This document is scheduled to be published in the
Federal Register on 02/10/2016 and available online at
http://federalregister.gov/a/2016-02676, and on **FDsys.gov**

6450-01-P

DEPARTMENT OF ENERGY

Request for Information (RFI) for Updated Critical Materials Strategy

AGENCY: Office of Energy Policy and Systems Analysis, Department of Energy.

ACTION: Notice of Request for Information (RFI).

SUMMARY: In 2010, the U.S. Department of Energy (DOE) developed and issued a Critical Materials Strategy report addressing the role of rare earth and other materials in energy technologies and processes. An update and additional analyses were completed the following year. In order to update the 2010 and 2011 analyses, DOE is seeking information from stakeholders on rare earth elements and other materials used in an array of energy technologies, as well as key materials used in the manufacturing of energy technologies that do not necessarily appear in the final product.

DATES: Written comments and information are requested no later than 5:00 pm ET, on **[INSERT DATE 60 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER].**

ADDRESSES: Interested persons are encouraged to submit comments, which must be submitted electronically to materialstrategy@hq.doe.gov.

Instructions: Electronic responses must be provided as attachments to an email. It is recommended that attachments with file sizes exceeding 25MB be compressed (i.e., zipped) to ensure message delivery. Respondents are requested to provide the following information at the start of their response to this RFI:

Company/Institution name; Company/Institution contact; Contact's address, phone number, and e-mail address.

Please identify your answers by responding to a specific question or topic if possible. Any information obtained as a result of this RFI is intended to be used by the Government on a non-attribution basis for planning and strategy development. DOE will not respond to individual submissions or publish publicly a compendium of responses, except as required by applicable law. A response to this RFI will not be viewed as a binding commitment to develop or pursue the project or ideas discussed. DOE will not pay for information provided under this RFI. This RFI is not accepting applications for financial assistance or financial incentives. DOE has no obligation to respond to those who submit comments, and/or give any feedback on any decision made based on the responses received.

FOR FURTHER INFORMATION CONTACT: Requests for additional information may be sent to materialstrategy@hq.doe.gov.

SUPPLEMENTARY INFORMATION:

I. Purpose

The purpose of this RFI is to solicit feedback from industry, academia, research laboratories, government agencies, and other stakeholders on issues related to the demand, supply, use, and costs of rare earth metals and other materials used in the energy sector. DOE is specifically interested in information on the materials and technologies in the following table, as well as other materials of interest identified by the respondents to this request that are used in energy technologies:

Materials of Interest:

- Rare earth elements (e.g., cerium, dysprosium, europium, gadolinium, lanthanum, neodymium, praseodymium, samarium, scandium, terbium, ytterbium, and yttrium)
- Platinum group metals (e.g., iridium, palladium, platinum, rhodium, and ruthenium)
- Antimony, bismuth, cadmium, cobalt, gallium, germanium, hafnium, helium, indium, lithium, magnesium, manganese, molybdenum, nickel, rhenium, selenium, silicon, tantalum, tellurium, tungsten, vanadium, and zirconium

Technologies and Components of Interest:

Technologies	Types	Components
Solar photovoltaics		Thin film
Concentrated solar power	Trough system Power tower system Dish engine system	Mirrors Molten salts
Wind turbines	Direct drive	Permanent magnets
Natural gas generators		Superalloys Coatings Magnetic materials
Hydropower		Permanent magnets
Nuclear		Control rods Cooling fluids Control absorbers or neutron shielding materials Fuel rod cladding Fuel assembly grid plates Alloys
Vehicles (in all vehicle classes)	Battery electric Plug-in hybrid electric Hybrid Fuel cells	Permanent magnets Batteries Catalytic converters Lightweighting (platform, frame, engine cradle, etc.)
Lighting	LEDs Fluorescents (CFLs, LFLs) Other solid-state lighting	Phosphors
Grid storage		Batteries
Stationary fuel cells & hydrogen electrolysis	Solid oxide Solid acid Phosphoric acid molten carbonate	Catalysts Cathode Anode

Polymer electrolyte membrane	Electrolytes

DOE is interested in receiving information on the following issues:

Category 1: Technology and Component Material Intensity

For the following questions, please express material intensity in terms of quantity per unit, such as weight percentage per magnet of a given size, content per unit of generation or storage capacity, weight content per lamp, content per vehicle type, weight requirement per industrial process output, or other appropriate metric or industry standard.

- For the energy technologies and components of interest listed above, what is the current and anticipated materials requirement over the next 15 years?
- What is the level of purity required?
- How much material is lost during use (i.e., dissipative losses)?
- What are the quantities of material loss in manufacturing currently and how might that change over the next 15 years as the technology develops?
- For the energy technologies and components of interest listed above, what are the quantities of material used in manufacturing them that do not appear in the final product (e.g., materials used in sputtering targets, as manufacturing equipment, as catalysts, etc.)?

Category 2: Market Projections

- For the energy technologies and components of interest listed above, what is the current and projected global market demand over the next 15 years and how does it vary by region? What are the key uncertainties that may significantly affect these projections?
- What is the anticipated average lifespan for the energy technologies of interest and how frequently do the components need to be replaced? How might these lifespans and replacement frequencies evolve as the technology develops?

- For the energy technologies of interest listed above, are the materials and/or components easily substitutable or do they require product and/or manufacturing process re-designs?
- If known, what are the most appropriate currently viable substitutes for these technologies or components? Are additional substitutes anticipated within the next 15 years?
- What are the leading concerns regarding using the identified substitute material(s) (e.g., lower performance, higher costs, product or process redesigns, capital requirements, inadequate supply, difficulty of use, etc.)?
- Do you use or expect to use significantly increasing quantities of the materials listed above for non-energy technologies? Please explain.
- Do prices, price volatility and/or basic availability affect your decision to use the materials of interest?

Category 3: Energy Technology Transitions and Emerging Technologies

- How do you anticipate technology transitions (e.g., fluorescent lights to LEDs) will affect material availability over the next 15 years? Please share any insight or recommendations with respect to technology transitions.
- How do you expect the emergence of new energy or energy efficiency technologies (e.g., fuel cells) to affect material demand over the next 15 years?
- What timescales or delays in production and utilization can affect the ability to plan for deployment of new energy technologies?

Category 4: Primary Production and Material Processing

- Do you anticipate additional production of the materials of interest coming online in the next 5 years?

- What technical, economic, or regulatory factors lead to barriers or delays in bringing on new production or increasing current production?
- What are the emerging processes or approaches (physical, chemical, or biological) to separation and processing these materials? Can they be scaled? What are the barriers to deploying these emerging processes?
- Do prices, price volatility and/or basic availability affect your decision to produce the materials of interest?

Category 5: Supply Chains

- For the technologies and components of interest listed, what are the process stages within the supply chain, and where geographically does each occur? What are the factors that affect where a component is manufactured?
- How vertically integrated are the supply chains in different countries? Does this matter? Why?
- How concentrated or diversified are the suppliers and consumers of the materials, components, or technologies?
- How much material inventory is typically stockpiled across the stages of the supply chain? How long is it stockpiled for? Given a supply disruption, how long would the inventory last?
- For the technologies and components of interest listed, what are the lead times at each stage of their supply chain?

Category 6: Recycling Opportunities

- What quantities of critical materials are currently being recycled from industrial and post-consumer sources and what quantities could potentially be recycled on what timeframe?

- What are the technological barriers to recycling materials?
- What recycling process innovations would increase recycling technical and economic viability?
- How could design for recyclability improve the level of recycling?
- How are current technological trends of the specific material, component, or technology of interest (e.g., miniaturization, increased complexity) likely to affect its recyclability?
- What types of policies would impact recycling?
- Are there synergies between industries (e.g., using cadmium telluride from semiconductor recycling for solar cells)?

Category 7: Impacts of Wide-Scale Electrification

We are also interested in the potential material implications of wide-scale electrification (industry, transportation, etc.).

- What components are needed and for what purpose to accomplish wide-scale electrification (both in the electricity infrastructure and end use applications) and what quantities will be required in what timeframe?
- What materials of interest are required for these components?

Category 8: Additional Information

- Are there other materials that DOE should analyze (beyond the materials of interest) that may be of concern due to increasing demand for energy technologies and/or supply risk? Please explain and provide material content by component and energy technology.
- Are there other technologies or components that DOE should analyze (beyond the technologies of interest)? Please explain.

- Is there additional information, not requested above, that you believe DOE should consider in updating the Critical Materials Strategy? If so, please provide here.

II. Confidential Business Information

Pursuant to 10 CFR 1004.11, any person submitting information that he or she believes to be confidential and exempt by law from public disclosure should submit via email two well marked copies: one copy of the document marked "confidential" including all the information believed to be confidential, and one copy of the document marked "non-confidential" with the information believed to be confidential deleted. DOE will make its own determination about the confidential status of the information and treat it according to its determination.

Factors of interest to DOE when evaluating requests to treat submitted information as confidential include: (1) A description of the items; (2) whether and why such items are customarily treated as confidential within the industry; (3) whether the information is generally known by or available from other sources; (4) whether the information has previously been made available to others without obligation concerning its confidentiality; (5) an explanation of the competitive injury to the submitting person that would result from public disclosure; (6) when such information might lose its confidential character due to the passage of time; and (7) why disclosure of the information would be contrary to the public interest.

Issued in Washington, DC,.

_____

Jonathan Pershing,
Principal Deputy Director for Energy Policy and Systems Analysis.

[FR Doc. 2016-02676 Filed: 2/9/2016 8:45 am; Publication Date: 2/10/2016]