



SANTIAGO, Chile (AP) — Just how to define a glacier is at the heart of a Chilean congressional battle that could determine the future of mining in the world's largest copper-producing country.

The revival of legislation to ban mining in glacial areas is spawning debate among miners, farmers and environmentalists about how to protect both vital water supplies and Chile's mining industry. If the bill passes, mining experts fear it could shutter multibillion-dollar mining projects and slow investment.

The key will be in the fine print of whether the final bill defines glaciers as including frozen areas around them, too, and whether the protections would apply retroactively to mines already operating next to glaciers.

"If it passes as a law with tough conditions, it could harm not only the operation of current projects but also future projects," said Juan Carlos Guajardo, head of the Chilean mining think tank CESCO. "Depending on the conditions,

the scenarios would make mining activity very difficult in high mountain areas."

Environmentalists point to the crucial role played by glaciers in protecting Chile's water as reason enough to implement the wider definition.

A glacier is snow that has compacted into ice and that survives the warm summer months. Glaciers are important because they act as natural dams, storing water for use throughout the year after the winter snow has melted. Even small glaciers can hold gigantic amounts of water that become critical during warm months and especially in long dry spells.

Argentina, across the Andes mountains from Chile, adopted a law in 2010 that broadly defines glaciers — theoretically protecting not only the icy masses most people think of, but also "rock glaciers" and frozen groundwater on mountaintops where glaciers have melted away from the surface. The Argentine National Glacier Institute, which had a heavy hand in drafting Argentina's law, pushed the definition because it's believed most glacial water actually comes from such reserves.

The Argentine law remains largely unenforced, but mining has still to develop in a big way there.

In Chile, however, such a move could have a much bigger impact on the world's copper and gold supplies. For now, the bill doesn't include protections on peri-glacial or permafrost areas and is far less punitive than Argentina's law, but it could be amended to broaden the definition of glaciers. No matter what, it would be Chile's first law specifically protecting glaciers.

Mining offers Chile's poor their best shot at a middle-class life, especially in the rugged desert areas in the north, where most mines are. Copper accounts for about a third of government revenue, and the state has a policy of shoring up national reserves during periods of high prices.

The country has some of Latin America's most stable ground rules for mining. But the narrow nation that stretches 2,650 miles (4,270 kilometers) along the Pacific also has the largest number of glaciers, from icy southern Patagonia to its most northern latitudes.

A broader definition could severely hamper the Chilean industry's hopes to mine gold and copper from places where icy masses have retreated on the surface, exposing rich ore veins that share mountaintops with other forms of glacier water.

Already, environmentalists have demanded tougher protections for nearby populations and natural resources, and mining projects have faced costly delays.

Jorge Daniel Taillant, director of the Center for Human Rights and the Environment, called glaciers a vulnerable resource that's in jeopardy because of mining.

Taillant tracks environmental compliance by mining companies and has focused on the impact of dozens of mining projects in Argentina and in Chile on glaciers.

"A broad definition of glaciers in the law helps capture the large variety of glaciers that exist in the Andes," Taillant said. "Protecting only the most well-known uncovered white glaciers is not enough. Melting glaciers are one of the telltale signs of climate change, and as such we need laws to protect climate-vulnerable glaciers."

If passed, the bill could halt mining operations such as Barrick's \$8 billion Pascua-Lama or state mining company Codelco's \$6.8 billion Andina 244 expansion project, which are both surrounded by glaciers and permafrost areas. To move forward, the projects would need further environmental safeguards to ensure they're not hurting ice.

The resurfacing of the bill comes at a time when the Andina project is being widely questioned. Codelco wants to turn Andina into its star mine to produce more than 600,000 metric tons of copper a year, up from 250,000 now.

Codelco said in a statement it believes the glacier bill is not needed because Chile has developed norms to protect glaciers since the legislation was first discussed in 2006.

"Depending on how this glacier law turns out, it could be very complicated. In reality, this project might not even be able to be developed because we're near glaciers," said Juan Carlos Jofre, sustainability chief for the Andina 244 project.

Environmentalists say the impact on nearby glaciers would be devastating, particularly for subsurface rock glaciers with colossal amounts of ice.

Before the Argentine law passed, analysts warned that it would mean an end to Pascua-Lama, the world's highest-altitude mine, which straddles the Chile-Argentina border. While mining has continued there, Barrick's project has been temporarily suspended in Chile after the company was cited for "very serious" violations of its environmental permit, requiring it to build infrastructure to prevent water pollution as it mines for gold and silver.

Critics say construction at Pascua-Lama has spread dust on the nearby Toro 1, Toro 2 and Esperanza glaciers, hastening their retreat by capturing heat on their surfaces. Meltwater from those glaciers feeds the Estrecho river, which supplies water to the Diaguita indigenous community living downstream.

Barrick has said it will work "to address environmental and other regulatory requirements" on the Pascua side of the project in Chile.

Conservationists say dozens of mining projects are in glacier areas and they have filed international complaints, pointing mining company shareholders to potential troubles for large-scale mineral investments.

Chile's Congress is expected to take on the glacier protection bill by mid-October. If debate drags, the measure's ultimate fate may depend on Michelle Bachelet, a former president who is heavily favored to win election and take office again next year. She has taken no stand on this bill and failed to back a similar measure in her first term, though she did take steps to protect glaciers.

"Any change that means that projects have to be evaluated would affect them significantly. It would mean a whole new legal framework on glaciers," said Winston Alburquenque, a professor of natural resources law at the Catholic University. "Clearly there's a change — there's a greater environmental awareness and respect for natural resources."

Luis Andres Henao on Twitter: <https://twitter.com/LuisAndresHenao>