Abstract—According to the complexity and variety of the problem and the high volume of data, Big Data is used to data analysis of variables related to the energetic consumption, in the copper production processes in the biggest copper state company of Chile, Codelco Division Chuquicamata, highlighting the problems that are still not treated in the great mining, such as energetic consumption.

The study demonstrates how energetic consumption is a key variable in copper production, and the relation that this variable has with the tons processed, specifically in the Concentrator, area of the most energetic consumption, and its most important assets, the mills. The variables involved are Power and Temperature provided by the mills and the total tonnage entering in each process.

To perform this analysis, it was necessary to propose initially the use of Data imputation, due to the great number of missing information, non-existing on the data basis. On the other hand, the study has allowed to determine a suitable model that allows to study the simultaneous correlation of the variables that influence the energetic consumption through a multivariate model of Canonical Correlation.

Finally, comparisons are established between the mean of consumption of the mills to verify potential significant differences between them. Starting from the experimental design the effect could be measured, in terms of the differences of the mills as a factor over the energetic consumption. Besides, it was determined that despite of the similar behaviour between both group of assets (The mills SAG 16, Ball 16A y Ball 16B with respect to the group of assets SAG 17, Ball 17A and Ball 17B), exists difference in the energetic consumption between the mills of a same group (of Ball and SAG).

Index Terms—experimental analysis, mining, energy, management

I. INTRODUCTION

During the first decade of the XXI century the mining industry lives a great moment. Chile is a world leader in copper production (32% of world production in 2012) and 63% of Chilean exports are associated to the mining sector [1].

For developing countries like Chile, there is a casual relationship between energy consumption and economic growth, the Gross Domestic Product (GDP) exhibits a direct relationship with the growth of electrical energy consumption [2]. In this sense, it is remarkable that the new mining investments in Chile are highly considerable [3].

At the time of improvement of growth and welfare indexes mining is the responsible established on basis of an activity that generates economical interrelations between multiple companies with several degrees of innovation.