



# Critical **Rare** Metals in the Multipolar Age

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TREM II

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# Critical **Rare** Metals in the Multipolar Age Selecting Critical Metals for Risk Management

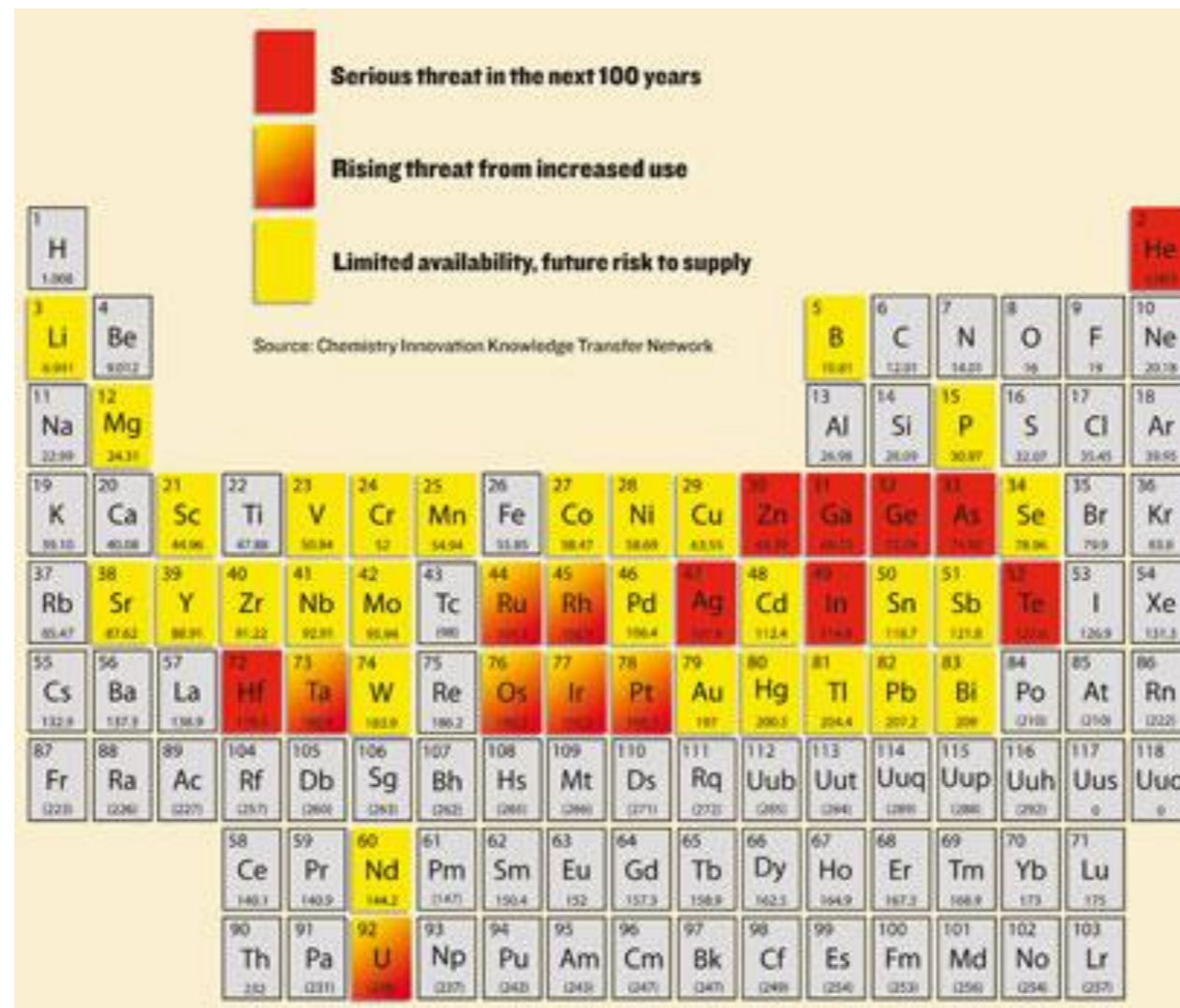
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# Critical Metals in the Multipolar Age



# Critical Metals in the Multipolar Age

 = Key material addressed in Strategy

1 H																	2 He						
3 Li	4 Be	Li-Lithium Y-Yttrium Co-Cobalt Ga-Gallium	In-Indium Te-Tellurium La-Lanthanum Ce-Cerium	Pr-Praseodymium Nd-Neodymium Sm-Samarium	Eu-Europium Tb-Terbium Dy-Dysprosium	5 B	6 C	7 N	8 O	9 F	10 Ne												
11 Na	12 Mg																	13 Al	14 Si	15 P	16 S	17 Cl	18 Ar
19 K	20 Ca	21 Sc	22 Ti	23 V	24 Cr	25 Mn	26 Fe	27 Co	28 Ni	29 Cu	30 Zn	31 Ga	32 Ge	33 As	34 Se	35 Br	36 Kr						
37 Rb	38 Sr	39 Y	40 Zr	41 Nb	42 Mo	43 Tc	44 Ru	45 Rh	46 Pd	47 Ag	48 Cd	49 In	50 Sn	51 Sb	52 Te	53 I	54 Xe						
55 Cs	56 Ba	*	72 Hf	73 Ta	74 W	75 Re	76 Os	77 Ir	78 Pt	79 Au	80 Hg	81 Tl	82 Pb	83 Bi	84 Po	85 At	86 Rn						
87 Fr	88 Ra	**	104 Rf	105 Db	106 Sg	107 Bh	108 Hs	109 Mt	110 Ds	111 Rg	112 Cn	113 Uut	114 Uuq	115 Uup	116 Uuh	117 Uus	118 Uuo						
119 Uun																							
* Lanthanides		57 La	58 Ce	59 Pr	60 Nd	61 Pm	62 Sm	63 Eu	64 Gd	65 Tb	66 Dy	67 Ho	68 Er	69 Tm	70 Yb	71 Lu							
** Actinides		89 Ac	90 Th	91 Pa	92 U	93 Np	94 Pu	95 Am	96 Cm	97 Bk	98 Cf	99 Es	100 Fm	101 Md	102 No	103 Lr							

# Critical Metals by Industry

## Automotive

Steel  
Aluminum  
Copper  
Tungsten  
Cobalt  
Molybdenum  
Vanadium  
Chromium  
Mangannese  
Platinum  
Palladium  
Rhodium  
Neodymium  
Dysprosium

## Aerospace

Aluminum  
Steel  
Copper  
Nickel  
cobalt  
Rhenium  
Scandium  
Neodymium  
Samarium  
Dysprosium

# Critical Metals by Industry

## Display Electronics

Tin  
Indium  
Europium  
Terbium

## Photovoltaic Thin Film

Copper  
Indium  
Gallium  
Selenium  
Cadmium  
Tellurium

# Critical Metals by Industry

## Wind Turbine Electricity

Steel  
Aluminum  
Copper  
Neodymium  
Dysprosium

## Energy Storage

Lead  
Antimony  
Graphite  
Lithium  
Cobalt  
Vanadium  
Manganese

# Critical Metals by Industry

## Nuclear Electricity Generation

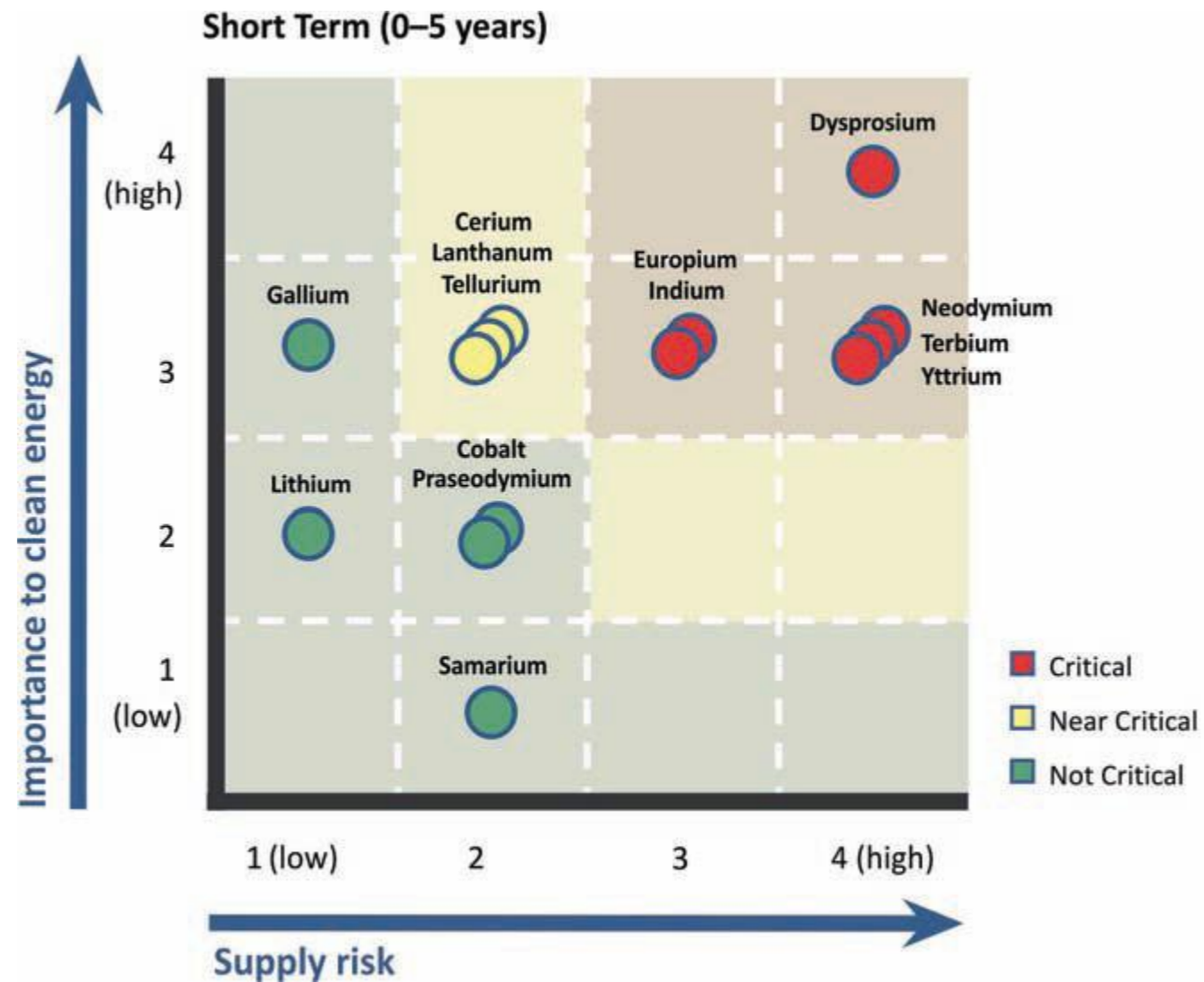
Steel  
Aluminum  
Copper  
Uranium  
Thorium  
Zirconium  
Hafnium  
Molybdenum  
Nickel  
Cobalt

## Fossil Fuel Electricity Generation

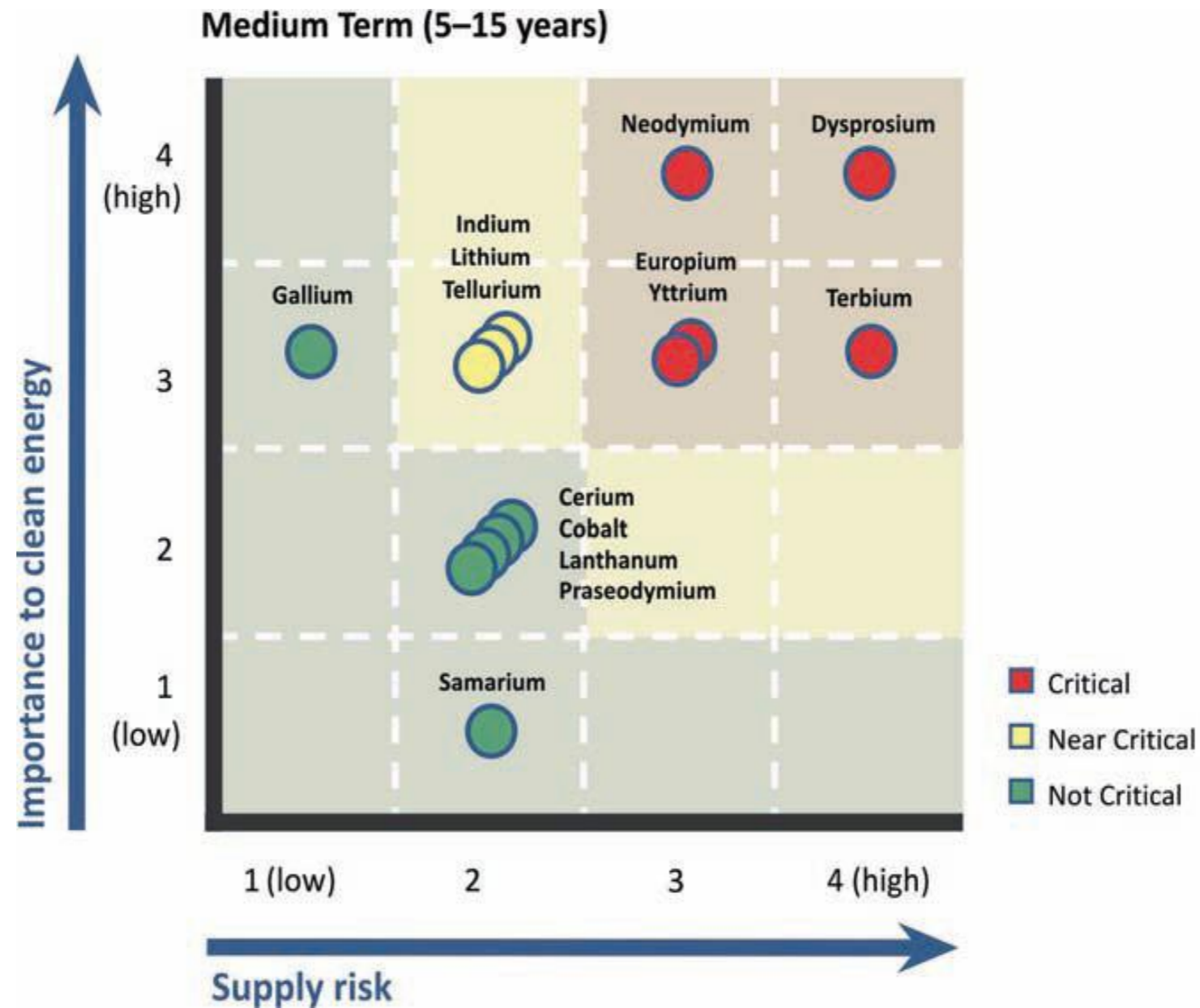
Steel  
Molybdenum  
Tungsten  
Cesium  
Lanthanum  
Cerium  
Platinum  
Palladium



# Critical Metals in the Multipolar Age



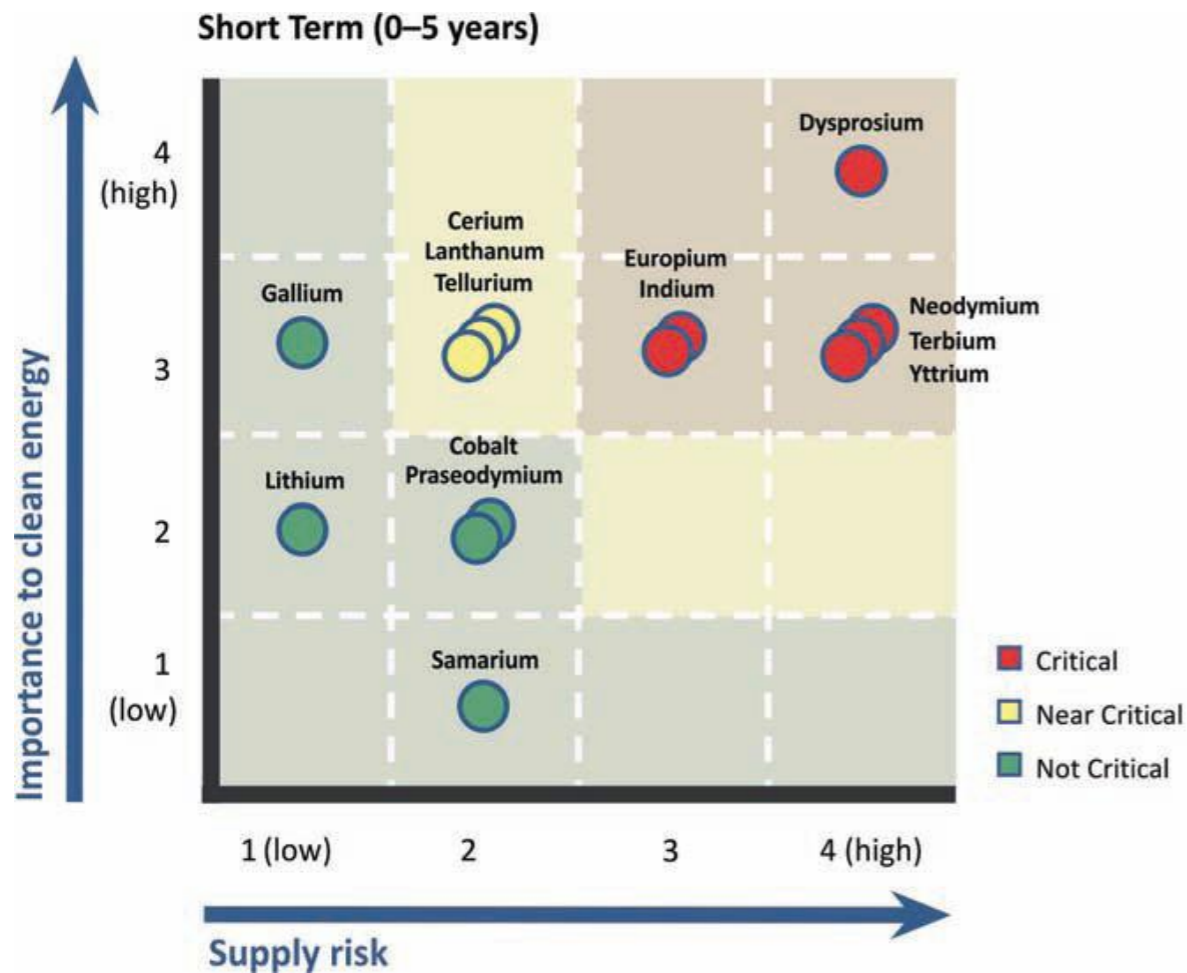
# Critical Metals in the Multipolar Age



# Critical, Critical Metals as projected in 2011

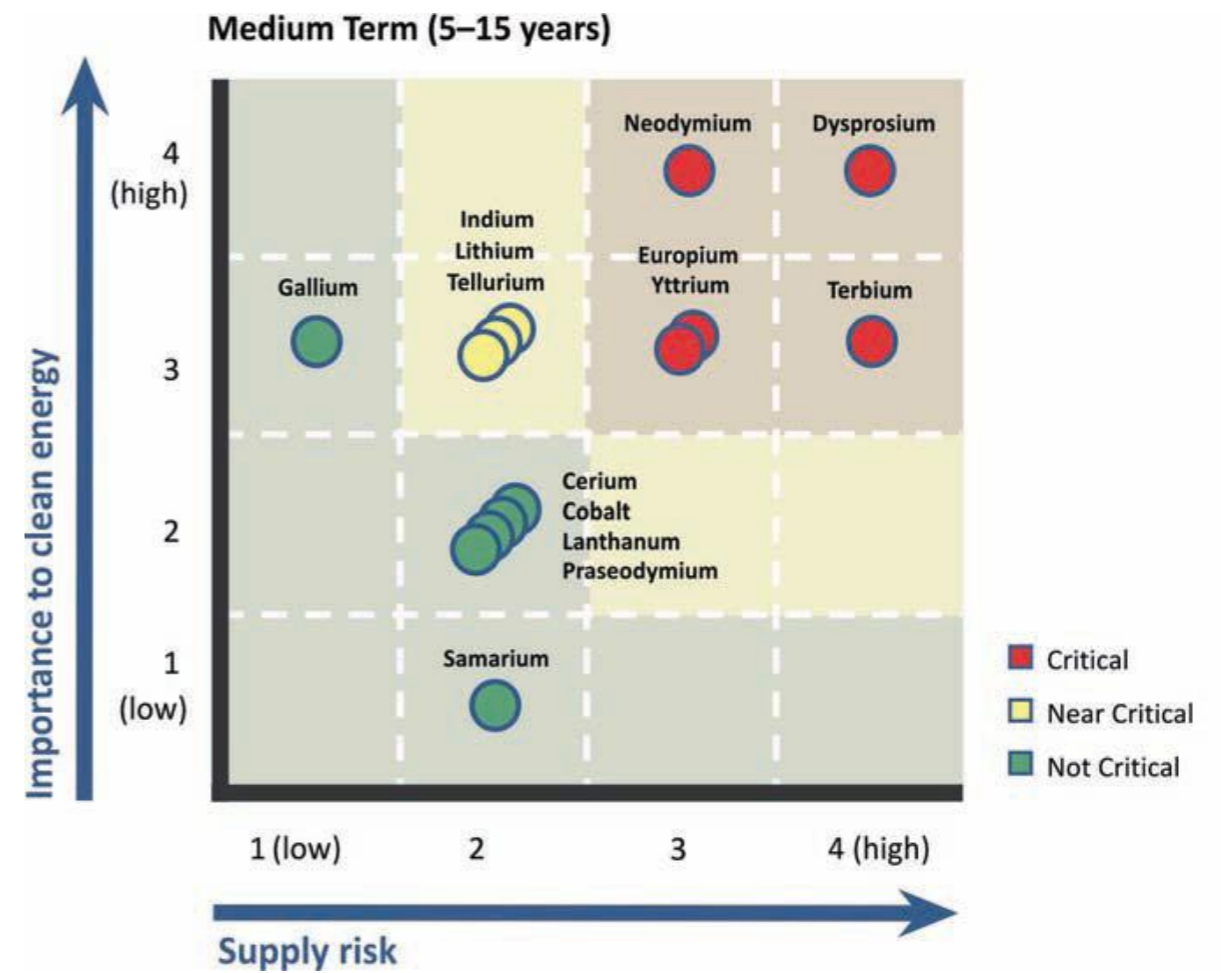
## Industries Affected

Automotive, Aircraft, Electronic Display



## Industries Affected

Automotive, Energy Conversion and Storage, Aircraft



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