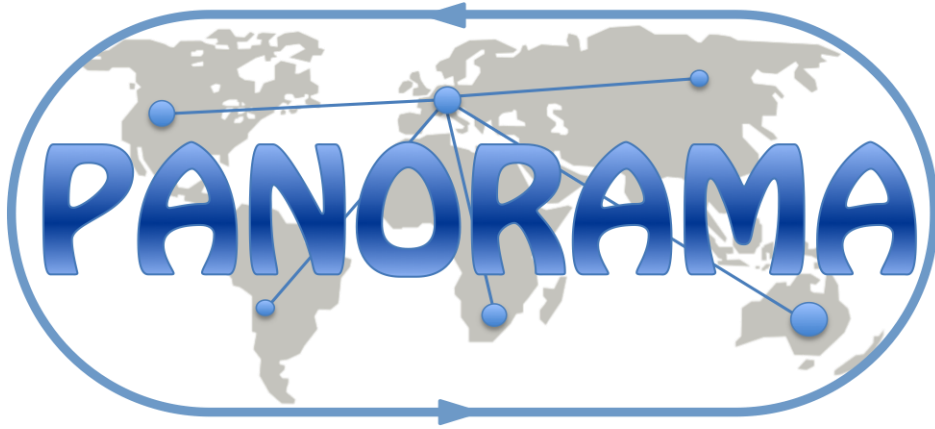




Deliverable 4.1

Map of data to stages along the anthropogenic metal cycle

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Fraunhofer-Institute for Systems und Innovation Research ISI
matthias.pfaff@isi.fraunhofer.de
denis.stijepic@isi.fraunhofer.de



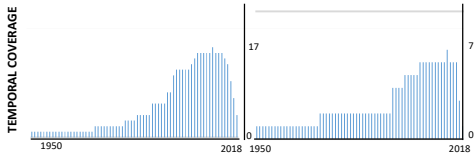
This activity has received funding from the European Institute of Innovation and Technology (EIT). This body of the European Union receives support from the European Union's Horizon 2020 research and innovation programme.

EXTRACTION

PROCESSING

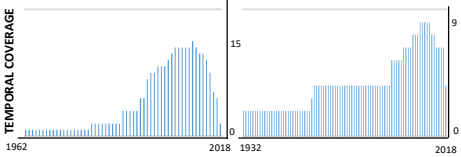
Data Sources

Monetary	Physical
19	9



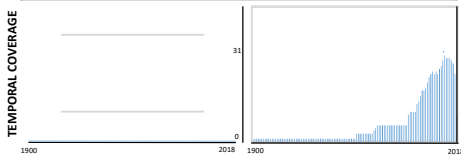
Data Sources

Monetary	Physical
17	10



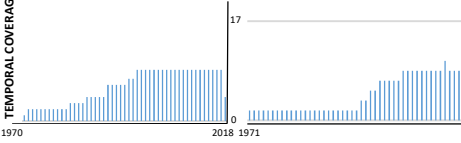
Data Sources

Monetary	Physical
0	46



Data Sources

Monetary	Physical
20	8

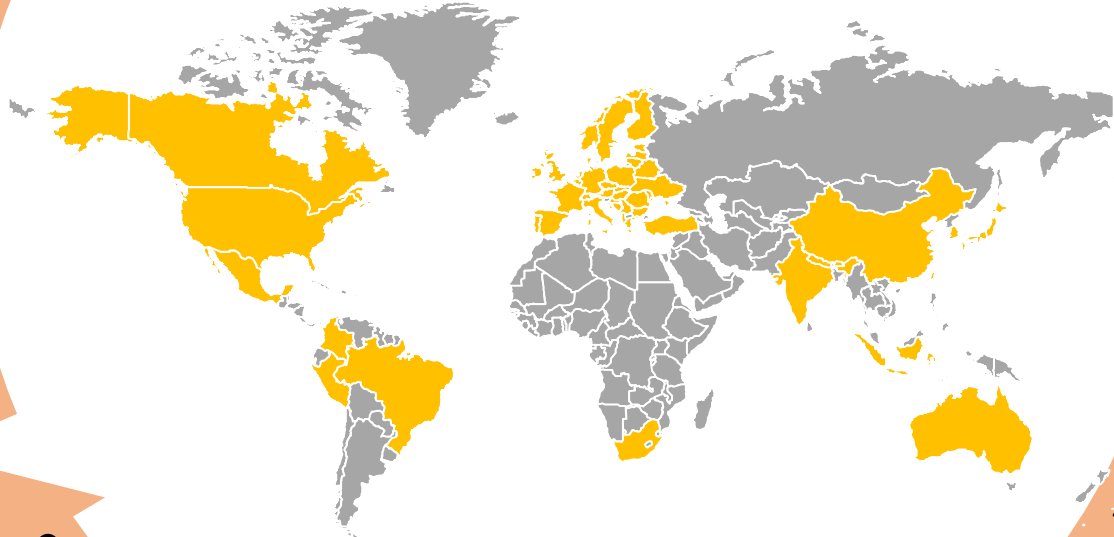


Aluminium

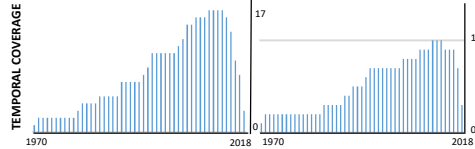
END OF LIFE

END USE GOODS

SEMI FINISHED



Monetary	Physical
21	14

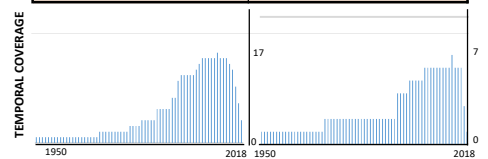


EXTRACTION

PROCESSING

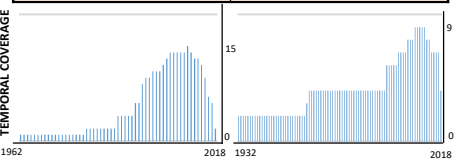
Data Sources

Monetary	Physical
19	9



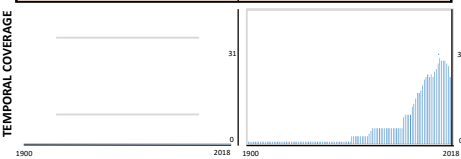
Data Sources

Monetary	Physical
17	9



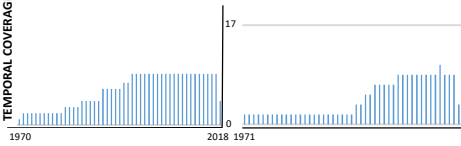
Data Sources

Monetary	Physical
0	46



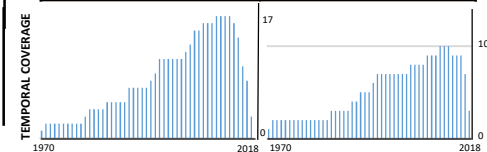
Data Sources

Monetary	Physical
20	8



SEMI FINISHED

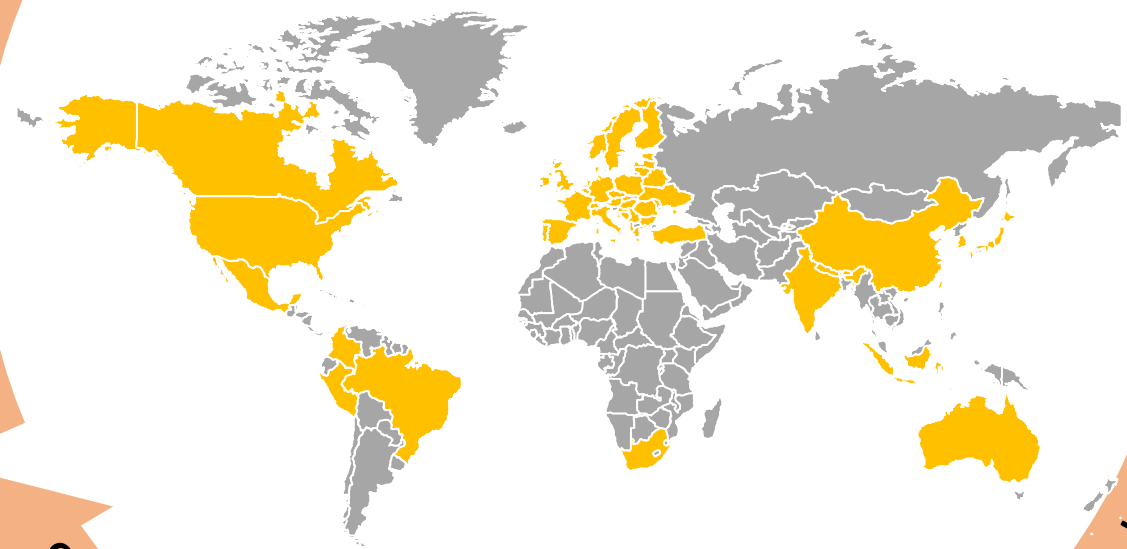
Monetary	Physical
21	14



END OF LIFE

END USE GOODS

Cerium

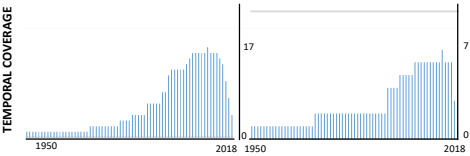


EXTRACTION

PROCESSING

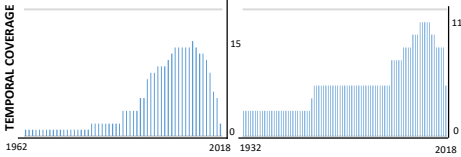
Data Sources

Monetary	Physical
19	9



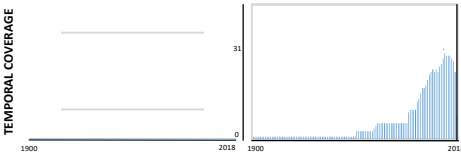
Data Sources

Monetary	Physical
17	12



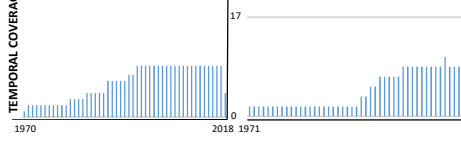
Data Sources

Monetary	Physical
0	46



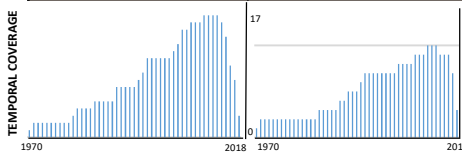
Data Sources

Monetary	Physical
20	8



Data Sources

Monetary	Physical
21	14

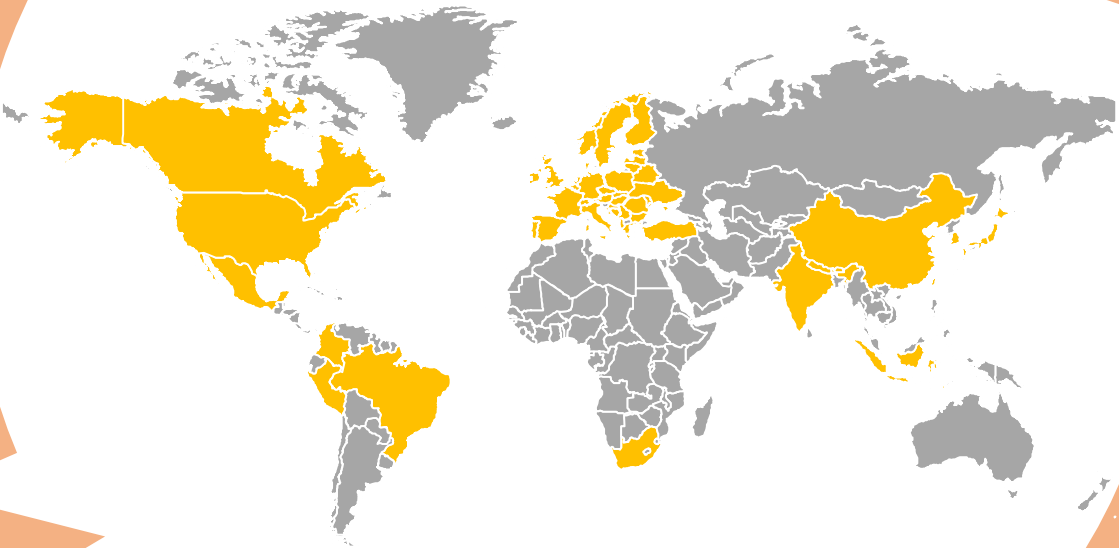


END OF LIFE

SEMI FINISHED

END USE GOODS

Cobalt

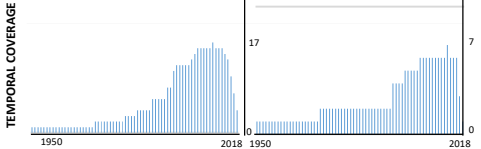


EXTRACTION

PROCESSING

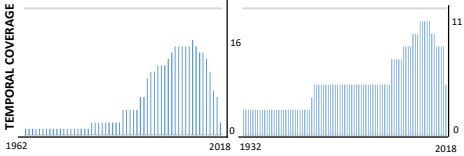
Data Sources

Monetary	Physical
19	9



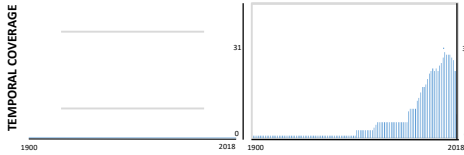
Data Sources

Monetary	Physical
18	13



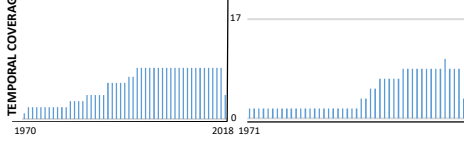
Data Sources

Monetary	Physical
0	46

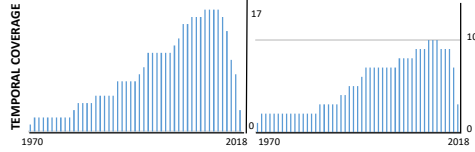


Data Sources

Monetary	Physical
20	8



Monetary	Physical
21	14

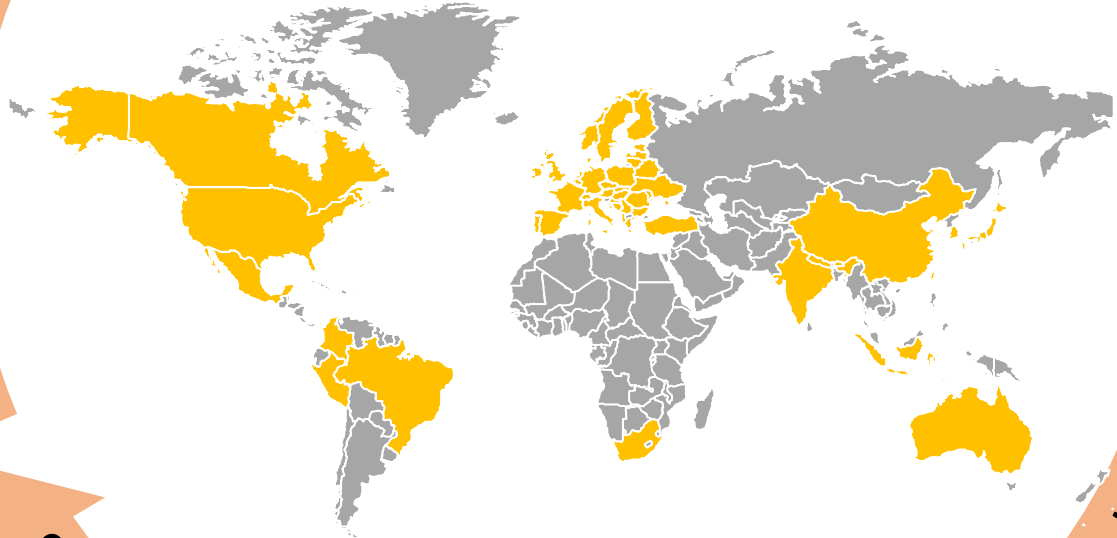


Copper

END OF LIFE

SEMI FINISHED

END USE GOODS

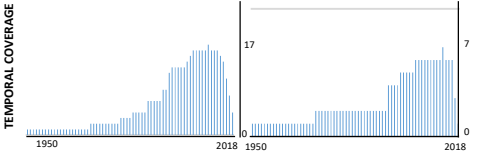


EXTRACTION

PROCESSING

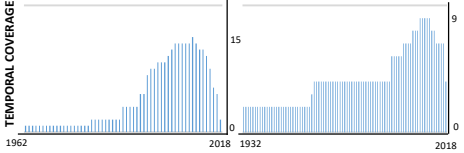
Data Sources

Monetary	Physical
19	9



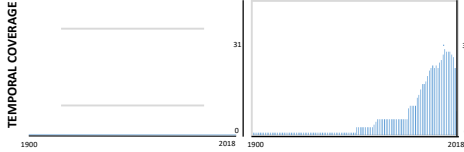
Data Sources

Monetary	Physical
17	9



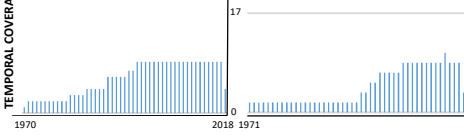
Data Sources

Monetary	Physical
0	46

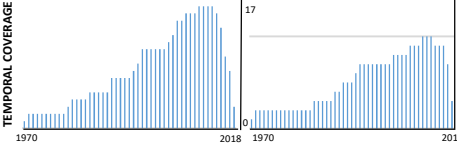


Data Sources

Monetary	Physical
20	8



Monetary	Physical
21	14

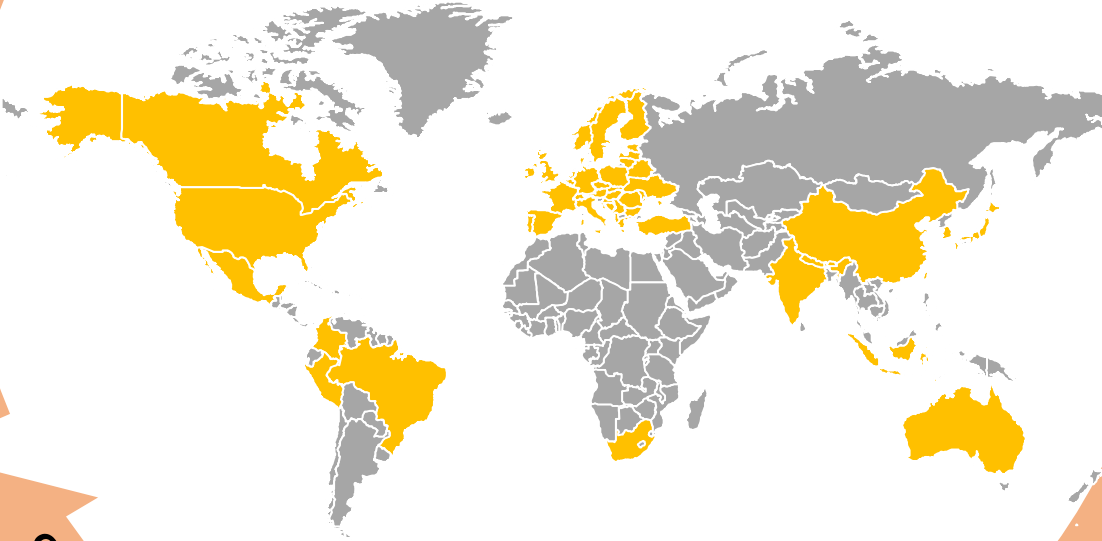


END OF LIFE

SEMI FINISHED

END USE GOODS

Dysprosium



EXTRACTION

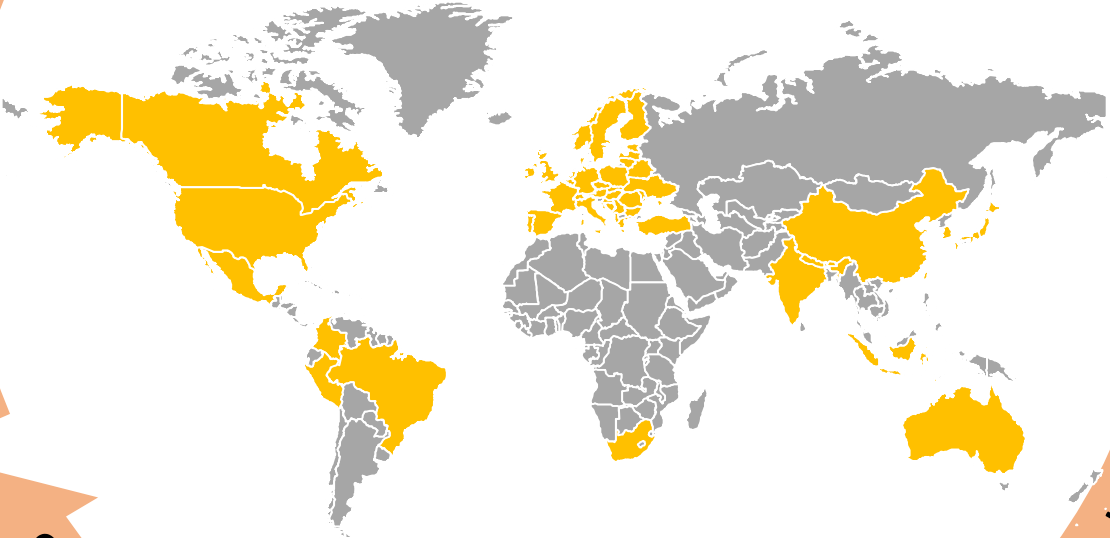
PROCESSING

SEMI FINISHED

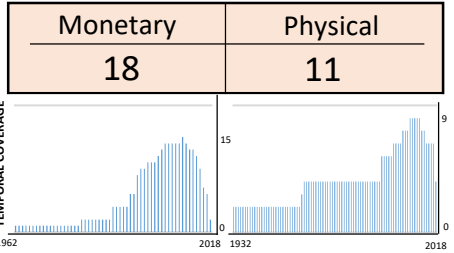
END OF LIFE

END USE GOODS

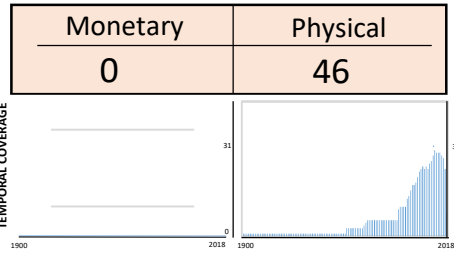
Iron



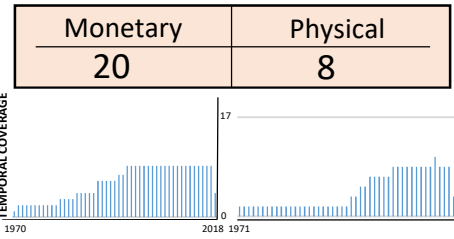
Data Sources



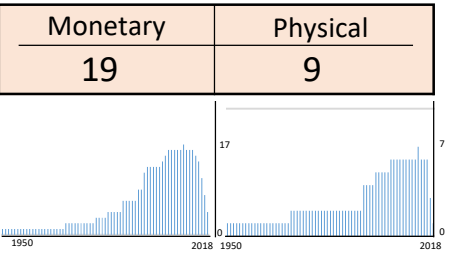
Data Sources



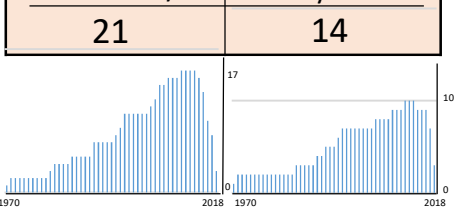
Data Sources



Data Sources



Data Sources



EXTRACTION

PROCESSING

Lanthanum

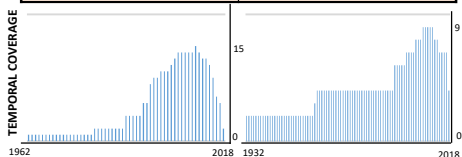
END OF LIFE

SEMI FINISHED

END USE GOODS

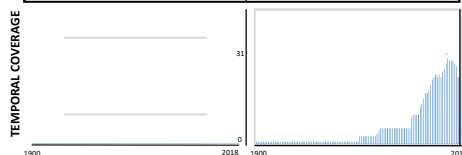
Data Sources

Monetary	Physical
17	10



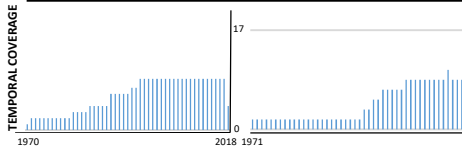
Data Sources

Monetary	Physical
0	46



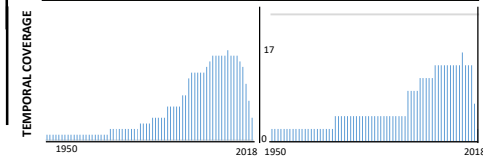
Data Sources

Monetary	Physical
20	8

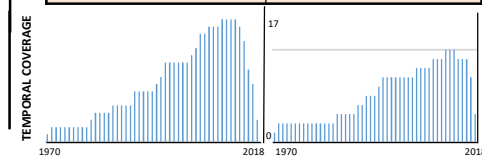


Data Sources

Monetary	Physical
19	9



Monetary	Physical
21	14



EXTRACTION

PROCESSING

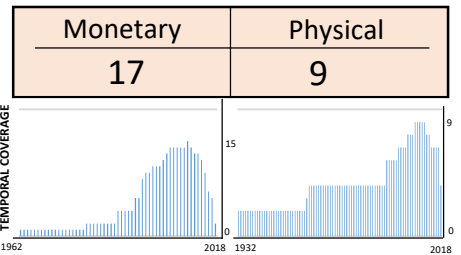
Natural Graphite

END OF LIFE

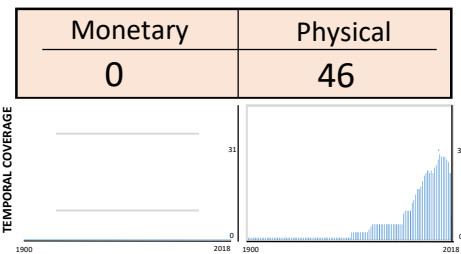
SEMI FINISHED

END USE GOODS

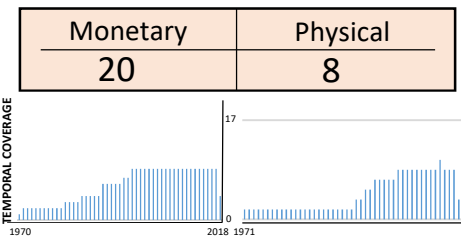
Data Sources



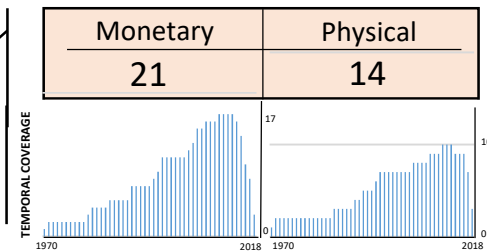
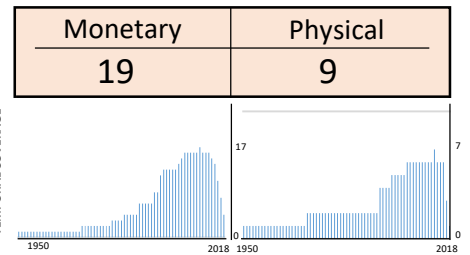
Data Sources



Data Sources



Data Sources



EXTRACTION

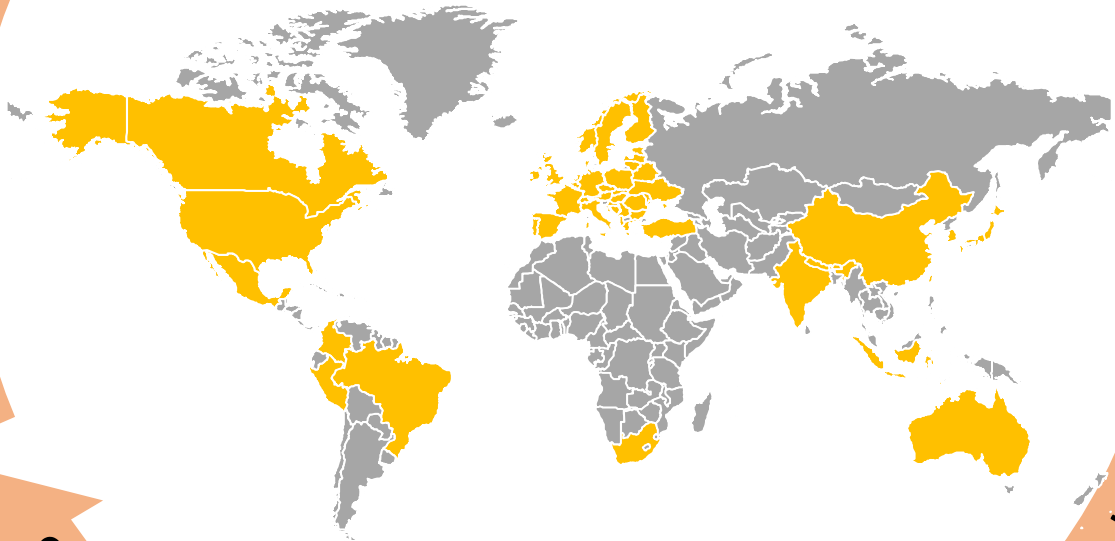
PROCESSING

SEMI FINISHED

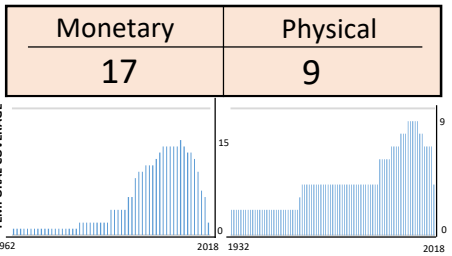
END OF LIFE

END USE GOODS

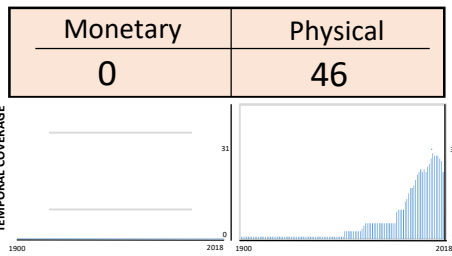
Neodymium



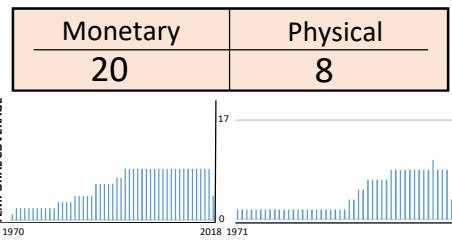
Data Sources



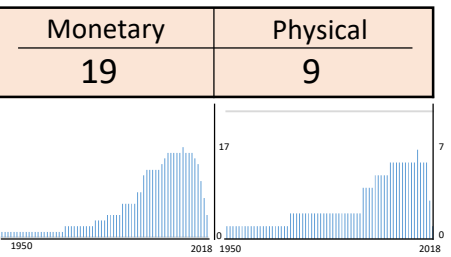
Data Sources



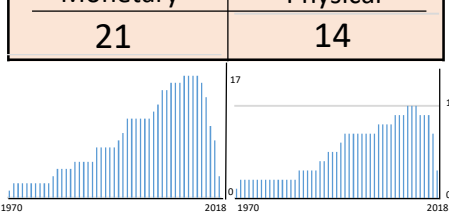
Data Sources



Data Sources



Data Sources



EXTRACTION

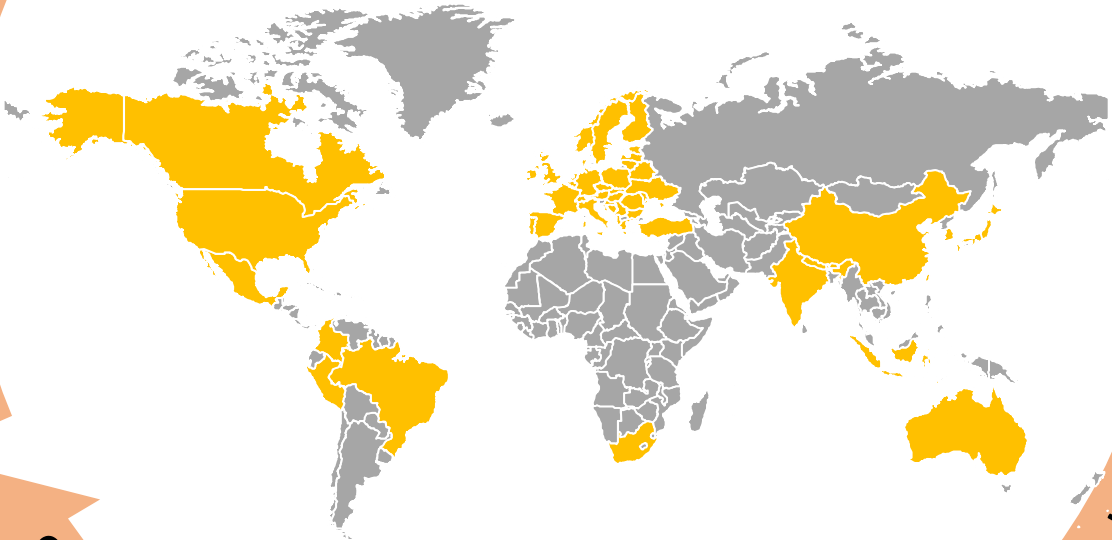
PROCESSING

SEMI FINISHED

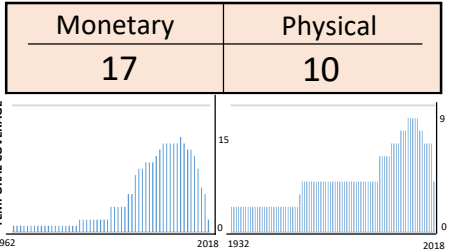
END OF LIFE

END USE GOODS

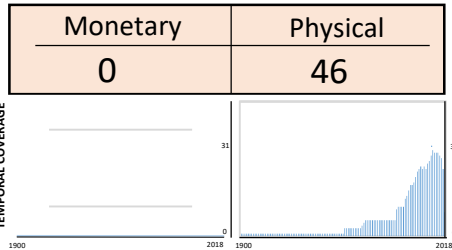
Niobium



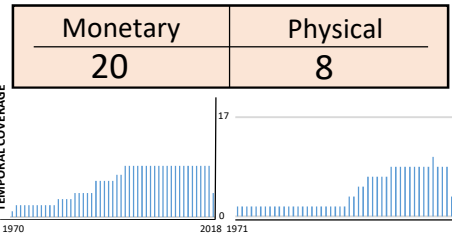
Data Sources



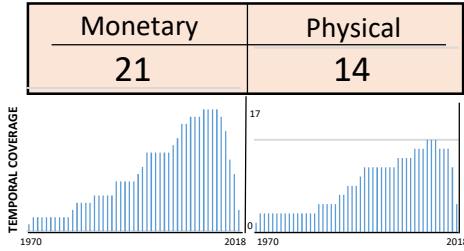
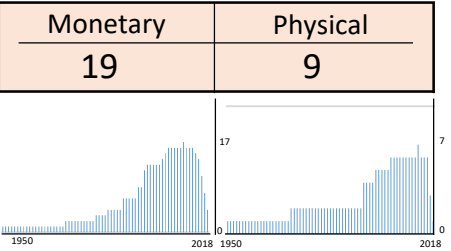
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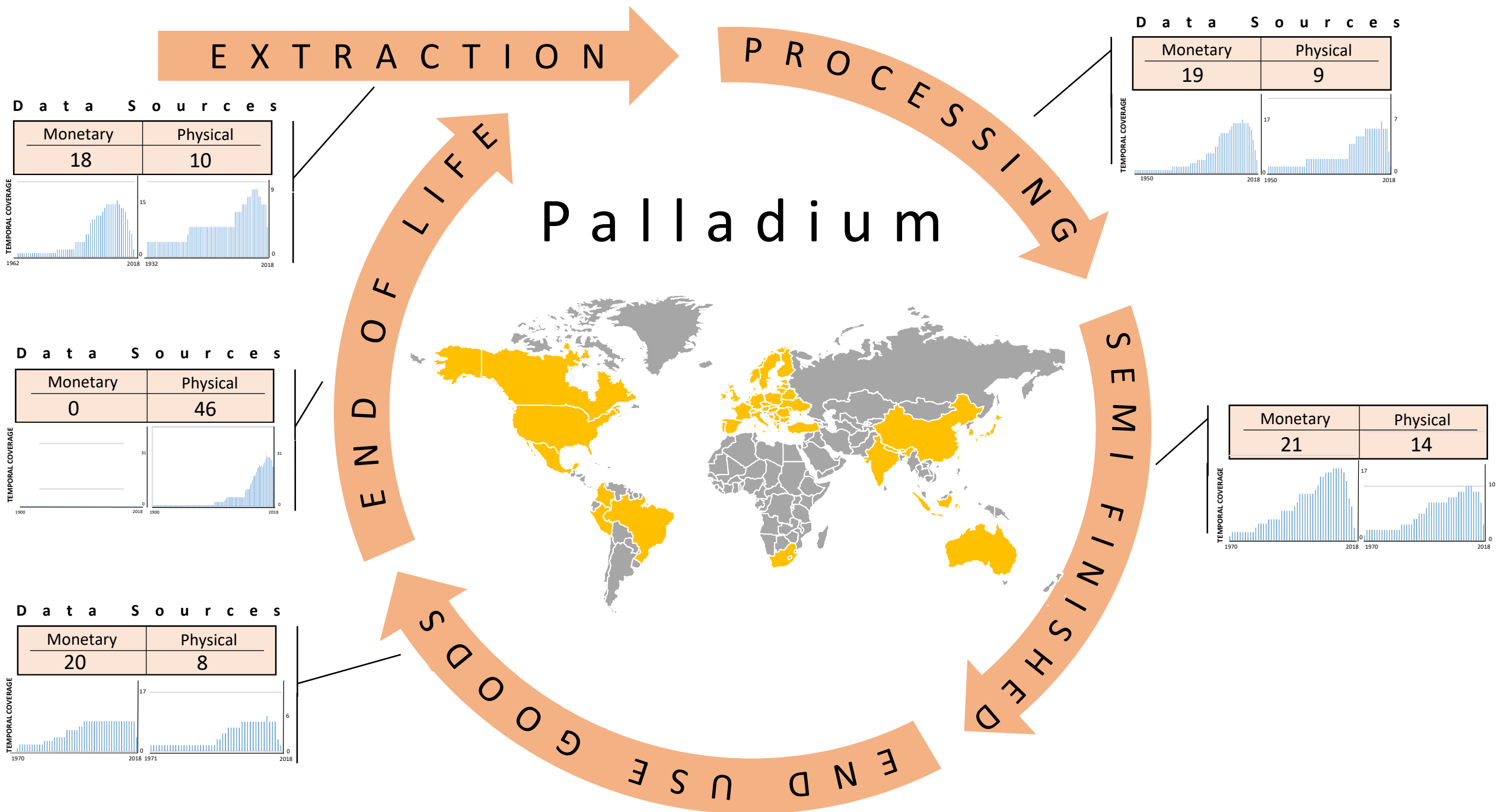


Data Sources



Data Sources





EXTRACTION

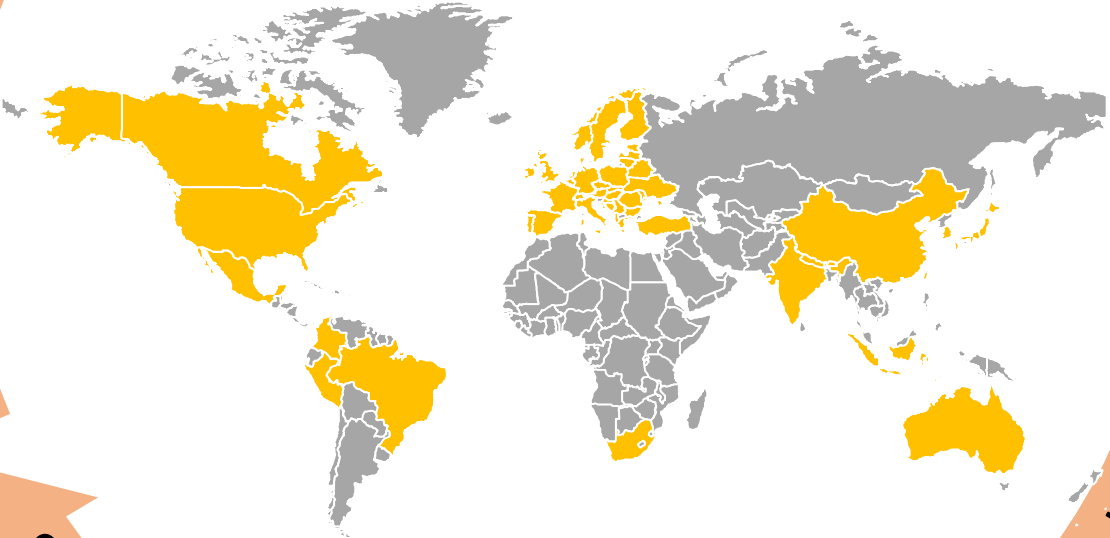
PROCESSING

SEMI FINISHED

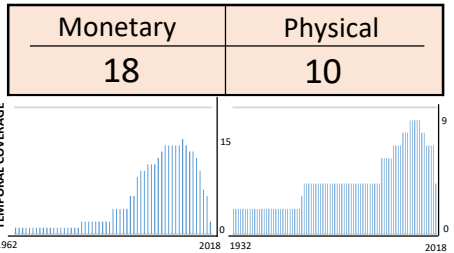
END OF LIFE

END USE GOODS

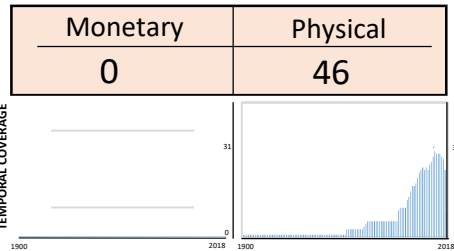
Platinum



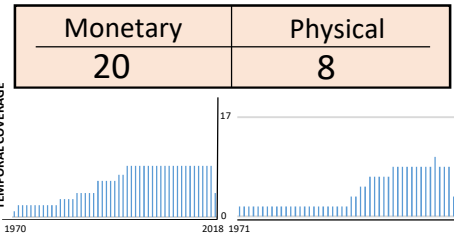
Data Sources



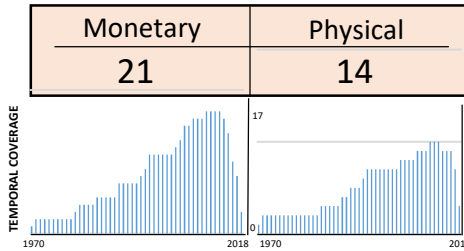
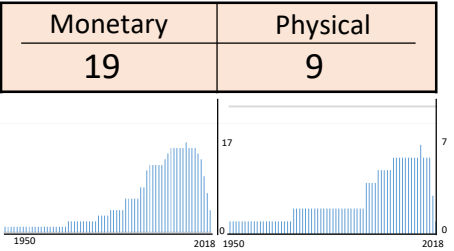
Data Sources



Data Sources



Data Sources



EXTRACTION

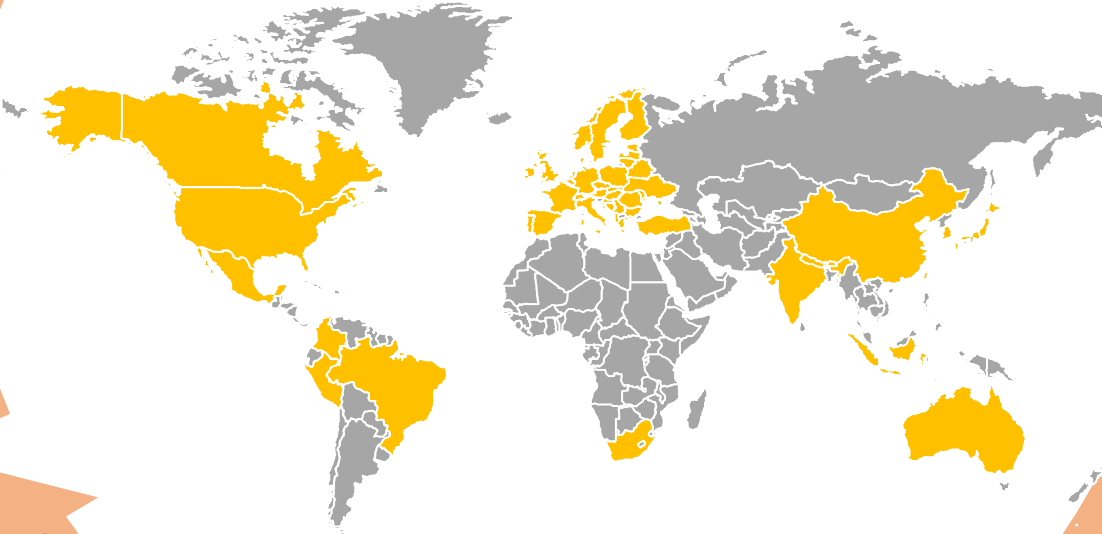
PROCESSING

SEMI FINISHED

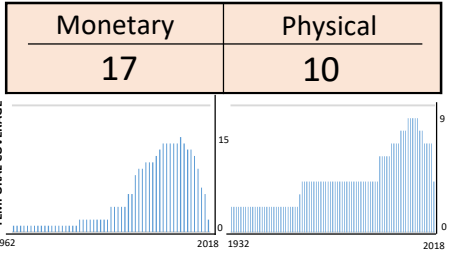
END OF LIFE

END USE GOODS

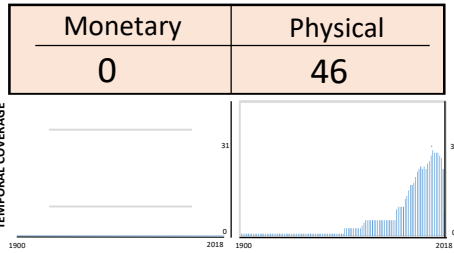
Tantalum



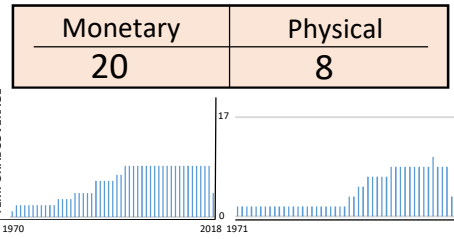
Data Sources



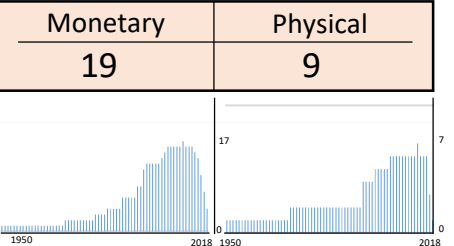
Data Sources



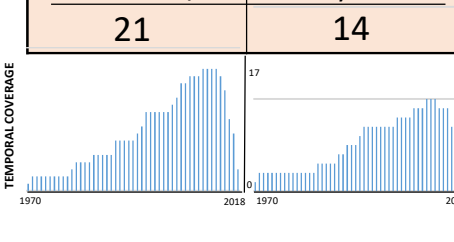
Data Sources



Data Sources



Data Sources



EXTRACTION

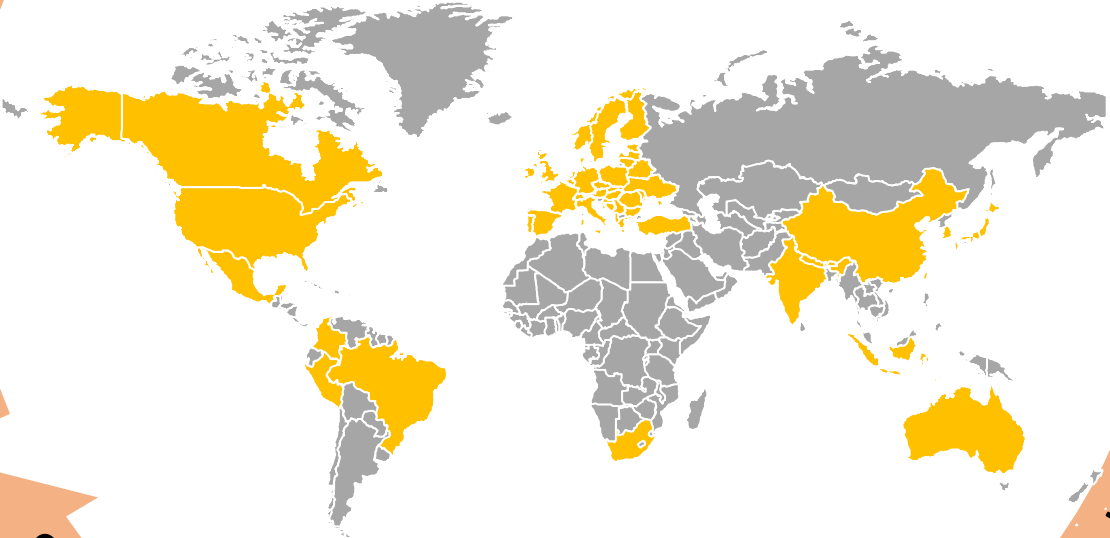
PROCESSING

SEMI FINISHED

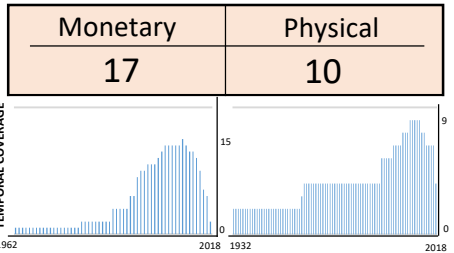
END OF LIFE

END USE GOODS

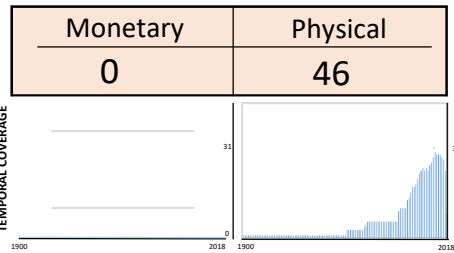
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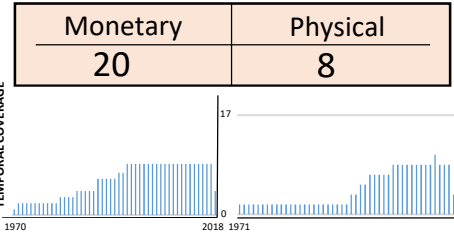
Data Sources



Data Sources



Data Sources



Data Sources

