Welcome and introduction

Consortium meeting, Brussels 6.11.2018

Daniel Müller

11/6/2018

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.

Agenda

09:30 Registration and coffee
10:00 Welcome
- Welcome address Marcin Sadowski, EASME

10:30 Introduction to MinFuture
- Framework (Daniel Müller)
- Initial recommendations (Evi Petavratzi)

12:00 Lunch
13:00 Existing initiatives for monitoring the physical economy (Martin H.-Gabers)
- EU: EW-MFA & MSA (Monika Dittrich)
- US: Tracking RMs through the economy (Priscilla Holloran)

14:00 Break
14:30 Data infrastructure for monitoring the physical economy (Martin H.-Gabers)
- JRC perspective (Dominic Wittmer)
- DG-GROW perspective (Patrice Millet)

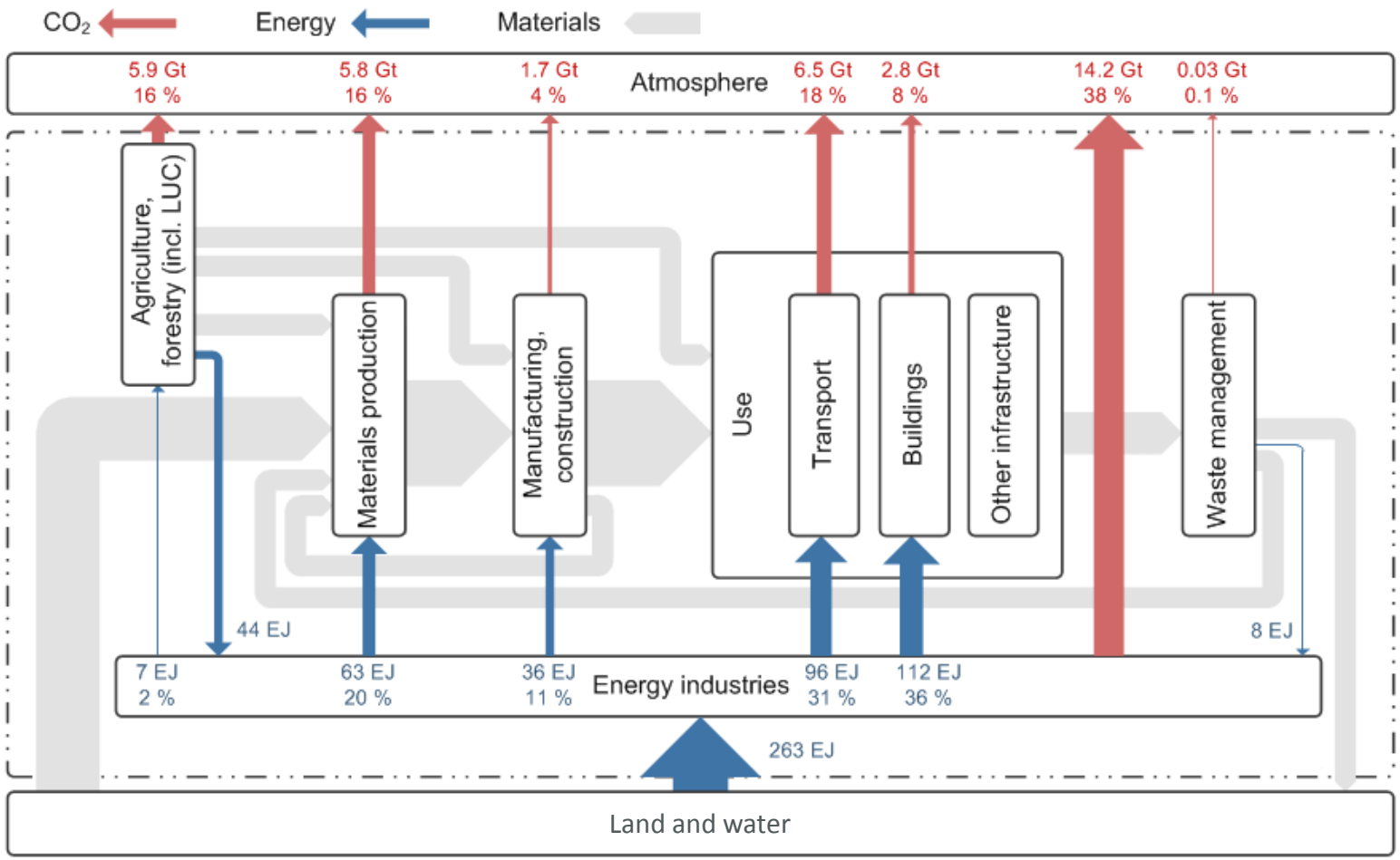
15:30 Break
16:00 Institutional needs for monitoring the physical economy (Martin H.-Gabers)
- EU level (Karen Hanghøj, Araceli Fernandez Pales)
- Global level (Sigurd Heiberg, Saleem Ali)

17:00 Way forward
17:30 End

MinFuture - overview

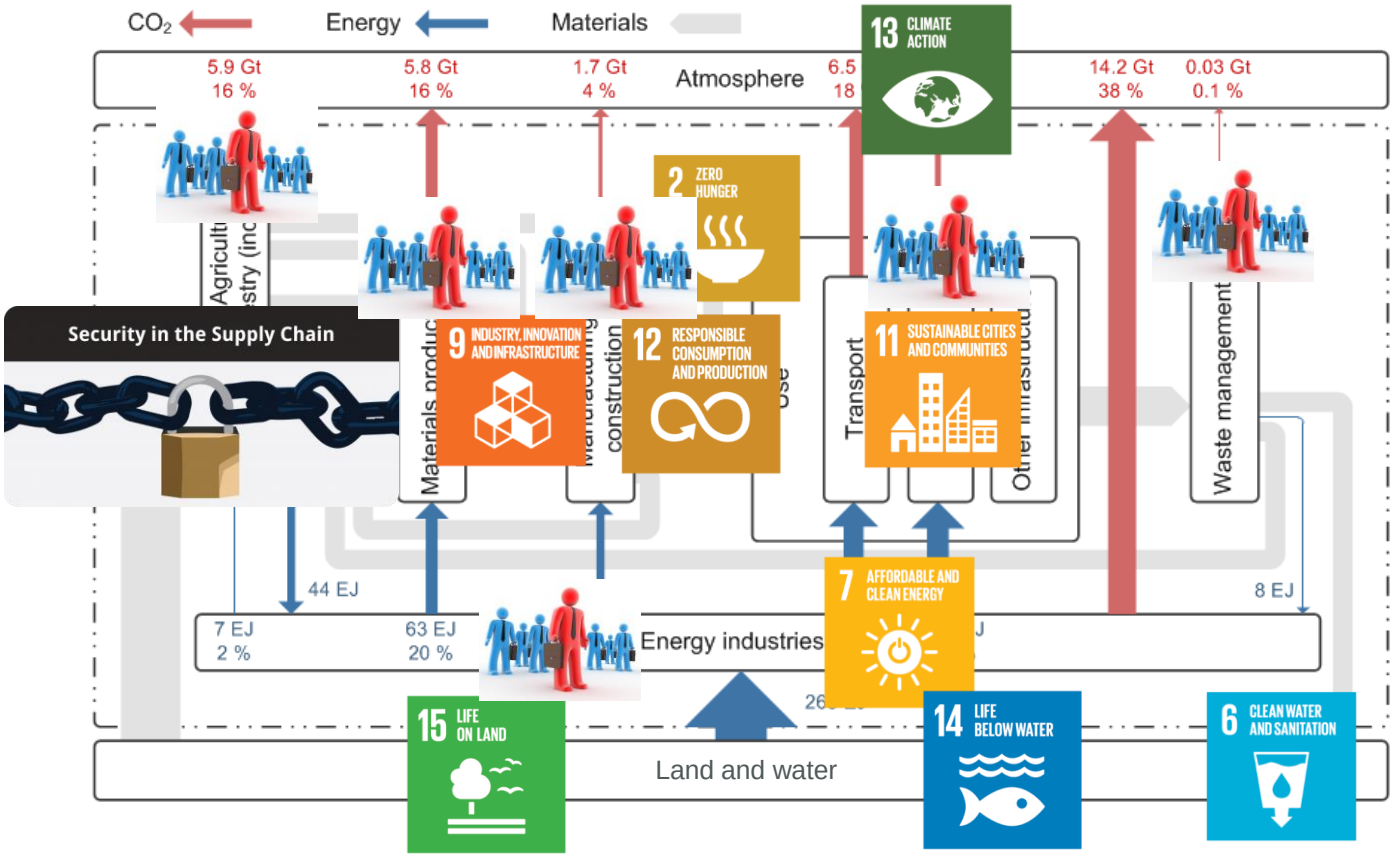
- H2020 CSA project
- Topic: SC5-2016-2017 – Raw materials international cooperation
- Period: 1.12.2016 – 30.11.2018
- EU contribution: EUR 999’710.-

Physical economy



Müller et al. 2013

Physical economy and SDGs



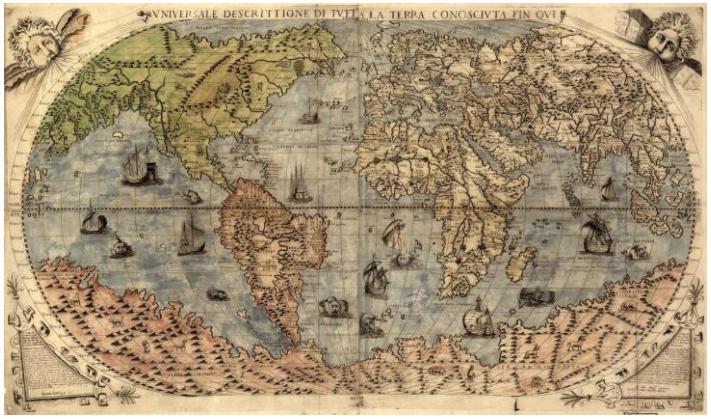
Müller et al. 2013

System understanding of the physical economy is important to address SDG's and other goals (supply security, circular economy, jobs) most effectively

MinFuture: Challenges and objectives

Challenge

- Solve many of today's big challenges require a **restructuring** of the physical economy
- However, **poor understanding** of the current physical economy
- Consequence: **Lack of robust tools** to inform strategies

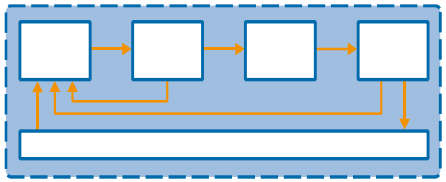


World map from 1565

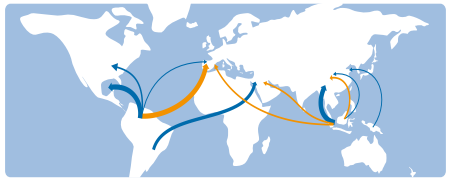
Objectives

- Develop a <u>proof of concept</u> 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

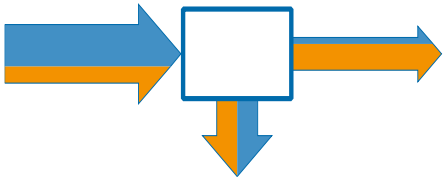
4 dimensions of the physical economy



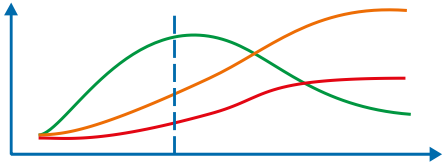
1. **Stages**
   Track material stocks and flows along the supply chain



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

Challenges for monitoring the physical economy

- Purpose of current monitoring and reporting is NOT a monitoring of the physical economy
- Monitoring of isolated flows, not systems
- Large data gaps, often high uncertainties
- Fragmentation of data (by country, sector, production vs. trade…)
- Location (system context, reference points) of the measured flows is not reported → wrong use / interpretation of data
- Data sharing is not encouraged (confidentiality, time consuming)

→ Current monitoring is inefficient and not fit for the purpose

MinFuture framework

Hierarchical structure

→ Robustness of each level depends on robustness of lower levels

MinFuture

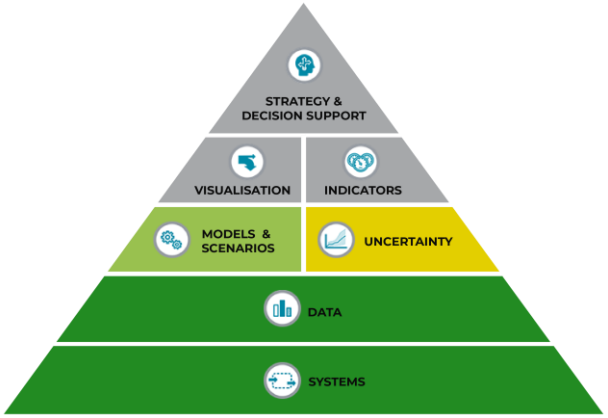
- Guidelines for components
- Case studies
- Quantification of component robustness for materials
- Recommendations for monitoring the PE

Testing of the framework – robustness for individual materials

Approach

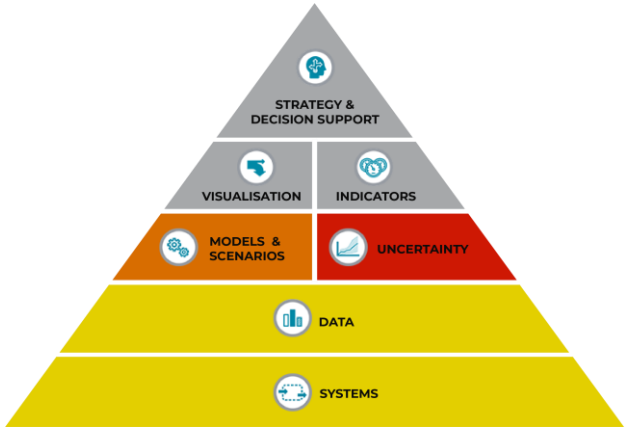
1. Defined criteria for the robustness of all components (in 4 dimensions)
2. Assessed published studies on selected materials using the criteria (1.)
3. Visualized the results of (2.) in the pyramid

Aluminium



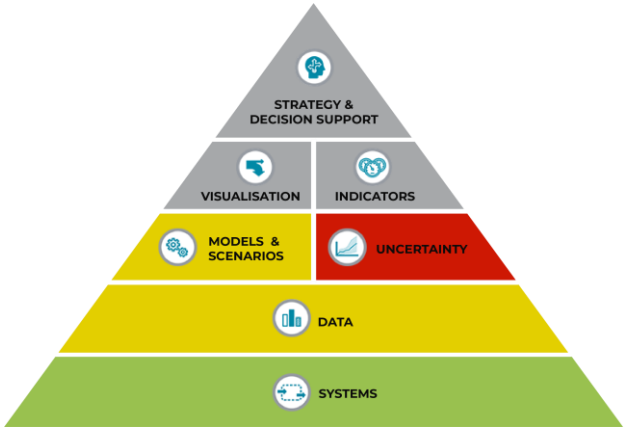
26 studies assessed

Lithium



4 studies assessed

Cobalt



10 studies assessed

Hypotheses about the monitoring of the PE

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…)

MinFuture consortium

Partners

NTNU
Norwegian University of Science and Technology

UNIVERSITY OF CAMBRIDGE

RITSUMEIKAN UNIVERSITY

UNIVERSITY OF SOUTHERN DENMARK

Massachusetts Institute of Technology

TU WIEN
TECHNISCHE UNIVERSITÄT WIEN

CHARLES UNIVERSITY

CSIRO

NERC SCIENCE OF THE ENVIRONMENT

UAB
Universitat Autònoma de Barcelona

eco logic

ifeu
INSTITUT FÜR ENERGIE- UND UMWELTFORSCHUNG HEIDELBERG

bio Intelligence Service

MinPol GmbH

NORGES GEOLOGISKE UNDERSØKELSE
- NGU -

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

Way forward

Recommendations for EU projects (H2020 / GeoERA / EIT-RM)

- Geological stocks
- Anthropogenic stocks
- Physical accounting in companies

Recommendations for expert groups

- Amendments of trade and production classification systems
- Data infrastructure – link to INSPIRE Directive
  → company, national, EU, and global levels
- Institutional solutions for material accounting (IMA?)
  → national, EU, and global levels

→ Identify key stakeholders and communication means
→ Develop policy and business briefs