Iran: Increasing Domestic Production of Rare Earth Elements

OE Watch Commentary: The 17 rare earth elements—15 lanthanides on the Periodic Table of Elements as well as scandium and yttrium—are increasingly important in industrial manufacturing as catalysts and in magnets, and play an import role in petroleum manufacturing. Despite their name, they are not all rare. Cerium, for example, is the 25th most common element in the earth's crust, more abundant than copper. Part of the reason for their 'rarity,' however, is that they are seldom found in concentrations of ore that make mining easy or profitable. China is the world's largest supplier of rare earth elements, but has sought to control the market first with export quotas (which the World Trade Organization deemed illegal in a 2014 ruling) and more recently via export licenses. (For a foundational understanding on rare earth and security issues, see: Cindy Hurst, "China's Rare Earth Element Industry: What Can the West Learn?" Foreign Military Studies Office, March 2010, https://community.apan. org/wg/tradoc-g2/fmso/m/fmso-monographs/237820.)

Ytterbium, used in production of higher-grade stainless steel and in nuclear medicine, is one of the rare earth elements Iran must now import.
Source: images-of-elements.com/ytterbium.php, https://upload.wikimedia.org/wikipedia/commons/c/ce/Ytterbium-3.jpg, CC BY 1.0

Many companies have turned elsewhere in order to diversify the market and reduce China's leverage over rare earths, but with mixed results. It is against this backdrop that the *Mehr News Agency*, an outlet owned by Iran's Islamic Ideology Dissemination Organization, reports on Iranian attempts to produce its own exploitable concentrations of rare earth elements. In the excerpted article, Iranian Vice President Sorena Sattari, a scientist and mechanical engineer, suggests that Iran's motivation is largely financial: Iran spends over $3.5 million importing rare earths annually. This amount may seem a pittance compared to an annual Iranian budget of over $100 billion, so Sattari's motivation may be more strategic than economic. The Islamic Republic has deliberately built its own indigenous industries in order to avoid dependence on outside powers or vulnerability to sanctions. As the United States and international community tighten sanctions on Tehran, Iranian authorities might fear that future sanctions could hamper their ability to import rare earth elements, an event that could adversely impact Iran's refining and domestic electronics production. As such, Iranian authorities might see building plants to extract and concentrate rare earth elements to be a growing priority. **End OE Watch Commentary (Rubin)**

"We are pursuing investments to build an industrial scale rare earths extraction plant."

Source: "Varadat-e Salaneh 200 Ton 'Anasar-e Kamiyab-e Khaki (Annual Import of 200 Tons of Rare Earth Elements)," *Mehr News Agency*, 28 January 2020. https://www.mehrnews.com/news/4838176

Annual Import of Rare Earth Elements

Sorena Sattari [Iran's vice president for science and technology], on Tuesday morning [January 28] at the inauguration ceremony of a pilot plant to extract trace and strategic elements at the Iranian Mineral Processing Research Center in Savojbolagh County [in Alborz province in northern Iran], and told reporters, "Crude mining prevents processing and extraction of rare earth elements." He noted that about 200 tons of these elements enter the country annually, and said, "The price of these per kilo is over $20."

The Vice President for Science and Technology said, "With the extraction and processing of trace and other strategic elements, production capacity increases and creates value, and it should be said for comparison, we sell one ton of limestone for $20, and the price of one kilogram of these imported rare earth elements is $20."

Sattari expressed happiness that the technology is indigenous to the country, and said, "We are pursuing investments to build an industrial scale plant, and we hope that this will occur soon."