

The class started by meeting at Auckland international airport. After making sure that everyone is safely made it New Zealand, the class departed for Huntly Power Station. Huntly Power station is the largest thermal power station in New Zealand and it was established in 1979. The station is owned and operated by Genesis Energy. A thermal power station is a power station that converts heat into electricity. A thermal powerplant is an umbrella term and can be used to describe a wide variety of energy sources like coal power stations, nuclear, geothermal, and natural gas. Once we arrived at Huntly power station we were generously greeted by Simon Herricks, Simon is the predictive maintenance engineer. After getting our Personal Protective Equipment (PPE), we made our way to the conference room where Simon was about to start his presentation. The presentation started by showcasing a video of a 500 kv breaker, the electricity arcs shown in the video were impressive. During the presentation, Simon made a key point that most of the energy generated in the south island comes from hydro and solar. Historically speaking, Huntly power station got its coal from the nearby mine named Rotowaro mine. Rotowaro mine is an open-cast mine found in 1915 and is located 15 kilometers from Huntly power station. There is an impressive special conveyor belt system that connects the mine to the power station. The conveyor belt had a capacity of transferring 4500 tons of coal per hour. The Huntly power station no longer sources its coal from the Rotowaro mine, the Huntly power station procures its coal from Indonesia. The reason for this transition was not covered comprehensively during the lecture, it is worth noting, that it was stated that the coal imported from Indonesia has a lesser % of ash (5%) compared to the coal found in New Zealand. Moreover, one could speculate that the reason for the shut down of the mine is that, the nearby people of the area and New Zealand as a whole is moving away from fossil fuel based activities. It is worth noting that, by importing coal the carbon emissions increase. In the lecture we learned that Huntly power station has the capacity to supply 953 MW, which accounts for approximately 15% of the entire energy demand in New Zealand. Huntly power station is not a small station, therefore, it faces a lot of criticism because of its reliance on fossil fuels. Simon also gave us pop quiz on why Alternate current (AC) is not ideal for long distance power transmission. He stated that, the two main drawbacks with AC are: AC loses power over long distances and AC requires more cables. Furthermore, during the summer time, Huntly faces challenged in terms of cooling. Simply put, during the summer season there is less water and the water is warmer. Huntly power station also has to abide by the local rules and regulations. Simon stated that there were two units that were currently online. Their natural gas unit seems to be the most reliable and consistent unit. A natural gas unit is a type of a unit that uses natural gas as its primary fuel source to generate electricity. The process of generating electricity in a natural gas unit involves several steps. First, the natural gas is combusted in a combustion chamber to create high-temperature gases. This combustion process releases energy in the form of heat, which is then used to convert water into steam. The steam produced is then used to drive a turbine. The turbine is connected to a generator that converts the mechanical energy from the turbine into electrical energy. This electricity is then sent to a transformer to increase the voltage to the level required for transmission to the power grid. The exhaust gases from the combustion chamber are then released into the atmosphere through a stack or chimney. At Huntly, these exhaust gases are treated to remove any pollutants before being released into the air. After the presentation concluded we embarked on our facility tour.



*Figure 1 A picture of Unit 1 taken during the facility tour*