

Methodology report sample

[Technology](#), [Development](#)



English Engineering Paper – Latest Updates on Low Carbon Technology

Abstract

A lot of things have changed and technologies developed ever since the world entered the industrial era. Now, we are in the so called digital era, where most, if not everything, appear computerized. Machines and computers are now a big part of people's lives that most cannot stand a day without access to such technologies. The continuously increasing reliance of companies and basically any type of organizations on computers, believing that they are keys in making work more efficient and effective at the same time, can also be easily noted. The world population has boomed so hard, the farmers and manufacturing plants now have to work not just three times but at least a hundred times more efficient than they had to be when the world's population used to be a fraction of its current population now. The efforts of farmers and manufacturing plants owners have paid so far because no catastrophic shortages on food and basic and luxurious commodities have happened so far. But there is one great consequence of all these keeping-up strategies that humans have committed for the past 100 years—carbon emissions. Every machinery that creates, uses, or converts one form of energy, or uses the process of combustion can be a potential source of carbon dioxide emissions. Some of the most common and major contributors to the current world levels of carbon emissions are automobiles, factories, and the not so popular coal, oil, and natural gas power plants. The objective of this paper was to investigate on the updates on the efforts that governments are taking to lessen their current carbon emission rates. A

thorough review of related literatures was conducted to get the most recent, valid, and related updates on the field of engineering, particularly on the available technologies that promise reduction on the current emission rates of the greatest carbon contributors. The results of the review suggest that there are already technologies being used in highly industrialized and developed countries to reduce the rate of carbon emission from their traditional power plants, automobiles, and domestic factories significantly. These findings will be significant not only for the citizens of the said countries but for the citizens of the world because in the end, all will be affected by the harmful effects of global warming.

Introduction

Lowering down carbon emission rates remains to be one of the top priorities of state policy makers and officials after arriving at the discovery that high levels of carbon dioxide and greenhouse gases in the atmosphere could lead to global warming. Global warming or climate change can be manifested by a lot of signs and symptoms such as the rise in average sea water levels due to the irrevocable melting of the polar ice caps; and the increased temperature in the environment. Unfortunately, there is no other way to reverse these reactions but to either decrease the overall carbon emissions rate or increase the volume of carbon sponges or those that absorb the unnecessary carbon in the atmosphere that traps the heat coming from the sun from going out of the planet and being released into the outer space.

Literature Review

Japan Roadmaps on Toward Low Carbon Society by Back casting

Japan plans to initiate a Low Carbon Society initiative that aims to reduce the country's total carbon emission rates by up to 70 percent. The government research and planning department plans to focus on reforming the residential and commercial, as well as the transportation sectors. The target deadline for the initiative is by the end of 2050. What is unique with this study is that it uses a back cast model of assessing the risks, advantages, disadvantages, possible investment and other requirements towards the achievement of the goal. Basically, the back cast model of analysis is just the opposite of a forecast model of analysis wherein future images of scenarios are predicted based on the current available factors such as technology and resources, and other things required to achieve a certain goal. A back cast model on the other hand predicts, facilitates or avoids the occurrence of a future scenario by investigating the actions and other things required to facilitate or avoid such. At the end of the study, the authors have concluded that “ the challenges toward a LCS include not only short to medium term targets such as the Kyoto Protocol and the midterm targets of CO₂ emissions, but also long term and broad ranging actions.” In earlier sections of their study, it has been established how technologies have a learning-by-doing effects, which could significantly decrease the overall investments required to develop the CO₂ emission reduction technologies. With other developed countries such as the United States and South Korea launching carbon emission policies decades before 2050, it would only logical to expect that there will be outflow of investments, grants, and funds from foreign firms unless continuous efforts are made to spread the technologies and build production infrastructure for better diffusion of the technologies and

international competitiveness. Nevertheless, all these events add up to the reasons why the Japanese government should start investing on low carbon policies at this early a time.

Assessing the Contribution of Carbon Emissions Trading in China to Carbon Intensity Reduction

National efforts towards the reduction of national carbon emissions rates may directly benefit the environment but it will definitely come at the cost of something. According to a literature published by the Canadian Journal of Energy, Science, Technology, carbon emission reduction policies may have a direct impact on a national economy's GDP. China's carbon reduction policies, for example, would have a direct impact on industrialized provinces that comprise large portions of the country's total carbon emission. The GDP loss of the Jiangxi province in China as a result of the green policies was projected to be somewhere around 1.07%, but after computing the province's gain due to emissions trading; the GDP loss rate was reduced down to 0.36%. It is worth noting that this study also focused on the effects of emissions trading on a province's economy despite carbon emissions restrictions imposed by the state. It is nonetheless clear that regardless whether emissions trading are involved or not, a country's economy can be considered as a factor that is dependent on carbon emission and other environmental policies.

Low Carbon Development Patterns: Observations of Typical Chinese Cities

Creating a development patterns towards the gradual but successful lessening of carbon emissions in highly industrialized cities is a good way of

setting up a good example that will be not only be a lot easier but also safer for other countries to follow, especially for the less developed ones. This is actually the aim of this study. In this study, the authors tried to assess the so called low carbon urbanization that went on in 12 Chinese cities—each were treated as a separate case studies so this current study is basically a series of case studies of the said cities. An integrated evaluation based on an index and assessment model was conducted on each of the 12 cities. The results and findings were then analyzed individually and collectively. The authors, in the end, recognized the fact that low cities have become a strong and consistent development trend not only in China but also in other countries in the midst of the huge pressure brought about by climate change. With that in mind, they have proposed the use of a standardized evaluation index system that would analyze the urban low-carbon development levels in a certain location considering various aspects such as: economic development, energy structure, social progress, living consumption, usage efficiency, and development surroundings. The researchers believed that with a standardized questionnaire available at the disposal of developing cities, the path towards low carbon emissions would not be so tricky, risky, and problematic but rather organized, and even evidence based.

Discussion of Findings

With the real-world evidences gathered from various literatures, it has been established that one of the reasons why the policy makers, despite knowing the possible catastrophic effects of climate change, appear to be acting so slow when it comes to the passing and ratification of bills and policies towards a low-carbon society, that is a society driven by low-carbon

technologies, is number one, failure apprehension; number two, lack of a development pattern or model to follow; and number three, fears of harming the economy (GDP and other macroeconomic indicators) while the country is on its way towards a low-carbon society. Swapping from the use of one technology to the use of another is a huge change. Therefore, it is only logical for policy makers not to pause and simply stare at the issue—an issue that could turn into a disaster if left unaddressed, but rather to take their time, assess the future implications of their steps towards lower carbon technologies, and most of all, the requirements needed to obtain such technologies and the process' negative impact on the economy.

Recommendations

Based on the literatures presented in this paper, which is actually similar to what other literatures suggest, the positive changes that would be brought about by the conversion of traditional industrialized cities or even countries into low carbon technology cities would be more meaningful if the process will be carried out systematically and with higher chances of success. The author of this paper recommends that state leaders drive the country towards low carbon technology development in an organized manner, meeting the investment requirements of such technologies as swiftly as possible, without putting the country's economy in unreasonable levels of risk. Using a standardized assessment of the development levels, using a back cast assessment of the development, and further strengthening the economy so that it can accommodate larger projects such as the research for low carbon technologies are all recommended strategies.

Conclusion

Most people keep on wondering what is it that keeps the government from implementing and then finally using technologies that would lead lesser carbon emissions, considering that the possible catastrophic effects of letting the this environmental issue deteriorate have already been analyzed and established in various literatures. The answer is simple. This research has shown that ratifying policies towards lesser carbon emissions is more complex than what most people think it to be. In a study that has been reviewed in this paper for example, it was discussed how a country could take 50 years to reduce up to 70% of its carbon emissions; and how carbon emission restrictive policies could have an impact on China's Gross Domestic Product. Add the fact that one clean air policy could cost billions of dollars to implement in just a single sector (what more if it would be enforced in all government sectors: residential, industrial, commercial, transportation) as in the case of Japan, and the situation becomes even more complicated. In summary, a complex analysis of not only the current but also the future requirements of the low carbon emission policies should be carefully taken into consideration. Significantly reducing worldwide carbon emissions would definitely be of great relief to the environment but we cannot take away from states their rights to analyze first the macroeconomic factors of doing so before plunging in the policy enforcement.

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