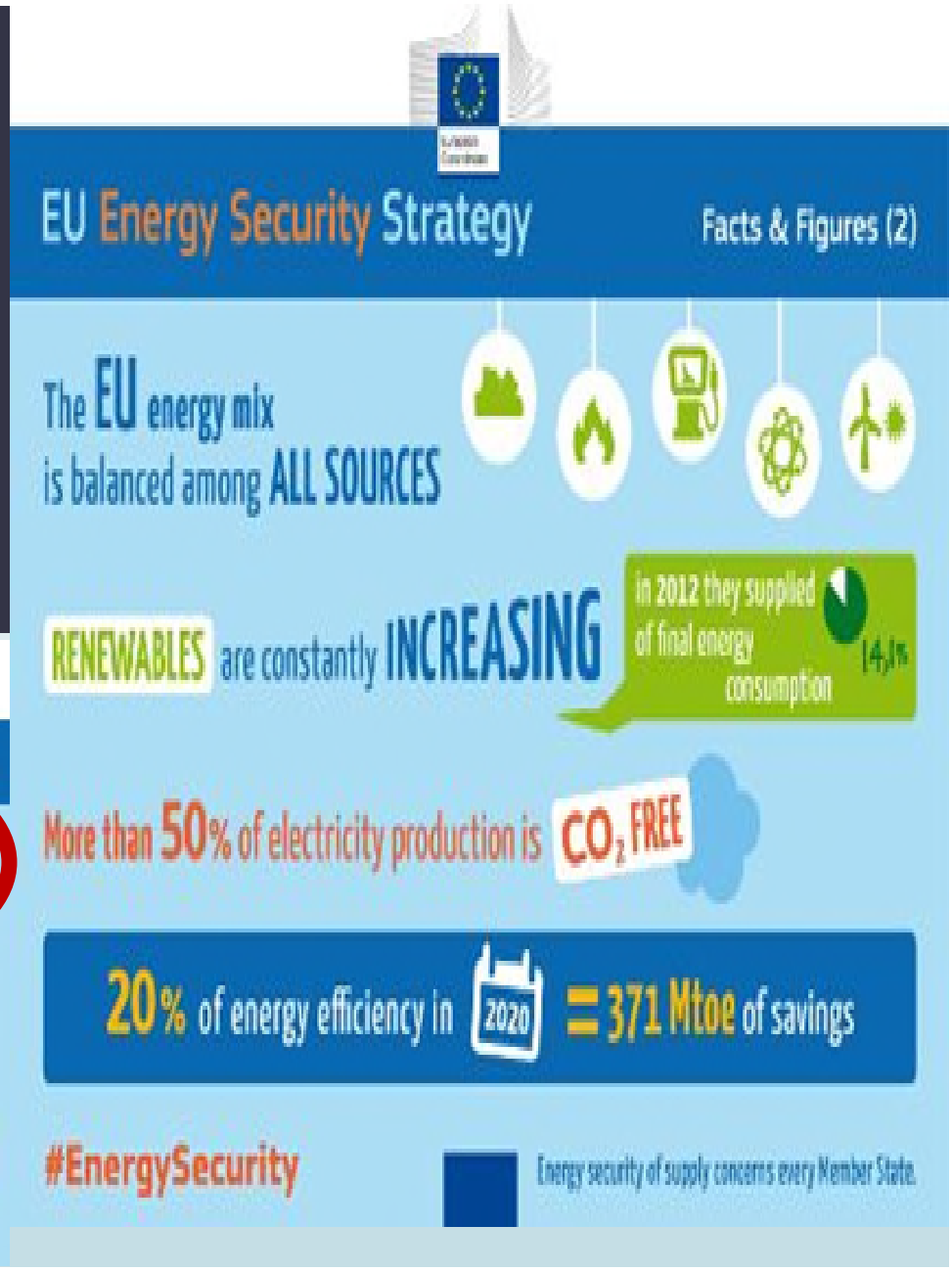
SEGURIDAD ENERGÉTICA Y CAMBIO CLIMÁTICO



El esquema energético de la Unión Europea

Producción de electricidad según el tipo de fuente (2019)

JULIO 2021: FIT FOR 55%

- 55% reducción emisiones GEI, respecto 1990
- 40% aportación ER (Energías Renovables)
- EU ETS: Endurecimiento de exigencias

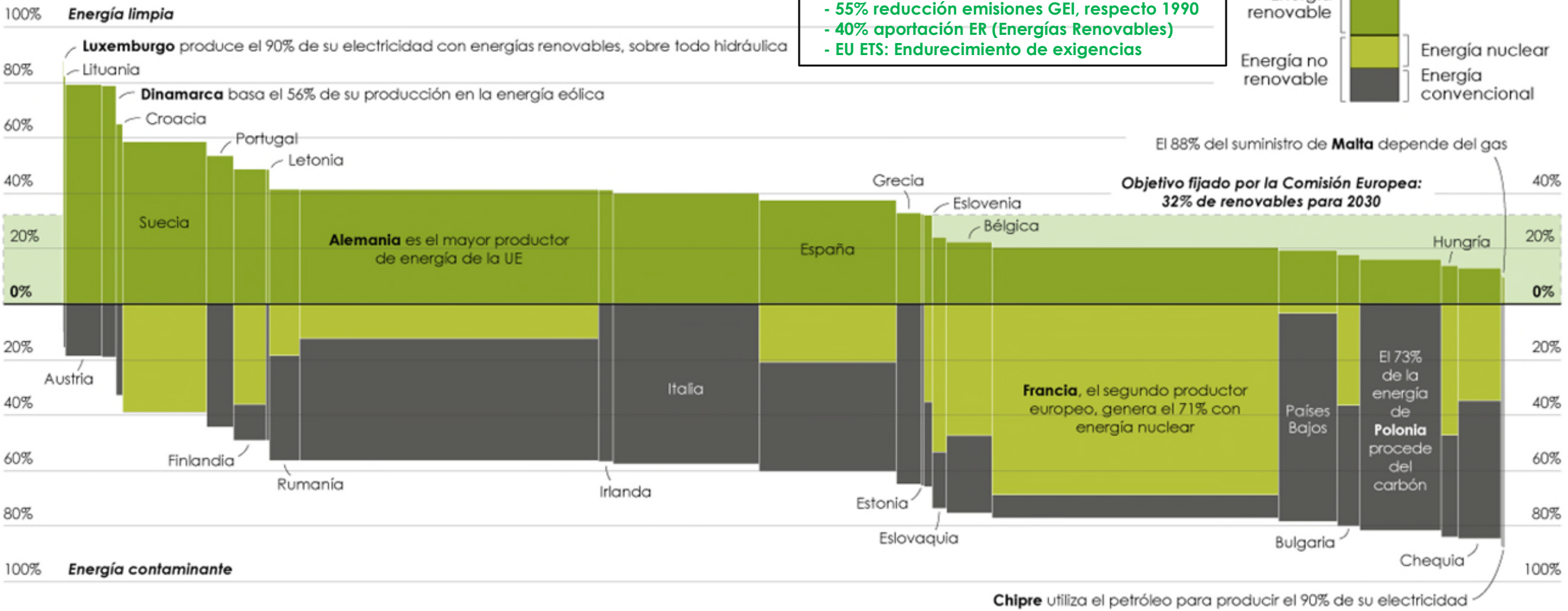
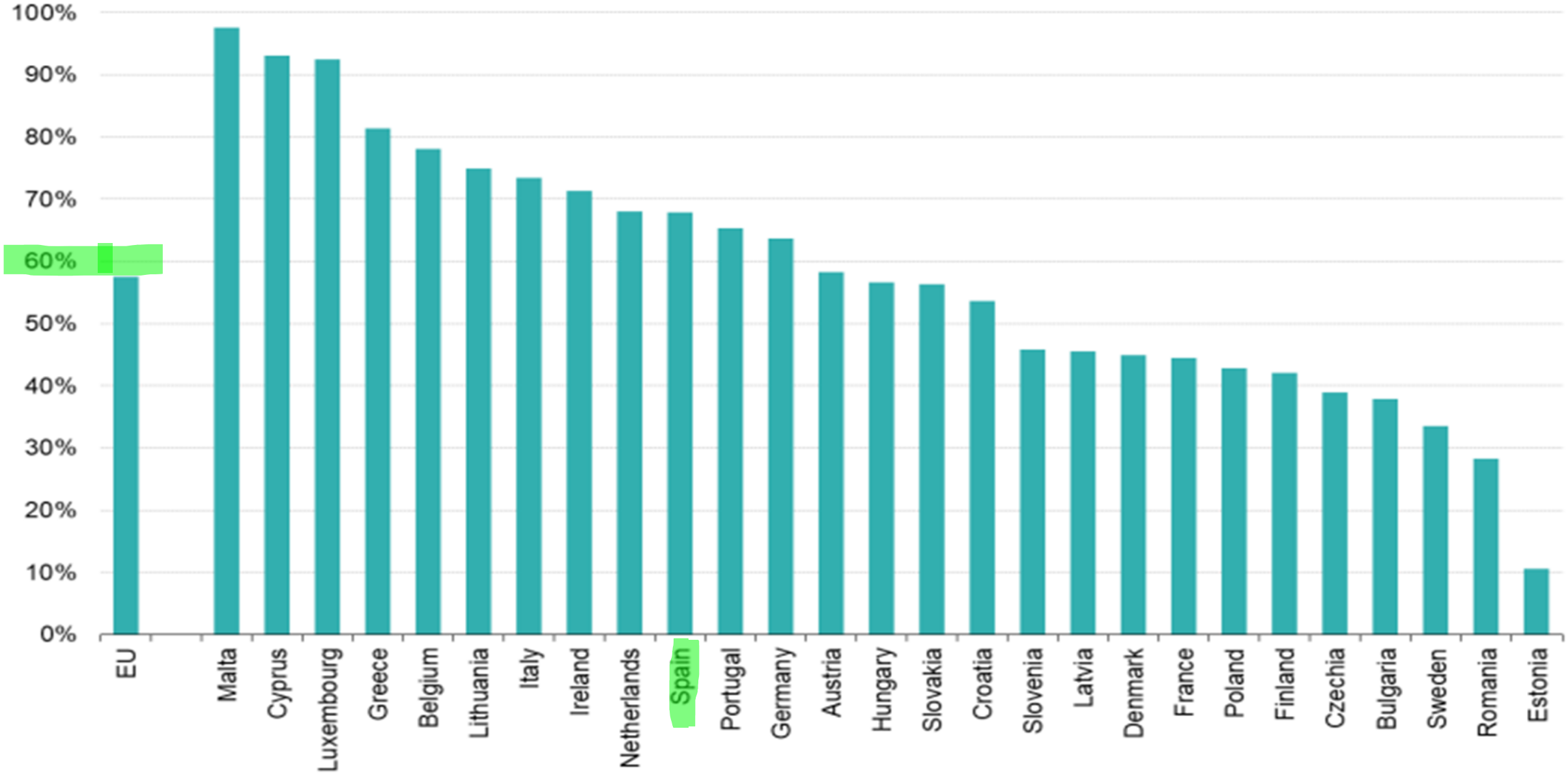


Gráfico:
Álvaro Merino (2021)
Fuente:
Eurostat (2020) y Karim Doubieb (2020)

elordenmundial.com

Energy import dependency, EU, 2020



Source: Eurostat, calculation based on energy balances

eurostat

Bottom-up basado en top down desde las Instituciones

18 March 2008

DOCUMENTO SOLANA

CLIMATE CHANGE AND INTERNATIONAL SECURITY

Paper from the High Representative* and the European Commission to the European Council

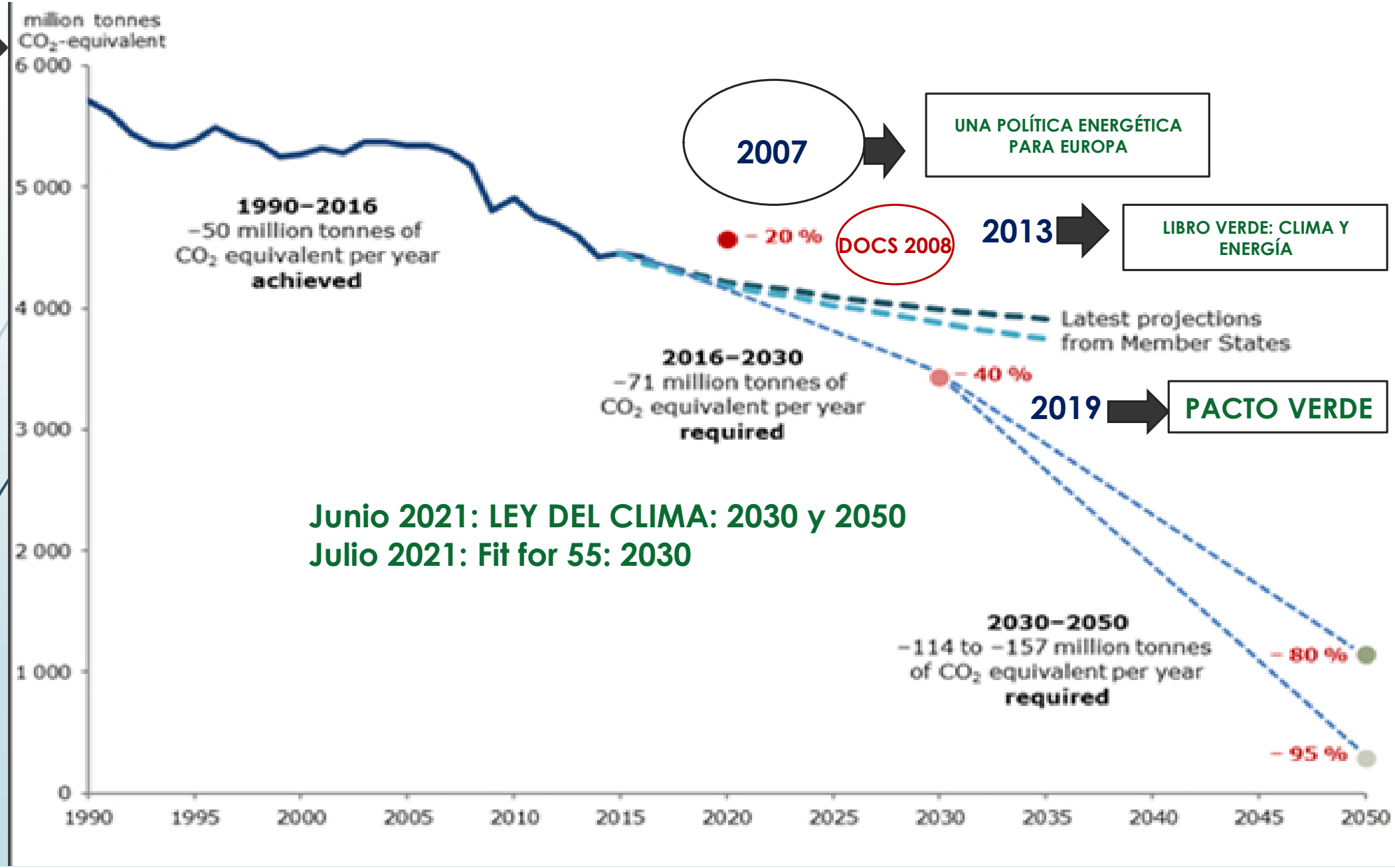
The effects of climate change are being felt now: temperatures are rising, icecaps and glaciers are melting and extreme weather events are becoming more frequent and more intense. The following section outlines some of the forms of conflicts driven by climate change which may occur in different regions of the world.

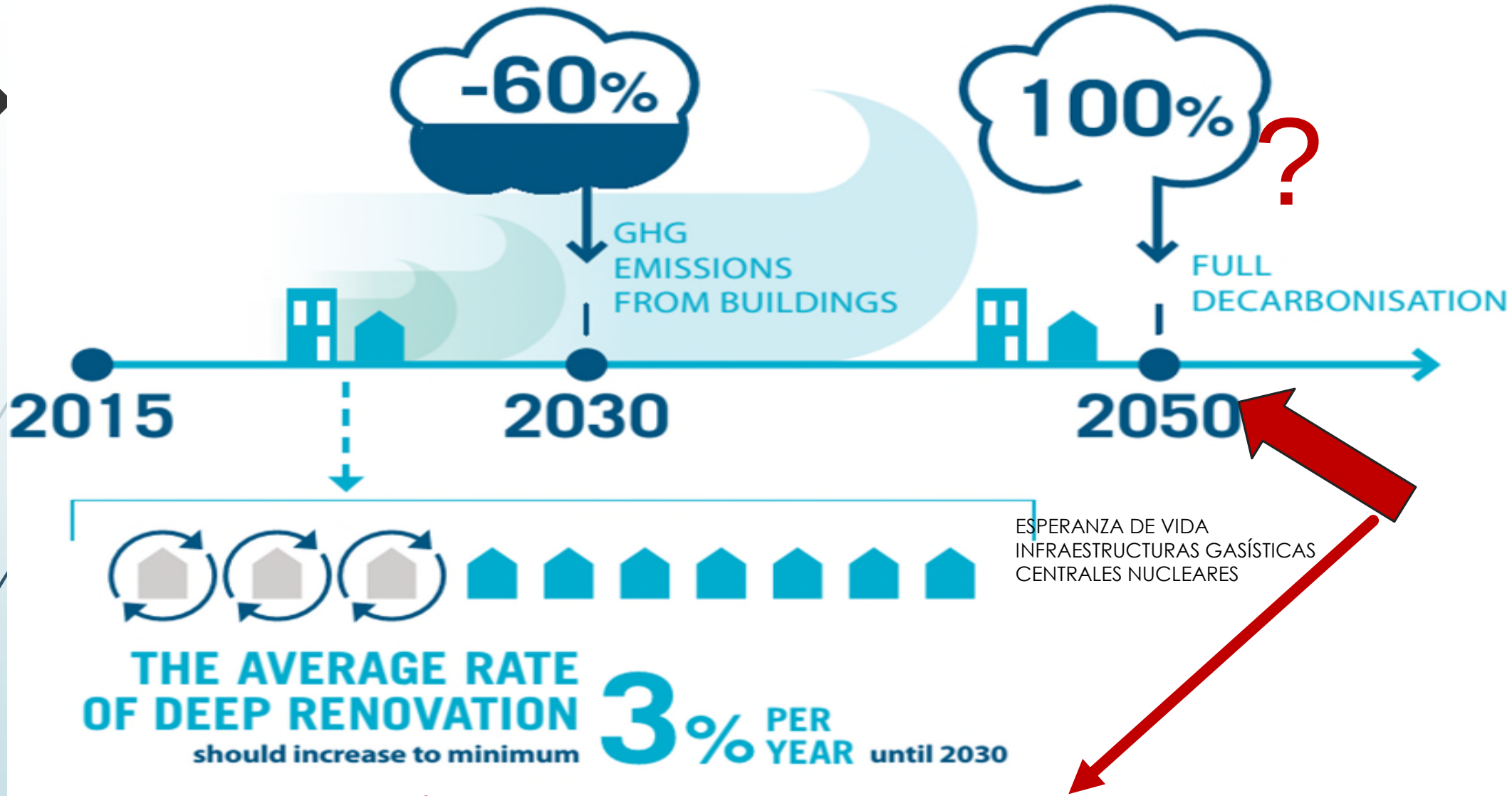
vi) Tension over energy supply

One of the most significant potential conflicts over resources arises from intensified competition over access to, and control over, energy resources. That in itself is, and will continue to be, a cause of instability. However, because much of the world's hydrocarbon reserves are in regions vulnerable to the impacts of climate change and because many oil and gas producing states already face significant social economic and demographic challenges, instability is likely to increase. This has the potential to feed back into greater energy insecurity and greater competition for resources. A possible wider use of nuclear energy for power generation might raise new concerns about proliferation, in the context of a non-proliferation regime that is already under pressure. As previously inaccessible regions open up due to the effects of climate change, the scramble for resources will intensify.

iv) Environmentally-induced migration

Those parts of the populations that already suffer from poor health conditions, unemployment or social exclusion are rendered more vulnerable to the effects of climate change, which could amplify or trigger migration within and between countries. The UN predicts that there will be millions of «environmental» migrants by 2020 with climate change as one of the major drivers of this phenomenon. Some countries that are extremely vulnerable to climate change are already calling for international recognition of such environmentally-induced migration. Such migration may increase conflicts in transit and destination areas. Europe must expect substantially increased migratory pressure.


million tonnes
CO_2-equivalent
6 000
5 000
4 000
3 000
2 000
1 000
0
1990
1995
2000
2005
2010
2015
2020
2025
2030
2035
2040
2045
2050
1990–2016
–50 million tonnes of
CO_2 equivalent per year
achieved
2016–2030
–71 million tonnes of
CO_2 equivalent per year
required
2030–2050
–114 to –157 million tonnes
of CO_2 equivalent per year
required
– 20 %
– 40 %
– 80 %
– 95 %
Latest projections
from Member States
2007
UNA POLÍTICA ENERGÉTICA
PARA EUROPA
DOCS 2008
2013
LIBRO VERDE: CLIMA Y
ENERGÍA
2019
PACTO VERDE
Junio 2021: LEY DEL CLIMA: 2030 y 2050
Julio 2021: Fit for 55: 2030



ESPERANZA DE VIDA
INFRAESTRUCTURAS GASÍSTICAS
CENTRALES NUCLEARES

VIDA INFRAESTRUCTURAS GASÍSTICAS: 20-40 AÑOS-AUTORIZACIONES: HASTA 2030+40= 2070
VIDA CENTRALES NUCLEARES: 40-60-80. AUTORIZACIONES HASTA 2045+80 años vida útil+5 años construcción=2.130

The road to climate-neutrality: Are national long-term renovation strategies fit for 2050?

LA GEOPOLÍTICA DEL PACTO VERDE: DILEMAS DE LA TRANSCIÓN ENERGÉTICA

EUROPEAN
COMMISSION

Brussels, 11.12.2019
COM(2019) 640 final

COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE EUROPEAN COUNCIL, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS

The European Green Deal

Figure 1: The European Green Deal

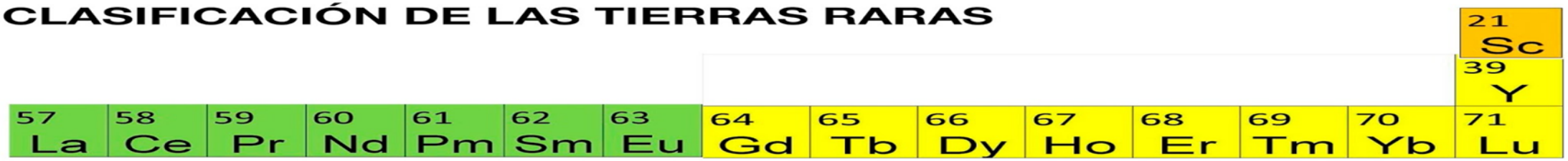
Access to resources is also a strategic security question for Europe's ambition to deliver the Green Deal. Ensuring the supply of sustainable raw materials, in particular of critical raw materials necessary for clean technologies, digital, space and defence applications, by diversifying supply from both primary and secondary sources, is therefore one of the pre-requisites to make this transition happen.

EU industry needs 'climate and resource frontrunners' to develop the first commercial applications of breakthrough technologies in key industrial sectors by 2030. Priority areas include clean hydrogen, fuel cells and other alternative fuels, energy storage, and carbon capture, storage and utilisation. As an example, the Commission will support clean steel breakthrough technologies leading to a zero-carbon steel making process by 2030 and will explore whether part of the funding being liquidated under the European

As the world's largest single market, the EU can set standards that apply across global value chains. The Commission will continue to work on new standards for sustainable growth and use its economic weight to shape international standards that are in line with EU environmental and climate ambitions. It will work to facilitate trade in environmental goods and services, in bilateral and multilateral forums, and in supporting open and attractive EU and global markets for sustainable products. It will work with global partners to ensure the EU's resource security and reliable access to strategic raw materials.

METALES DE TIERRAS RARAS EN LA TABLA PERIODICA

CLASIFICACIÓN DE LAS TIERRAS RARAS



(MREE)

Tierras Raras Ligeras
Tierras de Cerio
(LREE)

Tierras Raras Pesadas
Tierras de Itrio
(HREE)

Name	Symbol	Atomic number	Atomic weight	Melting temperature (°C)	Crustal abundance (ppm)
Scandium	Sc	21	44.95	1541	14
Yttrium	Y	39	88.90	1522	21
Lanthanum	La	57	138.90	918	31
Cerium	Ce	58	140.11	798	63
Praseodymium	Pr	59	140.90	931	7.1
Neodymium	Nd	60	144.24	1021	27
Promethium	Pm	61	145.00	1042	–
Samarium	Sm	62	150.36	1074	4.7
Europium	Eu	63	151.96	822	1
Gadolinium	Gd	64	157.25	1313	4
Terbium	Tb	65	158.92	1356	0.7
Dysprosium	Dy	66	162.50	1412	3.9
Holmium	Ho	67	164.93	1474	0.83
Erbium	Er	68	167.26	1529	2.3
Thulium	Tm	69	168.93	1545	0.3
Ytterbium	Yb	70	173.04	819	2
Lutetium	Lu	71	174.97	1663	0.31

Table 1 *Selected REE properties and abundance in the continental crust.*

POLICY CONTRIBUTION

The geopolitics of the European Green Deal

MARK LEONARD
JEAN PISANI-FERRY
JEREMY SHAPIRO
SIMONE TAGLIAPIETRA
GUNTRAM B. WOLFF

February 2021

BRUEGEL AND EUROPEAN COUNCIL ON FOREIGN RELATIONS

THE EU NEEDS TO wake up to the consequences abroad of its domestic decisions. It should prepare to help manage the geopolitical aspects of the European Green Deal. Relationships with important neighbourhood countries such as Russia and Algeria, and with global players including the United States, China and Saudi Arabia, are central to this effort, which can be structured around seven actions:

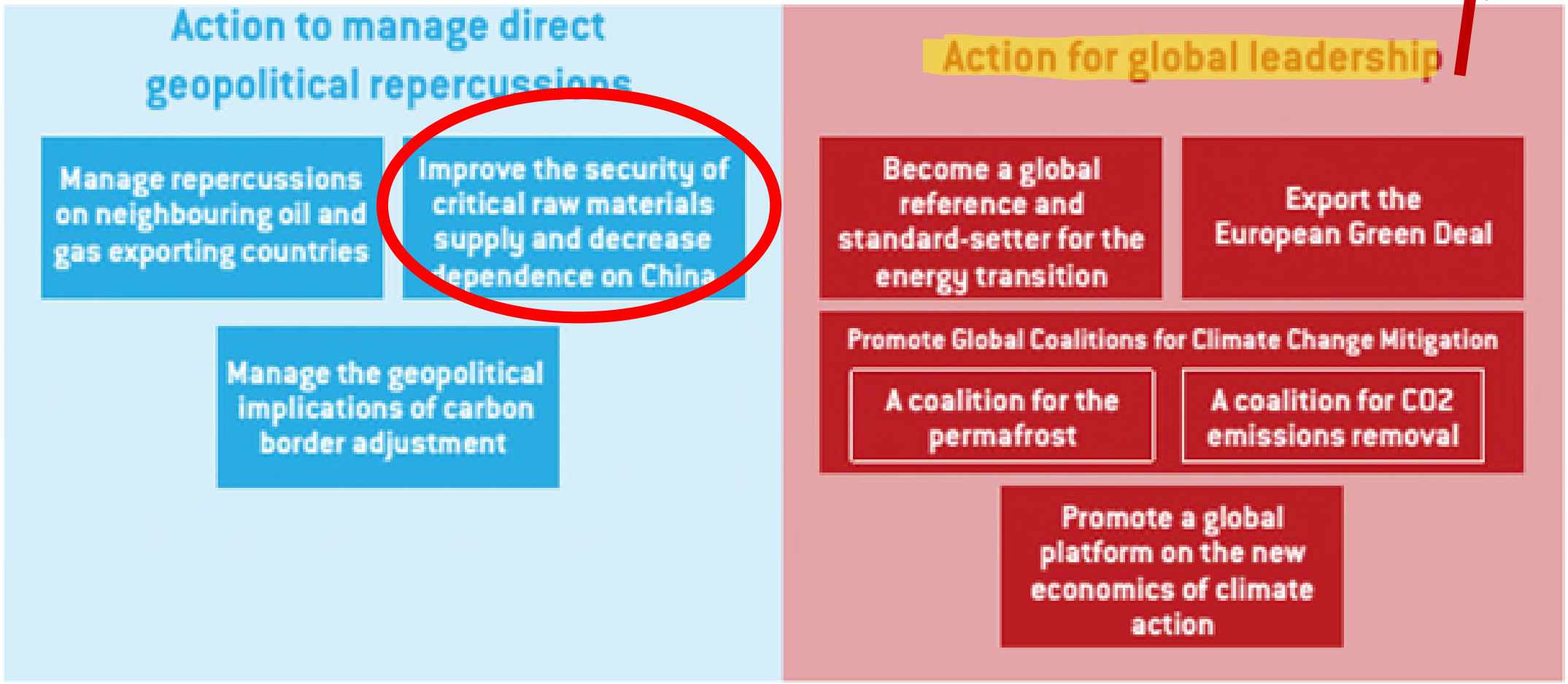
1. Help neighbouring oil and gas-exporting countries manage the repercussions of the European Green Deal. The EU should engage with these countries to foster their economic diversification, including into renewable energy and green hydrogen that could in the future be exported to Europe.
2. Improve the security of critical raw materials supply and limit dependence, first and foremost on China. Essential measures include greater supply diversification, increased recycling volumes and substitution of critical materials.
3. Work with the US and other partners to establish a 'climate club' whose members will apply similar carbon border adjustment measures. All countries, including China, would be welcome to join if they commit to abide by the club's objectives and rules.
4. Become a global standard-setter for the energy transition, particularly in hydrogen and green bonds. Requiring compliance with strict environmental regulations as a condition to access the EU market will be strong encouragement to go green for all countries.
5. Internationalise the European Green Deal by mobilising the EU budget, the EU Recovery and Resilience Fund, and EU development policy.
6. Promote global coalitions for climate change mitigation, for example through a global coalition for the permafrost, which would fund measures to contain the permafrost thaw.
7. Promote a global platform on the new economics of climate action to share lessons learned and best practices.

Recommended citation
Leonard, M., J.Pisani-Ferry, J. Shapiro, S. Tagliapietra and G. Wolff (2021) 'The geopolitics of the European Green Deal', *Policy Contribution* 04/2021, Bruegel

EUROPEAN COUNCIL ON FOREIGN RELATIONS
ecfr.eu

CALIFICADO COMO:
“COLONIALISMO VERDE”

Figure 9: A foreign policy action plan for the European Green Deal



Source: Bruegel/ECFR.

#2 Improve the security of critical raw materials supply and decrease dependence on China

Securing access to the critical raw materials that underpin green technologies is essential to safeguard the implementation of the European Green Deal and to ensure reliable industrial development in Europe. This will ensure *"Europe's strategic autonomy"* (European Commission, 2020).

This can be done through supply diversification, increased recycling volumes and substitution of critical materials. Where possible, increasing the domestic supply of critical raw materials could alleviate Europe's reliance on imports. Likewise, diversifying the import portfolio represents a sensible strategy to avoid risks of over-dependency on a single supplier. Trade agreements or contracts with different supplier countries could help reduce the threat of supply shortages. Alongside diversification, Europe should pursue recycling and substitution strategies. While several critical raw materials have a high technical recycling potential, their recycling rate remains generally low. Increasing the cost competitiveness and efficiency of sorting and recycling technologies is thus a priority. In this field, the EU can provide support for research and innovation (through Horizon Europe) and for technology demonstration (for example, via the Innovation Fund).

Horizon

The EU Research & Innovation Magazine

European Commission

Europe's rare earth deposits could shore up tech industry

Rare earth deposits found in **Sweden, Finland, Greece and Spain** suggest that Europe could reduce its reliance on imports of these critical raw materials, but the biggest challenge facing scientists is how best to extract and process them.
9 March 2015

https://ec.europa.eu/research-and-innovation/en/horizon-magazine/europes-rare-earth-deposits-could-shore-tech-industry

The **EU-funded EURARE project** **http://www.eurare.org/** aims to set up the basis for a European rare earth industry by finding ways to supply both raw materials and rare earth products for use in industries such as automotive, electronics, machinery and chemical.

One of their main priorities is to identify sites suitable for mining (…) but the important thing is that the elements can be mined economically and with little environmental impact.

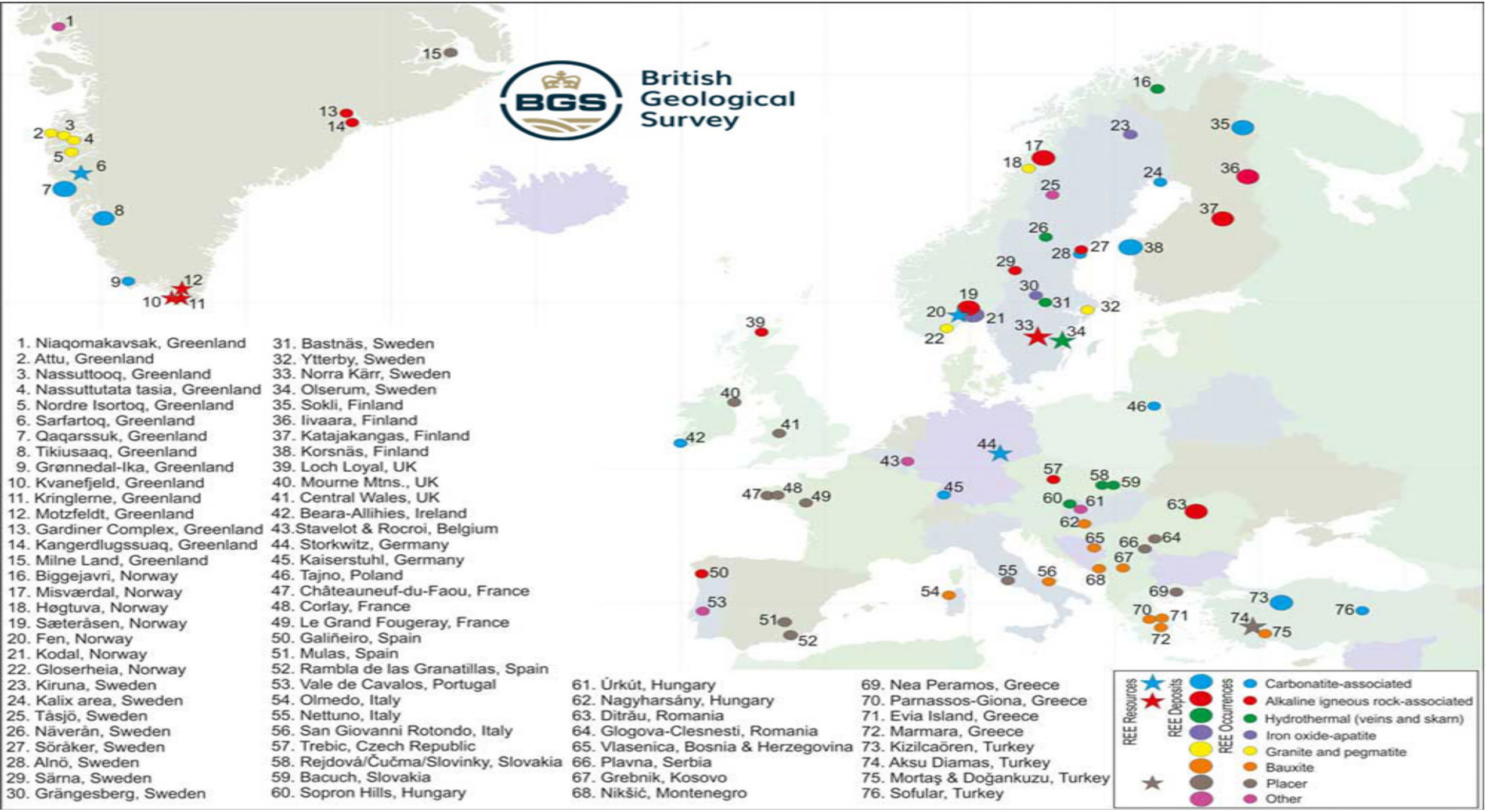
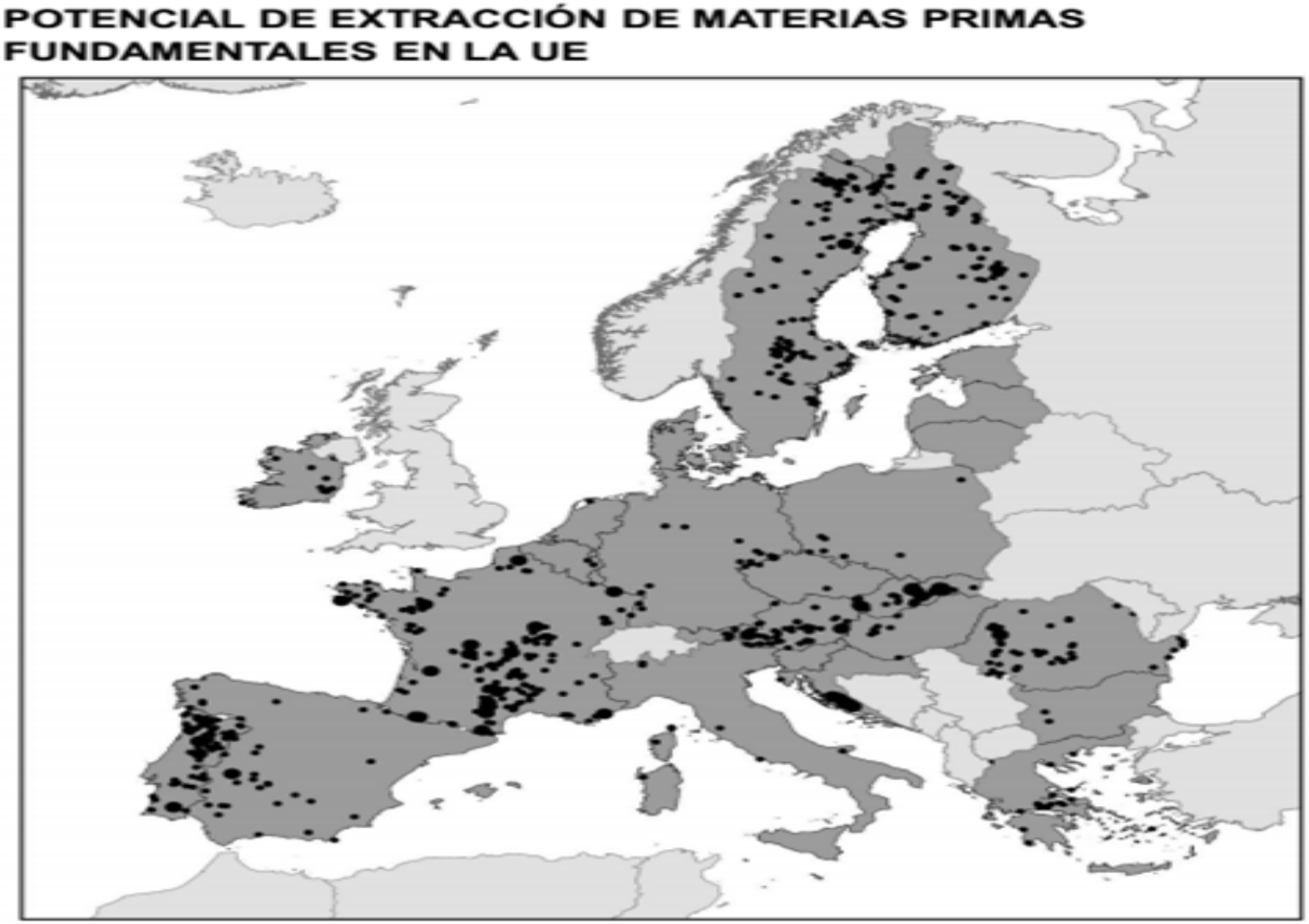

British Geological Survey
1. Niaqomakavsak, Greenland
2. Attu, Greenland
3. Nassuttooq, Greenland
4. Nassuttutata tasia, Greenland
5. Nordre Isortoq, Greenland
6. Sarfartoq, Greenland
7. Qaqarssuk, Greenland
8. Tikiusaaq, Greenland
9. Grønnedal-Ika, Greenland
10. Kvanefjeld, Greenland
11. Kringlerne, Greenland
12. Motzfeldt, Greenland
13. Gardiner Complex, Greenland
14. Kangerdlugssuaq, Greenland
15. Milne Land, Greenland
16. Biggejavri, Norway
17. Misværdal, Norway
18. Høgtuva, Norway
19. Sæteråsen, Norway
20. Fen, Norway
21. Kodal, Norway
22. Gloserheia, Norway
23. Kiruna, Sweden
24. Kalix area, Sweden
25. Tåsjö, Sweden
26. Näverån, Sweden
27. Söråker, Sweden
28. Alnö, Sweden
29. Särna, Sweden
30. Grängesberg, Sweden
31. Bastnäs, Sweden
32. Ytterby, Sweden
33. Norra Kärr, Sweden
34. Olserum, Sweden
35. Sokli, Finland
36. Iivaara, Finland
37. Katajakangas, Finland
38. Korsnäs, Finland
39. Loch Loyal, UK
40. Mourne Mtns., UK
41. Central Wales, UK
42. Beara-Allihies, Ireland
43. Stavelot & Rocroi, Belgium
44. Storkwitz, Germany
45. Kaiserstuhl, Germany
46. Tajno, Poland
47. Châteauneuf-du-Faou, France
48. Corlay, France
49. Le Grand Fougeray, France
50. Galiñeiro, Spain
51. Mulas, Spain
52. Rambla de las Granatillas, Spain
53. Vale de Cavalos, Portugal
54. Olmedo, Italy
55. Nettuno, Italy
56. San Giovanni Rotondo, Italy
57. Trebic, Czech Republic
58. Rejdová/Čučma/Slovinky, Slovakia
59. Bacuch, Slovakia
60. Sopron Hills, Hungary
61. Úrkút, Hungary
62. Nagyharsány, Hungary
63. Ditrău, Romania
64. Glogova-Clesnesti, Romania
65. Vlasenica, Bosnia & Herzegovina
66. Plavna, Serbia
67. Grebnik, Kosovo
68. Nikšić, Montenegro
69. Nea Peramos, Greece
70. Parnassos-Giona, Greece
71. Evia Island, Greece
72. Marmara, Greece
73. Kizilcaören, Turkey
74. Aksu Diamas, Turkey
75. Mortaş & Doğankuzu, Turkey
76. Sofular, Turkey
REE Resources
REE Deposits
REE Occurrences
Carbonatite-associated
Alkaline igneous rock-associated
Hydrothermal (veins and skarn)
Iron oxide-apatite
Granite and pegmatite
Bauxite
Placer
Other

Gráfico 3: depósitos de materias primas fundamentales en la EU-27 (2020)



Global Supply of EU Critical Minerals and Metals

The pie charts show the percent distribution of the production of critical metals and minerals.
In total, it is 100% for each raw material. The area of the pies are proportional. SGU 2017.

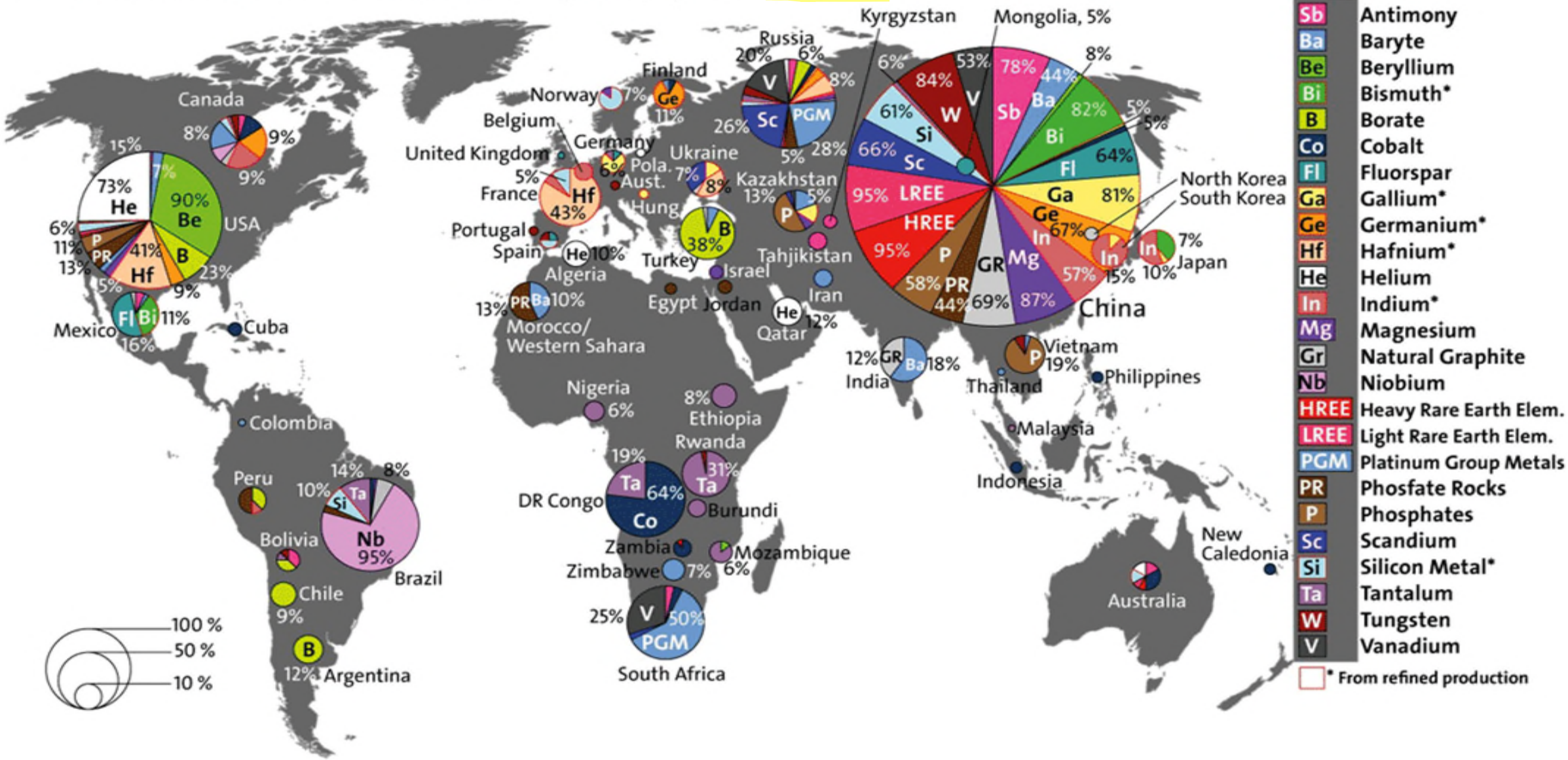
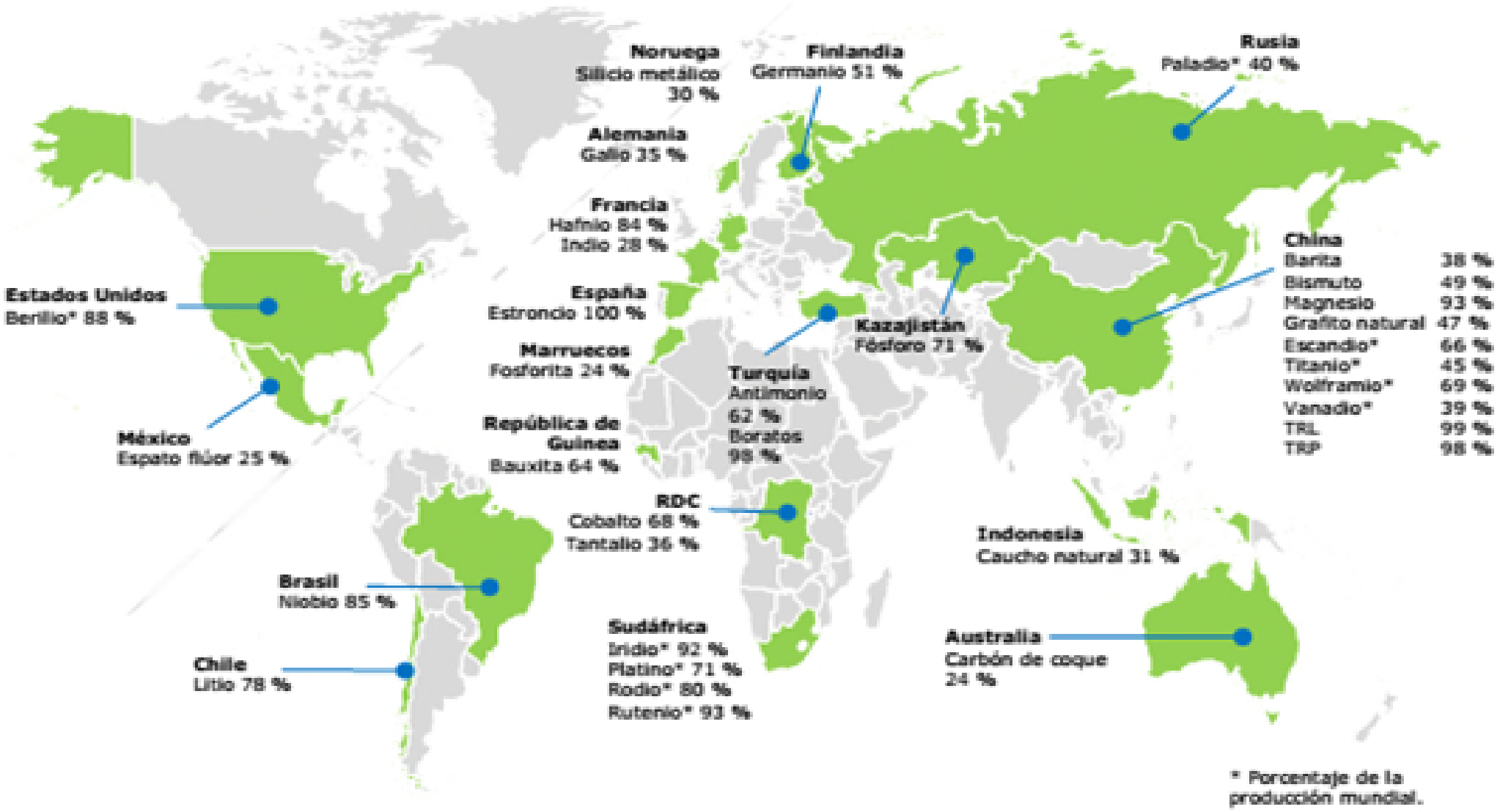


Gráfico 1: principales países proveedores de materias primas fundamentales a la UE



COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS

Brussels, 16.3.2023 COM(2023) 165 final

A secure and sustainable supply of critical raw materials in support of the twin transition

- The **EU should make the most of its reserves** and develop exploration, extraction, refining, processing and recycling activities at home in full respect of our environmental ecosystems. It will allow Europe to boost industrial capacities in an open and trade friendly manner, with high environmental and social standards, creating quality jobs and boosting growth while increasing our open strategic autonomy.

- **II. Developing the critical raw materials value chain in the EU**
- ***II.1. A Regulation dedicated to CRMs***
- The proposed **Regulation7** establishes the general objective of ensuring EU's access to a secure and sustainable supply of CRMs and contains measures to strengthen EU's capacities throughout the value chain. In order to ensure that the measures set out in the Regulation focus on the most relevant materials, a list of Strategic Raw Materials (SRMs) has been established.
- The Regulation contains measures throughout the value chain so that, by 2030, EU's capacity could approach or reach at least 10% of domestic SRMs demand for mining and extraction (where EU's reserves allow for this), at least 40% for processing and refining, and at least 15% for recycling. If these levels are attained, they would help significantly in the required diversification efforts, with a view to ensure that, by 2030, not more than 65% of the Union's annual consumption of each strategic raw material at any relevant stage of processing is from a single third country.

-