PORTALS
Ever Heard of Indium? Screen Makers Have, And Some Are Worried

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IMAGINE THE DAY when big, flat-panel liquid-crystal-display TV sets are finally affordable. You eagerly drive down the local electronics store to buy yours. But you arrive to find a sign on the door: “Sorry, no LCD TVs again today. The indium shortage continues.”

Indium -- element 49 on the periodic table -- is a silvery-white metal classified "minor" by the mining industry. For decades, it's been used chiefly in solders. Lately, though, it's taken on a small but crucial role in the manufacturing of LCD screens.

But Indium's sudden celebrity status is a problem because there's not a lot of it to go around. While the prospect of breadline-style LCD shortages are, in truth, remote, the issue could be one more headache for an industry that already has plenty.

At the very least, the indium tale is a reminder of the heavy industry infrastructure, full of its own supply and demand minidramas, that lies behind even the whizziest high-tech products.

Indium on its own isn't mined; instead, it's pulled out of the slag when mining companies are refining zinc, lead or other A-list metals. Barely 400 tons of indium are produced each year, mainly in China, Japan, Canada and Belgium. (By comparison, annual zinc production is nine million tons.)

Like nearly all metals, indium conducts electricity. But indium has another, almost magical quality: It is transparent. And that makes it perfect to be used in the "stitching" on an LCD screen, which hold in place the thousands of tiny liquid crystals that produce the actual picture.

AS NOTEBOOK PCS, cellphones and other flat-screen gadgets have become more popular, indium consumption has skyrocketed. So has its price. In late 2002, a kilogram of indium sold for about $60; now, it's about $610, and some predict it will reach $900 in coming years.

Those high prices aren't the problem. A big LCD screen needs only a gram or so of indium, worth a few dollars even at the metal's most expensive levels. The makers of LCD screens -- companies like Samsung Electronics, LG, Philips, Sharp and AU Optronics -- would just absorb the cost.

The real concern is whether there is going to be enough indium to go around at any price.

Brian O'Neill, the indium product manager at AIM Specialty Materials, a metals refiner in Cranston, R.I., is constantly mining reports for clues about indium production. His conclusion: Things will be OK for the next few years, but they look risky beyond that.

The problem, he says, is that refining raw indium to remove impurities, and thus make it useful, is notoriously inefficient. To get the 28 tons needed for LCD screens this year, you need to start with 230 tons of the unrefined element.

And that's what worries Mr. O'Neill. By 2006, the LCD industry will need 64 tons of indium -- meaning 540 tons of the stuff will have to come out of the ground. That's 20% more than currently is being produced.

In most industries, that sort of increase wouldn't be much of a problem. But in the case of indium, production is going down rather than up.
Last year, for instance, regulators in southern China closed the mine that, at 100 tons annually, had been the world's biggest producer. (Its output was cut two years earlier when the mine flooded and more than 80 workers died; the company that owns the mine is lobbying to reopen it.) And Metaleurop SA of Paris two years ago shut down a French operation that concentrated on zinc but also yielded indium, meaning the loss of another 60 tons.

WHY NOT JUST do the obvious and dig more indium? Ah, there's the rub. Indium is such a tiny business for mining companies that, even with the jump in prices, there's little incentive for them to search for more. The world's largest producer, Zhuzhou Smelter Group of China, produces about 50 tons a year, a trifle next to its 250,000 tons of zinc.

Mr. O'Neill summarizes things like this: "You've got this major, major industry tied to this minor metal that no one cares about."

Mr. O'Neill admits that calculations about an indium shortage are inexact. For one thing, he can't be certain how much of today's "wasted" indium is swept up for eventual recycling. "A good chunk is being captured, but what percentage is being recycled is unknown," he says.

Indeed, there's a new emphasis on indium conservation. In recent months, several makers of indium-tin-oxide, the indium-based compound that's actually used in LCD panels, announced new programs to recover wasted indium. And LCD panel makers themselves are beginning to recycle more of the indium they now lose.

If a serious indium shortage developed, LCD-panel makers could turn to existing alternative compounds that use tin or aluminum. But those are much harder to work with, meaning higher costs and lower yields for manufacturers.

Of course, efforts are under way for alternatives, especially on Taiwan. "Everyone is looking for some replacement material," says Torsten Halden of W.C. Heraeus GmbH, a German chemicals firm. "There's no reason for panic."

But George Jetson-wannabes like me, eager for an affordable, sleek-looking TV, panic easily.

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