EXIOMOD world-wide dynamic CGE model

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- EXIOMOD is a large scale and highly detailed world model built on the detailed environmentally-extended database EXIOBASE. It is a macro-economic 'computable general equilibrium' (CGE) model that divides the global economy in 44 countries and a Rest of World, and 164 industry sectors per country.

- Computable General Equilibrium (CGE) models (and in particular EXIOMOD) are the class of simulation tools that use large datasets of real economic data in combination with complex computational algorithms in order to assess how the economy reacts to changes in governmental policy, technology, availability of resources and other external macro-economic factors.

- EXIOMOD model consists of (1) the system of non-linear equations, which describes the behaviour of various economic actors and (2) very detailed database of economic, trade, environmental and physical data. The core part of the model database is the Social Accounting Matrix, which represents in a consistent way all annual economic transactions.

EXIOMOD combines economic, environmental and social domains in an efficient and flexible way:

- Social effects: includes the representation of three education levels, 28 occupation types, gender and households grouped into five income classes. One can trace the effects of specific policy on income redistribution and unemployment.

- Economic effects: the model captures both direct and indirect (wide-economic and rebound) effects of policy measures. EXIOMOD allows for calculation of detailed sectoral impacts at the level of 164 economic sectors and 200 goods/services markets.

- Environmental effects: the model includes representation of 28 types GHG and non-GHG emissions, different types of waste, land use (15 types) and use of material resources (171 types).

N	Element of EXIOMOD	Dimension	Main outputs
1	Households	Five income quintiles	Consumption of goods and services, expenditures, incomes and savings
2	Firms	Grouped into 164 types of sectors	Outputs, value added, use of factors of production and intermediate inputs, investments and capital stock
3	Governments	Federal governments	Governmental revenues and expenditures by type including main taxes and subsidies, social transfers to households, unemployment benefits
4	Markets for factors of production	Three education levels, gender, 28 occupation types, 171 types of natural resources including land, water, materials, biomass and energy	Wages, unemployment levels, natural resource rents, return to capital, supply of and demand for factors of production

5	Markets for goods and services	200 types of goods and services	Prices of goods and services, supply of and demand for goods and services
6	International trade	44 countries and five Rest-of-the-World regions, 200 types of goods and services	Trade flows of goods and services between the countries, use of international transport services
7	Savings and investments	National investment bank	Total savings, depreciation, new investments and change in sector-specific capital stock
8	Use of materials	80 types of physical materials	Use of materials by each of 129 production sectors and their extraction
9	Generation of emissions	29 types of GHG and non-GHG emissions	Emissions associated with energy use, emissions associated with households' consumption and emissions associated with general production process
10	Waste and recycling	Various types of waste treatment and recycling by type of material	Representation of waste treatment and recycling sectors as a part of the economy

- **Demographic and productivity improvement scenarios** The "2012 Ageing Report: Economic and budgetary projections for the 27 EU Member States (2010-2060), European Economy 2|2012". CEPII growth projections from the 'The Great Shift: Macroeconomic projections for the world economy at the 2050 horizon'

- **Mitigation impacts and energy mix** The World Energy outlook 2050 study of European Commission study has developed a reference projection of the world energy system for a carbon constraint case. For EU we can also make use of EU reference scenario with PRIMES model.

- **Baseline scenario (A1B IPCC scenario) (3.4°C)** We use the IPCC A1B as a climate baseline scenario to project climate change damages. This scenario is the so-called 'medium-high non-mitigation baseline scenario'. The temperature projections are combined with the detailed damage estimates from DARA Climate Vulnerability Monitor 2012.