Wolaita Sodo Converter Station: Ambitious station for national development

BY LAKACHEW ATINAFU

Ethiopian Electric Power (EEP) has devised various modern procedures and officialdoms that enable it to efficiently up line its mission. And it is traveling distant building electricity infrastructures that are equipped with modern technology.

This article shows a vivid picture of Wolaita Sodo Converter Station (WSCS) discussing what power converting is, the difference between converter and distribution stations with its importance.

The Ethio-Kenya Interconnection Project, Engineer Tewodros Ayalew said that Wolaita Sodo Converter Station is located 800 meters southwest of the city of Wolaita Sodo on a 650 meter wide area and was built with a loan from African Development Bank and World Bank. Its construction alone cost 214.5 million USD. An additional 120 million US dollars has been spent on the construction of the steel tower and the line that will extend to Kenya.

This does not include compensation and fees paid to the consulting engineer. It was developed by the internationally renowned German company: Siemens AG. Most of the items are imported and assembled from the well-known European companies.

“Stations like Wolaita Converter Station are few in the world. And the first task of electricity supply is to generate power, and the second is to transport it to power distribution stations and finally deliver or distribute it to the user community,” he noted.

The rationale behind the construction of such a convertor is to ensure that Ethiopia continues to provide electricity to African countries without interruption or waste.

The Station will convert the 400k Alternating Current (AC) received from the No. 2 Power Distribution Station of Wolaita Sodo into 500,000 Direct Current (DC) and transmit it to Kenya through the high power transmission line. All power distribution stations in Ethiopia use Alternating Current (AC) system except this. Their voltage fluctuates between high and low and has the same frequency, he identified.

This method is preferred and easy to generate, distribute and transmit energy and is still being functional today. However, AC power transmission method has higher power loss as compared to DC.

Specifically, it is not viable to carry electricity over long distances. Therefore, since the length of the power transmission line between Ethiopia and Kenya is about 1046 kilometers, the DC power transmission method is preferred as it has less energy loss and requires less transmission line during construction.

The need for a large number of AC power distribution stations is also costly. But the DC power transmission method can make the distribution uniform. Besides, the converter station has its own cooling system. This helps control the high heat generated by the electrical system. One of the criteria for determining the quality of electricity is its reliability.

The Ethio-Kenya high power transmission line has three options to avoid power outages. These are Mono pol, Bipolar and Ground return. The reason for using these three power transmission options is that if there is a problem with one of the transmission methods, the other method can be used.

For example, left and right lines on the Ethio-Kenya high power transmission line, one of them transmits current and the other circuit is interrupted, so if the electricity is interrupted somewhere, it cannot circulate. So the reason two transmission wires are needed is to perform two different roles. Therefore, it is necessary to use both poles and the system is called Bipolar. If there is a power cut on this line, there is no return (Mono pole ground return). This means that current flow is not interrupted by using earth as a conductor.

The third method is called Metallic Monopole, and even if there is a problem on Pole 1 and Pole 2 lines in the area of the converter station, one line can be used as a conductor of electricity to ensure that the flow of electricity is not interrupted. Since the power transmission line contains these three options, there is less chance of electricity being interrupted.