GOBIERNO DE ESPAÑA
MINISTERIO PARA LA TRANSICIÓN ECOLÓGICA Y EL RETO DEMOGRÁFICO
MINISTERIO DE CIENCIA E INNOVACIÓN
Instituto Geológico y Minero de España
CSIC
CONSEJO SUPERIOR DE INVESTIGACIONES CIENTÍFICAS

Spanish National Reporting according to UNFC

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Raw Materials Week – Brussels (BE) - 15 November 2022

Mining sector in Spain

EROPEAN UNION

1 st Producer

Roof slate

Gypsum

2 nd Producer

Copper

3nd Copper refinery in europe

3.370 M€
Production

2.665
Operating Mines

29.100
Employees

Source: Spanish Mining Statistic 2020

WORLD

2 nd Producer

Celestite

Unique in europe

Sepiolite

Unique in europe

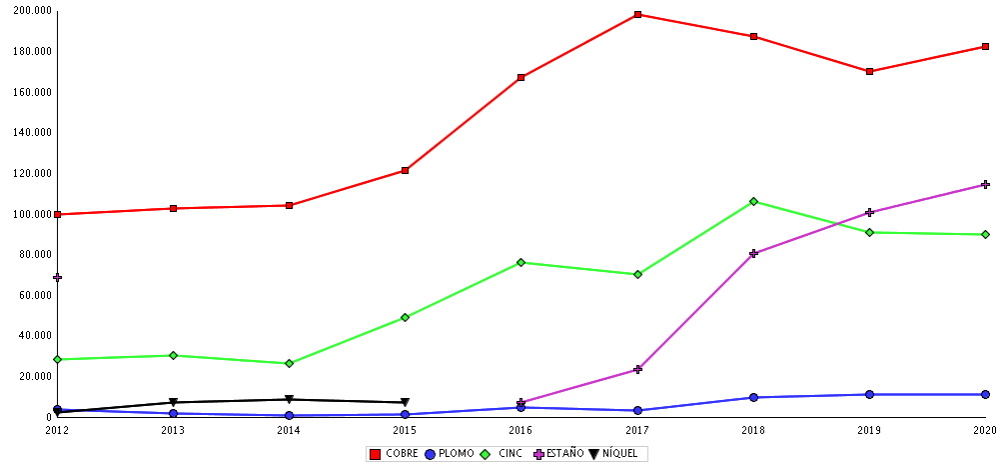
Sodium sulphate

6 th Producer

Magnesite

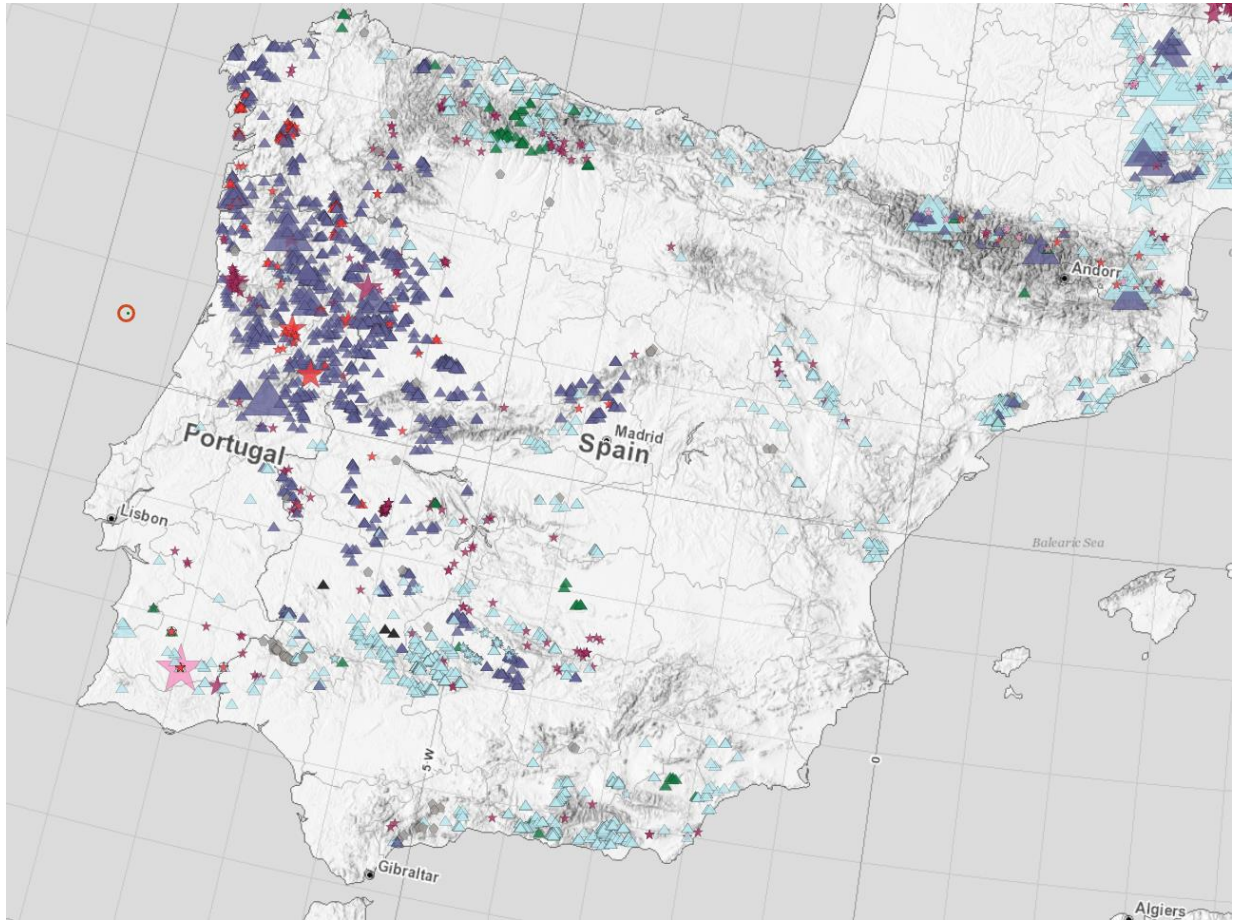
3rd in europe

Fluorspar



Growing metallic production (Cu, Sn (Kg), Pb…)
Decreasing metallic production (W, Zn) (non reflected in graph)
Source: Spanish Mining Statistic 2020; metal concentrate, tonnes

Mineral resources in Spain



Source: EGDI, Critical raw Materials Map (partial)

Minerals potential

- **Li** — Several exploration projects (20 M€ exploration expenditure in the last two years)
- **Co** — Large estimated resources (25 Mt) in two main areas: Asturias and Eastern Andalucía
- **CaF_2** — Promising results are available in several geological settings of the Variscan Iberian Massif
- **W** — Projects in the Central Iberian Zone (>5 Mt)

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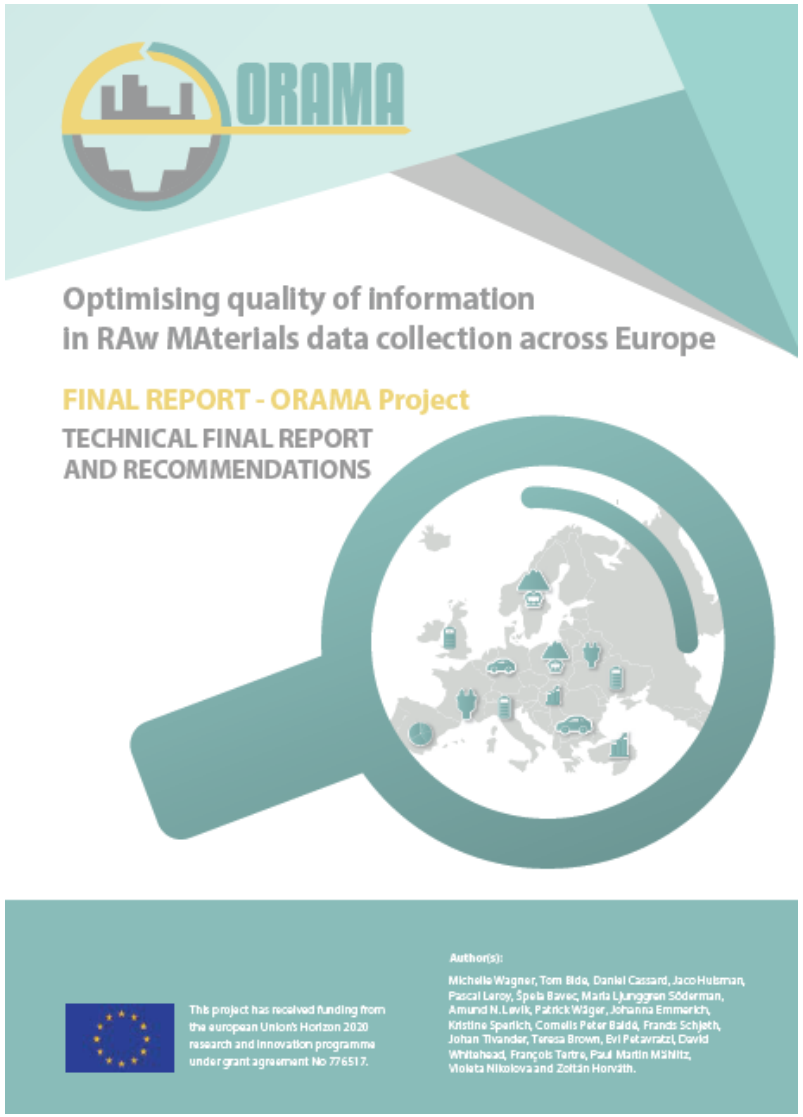
The beginning - 2018



Optimizing quality of information in RAw MAterial data collection across Europe

Technical Guidance note: worked example for conversion of Spanish Copper resource data to UNFC

Title of the project:	Optimizing quality of information in RAw MAterial data collection across Europe - ORAMA
Grant Agreement number:	776517
Funding Scheme:	H2020 – SC5-15-2017 – CSA
Start date:	01.12.2017
Duration:	24 months
Document title:	Technical guidance note: worked example for conversion of Spanish copper resource data to UNFC
Work Package:	1
Author(s):	Pedro Delgado, Tom Bide
Date of delivery:	8/11/19
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Reviewed by:	Teresa Brown
Status of the document:	**Final**
Document location:	Tiimeri: Documents / Deliverables
Project web site:	http://www.orama-h2020.eu

The results - 2019

Copper historical data

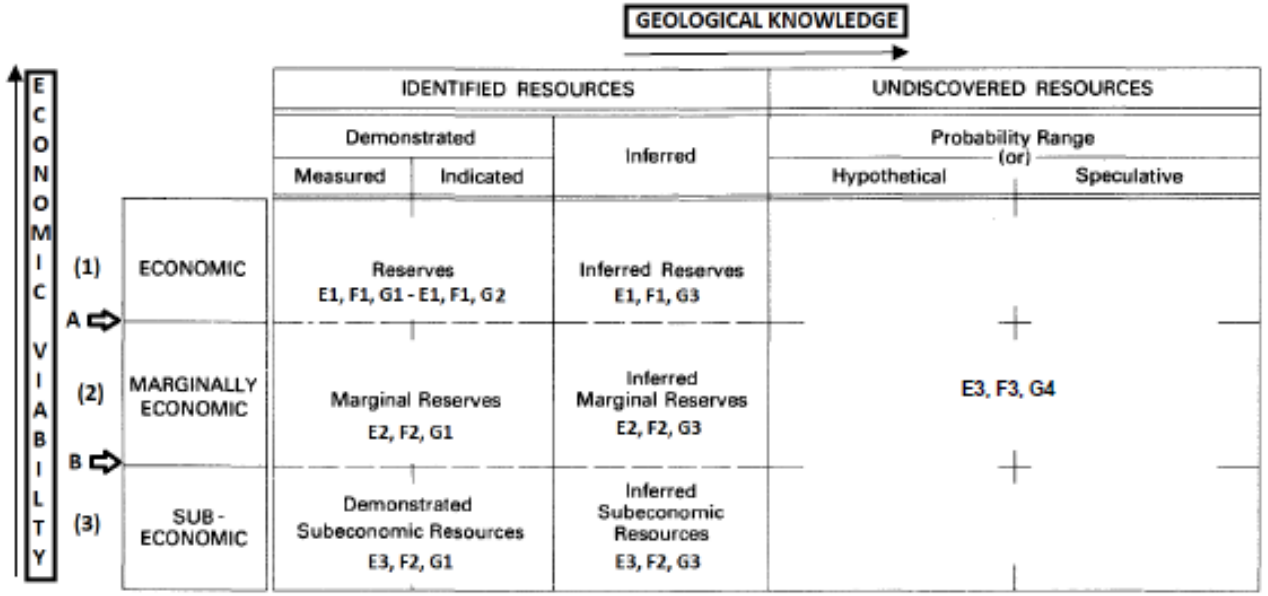


Table 2: Major elements of mineral resource classification according to the USGS Circular 831 with UNFC classifications bridged to it.

	Identified resources			Undiscovered resources	
	Demonstrated		Inferred	Probability range	
	Measured	Indicated		Hypothetical	Speculative
Economic	2 380 000 (111+2)		227 700 (113)	1 777 000 (334)	1 362 000 (334)
Marginally economic	632 900 (221)		126 800 (223)		
Sub-economic	811 100 (321)		450 000 (323)		

Table 3: Total copper resources in tonnes, Cu metal content, UNFC class in blue.

The results - 2019

ORAMA
Funded by the European Union

The total resources for these four operations can be summarised and compared as follows:

Summary of Spanish copper resources and reserves, period 2015-2018

UNFC Classes	111			112			221			222			223			342		
	Tonnage (million tonnes)	Grade (% Cu)	Contained Cu (thousand tonnes)	Tonnage (million tonnes)	Grade (% Cu)	Contained Cu (thousand tonnes)	Tonnage (million tonnes)	Grade (% Cu)	Contained Cu (thousand tonnes)	Tonnage (million tonnes)	Grade (% Cu)	Contained Cu (thousand tonnes)	Tonnage (million tonnes)	Grade (% Cu)	Contained Cu (thousand tonnes)	Tonnage (million tonnes)	Grade (% Cu)	Contained Cu (thousand tonnes)
Cobre las Cruces	2.4	4.19	100.56	0.70	5.57	38.99	(1)			(1)			4.42	1.17	51.71	34.5	1.12	386.4
Proyecto Riotinto	127.96	0.41	524.64	68.96	0.44	303.42	152.10	0.39	593.13	106.10	0.4	424.40	18.10	0.5	90.50			
Proyecto Touro	56.77	0.44	249.79	34.14	0.31	105.83	69.26	0.42	290.89	60.60	0.36	218.16	46.52	0.37	172.12			
MATSA	2.41	2.16	52.06	6.40	2.32	148.48	5.40	1.9	102.60	6.76	2.4	162.24						
	2.44	0.87	21.23	7.96	1.28	101.89	5.39	0.6	32.34	7.13	1.3	92.69						
Orovalle Minerals	0.725	0.64	4.64	1.27	0.4	5.09	3.48(2)	0.73	25.38	2.07(2)	0.51	10.54	3.78	0.41	77.7			
Total	**192.71**		**952.91**	**119.43**		**703.7**	**234.63**		**1044.34**	**181.66**		**908.03**	**72.82**		**392.034**	**34.5**		**386.4**

(1) The quantities of measured and indicated Secondary Sulphide resources should not be reflected in the table because they are counted in proven and probable reserves.
(2) In this case, because minerals resources are inclusive in mineral reserves, the quantities that appear in this table are smaller than those shown in the table "Summary of Mineral Resources Inclusive of Mineral Reserves El Valle Mine – September 30th, 2018".

Spanish database of Critical Raw Materials projects 2022

National Cadastre, Regions

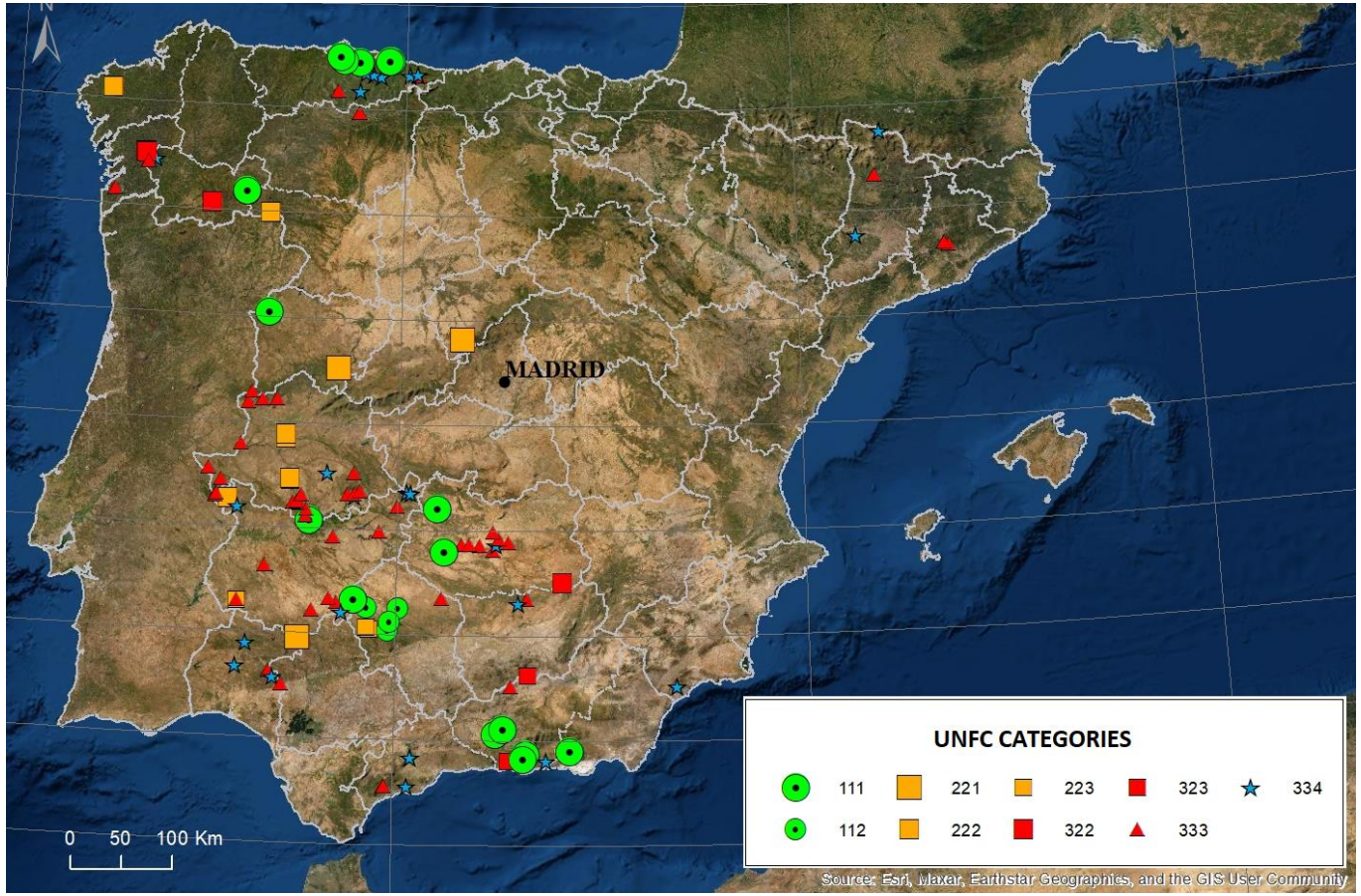
360

Final filtered data

140

License not cancelled or expired;
Exploration permit active (three-year term);
Mines on production

From data sources to UNFC



Data date, May 2022

Viable projects ($E_1;F_1;G_{1,2}$): **27**

Potentially viable projects ($E_2;F_{2.1,2.2};G_{1,2,3}$): **17**

Non-viable projects ($E_{3.2,3.3};F_{2.2,2.3};G_{2,3}$): **71**

Prospective projects ($E_{3.2};F_3;G_4$): **25**

COMMODITY	111	112	221	222	223	322	323	333	334
Antimony								8	3
Baryte		4						2	1
Bismuth								1	
Cobalt			1				1	13	8
Co, Sb								2	
Fluorspar	9				2				1
Graphite								4	
Lithium				5		2		5	2
Li, Ta, W								4	
Monazite (REE)									1
Natural graphite							1	4	2
Palladium (PGM)			1						
Phosphate	1								
Platinum (PGM)			1						1
REE						2		1	2
Strontium	2								
Tantalum	2					1		1	
Tin	6		1	2				1	
Tungsten	3		1	2	1			7	2
W, Bi, Co								1	
W, Ta								7	
Vanadium								3	2
TOTAL	23	4	5	9	3	5	2	64	25

UNFC - 111, more granularity

On production ($E_{1.1}$,$F_{1.1}$,G_1): 14 sites

7 Fluorspar, 2 Sr, 2 W, 2 Sn, 1 Ta

Operating mines: Aurora and others; Barruecopardo; Carbonero, Santa Lucia y Temple; G.Santo Firme;Jaimina; La Parrilla; Lújar; Lújar Sur; Mina Emilio; Mina La Collada (La Viesca); Mina Penouta; Moscona; Penouta 61

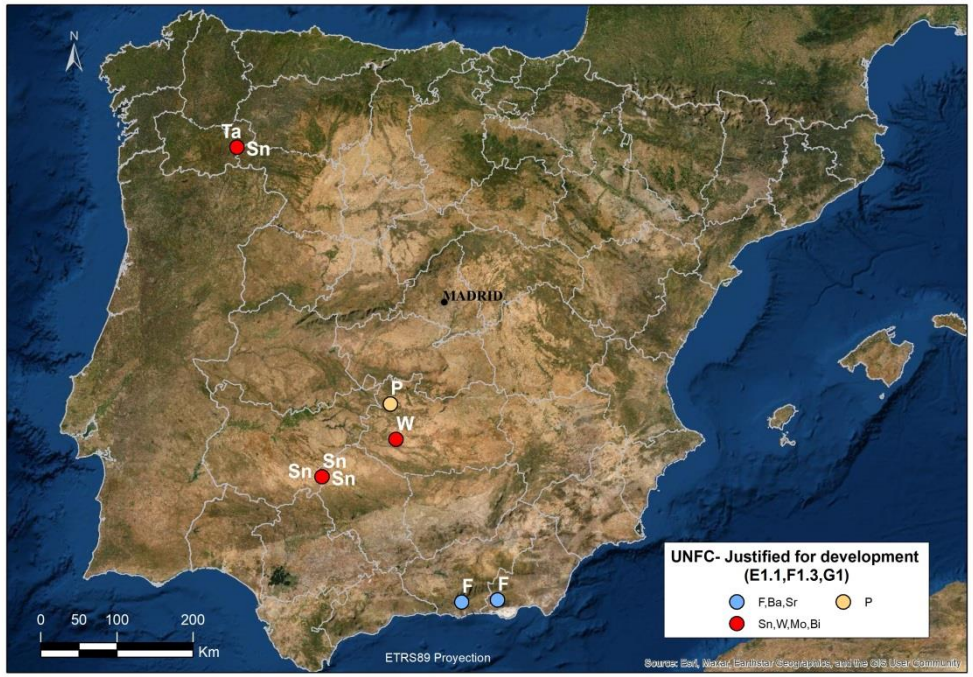
E1.1: "Development is environmentally-socially-economically viable on the basis of current conditions and realistic assumptions of future conditions"

F1.1: "Production is currently taking place"

Justified for development ($E_{1.1}$,$F_{1.3}$,G_1): 9 sites

Interpretation (examples): F1.3, extraction license request submitted

Coronada; Lújar norte; Lupión; Montuenga; Oropesa; Penouta; Sol-1 (El Moto); Sol-2 (Alcudia-1)



E1.1: "Development is environmentally-socially-economically viable on the basis of current conditions and realistic assumptions of future conditions"

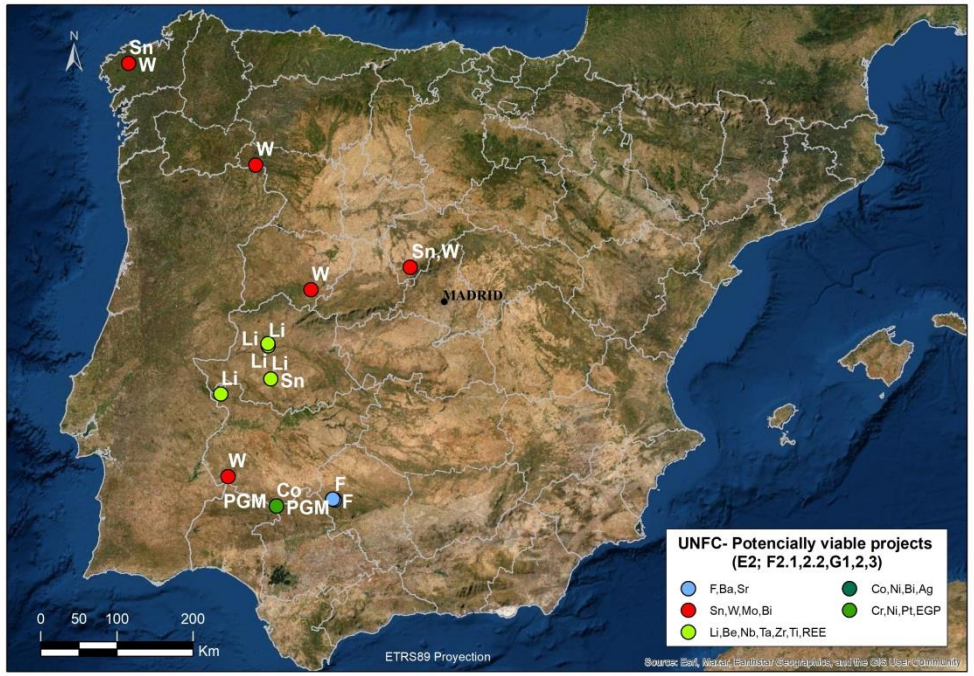
F1.3: "Studies have been completed to demonstrate the technical feasibility of development and operation. There shall be a reasonable expectation that all necessary approvals/contracts for the project to proceed to development will be forthcoming"

UNFC, more granularity

Potentially viable projects (E2; F2.1,2.2,G1,2,3): 17

Interpretation (examples):

F2.1, activities on-going (e.g. extensive drilling) but extraction license not submitted
F2.2, potential re-opening of a recently closed mine

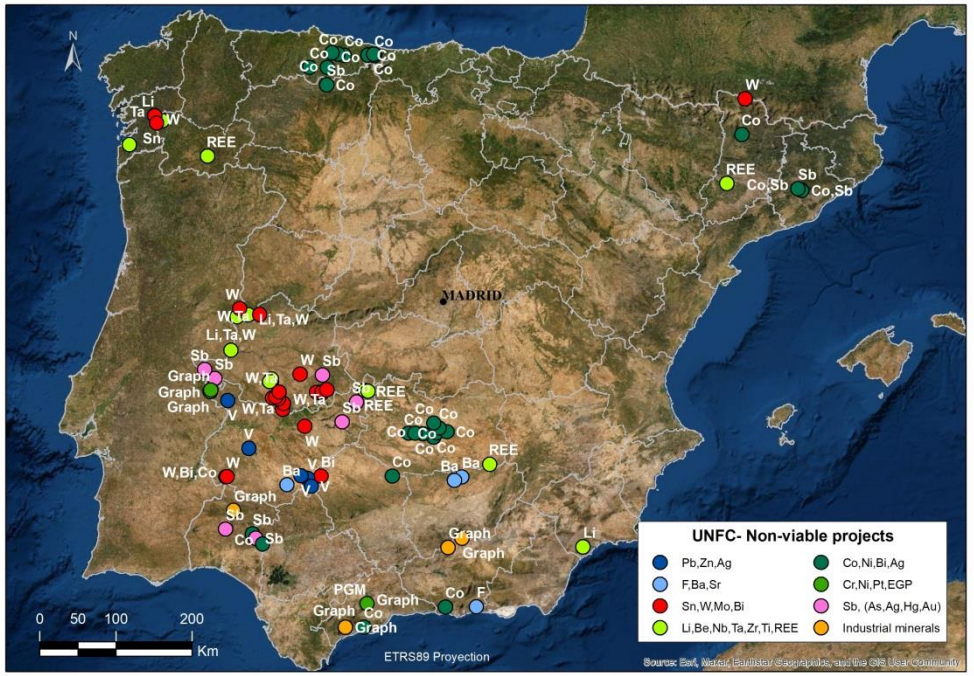


E2: "…expected to become environmentally socially economically viable ….."
F2.1: "Project activities are ongoing to justify development in the ……"
F2.2: "Project activities are on hold and/or….justification …..significant delay"

Non-viable projects, spot sources (E3.2,3.3;F2.2,2.3,3,1, 3,2,3.3; G1,2,3,4): 71

Interpretation (examples):

E3.3, negative environmental impact assessment
F2.3, drilling (limited) considered as "site specific studies have identified potential development"

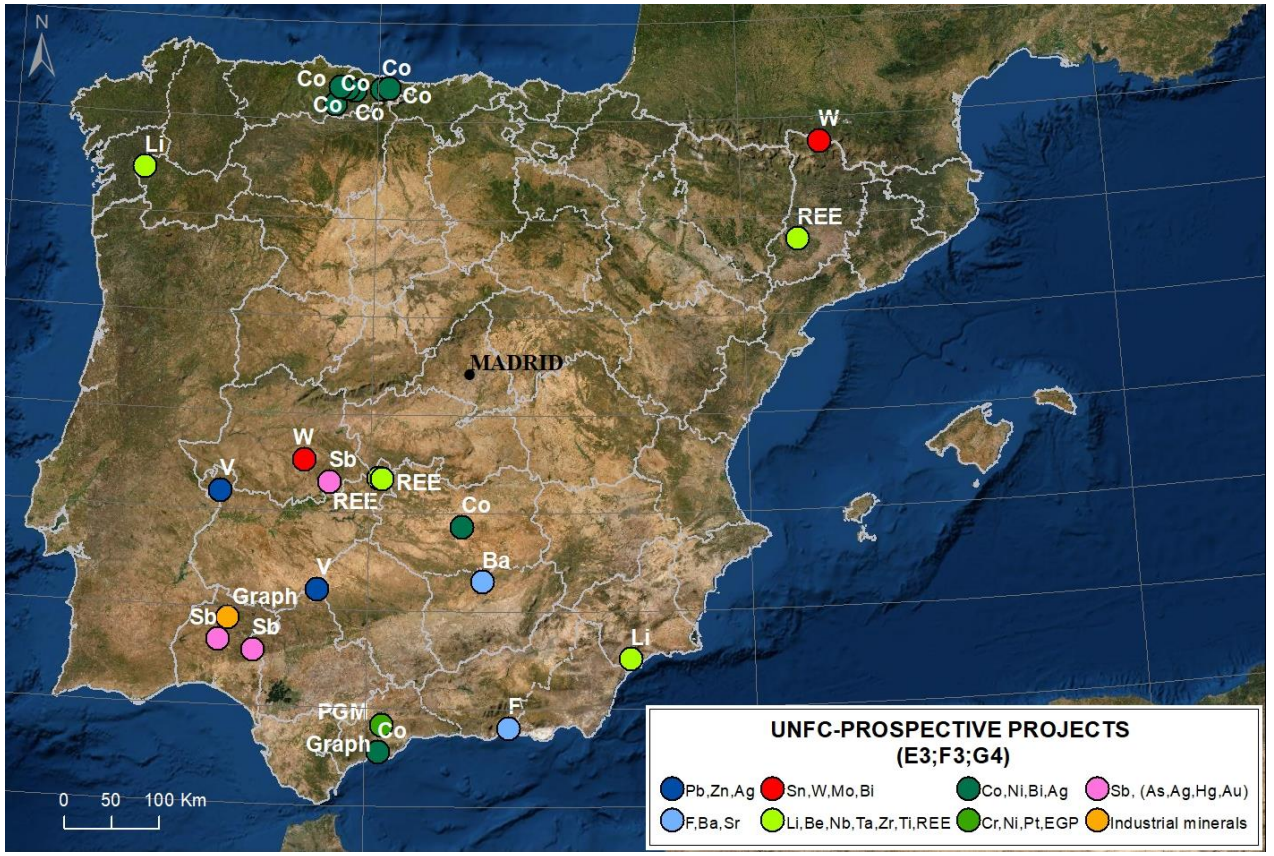


E3.2: "Environmental-socio-economic viability cannot yet be determined due to insufficient information"

E3.3: "…not reasonable prospects for environmental-socio-economic viability in the foreseeable future"

UNFC - 334, more granularity

Prospective projects (E3.2;F3;G4): 25



E3.2: “Environmental-socio-economic viability cannot yet be determined due to insufficient information”

Conclusions

- As Spain does not have a national reporting code, UNFC classification is useful to build a national picture of mineral resources and reserves
- If UNFC evaluations are deployed homogeneously, the mining potential in Europe can be better assessed and take advantage
- Useful for the Geological Surveys (IGME) to guide new basic exploration in the country
- Useful for decision makers in strategic planning of clean energies and digital transition
- On the other hand, some subjective decisions have an influence on the final qualification of the projects

(e.g. “Non-viable” might not be the best possible description – could be better “temporaly unfeasible”)

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Thank you!

Further information:

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