GOVERNMENT OF INDIA
DEPARTMENT OF ATOMIC ENERGY
LOK SABHA
UNSTARRED QUESTION NO.204
TO BE ANSWERED ON 02.02.2022

RARE EARTH ELEMENTS

204. SHRI MANISH TEWARI:

Will the PRIME MINISTER be pleased to state:

(a) the details of the amount of rare earth reserves India possesses and the installed mining, production and processing capacity;

(b) whether the Government is aware of the global supply chain constraints leading to global shortage of rare earths and by extension Microprocessor chips and whether the Government has assessed its impact on Indian markets and if so, the details thereof;

(c) whether the Government is aware of the fact that China is one of the leading producers of rare earths controlling 90% of the total global production;

(d) whether it is a fact that despite India possessing one of the largest Rare Earth Reserves, India imports most of its rare earth requirements from China;

(e) if so, the details of Rare Earth imports during the last five years, Country-wise, element/compound-wise, including both the weight and cost; and

(f) the steps taken/being taken by the Government to make India a leading Rare Earth producer?

ANSWER

THE MINISTER OF STATE FOR PERSONNEL, PUBLIC GRIEVANCES & PENSIONS AND PRIME MINISTER'S OFFICE (DR. JITENDRA SINGH):

(a) (i) Atomic Minerals Directorate for Exploration and Research (AMD), a constituent unit of DAE is carrying out exploration to augment resources of Rare Earth Elements (REE) in several potential geological domains of the country including exploration along the coastal / inland / riverine placer sands of the country for augmentation of Heavy Minerals which includes monazite (REE and Th mineral) and xenotime (REE + yttrium mineral).

As on January, 2022, AMD has established the following:

a. 12.73 Million tonnes (Mt) of Monazite (containing ~ 55 - 60% total Rare Earth Elements oxide) occurring in the coastal and inland placer sands of the country.

b. About 2,000t of xenotime bearing heavy mineral concentrate (containing ~2% xenotime) in the riverine placer deposits of Chhattisgarh and Jharkhand. Presently AMD is carrying out collection of xenotime bearing poly mineral concentrate in the unit established in Chhattisgarh and has a stockpile of 91.938 tonnes xenotime bearing poly mineral concentrate.

c. 7,37,283 tonne Rare Earth Elements Oxide (REO) (at variable REO cut-offs) in Ambadungar area, Chhota Udepur district, Gujarat.

d. 36,945 tonnes Rare Earth Elements Oxide (at 0.2% REO cut-off) in Bhatikhera area, Barmer district, Rajasthan have been estimated.

(ii) The principal ore of rare earth (RE) in India is BSM sand within which a prescribed substance monazite occurs, which is a phosphate compound of uranium, thorium and RE.

(iii) The annual installed mining, production and processing capacities are as under:

(i) Mining: 10 million tons
(ii) Processing capacity in terms of rare earth concentrate: 11,200 tons
(iii) Refining capacity in terms of Total Rare Earth Oxide (TREO): 5,000 tons
(iv) Rare Earth Concentrate Production: 5040 tons
(v) Refining in terms of TREO: 2000 tons
(Both Government and Private sector)

(b) As per Roskill report 2021, the global demand of RE is to the tune of 1,31,500 tons and the processing capacity is of the order of 1,47,570 tons, while as per Argus Report 2021, the global demand of RE is to the tune of 1,59,000 tons and the processing capacity is of the order of 1,97,000 tons. Hence, as such, there is no supply chain constraint. However, Rare earth comprises of seventeen elements and are classified as light RE elements (LREE) and heavy RE elements (HREE). Some REE which are available in India such as Lanthanum, Cerium, Neodymium, Praseodymium, Samarium, etc are in supply surplus while Dysprosium, Terbium, Europium which are classified as HREE are having supply constraint. These HREE are not available in Indian deposits in extractable quantity. Government is actively engaged in capacity building for consumption of the LREE.

(c) It is a known fact that China is one of the leading producers of RE with estimated production of about 70% of the global production. They have the highest global reserves, which is about 6.4 times higher than India and has multiple times higher grade than that of Indian resource.

(d)&(e)(i)The RE resources in India are fifth largest in the world. Indian resource is significantly lean with reference to grade and it is tied with radioactivity making the extraction long drawn, complex and expensive. In comparison to China, Indian resources are significantly lean.

(ii) India's import of Rare Earth Elements (ITCHS: 28461010, 28469010, 28469020, 28469030, 28469090) during the last five financial years (2016-2017 to 2020-2021) and current financial year (2021-2022 upto November, 2021) with item description is at Annexure-I.

(iii) Country-wise import of Rare Earth Elements (ITCHS: 28461010, 28469010, 28469020, 28469030, 28469090) during the last five financial years (2016-2017 to 2020-2021) and current financial year (2021-2022 upto November, 2021) is at Annexure-II.

(f) Production of RE depends on deposits and end Industry consuming the products. India is one of the pioneers in processing of RE and these capabilities are available in terms of capacity, technology and skill. The Government has targeted increasing REO producing capacity by 3 times by the year 2032. Also, in order to enhance consumption of RE in Indian industries, specially Electric Vehicles, recently Government has announced a PLI scheme vide item No. 6 page 44 of Notification No. S.O. 4632(E) dated 9th November of Ministry of Heavy Industries.

AMD is presently carrying out survey and prospecting operations to augment REE in Barmer district, Rajasthan; Chhota Udepur district, Gujarat; Cuddalore, Ariyalur, Sivaganga and Madurai districts, Tamil Nadu and East Singhbhum district, Jharkhand. AMD is carrying out collection of xenotime bearing poly mineral concentrate in the unit established in Jashpur district, Chhattisgarh.

Further, AMD is also carrying out exploration to identify additional resources of monazite in the beach sand deposits along coastal tracts in parts of Ganjam and Puri districts, Odisha; Srikakulam district, Andhra Pradesh, Thoothukudi – Kanyakumari – Tirunelveli districts, Tamil Nadu and Kottayam, Ernakulam, Thiruvananthapuram, Kollam and Alapuzha districts, Kerala.

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Annexure-I

India's import of Rare Earth Elements (ITCHS: 28461010, 28469010, 28469020, 28469030, 28469090) during last 5 FYs (2016-17 to 2020-21) and current FY (2021-22, upto November, 2021)

ITCHS	Item Description	2016-17		2017-18		2018-19		2019-20		2020-21		2020-21 (upto November, 2020)		2021-22 (upto November, 2021)	
		Quantity (KGS)	Value (Mill. US $)	Quantity (KGS)	Value (Mill. US $)	Quantity (KGS)	Value (Mill. US $)	Quantity (KGS)	Value (Mill. US $)	Quantity (KGS)	Value (Mill. US $)	Quantity (KGS)	Value (Mill. US $)	Quantity (KGS)	Value (Mill. US $)
28461010	CERIUM OXIDES	68871	0.31	968463	0.70	103955	0.46	102495	0.52	184250	2.04	115910	1.11	105179	1.11
28469010	RARE EARTH OXIDES NES	791	0.04	4321	0.14	4604	0.16	10848	0.20	15176	0.20	1604	0.04	12186	0.21
28469020	RARE EARTH FLUORIDES NES	109	0.01	3013	0.03	7	0.03	3	0.01	102	0.01	2	0.00	25	0.00
28469030	RARE EARTH CHLORIDES NES	21001	0.04	14002	0.04	14002	0.03	15004	0.02	20000	0.03	20000	0.03	20002	0.03
28469090	OTHER COMPNDS INORGNC/ORGNC OF RARE EARTH MATERIALS	260171	3.70	1346497	7.60	1052906	9.31	832370	11.35	510167	7.31	224129	2.98	477547	5.63
Total		**350943**	**4.09**	**2336296**	**8.51**	**1175474**	**10.00**	**960720**	**12.10**	**729695**	**9.59**	**361645**	**4.16**	**614939**	**6.99**

Note: Figures pertaining to the current FY are Provisional and subject to changes

Annexure-II

India's import of Rare Earth Elements (ITCHS: 28461010, 28469010, 28469020, 28469030, 28469090), country-wise, during last 5 FYs (2016-17 to 2020-21) and current FY (2021-22, upto November, 2021)

ITCHS	Item Description	Country	2016-17		2017-18		2018-19		2019-20		2020-21		2020-21 (upto November, 2020)		2021-22 (upto November, 2021)	
			Quantity (KGS)	Value (Mill. US $)	Quantity (KGS)	Value (Mill. US $)	Quantity (KGS)	Value (Mill. US $)	Quantity (KGS)	Value (Mill. US $)	Quantity (KGS)	Value (Mill. US $)	Quantity (KGS)	Value (Mill. US $)	Quantity (KGS)	Value (Mill. US $)
28461010	CERIUM OXIDES	AUSTRIA			0	0.00										
		BELGIUM	2	0.00	6	0.00	520	0.01	1	0.00	3	0.00	2	0.00	2	0.00
		CHINA P RP	62440	0.13	965666	0.60	98701	0.33	91000	0.31	134000	1.12	66500	0.23	102550	1.03
		CZECH REPUBLIC							25	0.00						
		ESTONIA									100	0.00	100	0.00		
		FRANCE			800	0.03	400	0.01	0	0.00						
		GERMANY	0	0.00	150	0.00	250	0.00	251	0.00	10400	0.20	10290	0.19	110	0.01
		HONG KONG	40	0.00							3720	0.02	3000	0.01	2	0.00
		ITALY													3	0.00
		JAPAN	3000	0.08	194	0.01	670	0.02	1	0.00	0	0.00	0	0.00		
		KOREA RP			400	0.01	1400	0.04								
		MALAYSIA	100	0.01	30	0.00										
		NORWAY					250	0.00			15500	0.29	15500	0.29		
		POLAND			800	0.02										
		SOUTH AFRICA									3000	0.07	3000	0.07	2500	0.05
		SPAIN			100	0.00										
		SWITZERLAND									10	0.00	10	0.00		
		TAIWAN									500	0.01	500	0.01		
		U ARAB EMTS									2	0.00	2	0.00		
		U K	24	0.01	14	0.01	752	0.02	10505	0.19	17013	0.32	17006	0.32	7	0.01
		U S A	3265	0.09	303	0.01	1012	0.03	712	0.02	2	0.00			5	0.00
	CERIUM OXIDES Total		**68871**	**0.31**	**968463**	**0.70**	**103955**	**0.46**	**102495**	**0.52**	**184250**	**2.04**	**115910**	**1.11**	**105179**	**1.11**

ITCHS	Item Description	Country	2016-17		2017-18		2018-19		2019-20		2020-21		2020-21 (upto November, 2020)		2021-22 (upto November, 2021)	
			Quantity (KGS)	Value (Mill. US $)	Quantity (KGS)	Value (Mill. US $)	Quantity (KGS)	Value (Mill. US $)	Quantity (KGS)	Value (Mill. US $)	Quantity (KGS)	Value (Mill. US $)	Quantity (KGS)	Value (Mill. US $)	Quantity (KGS)	Value (Mill. US $)
28469010	RARE EARTH OXIDES NES	AUSTRALIA	280	0.01												
		AUSTRIA	225	0.01	200	0.01	1000	0.03	0	0.00					5001	0.14
		BELGIUM	2	0.00												
		CHINA P RP	216	0.02	3576	0.11	3400	0.13	2200	0.02	10100	0.08	1000	0.01	6500	0.05
		FRANCE					0	0.00								
		GERMANY	65	0.01	29	0.00	1	0.00	8202	0.16	4003	0.08	3	0.00		
		JAPAN			500	0.01	200	0.01	427	0.01	1000	0.03	550	0.02	675	0.02
		NETHERLAND									20	0.00				
		U K	2	0.00												
		U S A	1	0.00	16	0.00	3	0.00	19	0.00	53	0.01	51	0.01	10	0.00
	RARE EARTH OXIDES NES Total		**791**	**0.04**	**4321**	**0.14**	**4604**	**0.16**	**10848**	**0.20**	**15176**	**0.20**	**1604**	**0.04**	**12186**	**0.21**
28469020	RARE EARTH FLUORIDES NES	BELGIUM									2	0.00	2	0.00		
		CHINA P RP			3000	0.01										
		FRANCE							1	0.00						
		GERMANY	109	0.01	13	0.02	7	0.03	2	0.01	0	0.00	0	0.00	0	0.00
		U K									0	0.00				
		U S A	0	0.00							100	0.01			25	0.00
		VIETNAM SOC REP			0	0.00										
	RARE EARTH FLUORIDES NES Total		**109**	**0.01**	**3013**	**0.03**	**7**	**0.03**	**3**	**0.01**	**102**	**0.01**	**2**	**0.00**	**25**	**0.00**

ITCHS	Item Description	Country	2016-17		2017-18		2018-19		2019-20		2020-21		2020-21 (upto November, 2020)		2021-22 (upto November, 2021)	
			Quantity (KGS)	Value (Mill. US $)	Quantity (KGS)	Value (Mill. US $)	Quantity (KGS)	Value (Mill. US $)	Quantity (KGS)	Value (Mill. US $)	Quantity (KGS)	Value (Mill. US $)	Quantity (KGS)	Value (Mill. US $)	Quantity (KGS)	Value (Mill. US $)
28469030	RARE EARTH CHLORIDES NES	CHINA P RP	21000	0.03	14000	0.04	14000	0.03	15000	0.02	20000	0.03	20000	0.03	20000	0.03
		U K	0	0.00			0	0.00	0	0.00						
		U S A	1	0.01	2	0.00	2	0.00	4	0.00	0	0.00			2	0.00
	RARE EARTH CHLORIDES NES Total		**21001**	**0.04**	**14002**	**0.04**	**14002**	**0.03**	**15004**	**0.02**	**20000**	**0.03**	**20000**	**0.03**	**20002**	**0.03**
28469090	OTHER COMPNDS INORGNC/ ORGNC OF RARE EARTH MATERIALS	AUSTRIA	300	0.02	16300	0.38	17800	0.38	31405	0.60	45900	1.21	34300	0.75	30150	0.58
		BELGIUM	22	0.00	2	0.00	13921	0.34	20707	0.50	501	0.01	500	0.01	2000	0.05
		BULGARIA			1	0.00										
		CANADA									200	0.00				
		CHINA P RP	74392	0.49	70400	0.47	83137	0.86	58208	0.63	178154	0.95	21134	0.42	263589	0.79
		FRANCE	65595	1.20	77133	1.40	34278	0.84	1033	0.08	628	0.17	307	0.07	23	0.05
		GERMANY	736	0.11	361	0.10	16092	0.54	48136	1.25	11582	1.12	1299	0.08	19135	0.61
		HONG KONG			4	0.00	741	0.02	14228	0.07	3	0.00	2	0.00		
		ITALY					300	0.01								
		JAPAN	66925	1.12	110692	2.24	212371	2.81	190635	5.22	80808	2.37	24425	0.74	99082	2.80
		KOREA RP			19060	0.01	25	0.00	20	0.00	500	0.02			20	0.00
		LIECHTENSTEIN	1	0.00	1	0.00										
		MEXICO	5	0.00			2800	0.07								
		NETHERLAND													750	0.03
		NORWAY							250	0.00						
		RUSSIA	26400	0.05	1036200	2.21	644777	2.44	451625	2.60	155681	0.85	125681	0.67	40000	0.25

ITCHS	Item Description	Country	2016-17		2017-18		2018-19		2019-20		2020-21		2020-21 (upto November, 2020)		2021-22 (upto November, 2021)	
			Quantity (KGS)	Value (Mill. US $)	Quantity (KGS)	Value (Mill. US $)	Quantity (KGS)	Value (Mill. US $)	Quantity (KGS)	Value (Mill. US $)	Quantity (KGS)	Value (Mill. US $)	Quantity (KGS)	Value (Mill. US $)	Quantity (KGS)	Value (Mill. US $)
		SINGAPORE	38	0.00	40	0.00	567	0.04	275	0.01	270	0.02	141	0.01	203	0.01
		SLOVENIA									10960	0.02	10960	0.02	5000	0.09
		SOUTH AFRICA	350	0.00												
		SWEDEN	377	0.07	66	0.01	4	0.01			39	0.00			95	0.01
		SWITZERLAND	3	0.00	9	0.00	40	0.00	10	0.00	138	0.01			415	0.03
		TAIWAN	10125	0.22			0	0.00								
		THAILAND					0	0.00								
		U ARAB EMTS					4	0.00	174	0.04	175	0.04	175	0.04		
		U K	1070	0.06	306	0.05	1665	0.07	23	0.04	3025	0.08	19	0.01	21	0.02
		U S A	13832	0.35	15922	0.72	24384	0.87	15641	0.31	21603	0.44	5186	0.14	17064	0.32
	OTHER COMPNDS INORGNC/ ORGNC OF RARE EARTH MATERIALS Total		**260171**	**3.70**	**1346497**	**7.60**	**1052906**	**9.31**	**832370**	**11.35**	**510167**	**7.31**	**224129**	**2.98**	**477547**	**5.63**
Total			**350943**	**4.09**	**2336296**	**8.51**	**1175474**	**10.00**	**960720**	**12.10**	**729695**	**9.59**	**361645**	**4.16**	**614939**	**6.99**

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