MODULE EIA, LESSON 7

THE NEED FOR MINERALS IN THE CURRENT WORLD

LECTURE NOTES

Hello, everyone. Welcome to Lesson 6 of Module 2 on marine mineral resources of the area. In this lesson we will focus on some examples related with the need for metals in today's world. We will look to global challenges ahead and I will leave a question for you to answer in the end of your course.

Where to mine in the near future?

It has been said that if you can't grow it, you have to mine it, meaning that anything we can't grow, we have to extract from earth in one way or another. Many people do not always realize that we lived in a mineral-based world. Indeed, virtually everything we use every day is made from resources from Earth. This is even more evident in the developed world, where there is also a call to implement a circular economy supported by reuse, repair and recycling. In practice, it implies that reducing waste to a minimum. In accordance with the recent report from the International Energy Agency, some precious metals like gold, silver and platinum have end of life recycling rates equal to or higher than 50%.

However, most base metals do not meet these values. Notwithstanding the search for other products that may substitute metals, this replacement is not always possible. In our demand for a better reuse of metals, we must not forget the least developed countries and the most vulnerable population. In this slide we can see examples of homes of families living with less than $55 per month. One obvious conclusion is that, independently of the region of the world, culture and our religion, people living in extreme poverty conditions lack basic infrastructures like sanitation facilities and electricity.

However, we should recognize that a long way has been traveled in the last 30 years, from 1990 to 2015, despite the increase of population in 2 billion, the global number of people living in extreme poverty decreased from almost 2 billion to well less than 800 million. This represents the access to sanitation and electricity, or in other words, to metals. To the COVID-19 pandemic, recent estimates from the United Nations point for the first time and since the 90s of the 20th century, to the inversion of this trend. Also, importantly, 50% of all people living in poverty are under 18 years old. It means that most probably these youngsters do not have access to the digital world and to all these tools that play a crucial role in education and training. Indeed, today more than ever, the lack of access to electricity represents an enormous disadvantage in education and personal development to bring equal opportunities to these young people, we need metals, and copper is certainly one of them.

This is one of the bigger terrestrial copper mines in Chile. Chile is the major copper producer in the world, where copper is recovered from a rock type named Porphyry. In pre pandemic times, the amount of copper produced in Chile was 5.6 million tons of copper. In volume, this value is represented by this cube that I put at scale in the O'Higgins Park in the city of Santiago. However, and as an example, if we estimate the volume of porphyry rock with a copper concentration of 6 kilogram per tonne needed to recover 5.6 million tonnes of copper, we would get a cube like this one represented at the scale of the Central Park in the United States. From this example we can get an idea of the amount of tailings and waste associated with terrestrial mining and of the impacts in the landscape, but we all face other global challenges. One of the most important is related with climate changes and urgent needs to reduce the CO2 emissions to the atmosphere.

In 2015 in Paris, more than 190 parties committed to make efforts to limit global warming to well below 2°C and, if possible, to 1.5°C compared to pre-industrial levels. People from all over the world have been protesting and demanding faster action from governments claiming for renewable sources of energy. This graph shows the current share of clean energy technologies in total demand for selected minerals, crucial for their development. They estimate for 2040, taking into account the policies already stated by most countries to be implemented in the near future is this one. However, for what is here called the sustainable development scenario in order to comply with the Paris Agreement goals, the share will be of 60% or more for nickel and cobalt and more than 40% for copper and rarest elements. Estimates for lithium are above 90%.

From where should we get the metals that will be needed to ensure a secure transition to renewable energy sources?

From this table, it can be easily seen that for cobalt and nickel, the resources from the area, notably nodules and crusts, exceed by far the tonnage of known land resources. For copper, non-resources and even non-reserves on land, exceed the tonnage of all combined resources known in the area. One of the main differences between the different occurrence of resources in the area and in land is that deep sea resources like nodules lie at the seabeds are very close to it and do not have overburden. This means that there is no rock to be removed in order to access the ore and potentially there is no significant waste along the value chain, but you will learn about the expected impacts in future lessons.

As final remarks, I would like to emphasize that access to minerals and metals has been a driver for societal development. New global challenges may demand more metals than ever, and all these challenges must be addressed in the sustainable way. This is a major goal of the ISA to comply with its mandate framed by the United Nations Convention on the Law of the Sea. Therefore, I hope that you are keen to engage with the International Seabed Authority and its actions aiming to benefit humanity as a whole. Thank you very much.