



MinFuture

Work Package 5

A roadmap towards monitoring the physical economy

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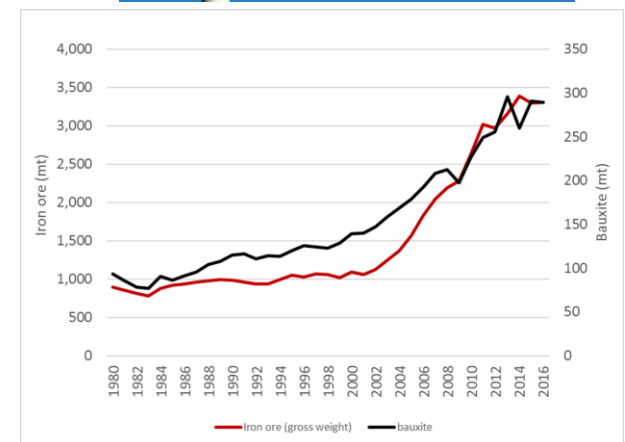
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Introduction and Rationale



Many challenges that require understanding of material cycles

- Complex material cycles influenced by many factors
- Global challenges e.g. sustainable development, climate change
- Increased demand for mineral raw materials
- Global political fragmentation



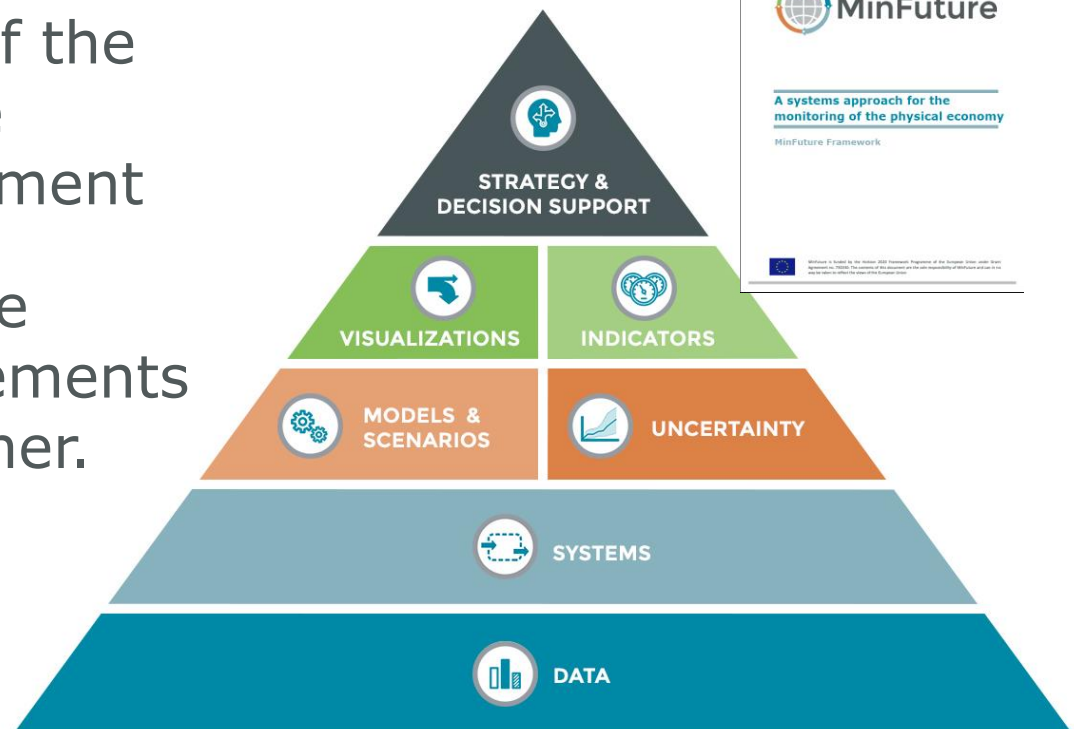
Demand for monitoring of the physical economy

The MinFuture Framework



The MinFuture pyramid provides the framework.

- Dedicated sections of the different parts of the pyramid in this document
- Demonstrate how the different pyramid elements are connected together.





Roadmap structure

Purpose

- to identify challenges with physical accounting
- to provide recommendations to address the challenges
- to discuss future steps to implementation

Section 2: Physical accounting (challenges and recommendations)

- Geological resources
- Production & Trade
- In-use stocks
- Companies
- Governments

Section 3: Implementation of physical accounting (recommendations)

- Institutions
- Legal changes
- Education and training
- Data infrastructure
- Financial support

Physical accounting: Geological Stocks

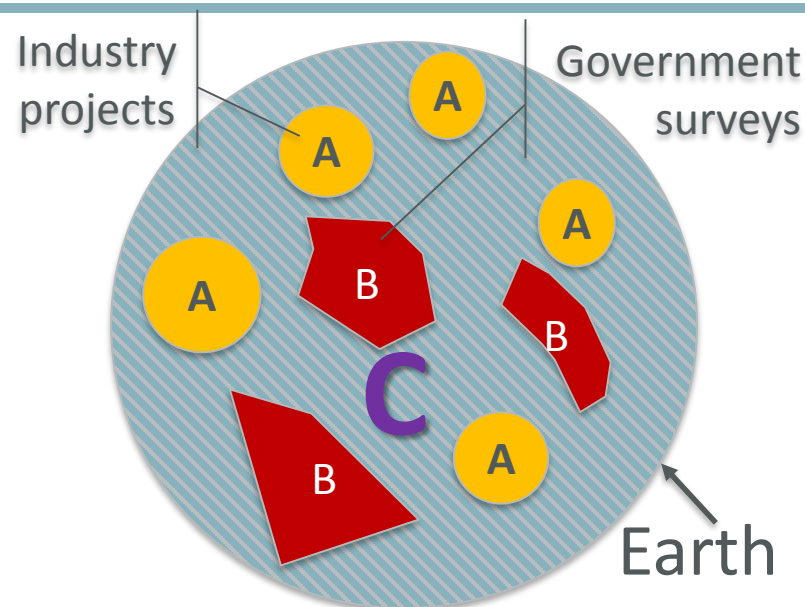


Goal:

Reliable data of geological stocks

Challenges:

- Lack of a framework for mass-balance-consistent figures of geological stocks
- Lack of robust data
- Insufficient understanding of mineral resources and reserves
- Lack of harmonisation and interoperability procedures



$$\textit{Geological stock} = \Sigma A + \Sigma B + C$$

Recommendations

- Framework development for physical accounting of geological stocks (e.g. new EU project)
- Development and improvement of 3D geological models

Physical accounting: Production and trade

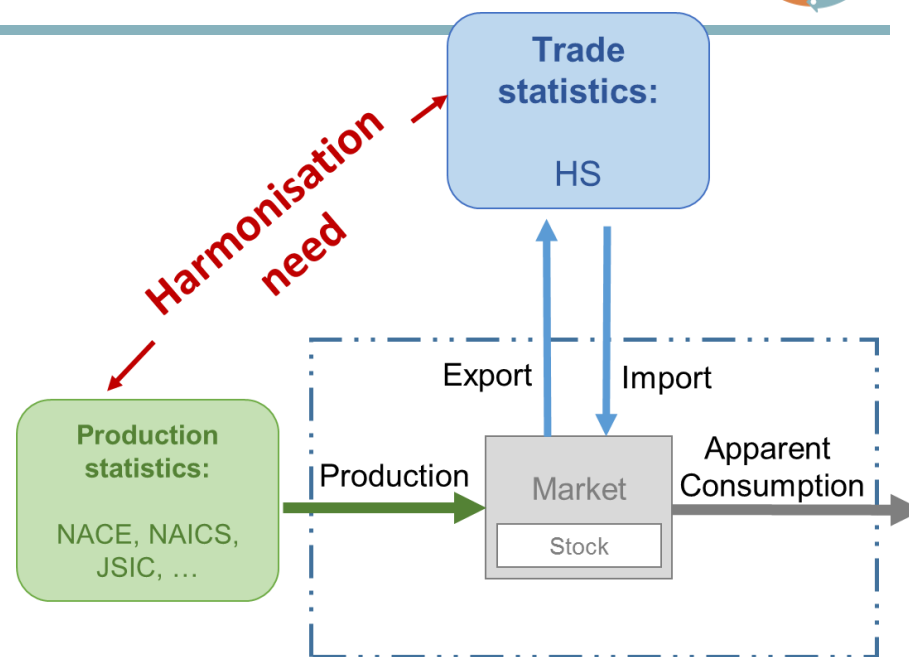


Goal:

Harmonised production and trade statistics

Challenges:

- Lack of consistent classification systems for production and trade statistics
- Lack of cross-collaboration between different data providers of production and trade data to promote harmonisation



Recommendations

- expert group working on the harmonisation of production and trade statistics
- amendments to trade and production classification systems, good metadata, training

Physical accounting: Anthropogenic stocks



Goal:

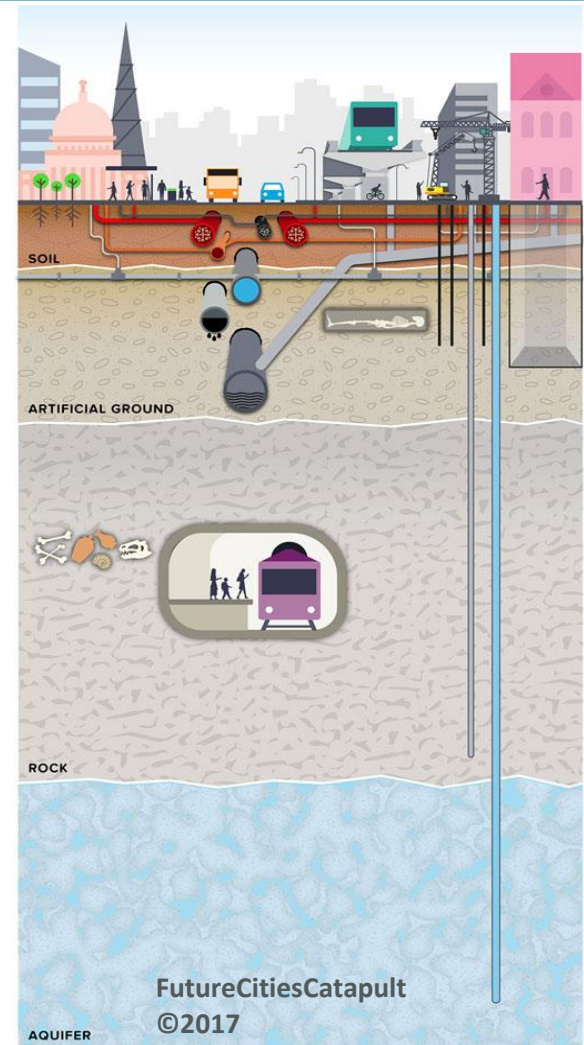
Reliable data of in-use stocks

Challenges:

- Lack of a framework for consistent assessment of in-use stocks
- Lack of robust data
- Lack of harmonisation and interoperability procedures

Recommendations

- Development of framework for physical accounting of in-use stocks (e.g new EU project)
- New data and models for in-use stocks
- Harmonisation and interoperability
- Address the role of stakeholders



Physical accounting: Companies

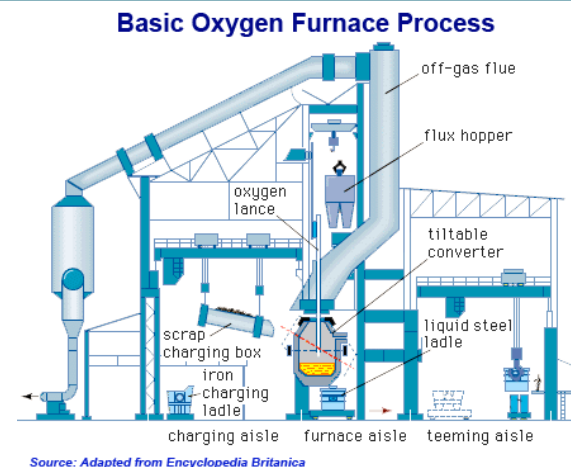


Goal:

Optimise resource efficiency and reduce emissions

Challenges:

- Analysis of process interactions between resources and energy. New methods and metrics
- Company confidentiality rules inhibit access to resource data



Recommendations

- Use of real-time data from process control systems for resource efficiency (new EU project)
- Integrate data from companies to monitor resource efficiency (country level)
- Modify climate change actions (EU ETS) to account for emission reductions from resource efficiency
- Influence the work of UN Resource Panel, IEA, G20, OECD on resource efficiency

Physical accounting: Governments



Goal:

Official monitoring of the physical economy at country level

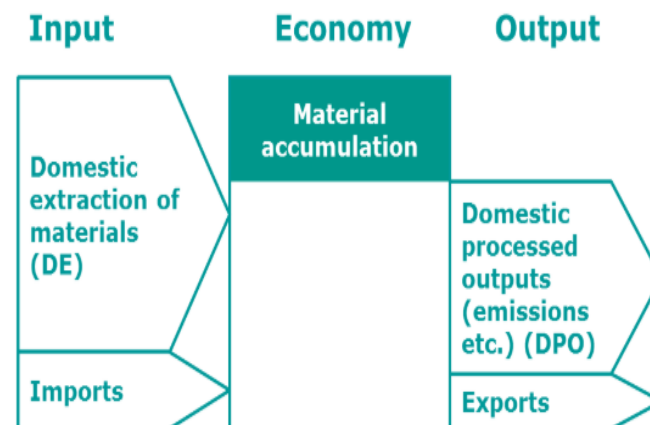
Challenges:

- Existing official monitoring is based on EW-MFA, but resolution is not sufficient
- Focus on monetary economy
- Integration of activities from different organisation

Recommendations

Improve current monitoring systems with:

- more detailed resolution of materials
- use hybrid physical-monetary models to fill any gaps and improve materials data
- coordination of activities of different national authorities



Implementation of physical accounting: Institutions



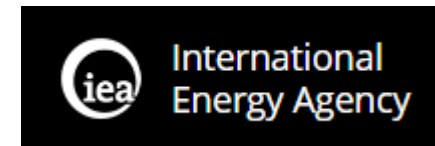
Goal:

Monitoring the physical economy as a whole (materials, environment, economic activities & local, national, global levels)



Challenges:

- Integration of activities from different organisation (statistics offices, environment agencies, customs offices)
- Integration of data, information, models from local and national to global levels



Recommendations

Establishment of a high-level working group exploring the integration of data, information and models to address global challenges

- EU working group?
- International working group?

Implementation of physical accounting: Legal changes



Goal:

Policy support for the development of harmonised and interoperable procedures for physical accounting

Challenges:

- EU level: lack of legislation for detailed tracking of physical flows and data collection procedures that promote harmonisation and interoperability
- National level: mineral policy does not encourage data collection with a system perspective; data collection is not coordinated

Recommendations

- New EU Communication (COM) on the importance of improving the accounting of the physical economy for better policy development
- An amendment of the EU INSPIRE or new EU Directive for monitoring the physical economy
- National policies and strategies should provide incentives to collect data with a systems perspective

Implementation of physical accounting: Education and training

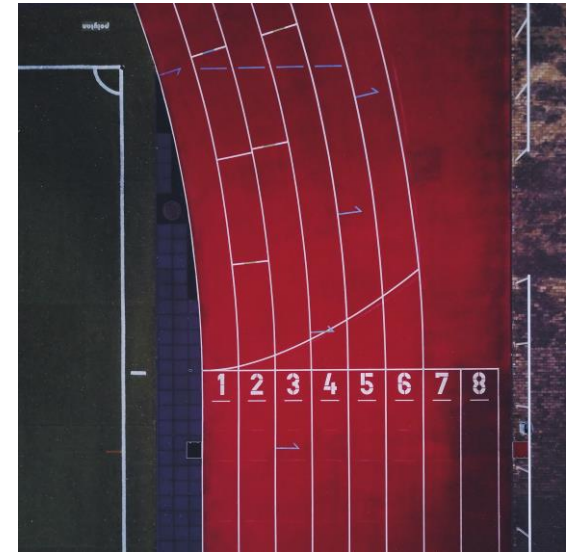


Goal:

Skilled personnel that can deliver physical accounts in a systematic manner.

Challenges:

- Training only through limited academic courses
- Lack of professional training to assist companies and public authorities
- Several organisations and personnel will required access to training and support – new funds, tools, procedures are needed.



Recommendations

- Tailored training to support public authorities, industry
- MFA community essential in delivering training
- Investment from national governments and the EU for training and support

Implementation of physical accounting: Data infrastructure



Goal:

Data infrastructure to support physical accounting

Challenges:

- Lack of systematic data collection procedures
- Harmonisation of data on single stages of the supply chain only
- Lack of sufficient metadata and recording procedures



Recommendations

A high-level expert group with the role to:

- Develop procedures for reporting metadata in a system context
- Develop technical guidelines and implementation rules for interoperability
- Provide recommendation on the development and maintenance of databases
- Advice towards options to centralise databases or keep in decentralised form

Implementation of physical accounting: Financial support

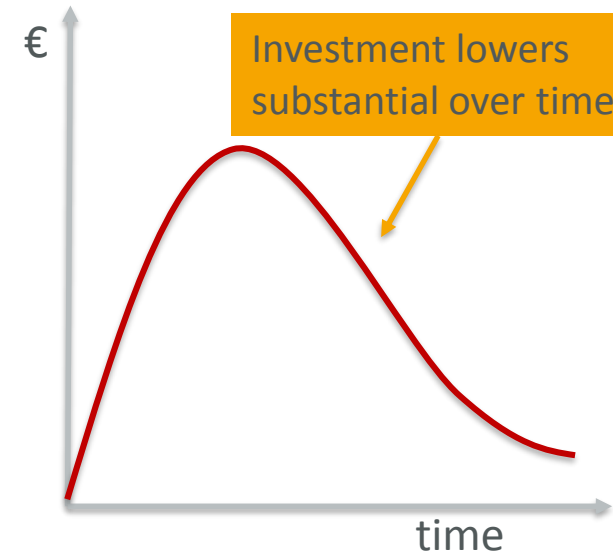


Goal:

Financial support to implement the monitoring of the physical economy

Challenges:

- Funding for developing systems, data, data infrastructure, training etc for all stakeholders
- Evidence to justify that the move to physical monitoring is an investment not an expense.



Recommendations

- Substantial investment will be required at the beginning of the process, which is expected to lower as time progresses and systems, data and data infrastructure are in place.
- Cost benefit analysis project to provide evidence for the level of investment needed and the benefits in the long term.

Conclusions



- MinFuture Roadmap with concise recommendations for future projects and policy needs.
- Feedback from our final event will shape the final document.
- Draft updated document will be circulated for final round of comments in November.
- Final submission due at the end of November.



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THANK YOU