



Case Study

## **Doppelmayr: Ropeway as a means to transport People and Material**

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The Cerattepe underground copper mine of the Turkish Eti Bakır A. Ş. mining company (a member of Cengiz Holding) is situated in very mountainous terrain approx. 3.5 km southwest of Artvin, a city in the Black Sea region in north-eastern Turkey. The mined copper ore is transported to the river with a 4.5 km long Doppelmayr ropeway, which covers a difference in elevation of more than 1500 m on its way there.

The mouth of the Cerattepe copper mine is at approx. 1700 m above sea level. From there, the ropeway transports the ore into the valley over a distance of 4.5 km across steep, wooded terrain. The incline is more than  $43^\circ$  at the steepest point. The ropeway can also be used to transport backfill material from the valley to the mouth of the mine.



The Doppelmayr ropeway at Ceratteppe transports the ore into the valley over a distance of 4.5km across steep, wooded terrain. (Picture: Doppelmayr)

The system consists of a continuously moving steel wire rope to which the 51 material buckets are attached by means of a grip. The rope loop is driven by bullwheels in the loading station and tensioned via a return bullwheel in the unloading station in the valley. A mechanism in the stations opens the detachable grip of the material buckets and slows down each bucket. The buckets can thus be stopped for the loading and unloading procedures in the stations but can still



travel along the track at full speed. They are re-attached to the rope as they leave the station. Furthermore, the Cerattepe ropeway allows for the combined transport of material and people. Apart from the material buckets in which the ore is transported, the system will also be equipped with some passenger cabins. In these cabins, the mineworkers can travel to their workplace comfortably and in safety. A trip in any of the cabins takes approx. 20 minutes. Two different types of guides are installed in the stations: one for the material buckets, and one for the passenger cabins. Material flow and passenger transport can thus be kept separated.



The ropeway is also equipped with some passenger cabins in which the



mineworkers can travel to their workplace comfortably and in safety.  
(Picture: Doppelmayr)

To prevent soiling of the sensitive environment, the buckets have been fitted with lids. Any loss of material along the track can thus be prevented. In the unloading station, the lids are opened automatically via a special mechanism and the buckets are turned upside down so that the material will fall onto a chute. Then the buckets are tilted back to their normal position.



In the unloading station, the lids are opened automatically via a special

mechanism and the buckets are turned upside down so that the material will fall onto a chute. (Picture: Doppelmayr)

Operation of the ropeway is fully automatic. Operating costs can thus be optimised. There are also hardly any moving parts along the track. All material buckets and cabins travel through the stations regularly and can be easily inspected and maintained there. To cover the entire distance and the enormous difference in elevation of 1500 m, the ropeway requires only 11 towers. The footprint on the ground can thus be minimized, and because the system is elevated off the ground, it does not represent an insurmountable obstacle for man or wildlife. The ropeway took up operation in December 2017 and has since been transporting 60 t of copper ore per hour into the valley.