, "Humanity already possesses the fundamental scientific, technical, and industrial know-how to solve the carbon and climate problem for the next half-century."³ Renewable energy is a technology that can compensate for the world's energy demand and limit the exhaustion of CO₂ into the atmosphere.

Climate change is happening here and now. Averaged over all land and ocean surfaces, temperatures warmed roughly 1.53°F (0.85°C) from 1880 to 2012, according to the International Panel on Climate Change (IPCC).⁴ Sea level is rising and extreme events such as abnormal heat waves and heavy precipitation events happen more frequently. Recent scientific findings indicate that climate is responsible for the increase in the intensity of these events in recent years. At our

¹ Andrea Thompson, "April Becomes 1st Month with CO₂ Levels Above 400ppm" <http://www.climatecentral.org/news/april-becomes-first-month-with-co2-levels-above-400-ppm-17367> April 29th, 2014

² Doyle Rice, "Climate Change is Here and Getting Worse" <http://www.usatoday.com/story/weather/2014/05/06/national-climate-assessment/8736743/> May 6th, 2014

³ S. Pacala and R. Scolow, "Stabilization Wedges: Solving the Climate Problem for the Next 50 Years with Current Technologies" *Science* Vol. 305. 13 August 2004

⁴ IPCC, "Climate Change 2013: The Physical Science Basis" pg 3

current trajectory, we are at risk of pushing our climate system toward abrupt, unpredictable, and potentially irreversible changes with highly damaging impacts.⁵ Earth's climate is on a path to warm beyond the range of what has been experienced in the past million years.⁶

With these facts in mind, the moment to act is now. The risk and costs will only increase the later we act. The CO₂ we produce and emit accumulates in Earth's atmosphere for centuries, and longer. The effects of CO₂ emissions cannot be reversed by one generation to the next until there is a large-scale, cost-effective way to scrub carbon dioxide from the atmosphere.⁷ However, this carbon capture/scrub system is currently not technologically and financially feasible. In order to reduce our CO₂ emissions, renewable power sources are absolutely critical as it can provide an energy source to substitute fossil fuels. Renewable energy sources such as wind and solar are growing exponentially with significant interest from investors. Additionally, wind and solar provide an ultimate advantage over alternative energy sources such as hydropower and nuclear, as wind and solar can produce energy as soon as they are constructed rather than waiting until the entire structure has been built.

Renewable energy has moved to the forefront of the politics throughout the world. The Asia Pacific region is an increasingly important market for renewable energy. It is on the agenda for most Asian countries primarily for energy security reasons, because it reduces reliance upon imported oil, gas, coal, and other commodities. Case studies in Europe in countries, such as United Kingdom and Germany, have shown that the establishment of a regulatory regime that

⁵ AAAS, "What We Know: The Reality, Risks, and Response to Climate Change" pg 3

⁶ National Research Council, "*Abrupt Impacts of Climate Change: Anticipating Surprises*" The National Academies Press. 2013

⁷ AAAS, "What We Know: The Reality, Risks, and Response to Climate Change" pg 4

offers clear financial incentives for investors is crucial to the development of renewable energy.⁸ Stability of the regulatory regime is a critical issue for investors in the sector. A wealth manager noted: “While investment incentives are significant, they are not the most critical variable in an investment decision. The most important thing is to have a predictable power system regime.”⁹ The global investment industry has become concerned with the risk of changes to support regimes.

While Climate Change is an acknowledge issue in Hong Kong, it is not the primary issue according to Professor Jimmy Fung of HKUST. He continued by stating that very few citizens were concerned about climate change. Prominent members of Hong Kong’s major power company, China Light & Power (CLP), conferred that Climate Change is not as “interesting” and it was more about “being responsible.” They continued by stating the Hong Kong government and the people of the city were more concerned about air quality. Air quality is a significant issue in Hong Kong as it is the most vertically integrated city with over 65% of its residents living above the 15th floor. In a recent survey by the Hong Kong think-tank, Civic Exchange shows that “drinking water pollution is the greatest environmental concern in Hong Kong, although the concern that increased the most since 2001 is Mainland China’s environmental problems. Nuclear power was the energy source respondents had most concern about and concern about nuclear power exceeds concern about climate change. Two thirds of respondents are worried about climate change. Respondents believe that climate change is more threatening than terrorism, a war between Taiwan and China, or the global banking crisis, but they also believe that nuclear accidents and water scarcity in China are more of a threat than climate change.”

⁸ Pew Charitable Trusts. “*Whose Winning the Clean Energy Race? 2013 Edition*”

⁹ David Strasburg, IHP Alum. Personal Communication. April 2, 2014

Hong Kong imports 100% of its energy from China. It is completely energy dependent. Additionally, it is not explicitly stated what sort of energy mix is being exported. Following the Fukushima crisis in Japan, citizens of China and Hong Kong have been extremely sensitive regarding nuclear power plants. With Daya Bay Nuclear Power Plant in the Guangdong Province, China providing close to 50% of the energy, citizens of Hong Kong are apprehensive. Primarily two private companies, CLP and Hong Kong Electric Company, power the city. The territory's two vertically integrated companies are regulated under the Scheme of Control (SOC) Agreement. According to CLP's website, "the Scheme of Control stipulates power companies' obligation to supply adequate and reliable electricity to customers at an affordable price and the government's role in monitoring the financial affairs and operating performance of the power providers. In return, the power companies are allowed to charge tariffs that enable them to recover operating costs, make long-term investments while fulfilling its obligation to the community." The Civic Exchange stated earlier surveyed the knowledge by the citizens of Hong Kong regarding how much energy sources provided power to the city. Just one in five know that coal provides more than half of Hong Kong's power. Small majorities know that alternative energy sources such as wind, solar photovoltaic and solar hot water make up a very small percentage of power generation in Hong Kong. A clear majority of the surveyors oppose expansion of coal and nuclear sources of fuel but support the expansion of natural gas, wind, and solar sources. Over 90% and 93% support the increase in use of wind and solar power generation in Hong Kong.

The Hong Kong SAR does not have a renewable energy policy. There is no feed-in tariff. Additional returns for investment in renewable energy is 11% compared to 9.9% for other energy sources. One might think that Hong Kong, as an island, has potential for offshore wind projects.

However, according to CLP, it is “too expensive for this part of the world” and there is a high tariff. CLP has been supplying electricity at 99.999% reliability to the people of Hong Kong. The company prides itself regarding this statistic, as it is one of the best in the world. With this core value in place, it provides an intriguing barrier for the intermittent energy sources such as wind and solar. Additionally, Hong Kong’s geography serves as additional constraints. As an island territory and high a population density, land costs are constantly increasing (one of the highest in the world) and land availability on the island is decreasing rapidly with constant development of high-rise apartments and malls. This creates additional economic constraints on renewable energy projects that already lack financial incentives. While there are wind power plants set up by CLP and Hong Kong Electric Co. in Town Island and Lamma Island, these projects serve more as a symbol rather as contributory power plants. They serve as stock photos for the companies’ annual sustainability reports.

If we wish for a sustainable Earth in the future, we need to reduce our carbon emissions drastically, now! The Intergovernmental Panel on Climate Change recommends the end of fossil fuel emissions by 2020 to stop “irreversible” damage. Multiple surveys show the demands of the citizens of Hong Kong for renewable energy sources. While the Scheme of Control limits the Hong Kong government from placing extreme pressure on the private power companies, it is the government responsibility to listen to its people. Additionally, by reducing the energy imports of coal energy and demanding the increase of renewable energy, the Hong Kong SAR will also be able to increase the air quality that its citizens crave. The Hong Kong government needs to adopt an ambitious carbon reduction target and ensure that it purchases renewable energy from Guangdong. Additionally, as one of the premier economies in Asia, Hong Kong can serve as a model for other island nations with these actions.

