WORK PACKAGE 4

Progress report september 2016

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28 september 2016

- Objectives of WP4:

Inventory and Assessment of Tools and Methods for providing Expertise to Stakeholders on Mineral Intelligence

- Two starting points:
  - What do stakeholders want to know?
  - What tools and methods are available?

- Planning WP4

- D4.1 Factsheets methods / tools: month 10

- D4.2 Methods/tools and stakeholder questions: month 14

- D4.3 Case study reports: month 22

- D4.4 Recommendations for stakeholders: month 24

- What tools and methods are available?

- Overview in WP4.1, to be described in fact sheets
  - Main characteristics
  - Range of relevant applications
  - System boundaries
  - Data needs, data
  - Model used (if any)

- Classification in proposal: methods to
  - Identify and asses geological and urban mines
  - Assess society's metabolism and environmental impacts
  - Assess economic aspects
  - Forecast or estimate future resource supply and use

- List of methods consolidated in WP4 team

Methods to identify and assess geological and anthropogenic (urban) stocks
Responsible WP4 partner: BGS
Geological mapping
Remote sensing, e.g. regional geophysics
Geochemical analysis, regional and local scale
Ground investigation, including drilling (boreholes), trial pits, trenching, etc.
Resource estimation, including: a) For primary minerals – 3D models, deposit modelling, deposit assessment (feasibility studies), etc. b) For secondary raw materials – compositional analysis of various stocks, e.g. municipal waste, mining waste, manufacturing stocks, etc.
Measuring input and output of industrial processes

- List of methods consolidated in WP4 team

Methods to assess society's metabolism and its environmental impacts
Responsible WP4 partner: CML
Material flow accounting
Material flow analysis and substance flow analysis: accounting, static modelling and dynamic modelling
Life cycle assessment, including attributional and consequential LCA, and including Life Cycle Sustainability Analysis
Environmentally extended Input Output Analysis
Risk Assessment, including Environmental Risk Assessment
Footprinting at micro- meso- and macro-level

- **List of methods consolidated in WP4 team**

Methods to assess the economic aspects of the use of resources
Responsible WP4 partner: UCL-ISR
Cost Benefit Analysis
Life cycle costing
Input output analysis
Criticality assessment, including Herfindahl-Hirschmann-Index or other measures for producer country concentration, and World Governance Indicators, Failed States Index or other measures for stability
Econometrics, includes causality tests and instrumental variables as well as time series analysis, structural Vector Autoregression models, dynamic and heterogeneous panel models , Bayesian Networks, Structural Equation Modelling
Computable Equilibrium Modelling; includes General Equilibrium Modelling and Dynamic stochastic general equilibrium (DSGE) modelling

- ## List of methods consolidated in WP4 team

Methods to forecast or estimate future use of resources
Responsible partner: joint WP4 / WP5 responsibility (CML / MinPol)
Bottom up forecasting using dynamic MFA to specify demand projections and stock saturation per metal application, adding up to a total per metal
Top-down forecasting • Identify trends based on the assumption that the future is a continuation of the past. Based on regression analysis or probabilistic methods • applying statistical and mathematical models to data from the present and the past (time-series analysis) to make projections for the future. Based on regression analysis or probabilistic methods • Extrapolate historical data into the future, whilst systematically examining the effects of possible future events that may affect the trend that is extrapolated
Forecasting based on the Cobweb theorem: a discontinuous adjustment on the supply side and an instantaneous reaction to price changes on the side of demand using a System Dynamics model and introducing delay functions
Backcasting: using a quantitative target for the future as a starting point and specify what is needed to get there in a quantitative, often technological sense

- D4.1 due end of september

- Fact sheets economic methods still incomplete

- Will be slightly delayed: end of october

- D4.2: Mapping methods on stakeholder questions

- Joint stakeholder / expert workshop of 27 september provides very important input

- D4.2 due at the end of January 2017

- No delay expected

- D4.3: Case studies

- First meeting yesterday, path laid out

- Purpose: show use of methods, from stakeholder question all the way to answer

- Agreed on case studies using the following methods:
  - Material Flow Analysis
  - Life Cycle (Sustainability) Analysis
  - Top down forecasting
  - Economic equilibrium modelling
  - Criticality assessment
  - Urban mining inventory
  - Uncertainty analysis

- D4.3 due end of November 2017, no delay expected.

THANKS FOR YOUR ATTENTION

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