Greenhouse Gas Emissions From Medupi Power Station: Analytical Essay

Load shedding is a result of insufficient electricity generation in South Africa. The state-owned power corporation, Eskom then developed the largest dry-cooled, coal-fired power station to increase the capacity of electricity generation. This is the Medupi power station, with turbine technology operating at very high temperature and pressure which means better efficiency [1]. Medupi power station, like all other coal-fired power stations, plays a major role in Greenhouse gas emissions. This paper discusses Greenhouse gas emissions as one of the impacts of the Medupi Power Station. The positive and negative effects of Greenhouse gas emissions from Medupi power station are explored with the focus on social, natural and economic environments.

The emission of Greenhouse gases contradicts South Africa's commitment to curb climate change. Instead, healthy natural environment is being traded-off with increased electricity generation. Pollution resulting from the emissions of the GHGs lead to habitat degradation since plants and animals cannot survive under these toxic gases. Food cycles are disturbed in the habitats and this may lead to extinction of species that are only adapted to that indigenous area. According to the 2013 Nature Climate Change Journal, climate change caused by burning fossil fuels will contribute to the extinction of one-half of plants and one-third of animals on earth by 2080 [2]. Disease-causing pathogens increase with increase in temperature and this kills plants and animals that were originally protected from diseases.

These emissions cause global warming, which is an issue not only to natural environments but also to the economy of the country. Productivity is lost under extreme weather conditions such as severe rainfall or high temperatures. This means loss of work when climate-related health risks arise, and disruptions in agricultural activities, tourism, energy production etc. These negatively affect the economy of the country. Water shortages results under high temperatures, and thereby arising the need to pump water over long distances to supply the affected areas. The intensive methods used in this process are expensive and therefore affect the country's economy [3]. Climate disasters such as heavy rain, thunderstorm and lightning also leads to economic losses.

Coal fired power stations also emit harmful substances and tons of waste which affect the lives of people in those areas. People must evacuate to places far from the power plant where exposure to these harmful substances is not severe. This disrupts social relationships amongst neighbouring people, affect people's modes of living as they may have to leave their grazing and agricultural land since elevated CO2 in the atmosphere affect food production and livestock. The ambient air quality assessment conducted show high pollutant concentration in the air and high dust fall rates in the area due to the Medupi power station [4]. The contaminated air cause diseases to humans and more money is needed to lessen these health problems which affect the economy of the country.

The pollution control technologies designed for the Medupi power station are yet to be deployed. These include Flue Gas Desulfurization to reduce Sulphur dioxide. It has been reported that Eskom has applied to delay compliance with Sulphur dioxide emission limits in the

Medupi power station. This decision was triggered by very high costs of deployment of these new technologies. This is not so wise of a decision because climate change caused by the emissions of Medupi power station greatly affect the demand for electricity, since extreme weather conditions lead to high energy demand. The government's limit of 1,000mg pollutants per normal cubic metre is much exceeded by the Medupi Power Plant which currently sits at 3,500mg per normal cubic metre [5]. An imbalance exists between the production of sustainable energy and ecology when fossil fuels are used in the generation of electricity.

Coal combustion products such as fly-ash, gypsum etc. play a major role in the production of concrete. Fly-ash can be used as a cement supplement in concrete and it produces strong, corrosion-resistant and durable concrete than conventional concrete [6]. The Flue Gas Desulfurization gypsum also finds its usage in geotechnical applications and as soil amendments for agricultural purposes [6]. This does not only eliminate the need for primary raw materials to produce concrete, but also reduce Greenhouse gases and the need for landfill space to dump the coal combustion products.

The disadvantages of non-renewable energy sources are very intense and lead to an unhealthy natural environment. Global warming and climate change resulting from Medupi Power Station affect social, natural and economic environments in South Africa. The new technologies to lessen Sulphur dioxide emissions in the Medupi Power Station are very costly but must be employed to ensure healthy natural environments. Divesting from fossil fuels as energy source to renewable energy sources could reduce GHGs and thus reduce climate change. This will not only favour the natural environment but also eliminate health risks arising from the toxic gases and boost the country's economy.