

Cobalt, Soon a Pigment of Our Imagination?

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Cobalt, both a metal and an illustrious shade of blue, has been in use for over 3000 years but is today far more important than ever before. It is a metal of crucial importance in the battery and electric vehicle industry and there is thus room for concern. Will it run out in the future, and what effects will this have on the green transition? Luckily, this does not seem to be happening, but how long our cobalt reserves will last and what environmental effects the use of cobalt has depends on how we shape our cobaltiferous future...

Without cobalt, the phone or computer you are using to read this would probably not work. It is vital for most batteries that today run our electronics. But cobalt was actually used long before we ever had iPhones, in fact, during the reign of King Tutmosis III, an ancient Egyptian ruler that lived over 3000 years ago, cobalt was used to create splendid blue pottery products. It was also long assumed to be worthless, German miners in the 16th century used to dread finding this deep-blue metal. They even went so far as to blame mischievous little mountain goblins, colloquially known as kobolds. These little guys are, incidentally, where the name cobalt comes from.

Our study looked at three different future scenarios regarding cobalt use, one that assumed increased recycling, one that assumed large technological improvements and, lastly, one that did not assume increased recycling nor improved technology. We came to the conclusion that the most important action to both make the Earth's cobalt last longer and reduce its negative environmental effects was to improve, enhance and replace obsolete technology. Surprisingly, significantly increasing the cobalt recycling rate did not cause nearly as large a decrease of virgin cobalt use and environmental effects as improving our current tech. The two most important factors in the technological improvements scenario were the fact that the electricity mix was assumed to become greener and that the amount of cobalt in each battery was assumed to decrease. These two factors caused a lot less cobalt to be used and decreased the environmental effects significantly.

Since we lack the foresight of Nostradamus, the accuracy of mentioned scenarios is hard to estimate. There are possible future sources of cobalt not included in the scenarios that would have an immense effect on the cobalt life cycle. It is, for example, not completely unreasonable that we will begin harvesting the rich cobalt seams at the bottom of the ocean or even the cobalt-containing asteroids of our solar system within the time period covered in the study. If any or both of these resources would come within the grasp of humanity, concepts like cobalt scarcity would be pushed far into the future.

These results might at first make it seem like recycling is a fruitless endeavor, but that is certainly not the case. In order to actually achieve long-term sustainability both technological improvements as well as improved and increased recycling are necessary. This report can't give you exact answers as to what the future of cobalt will look like, there will always be uncertainty. Batteries could, for instance, stop utilizing cobalt all together. It will, hopefully however, give at least some insight into the unknown, deep-blue future.