Compiling and Refining Environmental and Economic Accounts (CREEA) – towards a global Material/Energy/Economic MR EE SUT

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The EU funds a major project in the field of environmental accounts. The main goal of this so-called CREEA project is to
• refine and elaborate economic and environmental accounting principles as discussed in the London Group and consolidated in the future SEEA 2012,
• to test them in practical data gathering, to troubleshoot and refine approaches, and
• show added value of having such harmonized data available via case studies.

This will be done in the priority areas. waste and resources, water, forest and climate change / Kyoto accounting. Data gathered in CREEA will be consolidated in the form of Environmentally Extended Supply and Use tables (EE SUT) and update EXIOBASE. CREEA will produce a global Multi-Regional EE SUT (MR EE SUT) with a unique detail of over 160 sectors and products, 40 emissions, 80 resources, and 43 countries plus a rest of world. Base year will be 2007. A unique contribution of CREEA is that also an MR EE SUT in physical (mass) and energy (MJ) terms will be created. In this way, the project will develop a unique global database allowing for various systemic analysis of relations between economic activity and environmental impacts that includes all trade-offs at global level. Data sets will be harmonized, using work and experiences from major previous projects (most notably EXIOPOL, FORWAST and a series of EUROSTAT projects in Environmental Accounting).

The presentation will explain the methodological approach. In essence the project does the following:
• Harmonizing economic data. From the 43 main economies in the world, covering 95% of the global GDP, economic supply- and use tables or input-output tables are sourced. These must be harmonized and detailed. To this end, additional and more detailed data on total product output and industry turnover by country are gathered. Also, at a more detailed level input- and output co-efficients by industry are estimated (e.g. by using Life cycle inventory database, data from similar countries, or engineering knowledge). An advanced detailing program developed in CREEA harmonizes all this information and calculates for each country a harmonized, detailed SUT including valuation layers that is consistent with the original SUT.
• Constructing physical and energy SUT, including emissions and resource extraction. For energy, the IEA energy database is used as a basis. IEA energy products have been harmonized with the CREEA classification. The IEA industry structure is very different as of most economic SUT/IOT and is transformed to the CREEA classification using a similar method as used for detailing the economic SUT/IOT. Physical data on resource extraction and product flows are sourced or estimated in various ways, e.g. using FAOSTAT, PRODCOM, physical trade databases, or estimating mass via price data and run through an optimization routine to ensure full consistent

mass balances. This then allows for each industry sector in each country estimating:

o Total material and energy input (primary resources, intermediate products)

o Total mass of product output (including energy as feedstock)

o Losses in the form of

 Emissions (calculated using validated emission factors from e.g. IPCC with activity variables such as energy use and material throughput):

 Wasted heat

 Unused material output (e.g. various forms of waste). These waste data over different sectors are added up by type and their destination is estimated as well (recycling activities, landfill and various waste processes including incineration

• Adding land use and water use by economic sector, including land use change (e.g. via FAOSTAT and AQUASTAT)

• Linking the so produced Environmentally Extended Material/Energy/Economic SUT via trade. For this we use a version of UN COMTRADE in which bilateral trade is harmonized between countries (i.e. reported imports are identical to the reported export by the exporting country) and expressed both in value as mass per product. Imports and exports in the SUT are split up by country of origin and destination using trade shares, and then harmonized via an optimization program developed in the project.

The CREEA partnership consists of: TNO, IPTS, CML, CBS, NTNU, SCB, TUT, ETH, 2.-0 LCA, WI, SERI and EFI