

ECO Score: a new environmental standard for industry and its applicability in water management

David Vexler, Corporate Environmental Manager at Hochschild Mining PLC, Lima, Peru.

Claudia Revilla, Senior Environmental Officer at Hochschild Mining PLC, Lima, Peru.

Olenka Garavito, Environmental Officer at Hochschild Mining PLC, Lima, Peru.

Keywords: ECO Score; environmental indicator; footprint; environmental corporate objective, water management.

Abstract

Companies have always used quantitative data in decision making as it can be easily communicated, analysed, tracked and disclosed to stakeholders. However, environmental performance has not been historically managed in this manner despite being an integral part of business.

Managing a company's environmental footprint can be an intricate process involving many areas of expertise, dealing with qualitative and quantitative matters, in many cases intangible in nature. This has made it, in many cases, complex to deal with and difficult to hold employees accountable for their environmental performance. For Hochschild Mining, this lack of clarity hindered the company's ability to effectively manage their environmental performance.

This is the background against which the ECO Score was conceived in Hochschild Mining back in 2015 and launched in 2017. The ECO Score has allowed the company to express their environmental performance in a numerical fashion, that is, a universal language. It is comprised of environmental indicators representative of the activities performed by the company. A scoring system based on objective and transparent measurements tracks the performance of each business unit within the company. The corporate environmental performance goals based on the ECO Score are established every year and incorporated into the annual performance framework, determining the extent of annual bonus pay-outs to eligible employees.

Due to the ongoing global climate crisis, water is becoming a critical resource. Chronic droughts at some locations or extreme weather conditions at others may result in water shortages and affect operation and drinking water supply for many companies. As such, water management is an integral part of Hochschild's ECO Score, having key performance indicators on water quality, potable water consumption and implementation of adequate environmental practices. Since the implementation of the ECO Score the company has been able to reduce its water consumption per person by 53%, saving 1.6 million m³ of this vital resource.

The ECO Score has proven to effectively manage environmental matters, including water management. It has allowed Hochschild to hold employees to account and create value for all stakeholders. It also generates revenue through the reduction of the company's footprint, the efficient use of resources and the mitigation of risks while strengthening the company's environmental, social and governance culture.

Introduction

With over 100 years of operating experience in the Americas, Hochschild Mining PLC (“Hochschild”, “Hochschild Mining” or the “Company”) is a leading underground precious metals mining company focusing on the exploration, mining and processing high grade silver and gold mineral. Currently, it operates three underground mines, two located in southern Peru and one in southern Argentina. The Company is listed on the Main Market of the London Stock Exchange and is headquartered in Lima, Peru. In addition, the Company has an office in Buenos Aires, Argentina, and a corporate office in London. Its manpower comprises over 3,000 employees.

Guided by its corporate purpose – responsible and innovative mining committed to a better world - the Company endeavours to maintain and reinforce its corporate values which are: responsibility, innovation, seeking efficiencies and inspiring and promoting talent. They are the fundamental basis of our sustainability management system for the future, always acting with responsibility and environmental excellence.

Water is vital for humans and the ecosystem, and its distribution and availability due to climate change is one of the main concerns around the world (Rockström et al., 2009). Two thirds of the world’s population currently live in areas that experience water scarcity for at least one month a year (Mekonnen and Hoekstra, 2016). On the other hand, water is used in some form or fashion in most manufacturing processes, where chronic droughts with higher frequencies and intensity or other extreme weather conditions may result in water shortages and affect operation and drinking water supply for many companies (Lloyd, 2010).

As a result, reducing water use and consumption is one of the most important actions for sustainability (Arjen Y. Hoekstra, 2017). In this context, the need for water use data has been raised in the last few years by The United Nations Environment Program (“UNEP”). This data can be a source of valuable information (Pandit, 2015), so there is an ongoing challenge for companies to leverage its utility.

To attend to these matters, industry workforce usually include professionals whose main goal is to manage each Company’s footprint, such as water used in operations. Managing this footprint is often a complex and intricate process, involving many areas of expertise and dealing with diverse environmental cultural beliefs and values, as well as qualitative and quantitative matters, in many cases intangible in nature (Gallopín, 2008).

It is well known that companies have not been able to express their environmental performance in an objective and precise manner to decision-makers, despite collecting and storing large amounts of environmental data and despite being recognized as a vital tool for decision-makers (Gerrard, 2014). All of this has hindered the effective understanding and management of a company’s environmental footprint.

Back in 2015, Hochschild took on the challenge and developed the ECO Score. This tool has allowed Hochschild to distil the many facets of its environmental performance into a single numerical value.

Methods

The main input used to design the ECO Score is data generated by the Company during its daily operations. In that sense, the tool was developed internally at zero cost and allows it to replicate on any industrial sector which is already collecting environmental data.



Figure 1: Selene mine in Peru

It is comprised of key performance indicators (KPIs), scored on two levels: at each mining operation and, overall, for the entire Company. The KPIs are based on measurable and transparent environmental metrics. These measurements are closely linked to the environmental footprint of the Company and contribute directly to the sustainability of the business.

The measured environmental metrics are:

- Environmental monitoring: The Company has an extensive network of water quality monitoring stations at all operations to ensure compliance with the maximum permissible limits (“MPLs”) established by the regulatory authorities. The objective is to have zero (0) deviations from the MPLs.
- Environmental incidents: all activities must be carried out in accordance with best environmental practices to minimize the risk of environmental incidents. The emphasis is placed on establishing preventative measures to avoid such events. The objective is to have zero (0) environmental incidents per year.
- Environmental audits: this element records the amount of observations received in each mining operation from the environmental regulator. The objective is to have a maximum of two (2) observations per year for each mining operation.
- Environmental management: the ECO Score also incorporates quantitative indicators directly related to environmental management at each mining operation. These indicators provide the crucial link between mine employees and the Company's environmental performance, since they are directly related to the daily activities performed by the Company. With these indicators, all employees cooperate to reduce the Company's environmental footprint. These indicators include the measurement of:

- Water consumption per worker: the objective is to keep potable water consumption below 250 litres/person/day.
- Waste generation per worker: the objective is to generate no more than 1.5 kg/person/day of domestic waste.
- Percentage of marketable waste: the objective is to market or donate more than 75% of collected industrial waste.
- Environmental culture: the objective is to achieve compliance of over 95% with respect to critical performance indicators established for each workstation.

The sum of these four environmental management metrics reflects the Company’s culture of care for the environment. Good environmental practices, such as responsible water consumption, correct handling of waste are the result of a sound environmental culture.



Figure 2: San Jose mine in Argentina

The ECO Score for each mine is compared against a scoring table (Table 1). The corporate environmental performance goals based on the ECO Score are established every year and incorporated into the annual performance framework together with metrics relating to production, profitability and safety, determining the extent of annual bonus pay-outs to eligible employees.

Table 1. ECO Score standards (2021)

Environmental performance	ECO Score
Maximum	≥ 5.00
Target	4.80 – 4.99
Threshold	4.50 – 4.79
To be improved	< 4.50

ECO SCORE: A NEW ENVIRONMENTAL STANDARD FOR INDUSTRY AND ITS APPLICABILITY IN WATER
MANAGEMENT

Table 2 shows how the Company calculates the ECO Score for each mining operation.

Table 2. ECO Score calculation matrix

Environmental metric	Range	Score
Environmental monitoring	0	1.00
	1 - 2	0.75
	2 - 5	0.50
	>5	0.00
Environmental incidents	0	2.0
	1	1.0
	2	0.5
	>2	0.0
Environmental audits	0 - 2	1.5
	2 - 4	1.0
	4 - 6	0.5
	> 6	0.0
Water consumption per worker	<250 L	1.5
	250 – 350 L	1.0
	350 – 450 L	0.5
	>450 L	0.0
Waste generation per worker	<1.5 Kg	1.5
	1.5 – 2.0 Kg	1.0
	2.0 – 2.5 Kg	0.5
	>2.5 Kg	0
Percentage of marketable waste	>75%	1.5
	65% - 75%	1.0
	55% - 65%	0.5
	<55%	0.0
Environmental culture	>95%	1.5
	90% - 95%	1.0
	85% - 90%	0.5
	<85%	0.0

Note: The maximum ECO Score is 6.0

ECO Score results are published through the “Green Challenge” program. The results are tracked and shared with the whole Company on a monthly basis. At the end of every year, the Company rewards the mining operation that achieves the highest score in the ECO Score.

The 2020 and 2021 results have been independently assured following the International Standard on Related Services (“ISRS”) 4400, validating the calculations obtained by this tool.

Results and discussions

With the ECO Score, the Company has been able to express an intangible concept, such as environmental management, in a universal language, applicable to any industry. The most highlighted results are reported as follows:

In 2021, the ECO Score was 5.24 out of 6, surpassing the maximum objective established by the Board of 5 points. Since 2015, the ECO Score has improved by 59%, reflecting a significantly better level of environmental performance.

In 2021, the Company’s overall water consumption was 192.83 litres per person per day (l/p/d), improving significantly against the maximum set for the year (250 l/p/d). Since implementation of the ECO Score, consumption of potable water has been reduced by 53%. In 2021, Hochschild has saved 321,739 cubic meters of potable water¹. This is equivalent to 2.6 billion bottles of water².

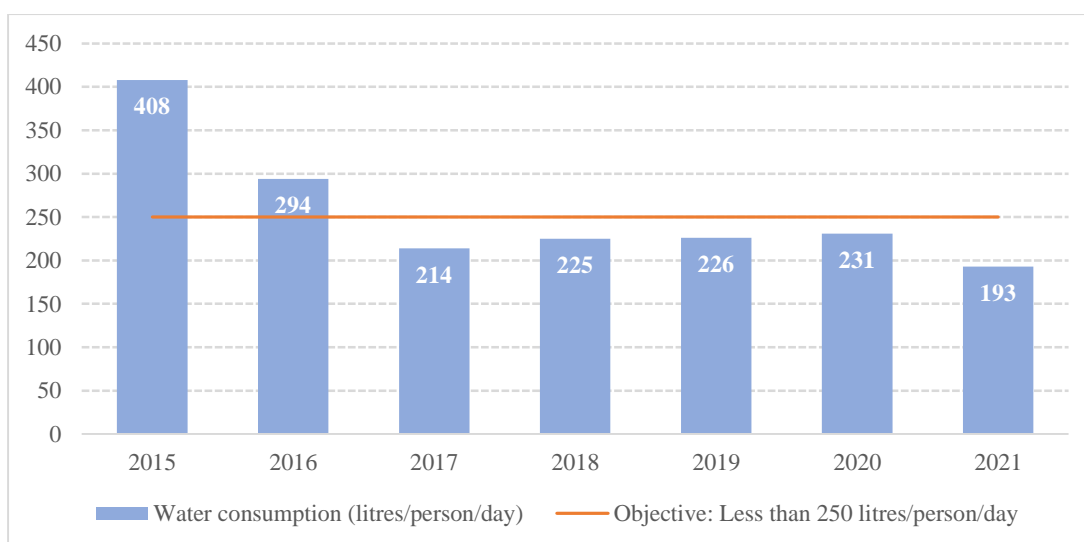


Figure 3: Historical potable water consumption

The strong environmental culture promoted by ECO Score has enabled the Company to identify opportunities to increase the percentage of recirculated water for the processing plants, thus reducing the consumption of fresh water. In 2021, 85.3% of all water used in processing was recycled water, predominantly from water recovery plants at our tailings storage facilities.

¹ Volume of water saved considering the 2015 water consumption per capita data.

² 625 ml bottle

ECO SCORE: A NEW ENVIRONMENTAL STANDARD FOR INDUSTRY AND ITS APPLICABILITY IN WATER MANAGEMENT

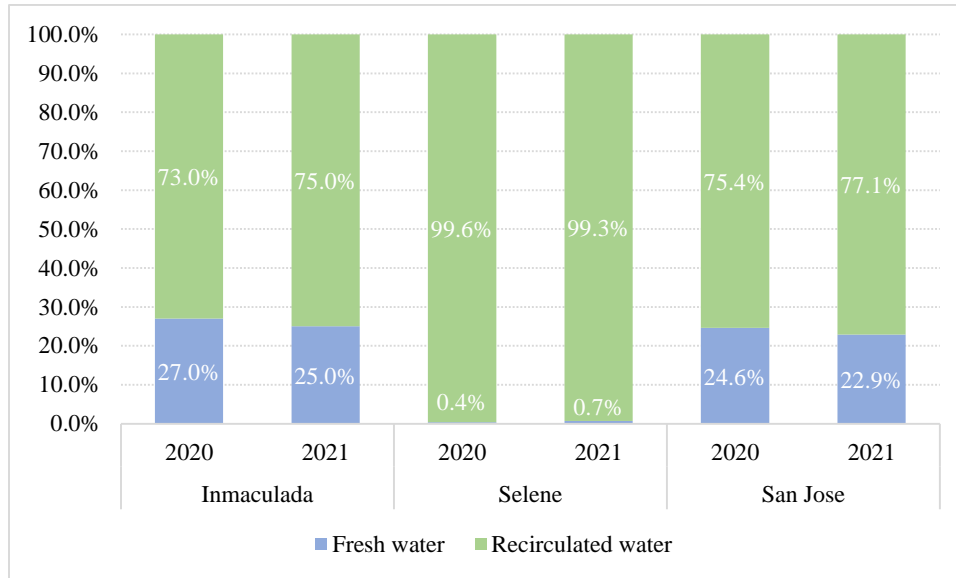


Figure 4: Recirculated water in processing mineral

The following figure shows the volumes of fresh water consumed at the three operating mines.

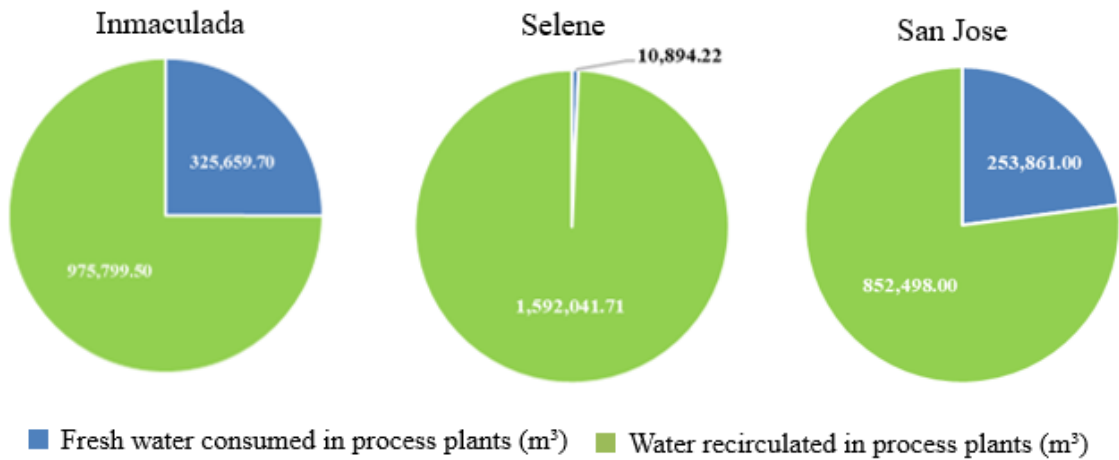


Figure 5: Industrial water consumption in Process Plants - 2021

Other results achieved through the ECO Score are:

- Between 2015 and 2021 the company reduced the generation of domestic waste from 1.94 kg/person/day to 1.00 kg/person/day, equivalent to more than 7.8 million kilograms of domestic waste.
- Since 2015 the company triplicated the marketable waste through improving sorting where only non-reusable or non-recyclable waste is sent to landfill.

- The ratio of observations per visit of our environmental regulator has decreased from 5.2 to 0.1 from 2015 to date³, equivalent to an improvement of 96%.

This shows that the implementation of the ECO Score has made it possible to achieve a substantially improvement in our environmental performance and water management.

Use in other industries

In 2020, the ECO Score was adopted by Resiter, a regional waste management service provider and strategic partner of Hochschild, in all of its Peru operations. They are trailing different indicators that can best reflect the environmental performance of their activities. During the first year of implementation Resiter was able to reduce 18% of water consumption in one of its operations.

With this, it is clear that the ECO Score can be adopted by any company striving to improve their environmental footprint and contribute to a better world. Our goal is to continue to encourage other suppliers and strategic partners to adopt the use of the ECO Score in their operations.

Conclusion

The ECO Score is an effective and innovative tool used to manage environmental matters, hold employees accountable and create value for all stakeholders. This tool has allowed Hochschild to quantify its environmental performance and express intangible environmental management into a single numerical value, which can be universally understood.

The healthy competition between mining units generated by the ECO Score, the transparency created around the company's environmental performance, and the integration with the other corporate performance objectives⁴ to determine annual bonuses, has allowed the company to encourage its workforce to achieve a common environmental purpose. As a result, the Company is effectively managing its environmental performance, minimize the Company's water footprint and reduce risks such as water scarcity. Most importantly, the ECO Score can be seen as a tool that other companies within, or beyond the mining industry can adopt to promote a sound environmental culture and effectively manage the water resource.

³ 2020 was subjected to a reduced number of inspections due to the COVID-19 pandemic

⁴ Aligned to production, profitability and occupational security.

References

- Arjen Y. Hoekstra, (2017) How to Reduce Our Water Footprint to a Sustainable Level? Available at:
<https://www.un.org/en/chronicle/article/how-reduce-our-water-footprint-sustainable-level>
- Gallopín, G. C. 2008. 'The abstract concept of environment', *International Journal of General Systems*, (March 2015), pp. 37–41. doi: 10.1080/03081078108934812.
- Gerrard, J. 2014. 'Environmental Data Management: Challenges and Opportunities', *SRA Information Technology*, (March). Available at: <https://events.development.asia/system/files/materials/2014/09/201409-environmental-data-management-challenges-and-opportunities.pdf>
- Hochschild. 2020. 'Committed to a Better World', *Sustainability Report*. Available at:
<http://www.hochschildmining.com/en/investors/results>.
- Lloyds, 2010 'Global water scarcity: risks and challenges for business' *Lloyd's 360° Risk Insight*. Available at:
https://awsassets.panda.org/downloads/lloyds_global_water_scarcity.pdf
- Mekonnen and Hoekstra, 2016. 'Four billion people facing severe water scarcity'. *Science Advantage*, (February 12, 2016), doi: 10.1126/sciadv.1500323
- Pandit, H. C. 2015 'WebCADAS : A New Online Education System for Casting Defect Identification , Analysis and Optimisation of Parameters', 5(4), pp. 246–253.
- Rockström et al. 2009 A safe operating space for humanity. *Nature* 461: 472–475