



MSMEs and Sustainable Resource Management

Guidelines and best practices for MSMEs to assure resiliency and progress towards a circular economy in sustainable resource management and critical raw material supply chain solutions

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RESOURCE MANAGEMENT WEEK 2021

ENABLING SUSTAINABILITY PRINCIPLES IN RESOURCE MANAGEMENT



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MSMEs and Sustainable Resource Management

Best practices for MSMEs to assure resiliency and progress towards a circular economy in sustainable resource management and critical raw material supply chain solutions



- Micro, Small and Medium Enterprises (MSME) are the main drivers of the world's economy

List of enterprises in the EU below 250 employees
(source Eurostat (online data code: sbs_sc_sca_r2))



Number of enterprises, turnover and persons employed and the share of enterprises with fewer than 250 persons employed, 2015

	Enterprises		Turnover (m €)		Persons employed	
	total	< 250 persons employed %	total	< 250 persons employed %	total	< 250 persons employed %
EU-28	23 500 341	99.8	27 309 775	55.8	137 444 935	66.3
Belgium	602 153	99.9	989 197	65	2 769 085	69.3
Bulgaria	326 219	99.8	121 308	69.9	1 911 916	74.8
Czech Republic	1 001 048	99.8	444 231	56.9	3 591 896	67.6
Denmark	210 726	99.7	479 464	59.3	1 666 048	64.3
Germany	2 408 352	99.5	6 061 400	47.5	28 258 410	62.9
Estonia	68 124	99.7	50 820	77.5	414 763	78.2
Ireland	243 433	:	595 095	:	1 308 019	:
Greece	789 975	:	236 153	:	2 162 572	:
Spain	2 465 540	99.9	1 789 292	62.2	11 109 702	72.8
France	2 908 814	99.9	3 624 869	55.3	14 645 799	61.4
Croatia	146 637	99.7	77 670	60.9	989 598	69.5
Italy	3 683 127	99.9	2 887 615	68.8	14 225 278	78.7
Cyprus	48 329	99.9	25 573	79.9	215 716	83.9
Latvia	109 642	99.8	51 304	77.8	633 450	79.4
Lithuania	186 468	99.8	73 997	68.5	934 440	75.9
Luxembourg	31 926	99.5	151 365	70	255 869	68.3
Hungary	536 610	99.8	277 690	57.1	2 596 236	69.8
Malta	26 059	99.8	18 665	85.1	134 212	79.7
Netherlands	1 092 243	99.9	1 412 433	61.8	5 461 082	65.7
Austria	322 325	99.7	653 111	:	2 742 655	:
Poland	1 606 559	99.8	921 350	56	8 652 063	68.3
Portugal	807 183	99.9	314 227	:	3 007 264	:
Romania	458 122	99.6	263 366	59.1	3 898 199	65.5
Slovenia	134 727	99.8	83 628	68.3	591 340	73.7
Slovakia	429 524	99.9	180 476	56.7	1 502 912	71.8
Finland	229 096	99.7	365 782	56.1	1 454 614	65.6
Sweden	686 433	99.9	811 397	:	3 102 080	:
United Kingdom	1 940 947	99.7	4 348 297	47	19 209 717	53.5
Norway	293 403	99.8	546 504	:	1 610 874	68
Switzerland	142 775	99.2	1 929 684	:	2 737 720	67.1

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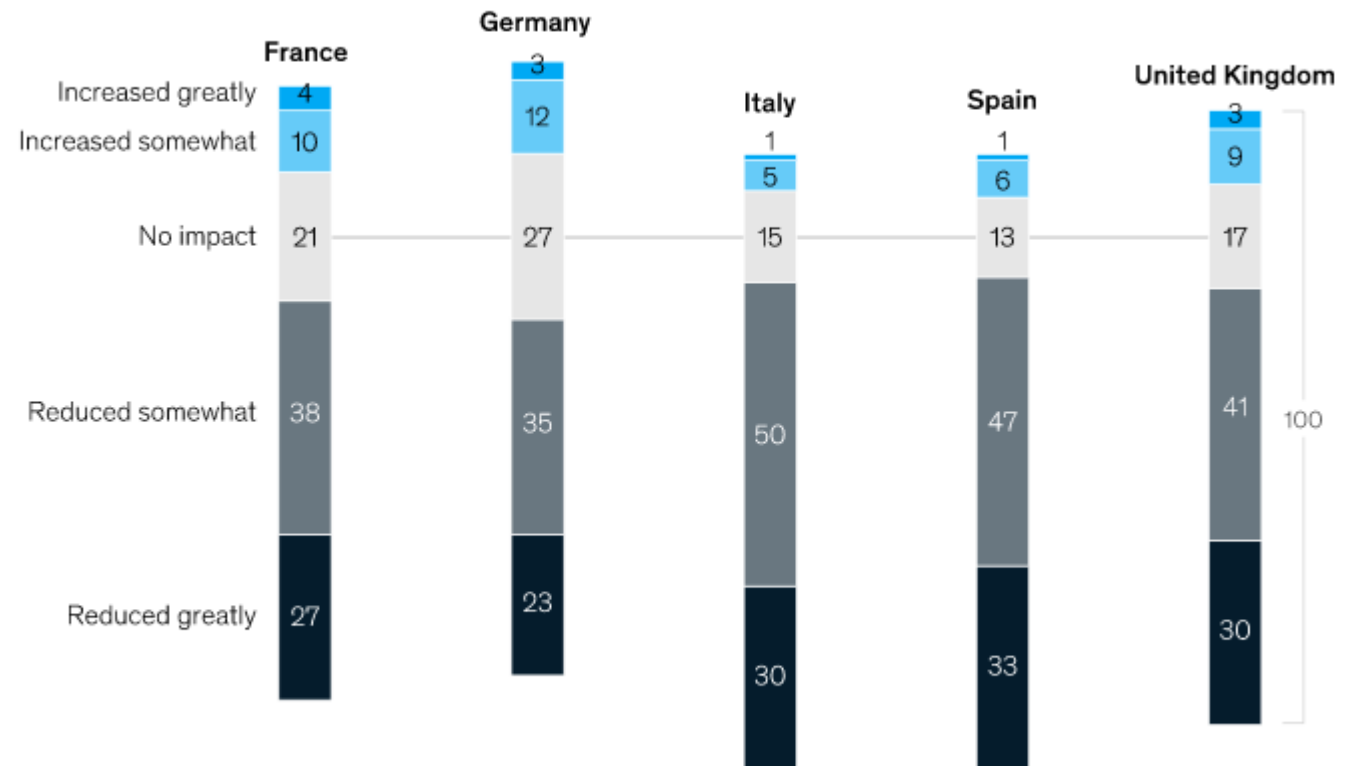


- Revenues have fallen for the vast majority of small and medium-size enterprises in Europe since the onset of the Covid-19 crisis

McKinsey & Company

Source: [McKinsey.com](https://www.mckinsey.com)

Respondents' views of COVID-19 impact on their companies' revenues, %



Note: Figures may not sum to 100%, because of rounding.
Source: Survey of SMEs conducted in August 2020; n = 500 in United Kingdom, n = 505 in Germany, n = 502 in France, n = 351 in Italy, and n = 350 in Spain

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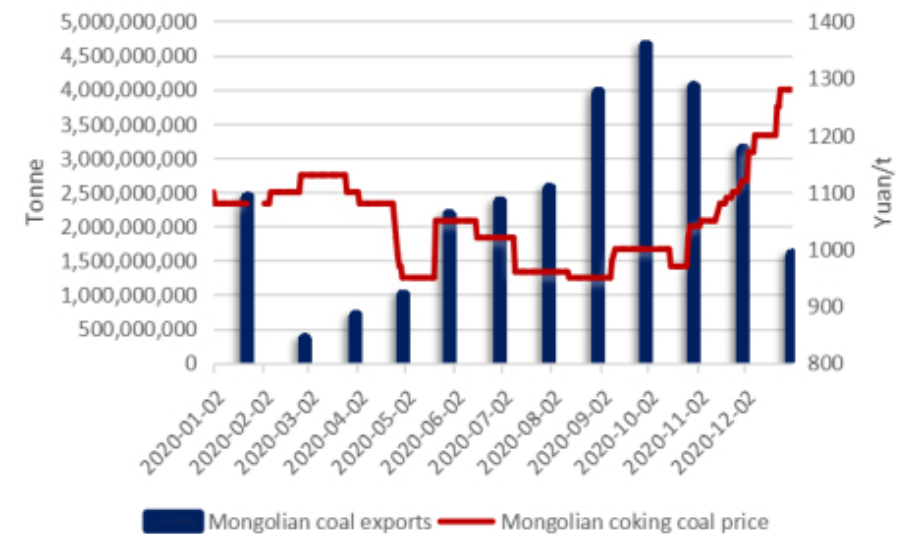


- How is the pandemic affecting the local economy and the provision of capital to companies - An Example from Mongolia

Minerals exports (as of 15th of April, 2020)

Minerals product	Unit	Volume	Increase or Decrease 2020.04.15/ 2019.04.15 (%)	Revenue (US\$ million)	Increase or Decrease 2020.04.15/ 2019.04.15 (%)
Copper concentration	thou.tn	359.4	-14.5%	409.7	-31.1%
Coal	thou.tn	3521.8	-62.4%	284	-63.8%
Iron ore	thou.tn	2404.5	-3%	164.5	+22.7%
Gold	tonnes	1.6	-66.6%	80.4	-58.9%
Zinc ore and concentration	thou.tn	41.7	-11%	53.7	-20%
Fluorspar ore and concentration	thou.tn	168.3	+27.8%	42.5	-10.6%
Refined copper	thou.tn	3.6	+18.4%	19.7	+7.3%
Crude oil	thou.bbl	359.9	-80.6%	18.6	-82%
Molybdenum concentration	thou.tn	1.7	-0.27%	12.23	-17%

Source: (Mongolian_Mining_Journal, 2020)



Mongolia 2020 coal exports shrink by 22% to 29 million t

Source: thecoalhub.com

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- What is a Critical Raw Material (CRM)?

List of critical raw materials to the EU 2020 (EC, 2020).

Critical raw materials		
2020 critical raw materials (new as compared to 2017 in bold)		
Antimony	Hafnium	Phosphorus
Baryte	Heavy Rare Earth Elements	Scandium
Beryllium	Light Rare Earth Elements	Silicon metal
Bismuth	Indium	Tantalum
Borate	Magnesium	Tungsten
Cobalt	Natural graphite	Vanadium
Coking coal	Natural rubber	Bauxite
Fluorspar	Niobium	Lithium
Gallium	Platinum Group Metals	Titanium
Germanium	Phosphate rock	Strontium

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- Why we need Critical Raw Material (CRMs)?

CRMs in Key Sectors

Defense Industry

Batteries

Automotive Sector

Electrical and Electronic Equipment

Renewable Energy

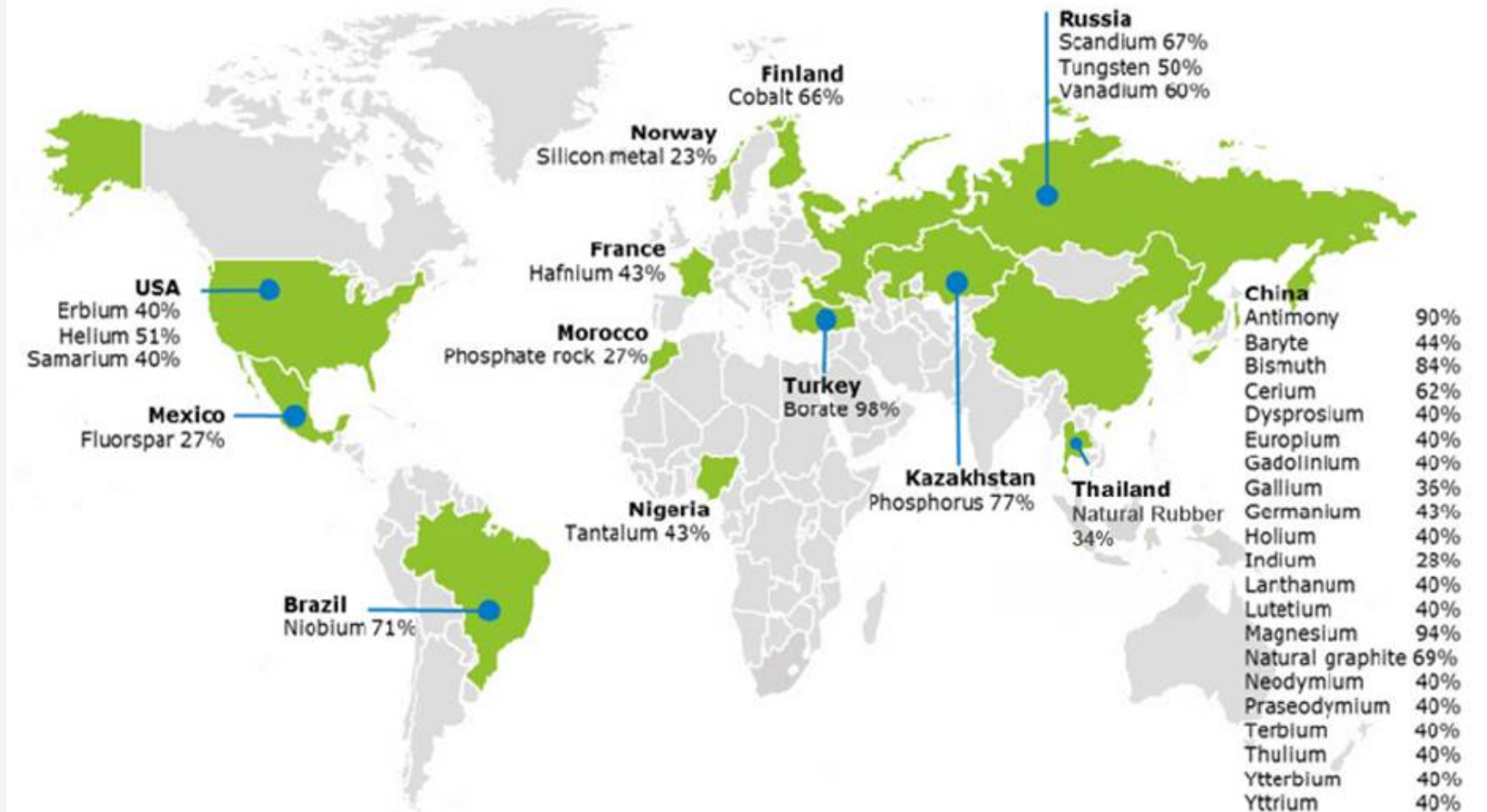
Chemicals and Fertilizers

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- The supply of CRMs from **Primary Mineral Resources** is in the hands of a few countries.

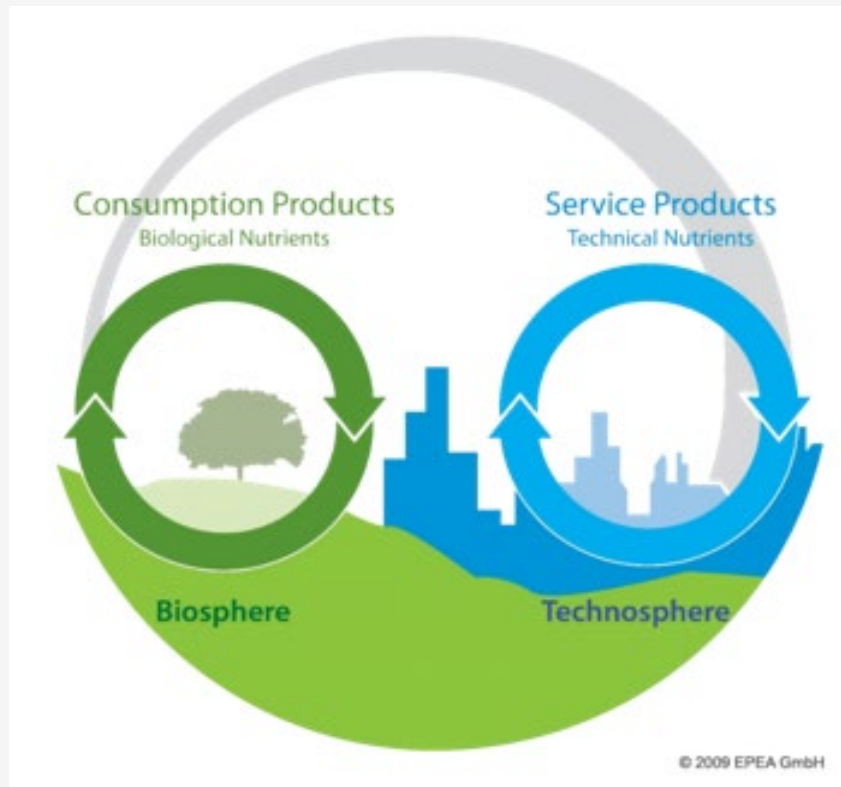


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- The world focusses today on Circular Economy



The circular economy is not always the panacea to guarantee supply. Biosphere and Technosphere can hardly be compared, even if a closed circular economy is sometimes dreamed up by some economists.



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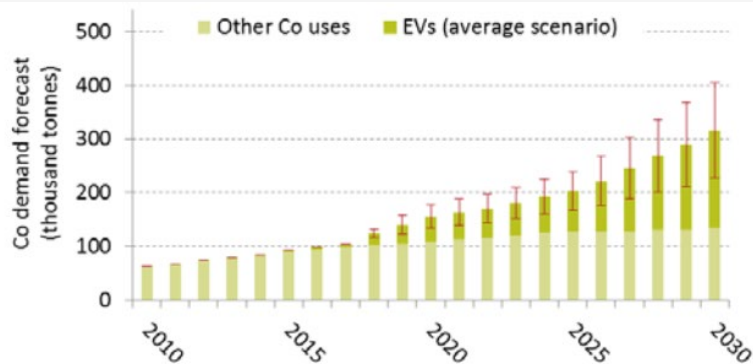
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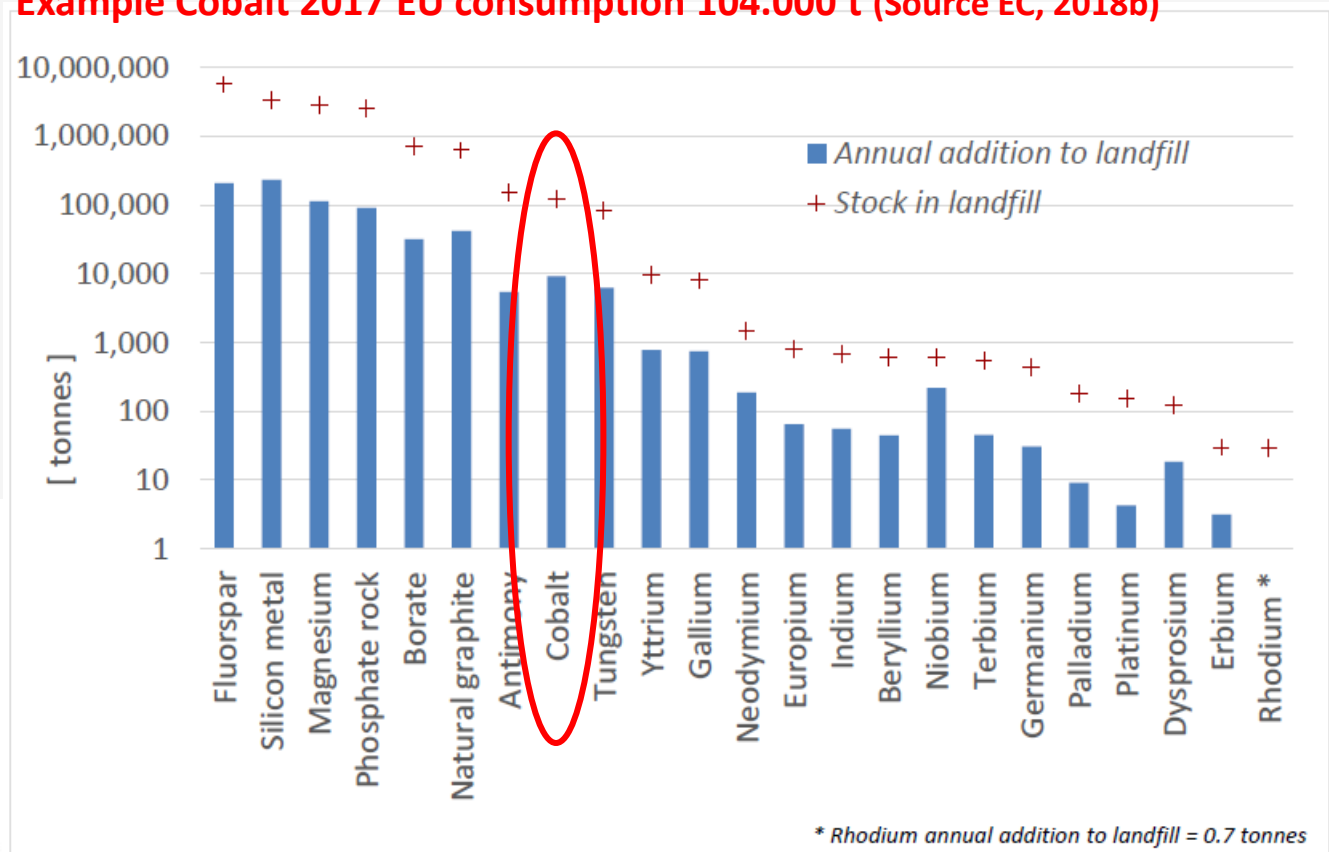
- The supply of CRMs from **Secondary Mineral Resource (SMR)** like landfills, dumps etc.

Amounts of some CRMs as Annual addition to stock in landfills in EU' and 'Stock in landfill in EU'.

Source: JRC elaboration based on 2015 MSA study (Deloitte Sustainability, 2015).



We do not have enough raw material to supply the EU with CRMs from SMR: Example Cobalt 2017 EU consumption 104.000 t (Source EC, 2018b)



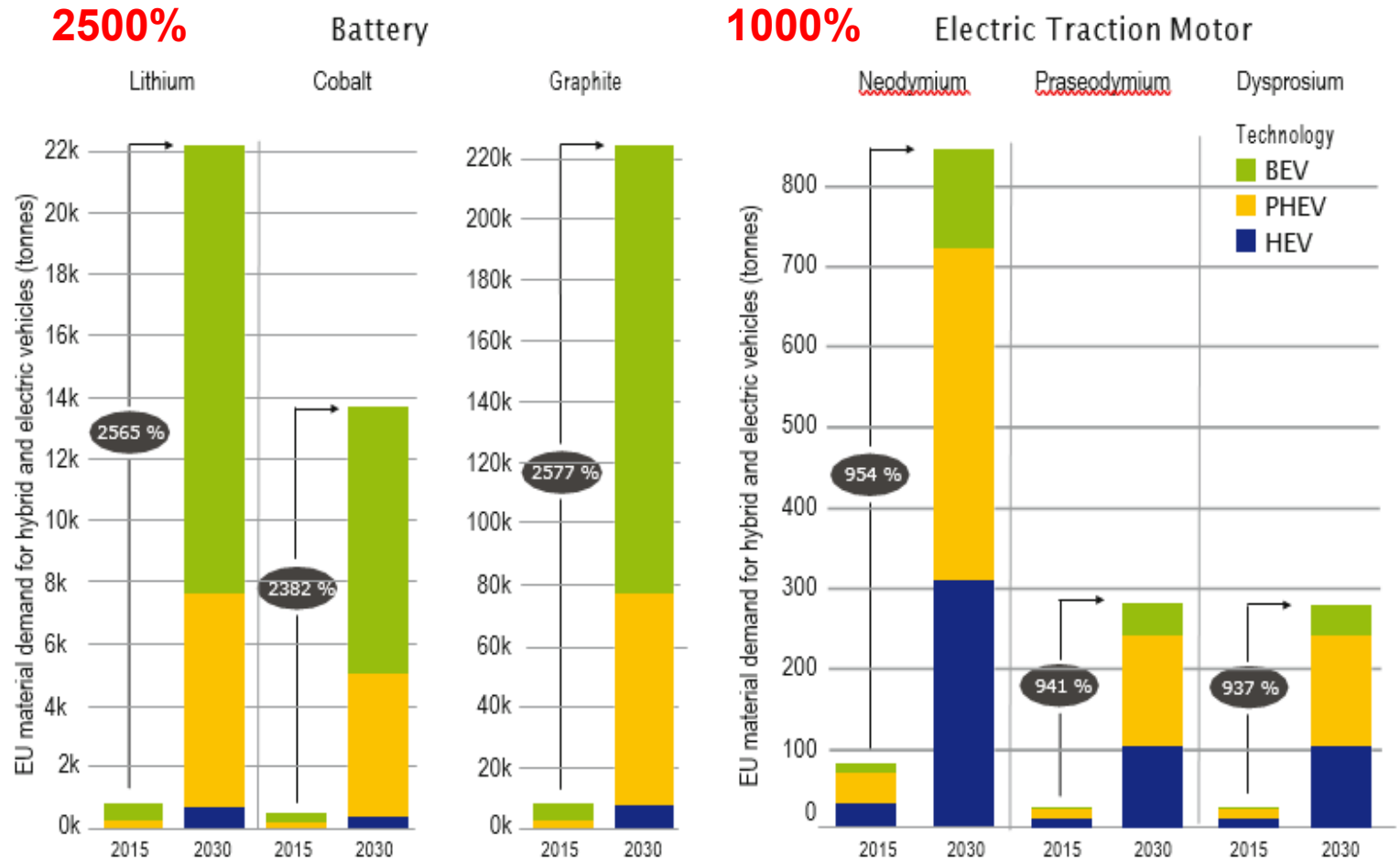
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- Why we need CRMs? – CRMs demand in the EU for the hybrid and electric vehicles segment (Source: EC, 2018a).

Technology
BEV: Battery Electric Vehicle
PHEV: Plug-In-Hybrid
HEV: Hybrid Electric Vehicle



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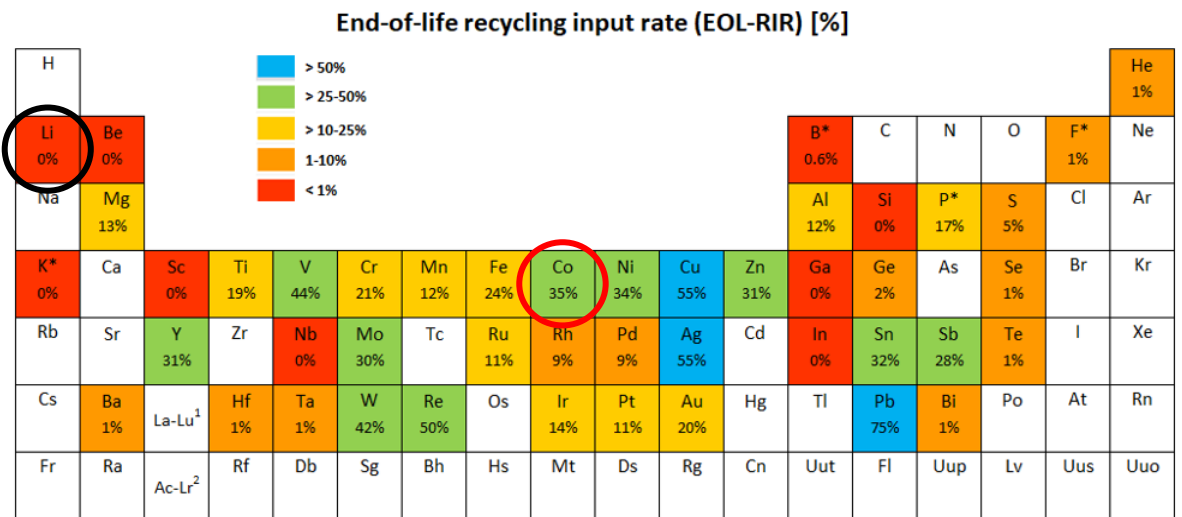
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End-of-Life Recycling Input Rate (EOL-RIR) for the periodic table



Source: JRC elaboration based on Deloitte Sustainability et al., 2017



¹ Group of Lanthanide	La	Ce	Pr	Nd	Pm	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu
	1%	1%	10%	1%		1%	38%	1%	22%	0%	1%	0%	1%	1%	1%
² Group of Actinide	Ac	Th	Pa	U	Np	Pu	Am	Cm	Bk	Cf	Es	Fm	Md	No	Lr

Aggregates	Bentonite	Cooking Coal	Diatomite	Feldspar	Gypsum	Kaolin Clay	Limestone	Magnesite	Natural Cork	Natural Graphite	Natural Rubber	Natural Teak Wood	Perlite	Sapele wood	Silica Sand	Talc
7%	50%	0%	0%	10%	1%	0%	58%	2%	8%	3%	1%	0%	42%	15%	0%	5%

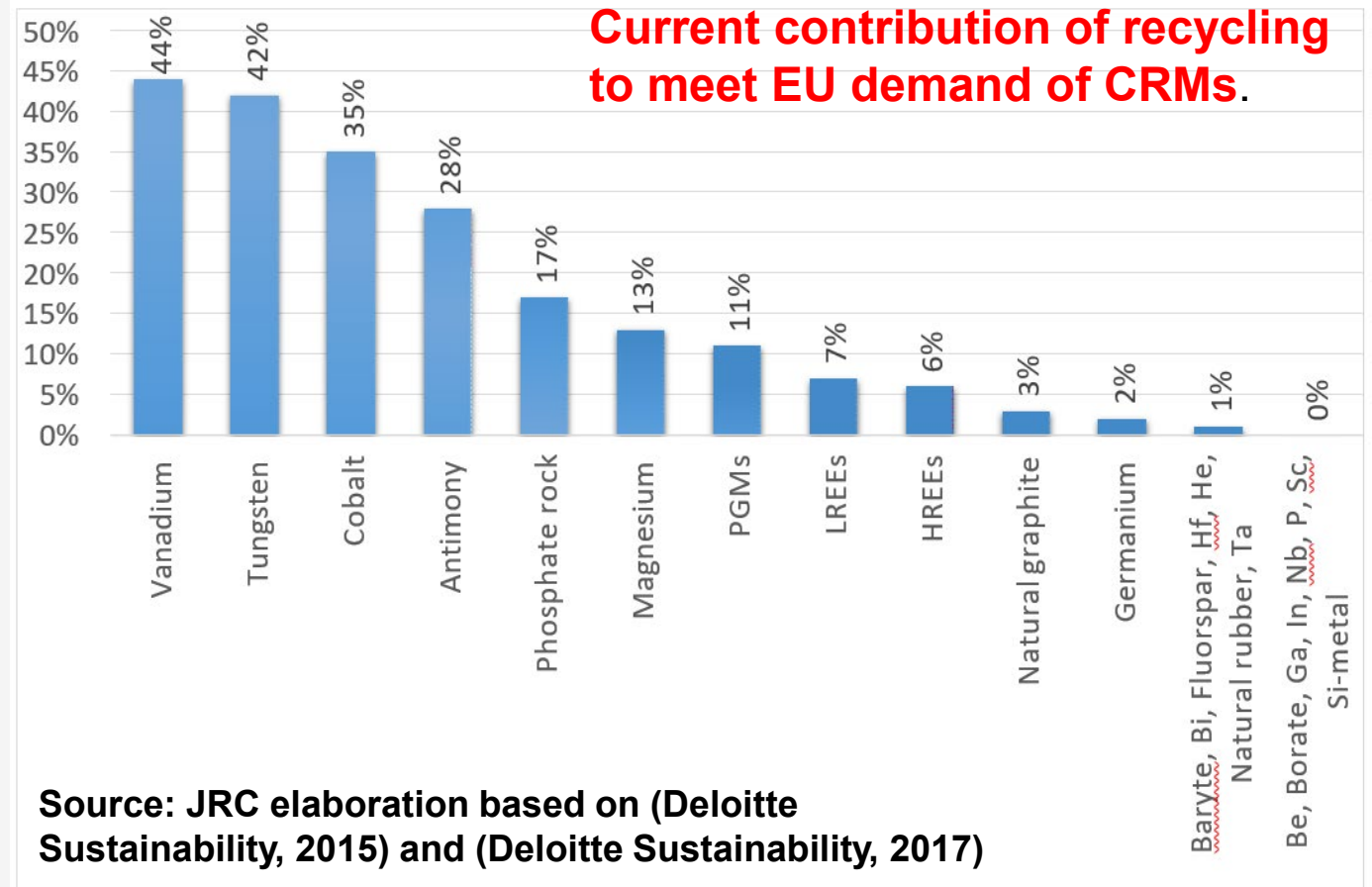
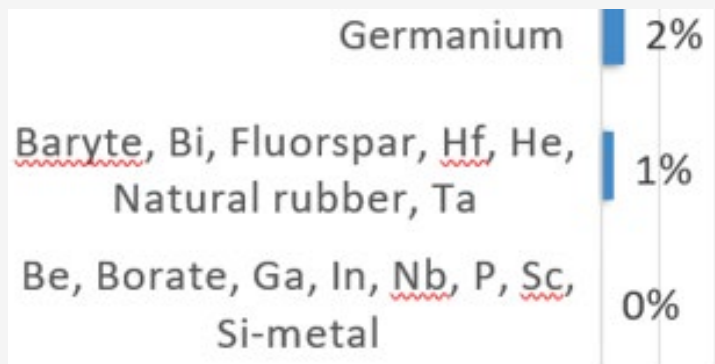
* F = Fluorspar; P = Phosphate rock; K = Potash, Si = Silicon metal, B=Borates.

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- The industry needs CRMs from Primary Mineral Resource (PMR) because recycling of many CRMs is only partially or not possible.



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■ What effects the supply of CRMs in the COVID-19 pandemic?

- The availability of Transportation staff (lorry driver, porters etc.)
- the truck, which is not allowed to pass a provincial or national borders
- the interposed customs office in the port with too few staff
- the merchant ship which has to be in quarantine for 3 weeks in the port
- the customs clearance in the port of destination which has no people to clear, etc.

are problems which cannot be calculated in advance.



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- Current status of MSMEs in critical raw material (CRM) supply
 - MSMEs need CRMs from primary deposits because recycling of many CRMs is only partially or not possible.
 - The supply of CRMs from primary deposits is in the hands of a few countries.
 - The further development of any future technology is not feasible without access to CRMs. Without access to CRMs, there will be no progress in the field of communication, the further development of electric vehicles, renewable energies and national defence.
 - The pandemic has shown the world how vulnerable supply chains are in the globalised world. The pandemic will change these supply chains and their future organisation.

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■ Final Conclusions:

- The search for CRMs in Secondary Deposits will not provide us with CRMs for a long time, it is only an interim solution.
- Recycling management and Circular Economy only works to a limited extent and only for a short time, it is not the *perpetuum mobile*.
- What Europe and the world needs to be independent from CRM producing countries are own Primary Deposits.

We must start again exploration and mining in our own countries.

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Thank you!

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