

# Rare Earth Elements: Under pressure, global industry responds with new solutions

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## Abstracts

Rare Earth Elements: Under pressure, global industry responds with new solutions

### SUMMARY

Rare earth elements have transformed industry and consumer products. Smartphones and highly efficient jet engines, among other products, have become dependent upon hard to extract elements, almost all of which are exported from China.

This presents industry with very real problems. Not only are profitable reserves dwindling but supply is determined by the Chinese government, leaving many industries exposed.

However, alternative materials are being developed; recycling is becoming relevant; and means of not using rare elements are entering mainstream production. Despite the problems associated with rare earth elements, industry is undergoing substantial changes to solve the difficulties, heralding new and innovative ideas.

Higher demand is causing industry to find means of improving the security of supply, and several methods have emerged to help.

Now that is changing: industry is waking up to the benefits on offer to product disassembly. However, even successful efforts so far remain small in scale compared to the extent of consumption.

Big shifts in rare earth element use are emerging due to the development of substitute materials. Still in infancy, substitutes to metals such as indium are gradually creating

possibilities that industry will be able to radically reduce consumption of these materials over the coming years.

## **SCOPE**

Explores the impact of rare earth elements on industry

Analyses overdependence of rare elements across major industries

Looks at the development of substitute materials

Assesses the impact of geopolitics on rare elements

Examines developments in recycling of rare earth elements

## **REASONS TO BUY**

What progress has been made towards substitute materials?

Can recycling have a major role to play in recovering rare elements?

Can industry become less dependent upon rare earth elements?

Will efforts to not use rare earth elements prove successful?

## Contents

Overview

Catalyst

Summary

Rare Earth Elements in demand causing industry to seek improved security

Rare earth elements are now critical to high-tech manufacturing, increasing dependence

Industry is seeking to improve security and partnerships with mining companies

Car industry racing to improve security of rare earth element supply as electric era dawns

Industry expands usage of rare earth elements, creating future problems

Demand in developing countries to raise competition for rare earth elements to new levels

Global air travel places greater strain on rhenium supplies as China catches up in jet engine manufacturing

Renewable energy continues to exhibit high dependency on rare earth elements

Recycling is a major development goal for users of rare earth elements

Apple is beginning to recycle and redesign, but progress has so far been limited

Recycling techniques for rare earth elements are improving at considerable speed

An end to shredding electronic devices is essential for recycling progress

Potential replacements to rare earth elements are emerging

Alternatives to touch-screens are being developed, placing pressure on traditional production methods

New electric motors free of rare earth elements are moving towards mainstream use

New materials offer promise in race to substitute rare earth elements

Geopolitics of rare earth elements is propelling substitute development

Chinese domination in 'soft monopoly' creates need for substitutes

Territorial disputes could become more common in wake of deposit discoveries

Conclusions

Role of rare earth elements in global industries is experiencing rapid developments

Appendix

Sources

Further Reading

Ask the analyst

About MarketLine

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## List Of Tables

### LIST OF TABLES

Table 1: Top ten metal and mining industry values, 2016 (\$bn)

## About

Rare earth elements have transformed industry and consumer products. Smartphones and highly efficient jet engines, among other products, have become dependent upon hard to extract elements, almost all of which are exported from China. Higher demand is causing industry to find means of improving the security of supply, and several methods have emerged to help. Rare earth elements have become ubiquitous in high-tech manufacturing thanks to properties not found elsewhere on the periodic table; without them products such as smartphones and fuel-efficient jet engines would not be possible.

Increasing demand has led several companies with global reach to seek out partnerships with mining companies or to source rare elements directly. Increased demand has led other companies to seek reductions in usage by utilizing old ideas but updating them with modern materials. Recycling rare earth elements has long been held up as a solution to supply problems, except efforts towards achieving methods of reclaiming elements have for a long time been limited and have failed to attract widespread attention.

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