Construction Aggregates

System definition and reporting

Mark Simoni & Tom Heldal
Geological Survey of Norway

30/11/2017

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THE CONVERSATION

Academic rigour, journalistic flair

Search analysis, research, academics...

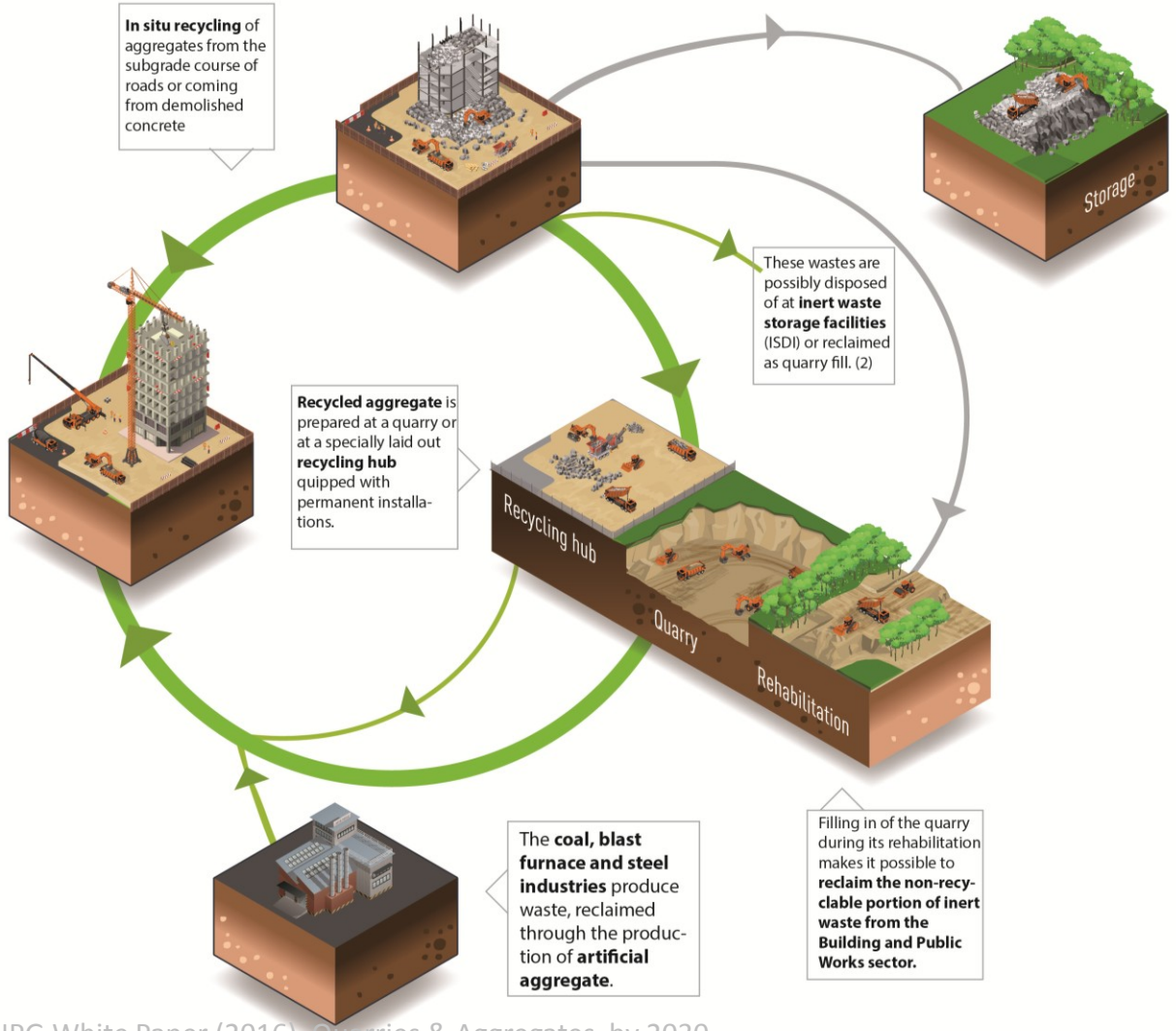
Arts + Culture | Business + Economy | Cities | Education | Environment + Energy | Health + Medicine | Politics + Society | Science + Technology | Brexit

The world is facing a global sand crisis

September 7, 2017 9.22pm BST

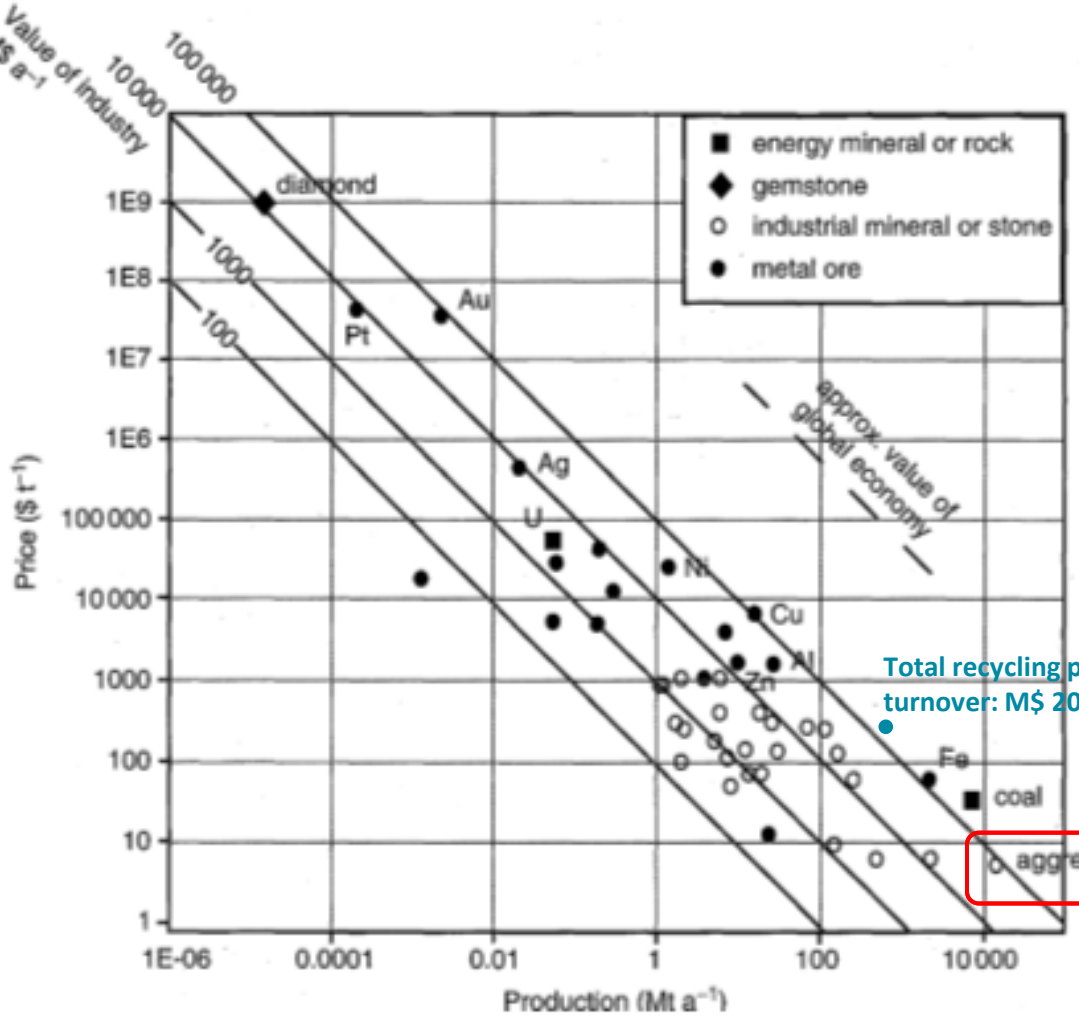
Sand for use in hydraulic fracturing operations at a processing plant in Chippewa Falls, Wisconsin in 2011. AP Photo/Steve Karnowski), Author provided

The Aggregates Industry



Modified from UNPG White Paper (2016). Quarries & Aggregates by 2030
http://www.uepg.eu/uploads/Modules/Publications/unpg_livre-blanc_gb.pdf

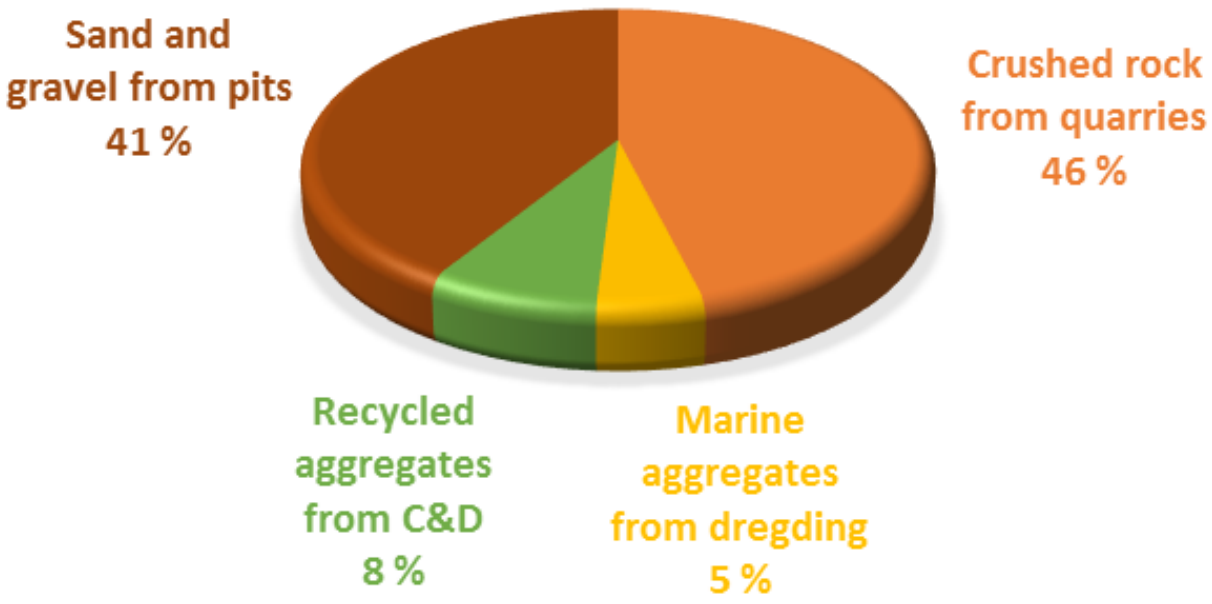
Value of the industry



Total recycling production: 600 Mt a^{-1}
turnover: M$ 200 000 a^{-1}

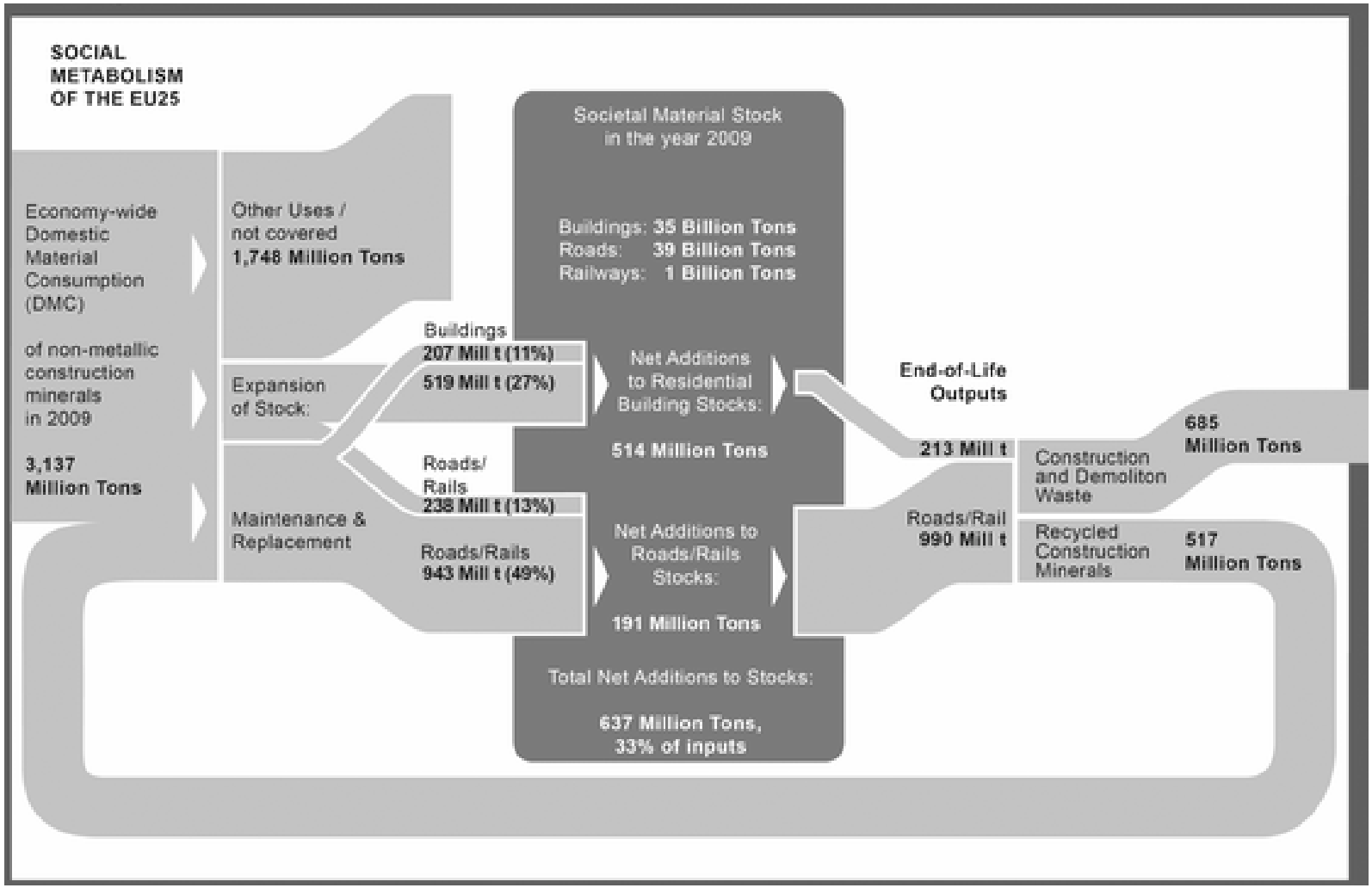
Ridley, J. (2013). Ore deposit geology. Cambridge, UK, Cambridge University Press. 398.
BIR Study on the Environmental Benefits of Recycling, 2009 http://www.bir.org/industry/

Construction Aggregates Supply in the EU



UEPG Annual Review 2105-2016; http://www.uepg.eu/uploads/Modules/Publications/uepg-ar2016-17_32pages_v04_small.pdf

Economy-wide material flows



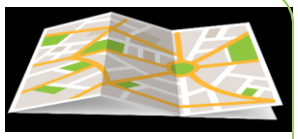
Wiedenhofer, D., Steinberger, J. K., Eisenmenger, N. and Haas, W. (2015). Maintenance and Expansion: Modeling Material Stocks and Flows for Residential Buildings and Transportation Networks in the EU25.

Mineral Information – Norwegian Stakeholders

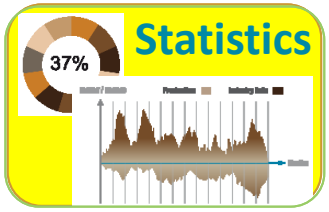
Einvironmental Agency
- Environmental monitoring
- Protected landscapes
- Waste landfills

Mapping authority
- Topographic maps
- Land use maps
- Settlement maps
- Landscape change

Directorate of Mining
- Production statistics
- Resources and reserves
- Licensing and taxation
- Mining life cycle + safety



National agencies
- (JBV, SW, NVE)
- Procurement & resource use
- Material testing
- Technology development



SSB Statistical Office
- Export statistics
- Population statistics
- Waste statistics
- Sustainability indicators

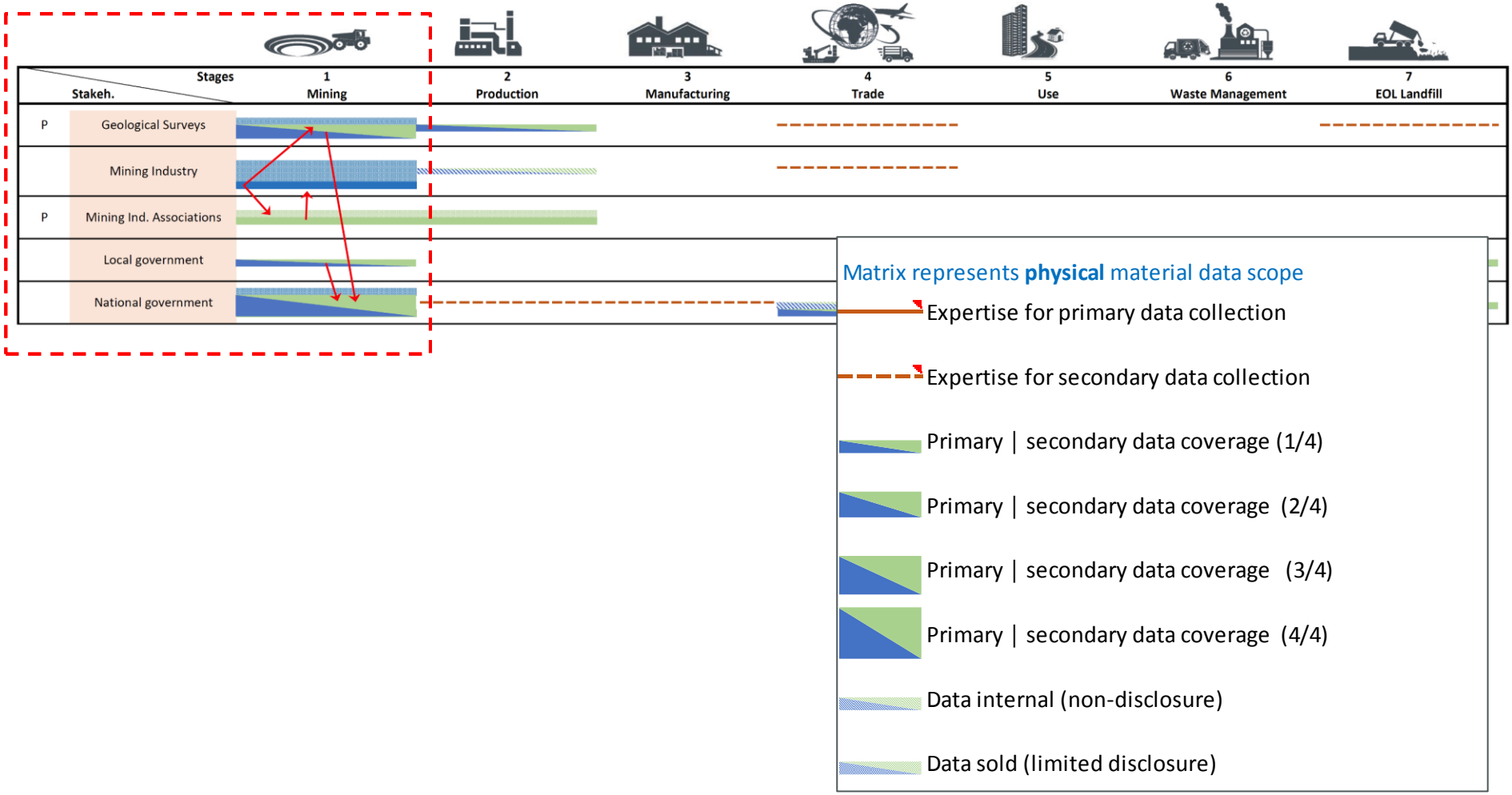
NGU Geological Survey
- Resources and reserves
- Geoheritage and geoenvironm.
- Quality assessm. + ranking
- Resource management

Industry
- Production statistics
- Employment statistics
- Resources & reserves
- Certification + licensing

Counties
- Land-use planning
- Resource-use planning
- Waste planning
- Licensing and taxation

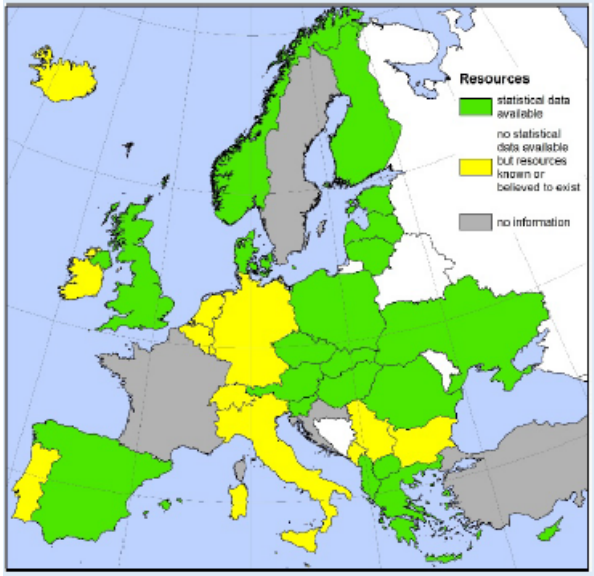
Research
- Material Flow Models
- Resource Management
- Sustainability Concepts
- BAT (Best Available Technology)

Primary and secondary data availability

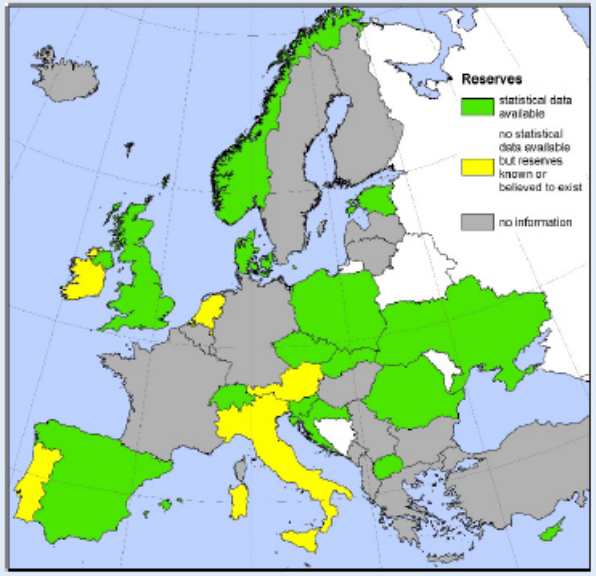


Primary aggregates - data coverage

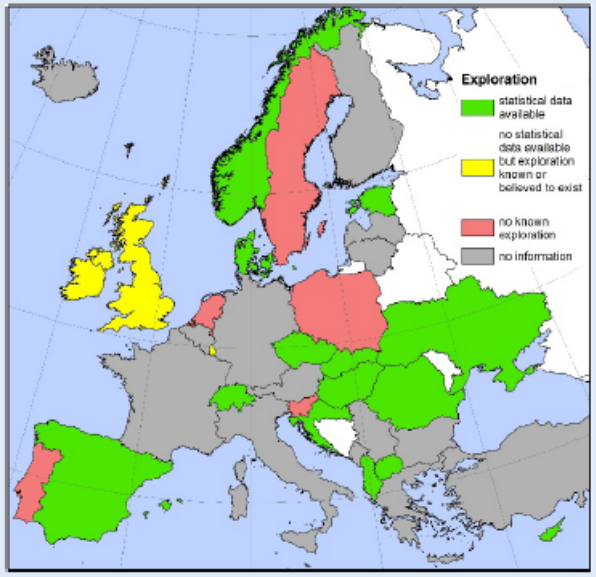
Resources



Reserves



Exploration



	Albania	Austria	Belgium	Bulgaria	Croatia	Cyprus	Czech Rep	Denmark	Estonia	Finland	France	Germany	Greece	Hungary	Iceland	Ireland	Italy	Latvia	Lithuania	Luxembourg	Macedonia (FYROM)	Malta	Montenegro	Netherlands	Norway	Poland	Portugal	Romania	Serbia	Slovakia	Slovenia	Spain	Sweden	Switzerland	Turkey	Ukraine	United Kingdom
Resources																																					
Reserves																																					
Exploration																																					

statistical data available
no statistical data available but resources known or believed to exist
no information

data from European Minerals Yearbook (Minerals4EU, 2014)
© EuroGeographics for the administrative boundaries (2014)

MFA system for construction aggregates

1. **What is reported** to whom by whom
2. How to improve the **MFA system definition**
3. Possible measures to **improve the data**
4. How is **data aggregated** (company/country)
5. Estimates for non-reporting
6. Recommendations for **better transparency**

Norwegian Mineral Law

Extraction of minerals

- concession required
- operation and restoration plan required

Every extractive operation with more than 500m^3 requires notification to DMF according to the mineral law §42.

Every extractive operation totalling more than 10'000m^3 in situ as well as every extraction of natural stone requires a concession according to §43.

Q: How much is exempt of reporting?

Construction Aggregates

Discussion draft v.01 MinFuture Nottingham Workshop, 29.11.2017

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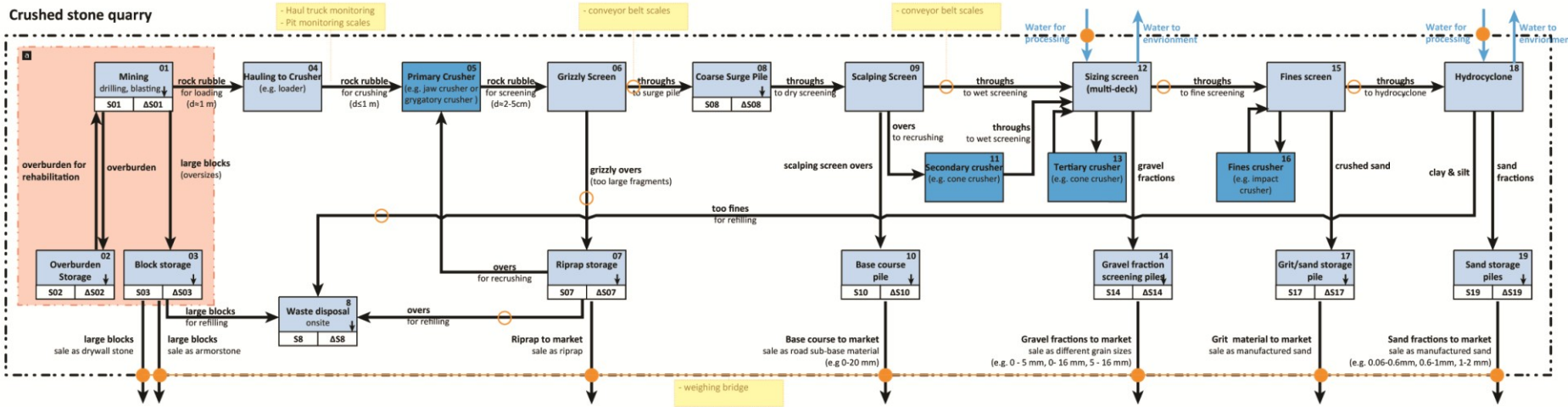
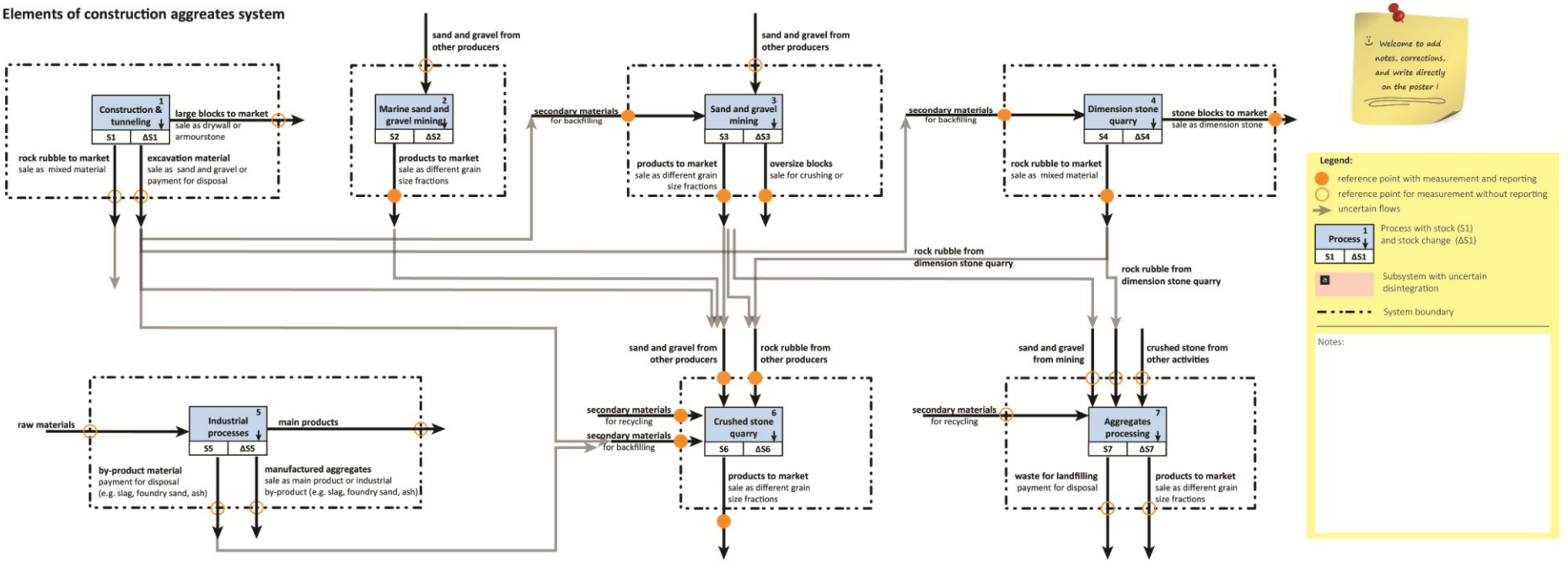
Crushed stone quarry



Elements of construction aggreates system



Welcome to add notes, corrections, and write directly on the poster !

Legend:

- reference point with measurement and reporting
- reference point for measurement without reporting
- uncertain flows
- Process (1) S1 ΔS1 — Process with stock (S1) and stock change (ΔS1)
- Subsystem with uncertain disintegration
- System boundary

Notes:

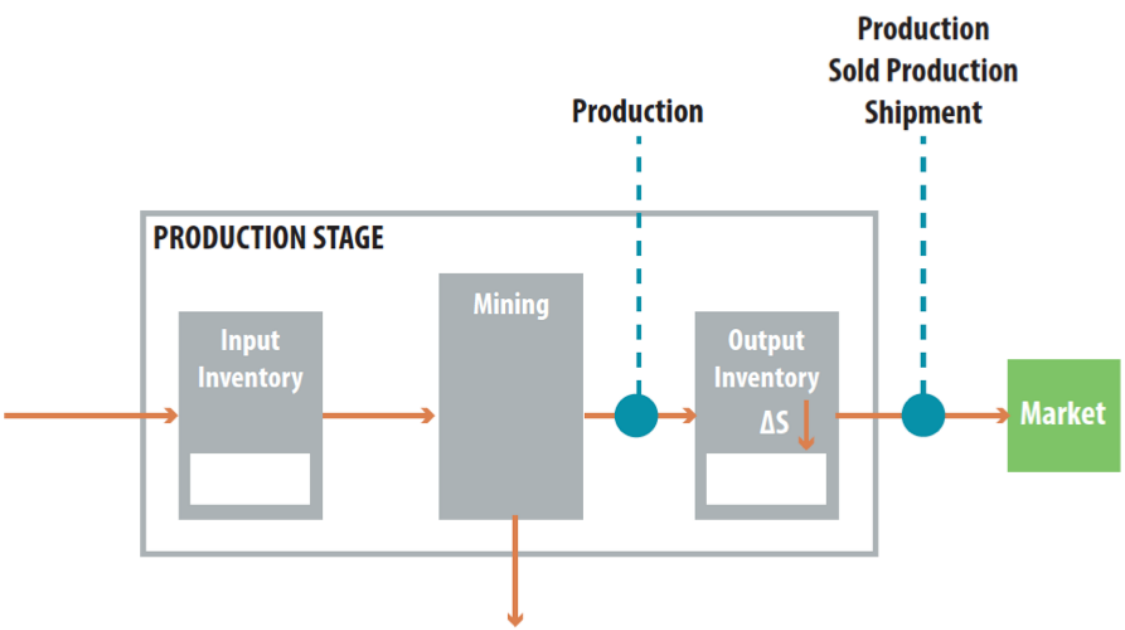
This project has recieved funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 730330.

Production vs. shipment

Inconsistency/challenge

The terms “production”, “shipment”, and “sold production” are used inconsistently.
→ This can lead to inconsistent accounting for inventory changes.

Design principle



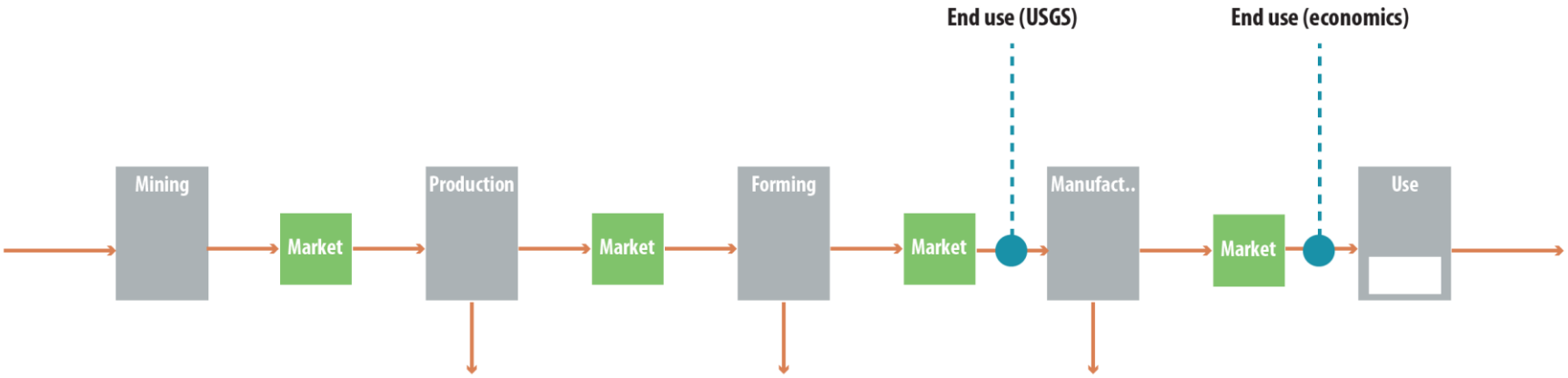
End Use

Inconsistency/challenge

The term “end use” is relative and has different meanings for different sectors.

→ Wrongly interpreting the end use statistics can result in inconsistencies throughout the material cycles.

Design principle



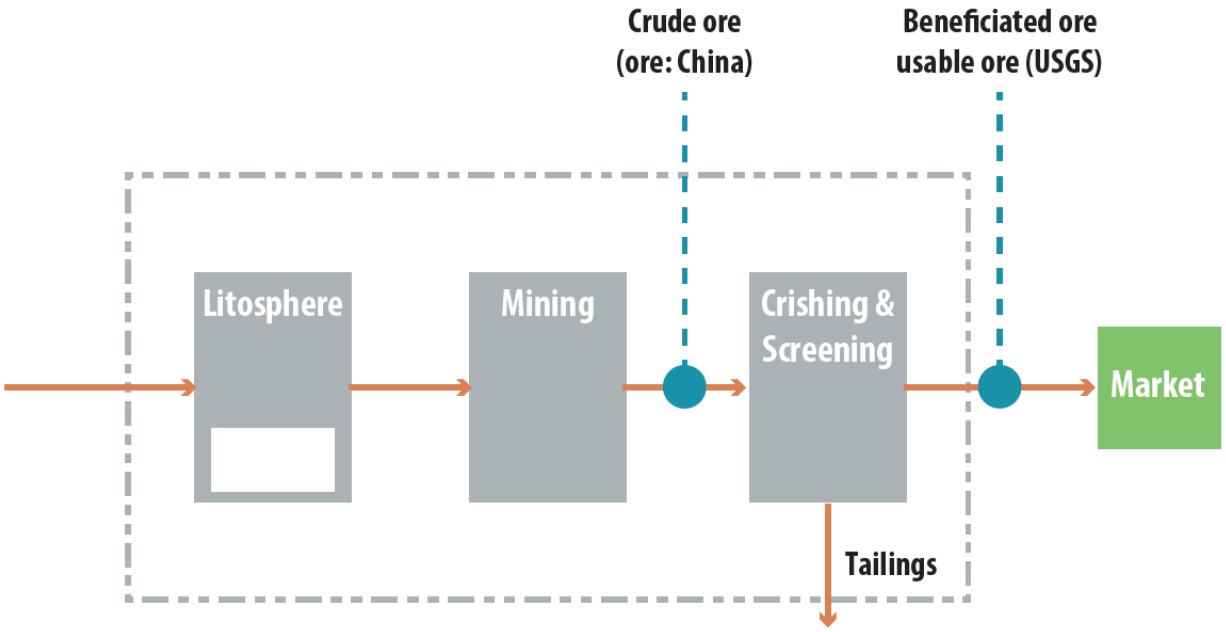
Ore

Inconsistency/challenge

"Ore" can mean "crude ore" or "beneficiated ore" / "concentrate".

→ Confusing the two can result in accounting errors at the magnitude of the tailings.

Design principle



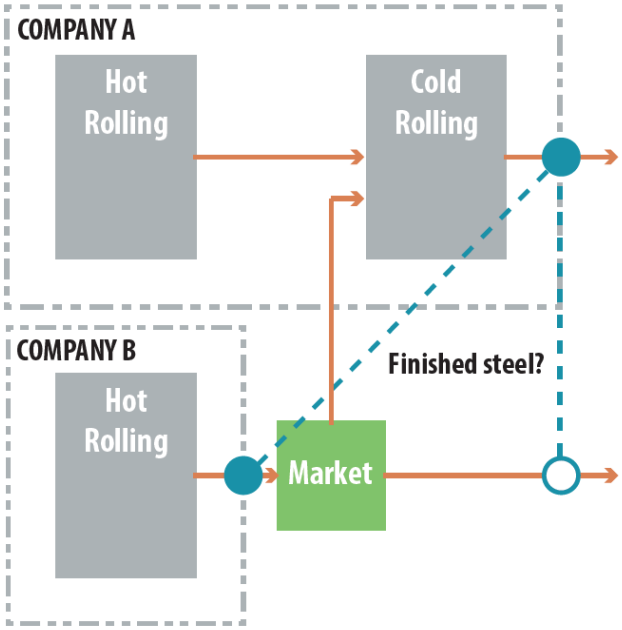
Finished products

Inconsistency/challenge

The term “finished products” can include products from different production stages. It can be interpreted as the sum of the production of all companies or as the total of finished products in a country or globally.

→ Interpreting the numbers wrongly results in double counting to the extent of domestic exchange of intermediate products.

Design principle



Example: finished steel

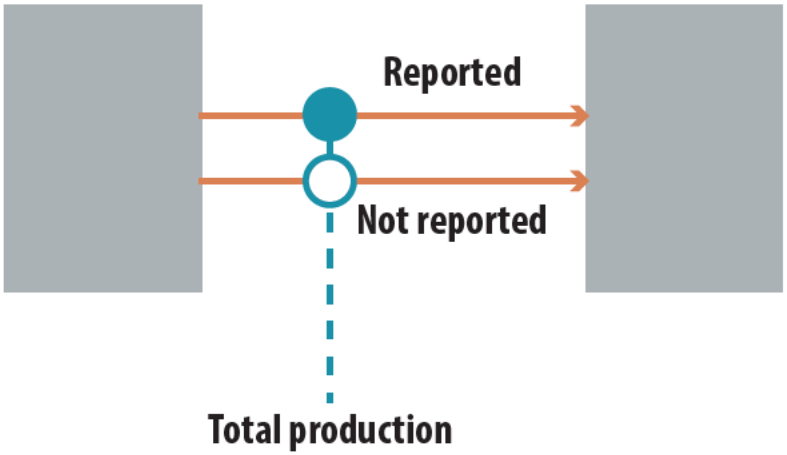
Incomplete reporting

Inconsistency/challenge

Not all companies may report their production data to the government agency due to different reporting requirements. It is often not transparent whether “production” numbers published by the government agency refer to the reported production only, or whether they include an estimate of the not reported production.

→ The difference between reported production and total production can be large.

Design principle



Domestic shipment

Inconsistency/challenge

The term “domestic shipment” is not visible in MFAs that use markets. Domestic shipment, production, import, export, and apparent consumption are all related with each other through mass balances.

→ The conversion formulas provided below only hold under the assumption of no stock change in the markets.

Design principle