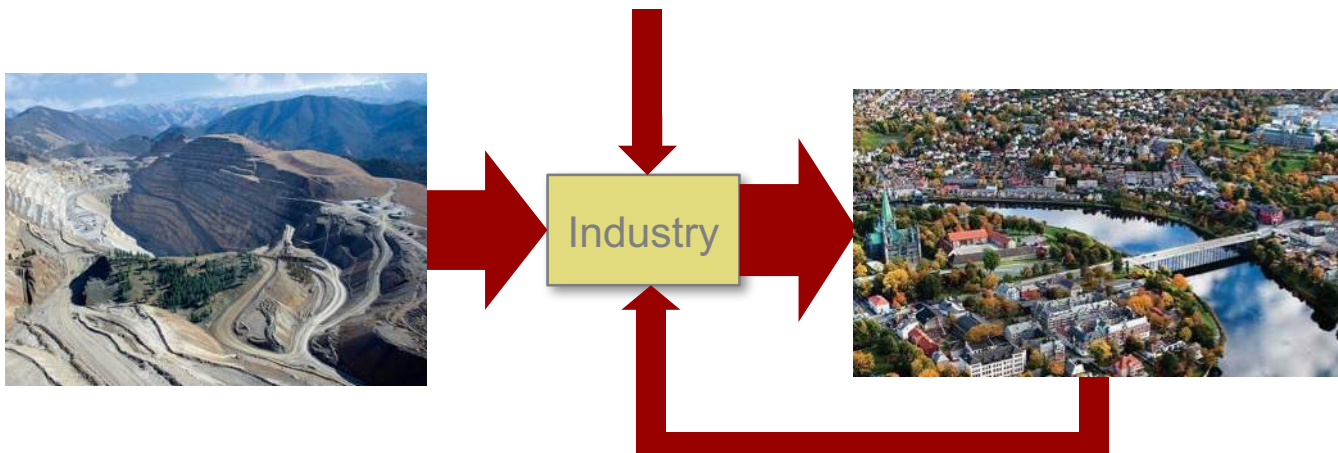


Introduction to MinFuture

Daniel B. Müller



MinFuture project

Challenge

- Proposals to solve many of today's big challenges ask for a **restructuring** of the physical economy → **Circular Economy (?)**
- However, **poor understanding** of the current physical economy
- Consequence: **Lack of robust tools** to inform strategies



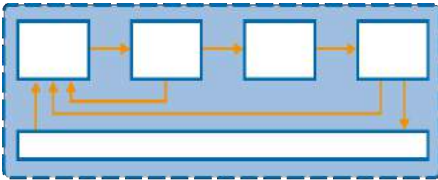
World map from 1565

Objectives

- Develop a proof of concept for a “**Google Maps**” of the **physical economy** in 4 dimensions
- Involve governments and industry in the development of a **common framework**
- Develop a **recommendations** for the monitoring of the physical economy

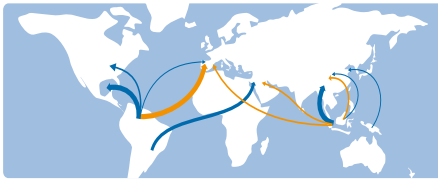


4 dimensions of the physical economy that need further exploration



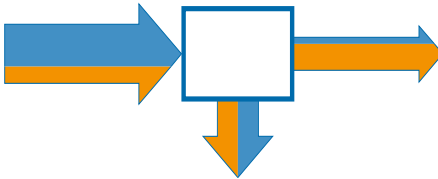
1. Stages

Track material stocks and flows along the supply chain



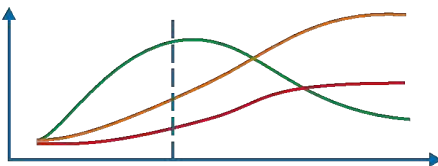
2. Trade

Track material stocks and flows in international trade of goods along the supply chain



3. Layers

Track individual components of goods and their linkages (materials, energy, value)



4. Time

Historical development and future scenarios

Hypotheses about the monitoring of the physical economy

1. It is **technically feasible** on any scale
(company, country, sector, global...)
2. Companies and governments would **benefit**
from monitoring their own systems and from sharing data
→ Initial investment, but long-term saving
3. It requires a **collaborative effort**
(companies, countries, international institutions...)

7 components of material flow analysis (MFA)



Hierarchical structure

→ Robustness of each level depends on robustness of lower levels

MinFuture

- Guidelines for components
- Case studies
- Quantification of component robustness for materials
- Recommendations

Initial recommendations

1. Monitor systems / report data with system context (4D)

- Company level: physical accounting alongside financial accounting
→ Improve resource efficiency, simplify reporting
- National level: consistent aggregation of company-level data
→ National resource strategies, simplify reporting
- International level: consistent aggregation of national data
→ Facilitate data harmonization
→ Harmonize production and trade data

2. Facilitate finding, sharing, and using data

- Technical: standards for data structure
→ define system context (“coordinates”) of data
→ allows for centralized or decentralized databases
- Legal: extend / complement INSPIRE Directive (EU)
- Institutional: International Materials Agency (IMA, analog to IEA)?
Link to UN Statistics / WCO?

MinFuture consortium

Partners



CHARLES UNIVERSITY



Advisory Board

Magnus Ericsson, Luleå UoT

Nedal Nassar, USGS

Christian Hagelüken, Umicore

Johannes Drielsma, Euromines

Stefan Bringezu, WI

Karen Hanghøj, KIC EIT RM

Ronald Jansen, UN Statistics

Sigurd Heiberg, Petronavit AS

Constantin Ciupagea, JRC