

# HOT COMMISSIONING

## EXPLAINED BY THE TEAM AT LTWP



### FIRST COMMERCIAL OPERATION

'Cold Commissioning' is the process of carrying out all tests that are possible without the transmission line being available, i.e. without a 'live connection'. The first group of LTWP wind turbines were 'Cold Commissioned' on 27 January 2017. This is the date defined as First Commercial Operation. The Cold Commissioning process confirms that the Wind Turbine Generators (WTG) are 'mechanically available', i.e. had the transmission line been fully available, the WTGs would have been able to generate power in accordance with the technical / manufacturer specifications. However, not all tests can be carried out without a live connection; a lot of them depend on the T-Line being energised.

Since the First Commercial Operation date, LTWP was mechanically able to generate power, but could not do so in practice because the transmission line had not been completed, thus electricity could not have been transmitted in to the national grid.

**27 JAN 2017**

### REASSURING PROCESSES

All 365 turbines were installed, certified by independent engineers and ready to generate clean and renewable energy in 2017. However, in order to begin injecting this power into the national grid, they first needed to be 'Hot Commissioned' when a 'live connection' via the transmission line became available. The Hot Commissioning process provides reassurances to all parties - LTWP, the Manufacturer and the Offtaker (KPLC) - that what was agreed to be installed and the specifications thereof has been achieved.



### ENERGISATION

T1 Operation (i.e. the energisation of the double-circuit transmission line) occurred on 24 September 2018. This is when the wind farm was 'powered-up' using electricity from the national grid (in this case from the Suswa sub-station, 436km from the wind farm).

**24 SEP 2018**

### WHAT DOES THIS MEAN?

Imagine putting a new battery in your car – you cannot start the car unless you 'charge' the battery. That is what energisation of the wind farm through the Transmission Interconnector (TI) entails. Once the TI was operational, LTWP commenced 'Hot Commissioning' of the WTGs and the ancillary equipment (the Statcoms and high voltage 220kV Transformers and 33kV collection grid).



### HOT COMMISSIONING

Hot Commissioning is when the WTG is tested once again with the turbine 'switched on' and when all tests that require a live connection are carried out so that the WTG can be certified. The carrying out of Hot Commissioning does not in any way prevent the WTG from generating power. However, Prudent Operating Practice and LTWP's contractual arrangement with the Offtaker (KPLC) dictates that to ensure system stability and protect the plant as well (from voltage fluctuations), that WTGs are commissioned and power from 'Unit Groups' are fed into the national grid.

**END OF  
OCT 2018**



### FULLY OPERATIONAL

Once the wind farm is commissioned, the plant achieves the status of being in Full Commercial Operation. But, it does not mean that from First Commercial Operation Date to Full Commercial Operation Date that LTWP was not ready or could not deliver power -quite the contrary. LTWP has been ready to generate power in to the national grid since 27 January 2017.

### WORKING TOGETHER

Testing and Hot Commissioning is a complex process to ensure that everything works well together when all the wind farm's components are 'live' (WTGs, the Sub-Station, Statcoms etc.) and linked to the national grid via the transmission line (T-Line). There are both standard and very specialised tests that need to be carried out. Some tests are used to assess the impact of the national grid on the wind farm operations – and vice versa. A key aspect is to assess reactive power (vars) which is required to maintain the voltage to deliver active power (watts) through the transmission line on both sides and this is why a slow and controlled integration of the wind farm into the national grid is adopted. It is important to note that LTWP will be producing a large chunk of the electricity supply at any given time and any interruption will result in network instability. Therefore, operational and dispatch protocols and processes are also being agreed between the wind farm and national control centre in Nairobi.

For more information, please visit our website [www.ltwp.co.ke](http://www.ltwp.co.ke) or contact us on [info@ltwp.co.ke](mailto:info@ltwp.co.ke)