

## **The dream of the clean car**

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**Electric drives instead of combustion engines - this is how cars are supposed to become clean. BMW claims to source lithium for batteries from a sustainable manufacturer. But NDR research casts doubt on this.**

*By Lutz Ackermann, Stefan Borghardt, Sebastian Friedrich, Lisa Hagen, Nadia Kailouli, Simon Zamora Martin and Salome Zadegan, NDR*

Lithium is considered the white gold of the energy transition. The automotive industry's demand for e-mobility in particular is causing the demand for the alkali metal to explode. One of the largest deposits is in South America, where lithium is extracted from salt lakes. Car manufacturer BMW claims to source lithium there directly from a particularly sustainable producer: Livent. In March 2021, BMW signed a 285 million euro contract with the US company, which mines lithium at the Salar del Hombre Muerto, a salt lake in Argentina.

### **"Particularly sustainable"**

BMW claims in a press release that Livent's process is "particularly sustainable" compared to conventional lithium mining in the triangle of countries between Argentina, Bolivia and Chile. Livent uses "an innovative process that ensures sustainable water use and minimises impacts on local ecosystems and communities". Indeed, Livent's process sounds exemplary at first. Most lithium mines in South America evaporate lithium-containing salt water with the addition of chemicals until the lithium remains. Instead, Livent uses the "Direct Lithium Extraction" method, in which the salt water is pumped directly into a treatment plant where the lithium is extracted through chemical processes. One advantage of the method: unlike evaporation processes, for example in the Atacama Desert of Chile, countless evaporation ponds do not have to be created. The land consumption is therefore lower with the direct method as used by Livent.

### **High freshwater consumption**

However, the direct method is less sustainable than the conventional evaporation method in terms of freshwater consumption. This is the result of research by the ARD magazine Panorama and the online format STRG\_F. For the production of one kilogramme of lithium, Livent consumes almost 900 litres of fresh water, according to the company's business and environmental impact reports. That is more than five times as much freshwater as the evaporation method at the Atacama Salt Lake in Chile. There, the Chilean company SQM requires 173 litres of freshwater per kilogram, based on figures from its sustainability report and its own online monitoring. BMW counters that it is not possible to compare the projects. At the Hombre Muerto salt lake, where Livent mines lithium, there is more precipitation and available water resources than at the Atacama salt lake. According to the World Resources Institute's "Aqueduct Water Risk Atlas", Livent's mine is even located in a region with "Low Water Risk" - the lowest category. This is surprising at first, because the desert-like area is considered a very dry region. However, the Risk Atlas actually looks at water resources in relation to water users, for example based on population density. Accordingly, parts of the Libyan desert also fall into the lowest category. Román Guitian, spokesperson for the

indigenous community "Atacameños del Altiplano", criticises Livent's freshwater consumption in the region. In the 1990s, Livent built a dam on a river for lithium production, which then dried up below the dam. This has had devastating consequences for local livestock farming, for example. Guitian fears that with increasing demand for lithium, the largest river in the region could also dry up. Several kilogrammes of lithium are needed for the battery of an electric SUV, for the BMW iX M60, for example, even around ten kilogrammes. If the lithium were to come entirely from Livent, that would be almost 9,000 litres of fresh water.

### **Concern about the groundwater level**

Important for the arid region is the groundwater level, for which the handling of the salt water under the salt lakes plays a role. BMW highlights Livent's approach as positive in this regard. In fact, the conventional evaporation method involves pumping the salt water, also known as brine, from beneath the salt lakes before it is fed into large evaporation ponds. The problem with this is that, according to various studies, the consumption or evaporation of large quantities of brine can not only cause the level of the underground salt lake to fall, but also the groundwater at the edge of the salt lakes. In the process used by Livent, the processed brine can be injected back into the underground salt lake. This can prevent the lake level, and thus the groundwater in the surrounding area, from sinking. BMW claims that "most of the brine used" does not evaporate. This would be a plausible procedure if it were implemented in this way. But there are doubts as to whether the procedure is implemented in this way. Nowhere in Livent's own environmental reports is there any mention of the remaining brine being returned underground. What can be read in the reports, however, is that according to Livent, the residual brine is discharged into an artificial lake on the Salar del Hombre Muerto after neutralisation of the pH value.

### **Doubts about implementation**

Broder Merkel, professor of hydrogeology at the Freiberg Mining Academy, sees only two possibilities for what will happen to the residual brine: "Either the residual brine will be pumped back into the brine or directed to the salar, where it will evaporate." Based on the NDR research, Merkel assumes that the latter is the case. Contrary to BMW's statements, he thus sees no positive effect with regard to the brine level. BMW and Livent did not answer NDR's questions about what happens to the brine used. BMW emphasises that it takes its responsibility within the framework of environmental and social standards in lithium procurement very seriously. The company points to scientific studies on lithium mining in Chile and Argentina that it has commissioned. BMW did not answer specific questions about mining by Livent. When asked, it says: "We oblige all our suppliers to comply with environmental and social standards, human rights and to apply management systems for occupational health and safety and environmental protection. This is also the case with our supplier Livent." Livent also did not answer questions about the production process and sustainability. By 2040, global lithium demand could increase more than tenfold compared to today. What ecological consequences mining will have for the ecosystems in the mining areas is not foreseeable.