



MinFuture

Primary data – Geological Survey of Norway (NGU)

Mark Simoni¹, Tom Hheldal¹ ¹ NGU

20 June 2017



MinFuture is funded by the Horizon 2020 Framework Programme of the European Union under Grant Agreement no. 730330. The contents of this document are the sole responsibility of MinFuture and can in no way be taken to reflect the views of the European Union.

www.minfuture.eu

Norway



- State resources: all ores with specific density above 5
- Landowner's resources: everything else (all industrial minerals and rocks, construction materials)

Geological
Survey

Resources in the
ground/exploration



Directorate
of mining

Mining/exploitation



Statistics
Norway

Production/proces-
sing of mineral based
products



Disposal, secondary
resources,

Mess!!

Annual mineral
statistics

Annual industry
statistics

Resources in the ground – INSPIRE classification (ongoing)

Occurrence (“showing”) – point with high value of ore mineral

Prospect – target for prospecting, but rarely quantitative measurements

Deposit – quantities estimated or possible to estimate

Province – area with high probability of locating deposits

Resources in the ground – information sources

NGU own data collection

Industry public data (may be old)

Data collected by the Directorate, from concession applications (public) or annual reporting; it will still take a while to get those figures complete

Reporting of exploration results from industry (only state minerals)

Note: resources and reserves are still confidential for many mining companies in Norway

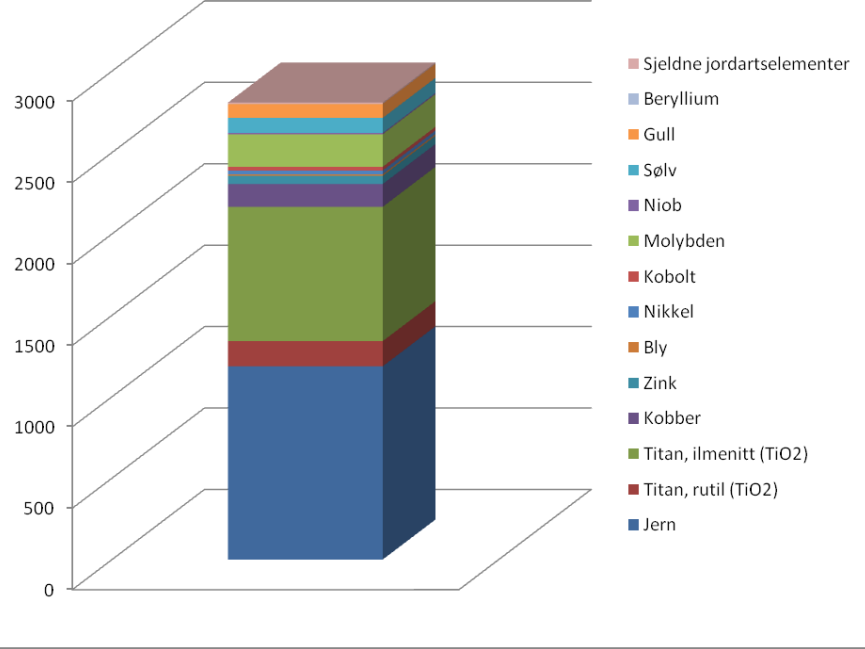
Resources in the ground – standards and reporting

Mix of standards, much are historical records, not standardized

Moving towards UNFC

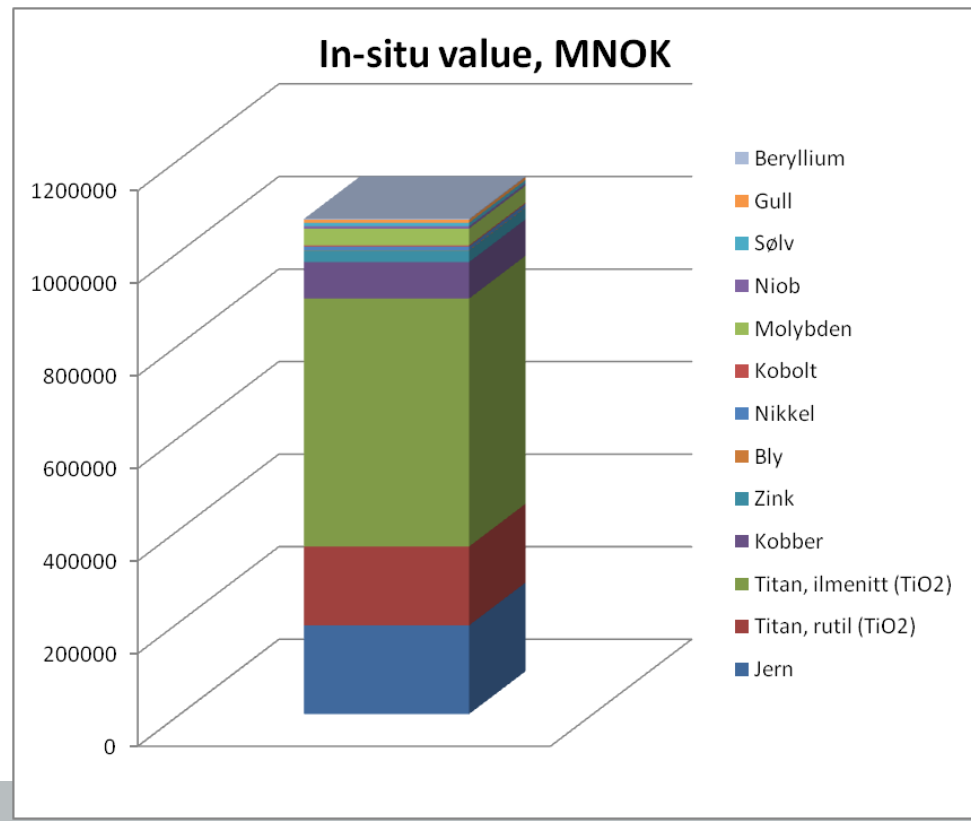
From 2017, annual report with analyses

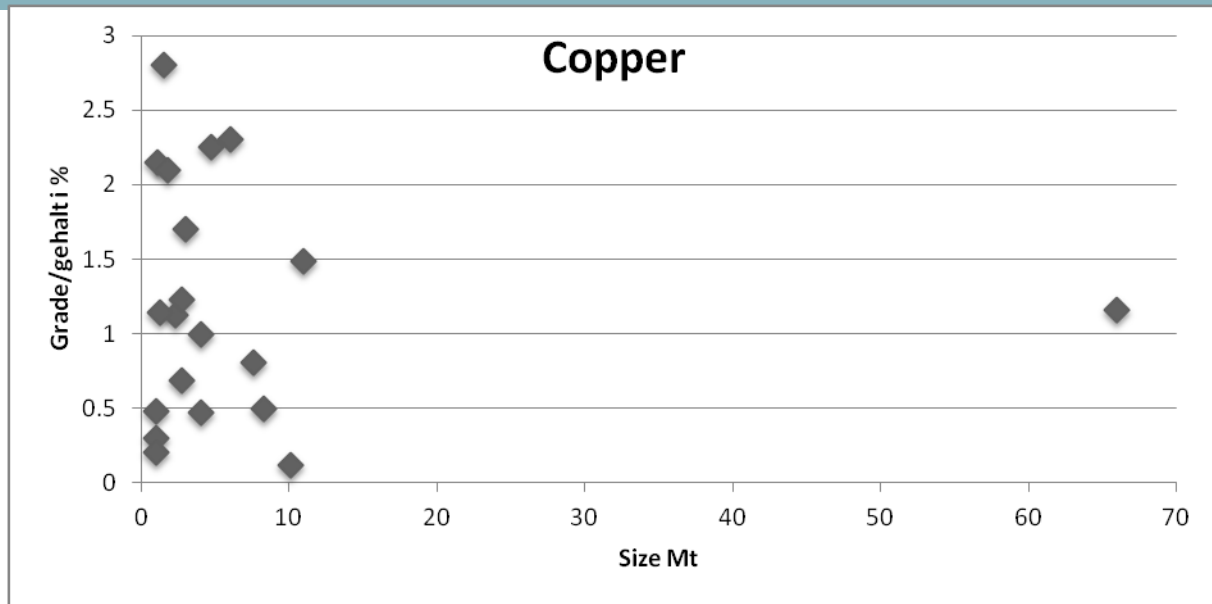
Total metallic ore, Mt



Example: gross ore volume

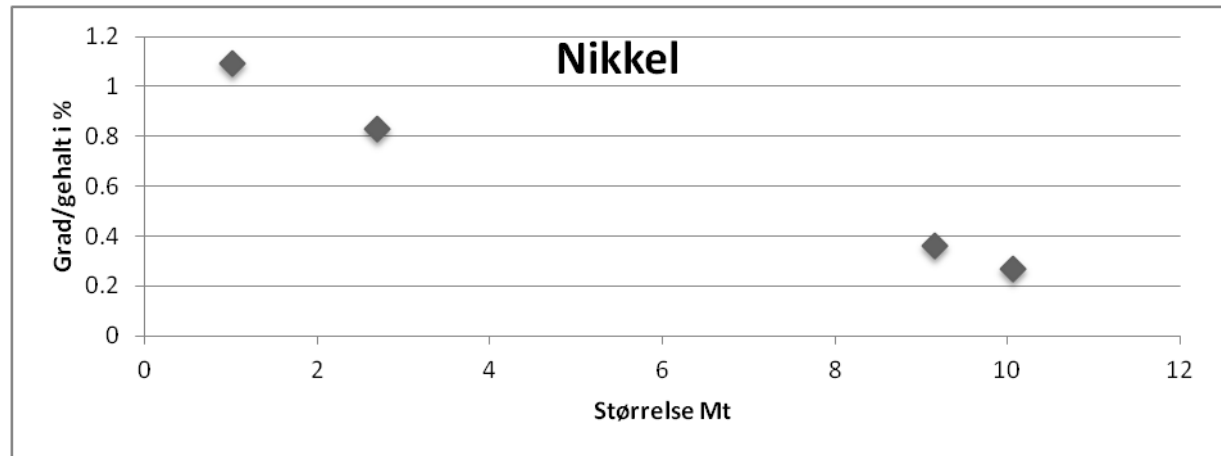
Example: gross in situ ore value





Example: grade and size of known copper resources

Example: grade and size of measured Nickel deposits



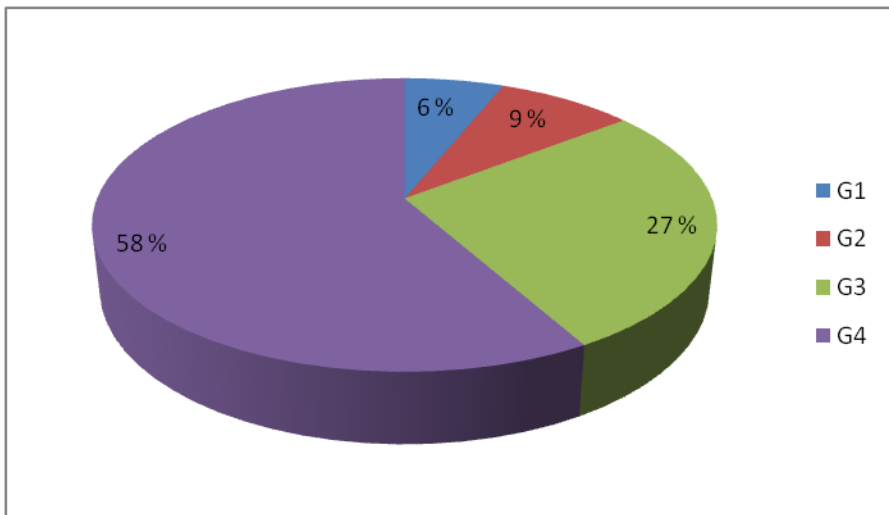
Resources and reserves



- NGU will remove the word “reserves” from our databases, since:
 - 1. Legally complicated: “reserves” are what you plan to produce, and the day a company goes bankrupt they are reduced to “resources”. Wrong wording may create problems
 - 2. For a public agency, we believe that “resources” and the grade of certainty they are estimated/measured is the best reporting practice.

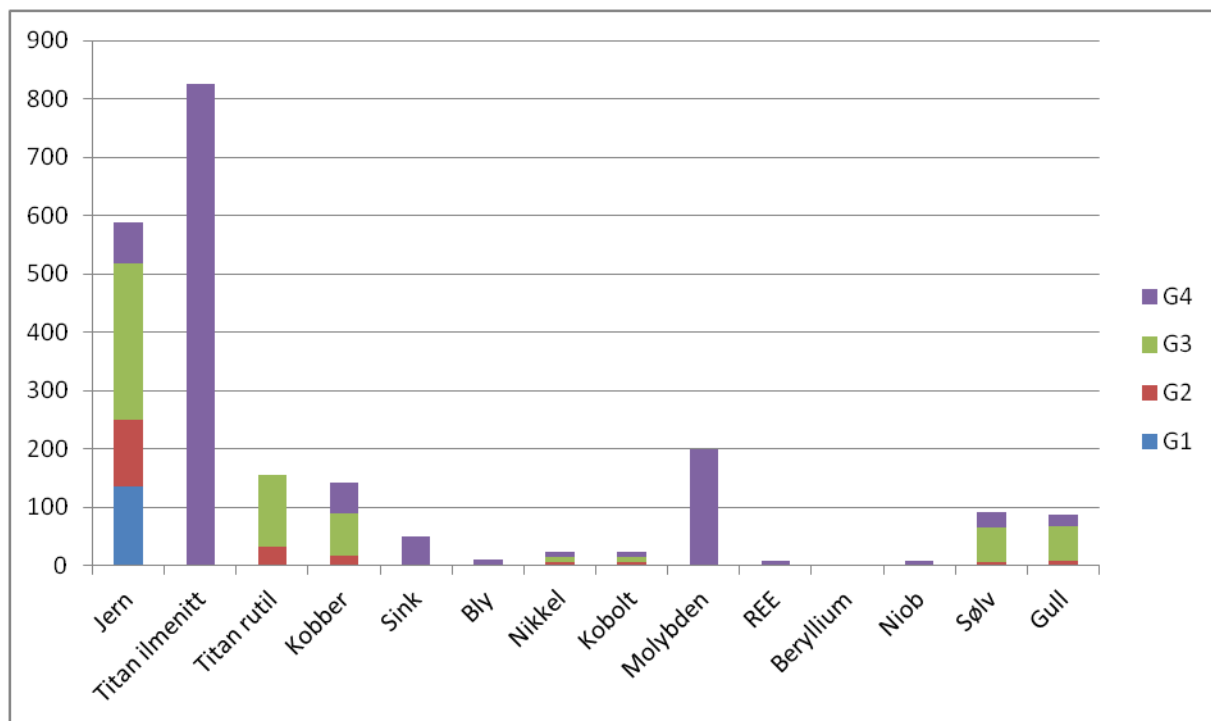


- For us, UNFC is the most interesting reporting format – in particular for aggregated data on regional and national scales
- It is also interesting that UNFC is now becoming the preferred system for the Norwegian Petroleum Directorate, and that we in the future will see adaption to other energy resources and ground water
- However, needs for translating G-axis to low-value minerals, such as aggregate



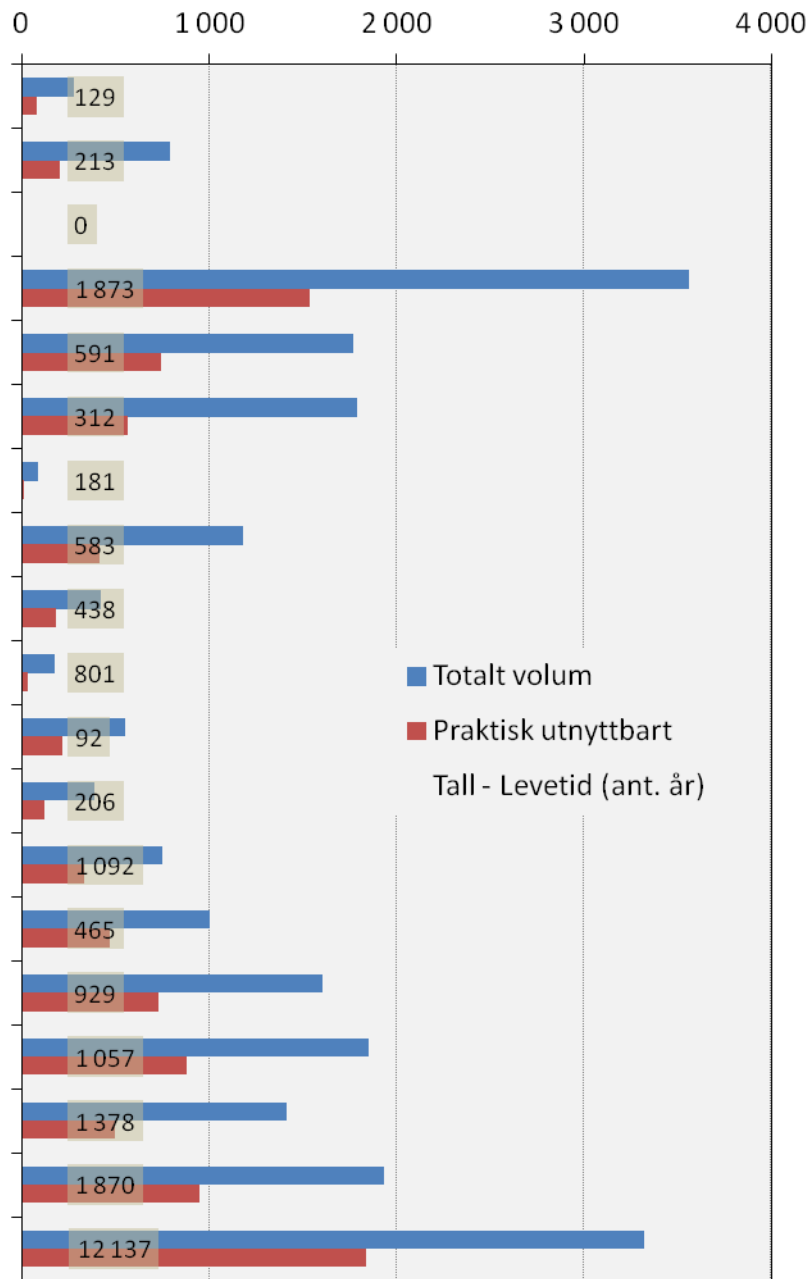
Metallic ore and the UNFC G-axis
 (Note: all historical data has been put in the G4. Detailed evaluation of such data may upgrade the classification.)

G-axis on metallic ore commodities



Sand and gravel

x 1000 tonn



Total and available volume of sand and gravel deposits, per county, and remaining years of production.

Next: to include "legal volume" (concession) – then the years will be reduced drastically

County	Deposits with sales in 2014 or 2015	Resource volume mill. tonn	Life time*
Østfold	25	135,8	54
Akershus	22	193,3	44
Oslo	2	19,8	34
Hedmark	32	153,6	53
Oppland	38	262,2	164
Buskerud	34	255,3	96
Vestfold	15	54,5	25
Telemark	30	240,4	142
Aust-Agder	16	48,7	73
Vest-Agder	18	27,2	29
Rogaland	41	590,1	32
Hordaland	24	201,9	56
Sogn og Fjordane	42	2 680,8	414
Møre og Romsdal	46	209,9	69
Sør-Trøndelag	45	155,2	43
Nord-Trøndelag	53	599,8	289
Nordland	53	1 332,1	432
Troms	14	93,5	119
Finnmark	11	29,3	73
Sum	561	7 283,4	118

Rock
aggregate life
time

Production figures (Directorate of mining)

**Annually collected through online services
(penalty for no delivery)**

**Production in t and value (NOK), and non-
salable products**

Only concession minerals

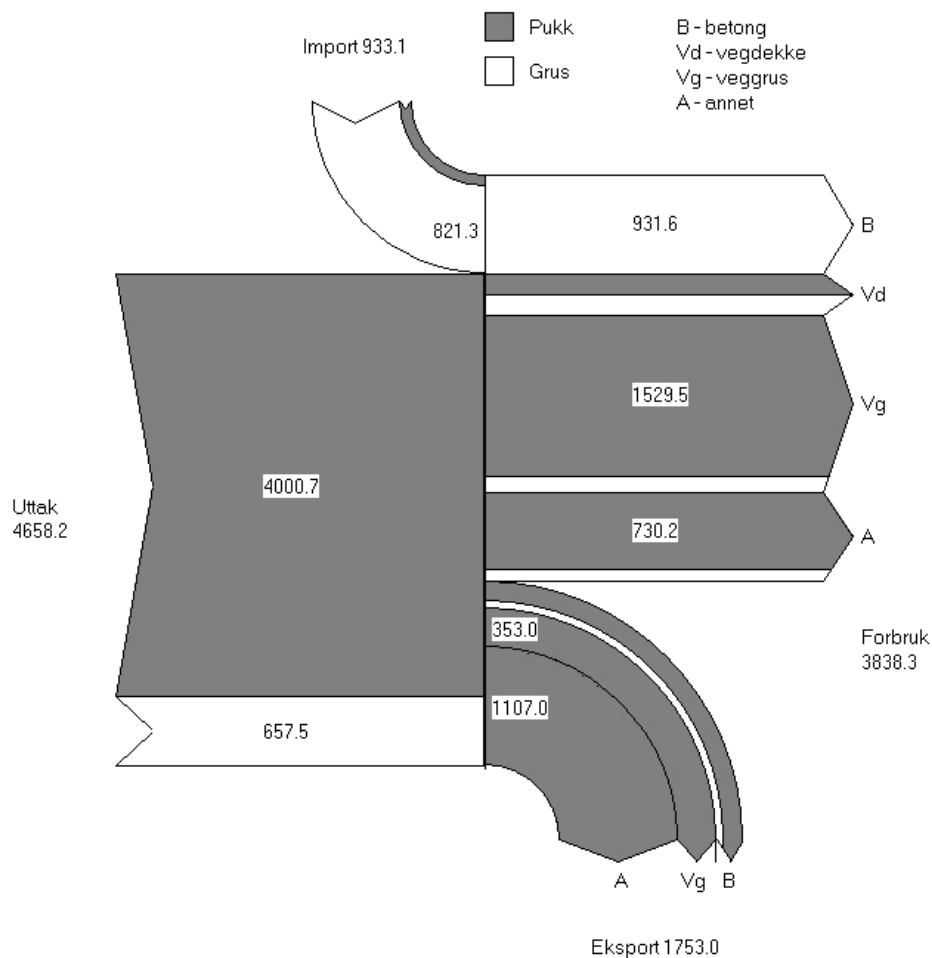
Coordination with resource data

**New roles; Directorate stronger ownership of
data since 2015**

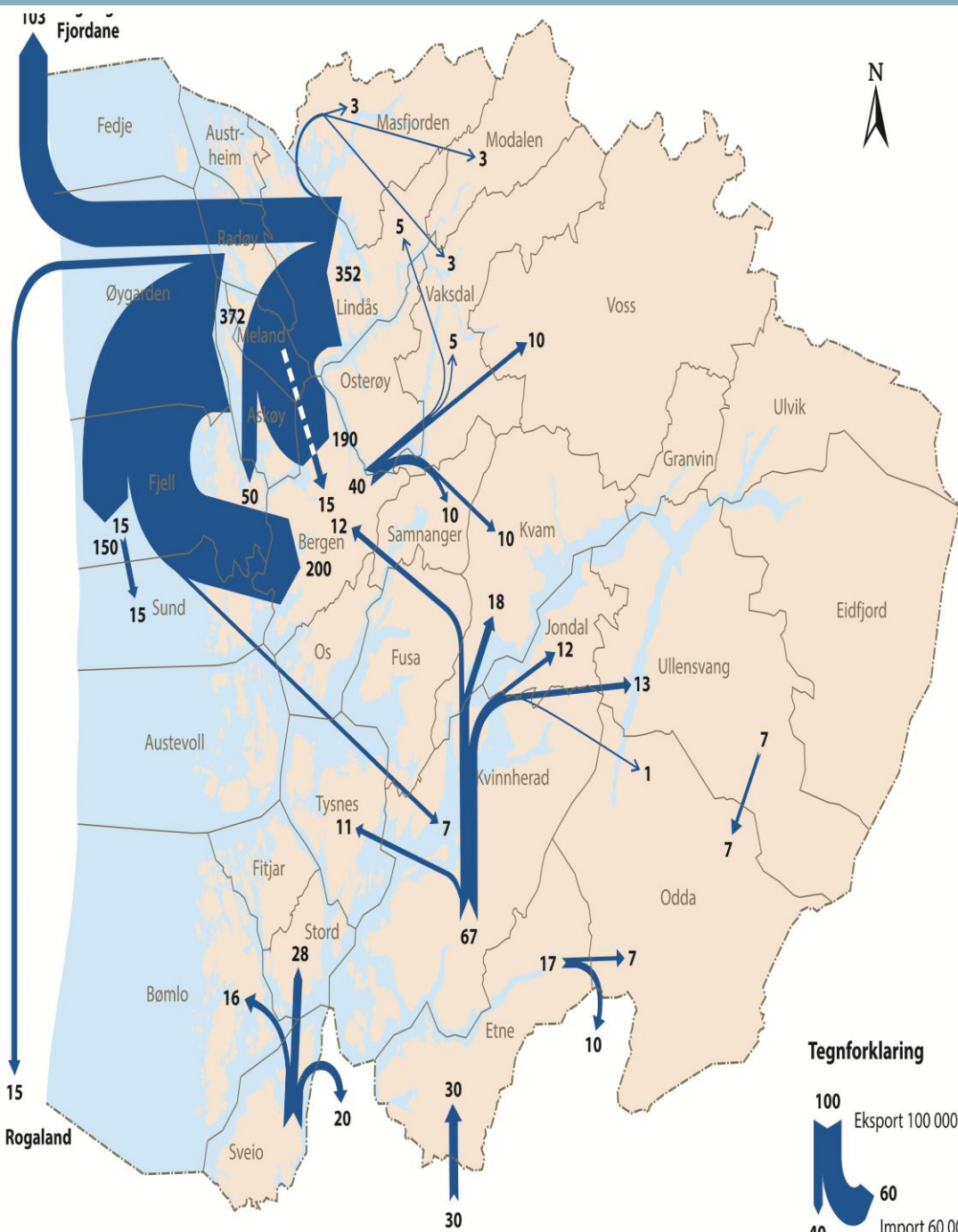
MFA Hordaland county sand/rock aggregate



Ressursregnskap for Hordaland (12 fylke) 2013



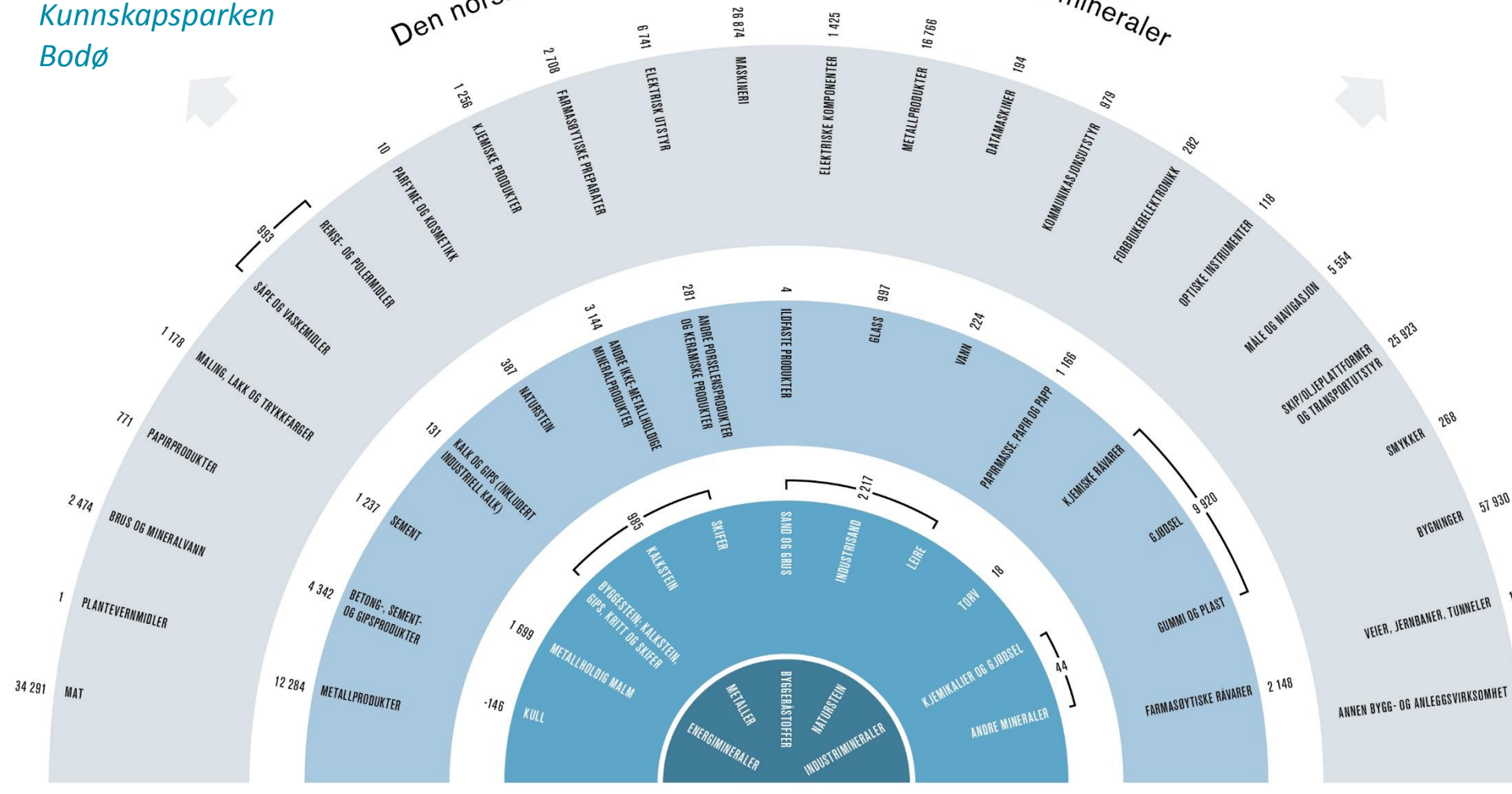
NGU have been doing analyses of MF since 1993



Downstream data (Norwegian Statistics)

Kunnskapsparken
Bodø

Den norske økonomien er helt avhengig av tilgang til mineraler



Første gangs bruk
276 866
939 423

Prod. produkt
36 265
167 790

Utvinning
4 817
12 959

Mineraler (eks. olje og gass)
← Verdiskaping →
← Omsetning →
Mill. kroner

Utvinning
4 817
12 959

Prod. produkt
36 265
167 790

Første gangs bruk
276 866
939 423

The big unknown

Non-concession exploitation (predominantly aggregate from tunnelling or industrial site construction): Should be reported in the future

Unclear and innaccurate reporting

Reporting duty: One company deliver and publish all data on resources (if it is on the stock market), Another need not report anything (like a family owned company)

No company utilizing waste from mineral exploitation need to report

Loosing information on the way

Non-
stockmarket
company



Utilizing waste from
primary production

Non-concession minerals



Minerals4EU

European Minerals Knowledge Data Platform (EU-MKDP)

A simplified, user-friendly and efficient access to all available and new data related to mineral resources through the 'Minerals4EU' Knowledge Data Platform.



DATA SEARCH

Search into the EU-MKDP (Mineral Resources Database and Knowledge Documents) to find the best data

MAP VIEWER

View the data inside the EU-MKDP and combine them with other data to create decision support maps



MINERALS YEARBOOK

View data for primary minerals production, trade, resources and reserves; and for secondary materials



FORESIGHT STUDY

View Foresight Study reports on raw materials supply and demand in the EU

NEWS

March 10, 2016

The Minerals4EU foundation, the new private-public bridge for the EU Raw Materials Sector

Following the huge success of the European Intelligence Network on the Supply of Raw Materials (Minerals4EU) project, the "Minerals Intelligence Infra

August 24, 2015

The EU-MKDP is operational

More than 17 European Geological Surveys are serving their national data and over 190 documents related to European mineral potential are available.

[All the news](#)



Welcome to the first edition of the new 'European Minerals Yearbook'!

This Yearbook contains data for primary minerals production, trade, resources and reserves; and for secondary materials it contains data for mineral-based waste generation, treatment and trade. It also contains case studies relating to the recovery of 10 commodities from key waste streams.

Please select the data you wish to view from the one of the following 4 options.

We would be pleased to receive any comments you may have relating to this Yearbook, please send them to Yearbook@Minerals4EU.eu



BY COUNTRY

Norway

VIEW



BY COMMODITY
FOR PRIMARY MINERALS

Indium

VIEW



BY CATEGORY

FOR MINERAL-BASED WASTE FLOWS FOR CASE STUDIES ON COMMODITIES FROM WASTE AND

- Batteries and accumulators
- Combustion wastes
- Discarded equipment (except discarded vehicles and batteries)
- Discarded vehicles
- Dredging spoils
- Glass waste
- Metal wastes, ferrous
- Metal wastes, mixed ferrous and non-ferrous
- Metal wastes, non-ferrous
- Mineral waste from construction and demolition
- Mineral waste from waste treatment and stabilised wastes
- Other mineral wastes

ACKNOWLEDGEMENTS

Mineral yearbook; reported statistical data from participating countries.



EUROPEAN MINERALS YEARBOOK - DATA FOR Copper

Production Import Export Resource Reserve Exploration

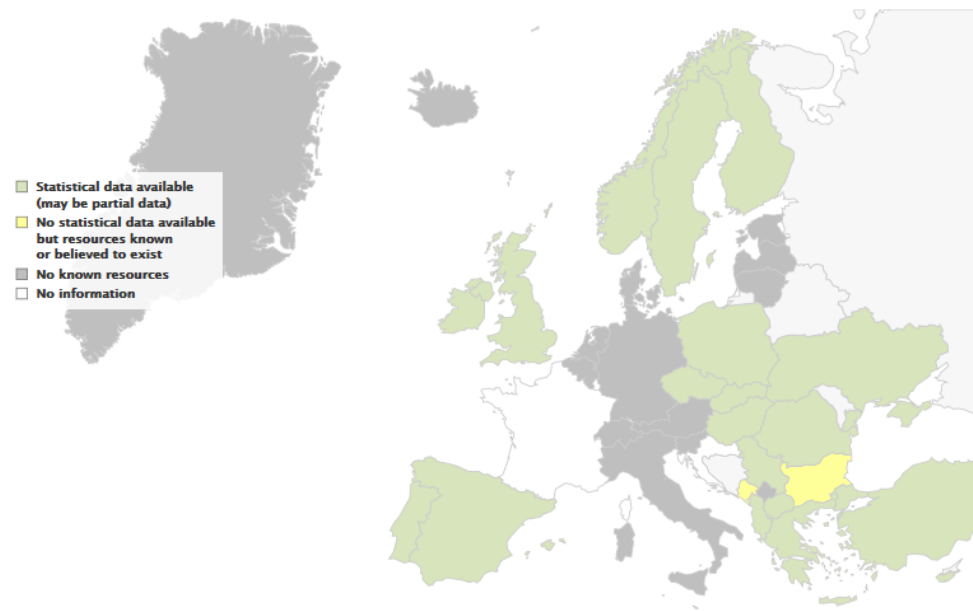
Important information regarding resource data

The resource data presented here may have been compiled according to an international reporting system, such as JORC, PERC or NI 43-101, or to a national system restricted to an individual country or group of countries. Where known, the reporting system used in the data compilation is stated alongside the statistics. In other cases there is no information available about the method used to estimate the reported resources and reserves.

On account of these variations in reporting methodology it is inappropriate to sum the resource and reserve data presented to determine national or European totals because the figures are not directly comparable.

The map shows the distribution of available resource data within the European countries covered by this Yearbook. The colours indicate the availability of resource data (see map legend).

Please click on an individual country on the map to show the available resource data.



Harmonization

No standard/common procedure for collecting national data

Through European platform: each national database harvested and processed to harmonized spatial data

Norway: gradually turning primary spatial datasets INSPIRE compliant