GTAP Consortium Agency Report Template

OECD Environment Directorate and Economics Department

1. **GTAP Model and Data Base Usage**

   The GTAP databases are important input for the OECD ENV-Linkages model, which is primarily hosted by of the Environment Directorate but – in a more compact version - is also used at Economics Departments.

   The GTAP database version 9.2 and 10.1 as well as GTAP's carbon emissions databases are one of a few database inputs into ENV-Linkages. The GTAP circular economy database is also being used for current projects.

   ENV-Linkages has been used to produce OECD reports, papers, country-specific economic surveys, country roadmaps for circular economy and documents with policy messages in support of policy makers. The ENV-Linkages model has been used to assess climate, plastics, circular economy and air pollution policies and, since this year, to provide support for country desk about climate mitigation of countries.

2. **Publications**

   - OECD (2022), *Global Plastics Outlook: Policy Scenarios to 2060*, OECD publishing, Paris, https://doi.org/10.1787/aa1edf33-en
   - Lanzi, E., et al. (2022), "The economic benefits of international co-operation to improve air quality in Northeast Asia: A focus on Japan, Korea and China", *OECD Environment Working Papers*, No. 197, OECD Publishing, Paris, https://doi.org/10.1787/5c5ee1a3-en.
   - Ostalé Valriberas, D., et al. (2023), "The economic consequences of air pollution policies in Arctic Council countries: A sectoral analysis", OECD Environment Working Papers, No. 212, OECD Publishing, Paris, https://doi.org/10.1787/19875eaf-en.
   - OECD (2023), *Net Zero+: Climate and Economic Resilience in a Changing World*, OECD Publishing, Paris, https://doi.org/10.1787/da477dda-en.
   - OECD (2023), *Towards a National Circular Economy Strategy for Hungary*, OECD Publishing, Paris, https://doi.org/10.1787/1178c379-en.

   Forthcoming publications
   - Borgonovi et al. (2023), "The effects of the EU Fit for 55 package on labour markets and the demand for skills", OECD Skills Working Paper, OECD Publishing, Paris.
   - OECD (2023), *Skills Outlook*, OECD Environment Working Paper, OECD Publishing, Paris.
   - Fouré et al. (2023), "Public finance resilience in the transition towards carbon neutrality: modelling policy instruments in a global net-zero emissions scenario", OECD Environment Working Paper, OECD Publishing, Paris.
   - OECD (2023), *A circular economy roadmap for Italy*, OECD Publishing, Paris.

- OECD (2023), *OECD Economic Surveys: European Union 2023*, OECD Publishing, Paris.
- OECD (2023), *OECD Economic Surveys: Italy 2023*, OECD Publishing, Paris.
- OECD (2023), *OECD Economic Surveys: Australia 2023*, OECD Publishing, Paris.
- OECD (2023), *OECD Economic Surveys: Thailand 2023*, OECD Publishing, Paris.

3. Projects

- ENV-Linkages model

    Plastics:
    - The ENV-Linkages model has been used to estimate current and projected amounts of plastic production, use, waste as well as environmental impacts related to the plastics lifecycle. Additionally, the model has been used to study the environmental benefits and economic consequences of policy scenarios that aim at increasing the circularity of plastics in the economy and at reducing the amounts of plastics that ends up in the environment. The outcome of the project consists in two "Global Plastic Outlook", published in 2022. These reports are based on a version of ENV-Linkages enhanced to take into account 14 different plastic polymer categories, attributed to 14 different applications. Plastics use is linked to the GTAP 10 Social Accounting Matrix, through the sectoral demand for the rpp plastic commodity, produced by primary and secondary technologies. Volumes of plastics are then used to calculate generated waste, based on product lifespans of different applications. The waste generated is further broken down by waste treatment, i.e. recycled (collected for recycling), incinerated, landfilled, mismanaged and littered waste.
    - Following the publication of the Global Plastics Outlook, the Environment Directorate is working on a Regional Plastics Outlook, which will provide a set of coherent projections on plastics to 2060 for Asian Plus Three (APT) countries. These countries (ASEAN, plus China, Japan and Korea) have arisen as a hotspot for plastic pollution, because of rising living standards, fast-paced urbanization and an infrastructure for waste management that is not yet equal to the needs. The methodology will be similar to the one used for the Global Plastics Outlook but with detailed results for the region and key countries. This entails a difficult data collection and matching to the GTAP database. The project is ongoing and to be finished in 2024.
    - Following the publication of the Global Plastics Outlook, the Environment Directorate is working on two additional plastic related projects, relying on the same methodology: (1) The international consequences of regional plastic policies: a modelling analysis will focus on understanding international effects when plastic policies differ in ambition across regions, with focus on the European Union; (2) Eliminating plastic leakage by 2040: a modelling analysis will study the socio-economic consequences of eliminating plastic leakage by 2040, in support of the plastic negotiations. These projects are ongoing and to be finished in 2024. The project on eliminating plastic leakage by 2040 will be developed with other modelling teams in close coordination with negotiators and it will serve as an input for the negotiations.

    Circular economy:
    - Additionally, the ENV-Linkages model has been used to contribute to a country specific project on the transition to a circular economy. A roadmap for Hungary has recently been published and we are currently working on circular economy policies in Italy. The project is ongoing and to be finished in 2023.

Climate change:

- The ENV-Linkages model has been used to produce a net-zero transition scenario. The policy scenario relies on the 2021 World Energy Outlook of the International Energy Agency. The model uses the GTAP 10 database as well as the GTAP 10 satellite emission database, which is used together with other emission sources (e.g. IEA). A report is close to publication (June 2023). The results from the report have also been used as input in the OECD flagship publication *Net Zero+: Climate and Economic Resilience in a Changing World*, which was recently published.

- We are working on a net-zero emission scenario for Korea, which aims at understanding the contribution of air pollution policies to the climate transition. For this project, the OECD ENV-Linkages model will use input from IIASA's GAINS model. The project is ongoing and to be finished in 2024.

- We are working on a net-zero emission scenario for Spain. For this project, ENV-Linkages has been calibrated to match Spain's baseline scenarios and to meet the policy targets specified by Spain. The project is ongoing and to be finished in 2024.

- We are working on a Fit-for-55 scenario to analyse the consequences of the policy package on the demand for skills. 20. For this project, the ENV-Linkages model has been enhanced to distinguish employment for five different job categories: (i) 'Professionals', (ii) 'Managers and officials', (iii) 'Service and sales workers', (iv) 'Clerical workers' and (iv) 'Blue collar and farm workers', following the ILO ISCO-88 classification (Walmsley and Carrico, 2019). The model results have then been matched to the Lightcast database to understand the distribution of skills across sectors and occupations. This analysis will be published as an OECD Working Paper in mid-2023 but will also feed into the OECD Skills Outlook that will be published in September 2023. Follow up work on the consequences of climate policies on skills will take place in 2023-2024, with focus on a specific country, yet to be decided.

- The ENV-Linkages model (both Environment Directorate and Economics Department) will be used as a key modelling tool for the OECD's Inclusive Forum on Carbon Mitigation Approaches (IFCMA). The IFCMA is an initiative designed to help improve the global impact of emissions reduction efforts around the world through better data and information sharing, evidence-based mutual learning and inclusive multilateral dialogue. It brings together all relevant policy perspectives from a diverse range of countries from around the world, participating on an equal footing basis, to take stock of and consider the effectiveness of different carbon mitigation approaches. We are currently scoping the modelling work for the IFCMA. The project is long term but, its first phase, which includes 4-6 country studies, should be finished by 2025.

- The Economics Department version of OECD ENV-Linkages model is based on GTAP10.1 and is used for supporting Economic Department Desk providing insight about climate mitigation strategies adopted by countries. Up to spring 2023 this work covered "EU country survey", "Thailand Country survey", "Italy country survey" and "Australia country survey".

- The Economics Department version of OECD ENV-Linkages model is closely linked to the OECD "Long Term Model", macro-economics in ENV-L come from LTM projections while mitigation cost in LTM is calibrated using LTM MAC curves.

Economy-environment linkages

- The OECD Environment Directorate has started working on a new Environmental Outlook, due to be published in 2025. This project will focus on the economic drivers of environmental change, providing a range of environmental indicators. It will also look at the benefits from policy action.

4. Other Activities

While not based on GTAP data, it may be relevant to note that the OECD is updating the GDP projections for the Shared Socioeconomic Pathways (SSPs) as used by the IPCC. This update incorporates updated data on GDP and main drivers, including scenario-specific demographic projections by IIASA, and updated forecasts by OECD and IMF. The storylines of the scenarios have not changed. First results should be made available for review by June or July 2023.

OECD Trade and Agriculture Directorate (TAD)

Standard METRO model Database

The METRO model database is derived from the GTAP 11L17 database pre-release 2 extended with trade flows disaggregates by use categories derived from the OECD and UN sources. Bilateral remittance information from the GTAP satellite data GMIG2 is also included and quantitative labour data from ImpactEcon.

UN Comtrade is used to calculate split shares for the 45 agriculture and manufacturing sectors. The OECD Inter-Country Input-Output Model provides use information for the 20 services sectors. Despite the fact that the OECD ICIO data, is available only for a subset of countries, METRO maintains all GTAP regions, which are aggregated to match the 65 regions available in the OECD data. The standard METRO model database, therefore, distinguishes 65 regions, 65 sectors and 4 use-categories.

Note that the current version 11 of the METRO database is still preliminary awaiting final releases of the satellite database associated with GTAP version 11. We expect to have an updated final version of the database using the version 11 final release and associated satellite accounts by the fall of this year.

OECD agriculture support database

In the context of its [Agricultural Policy Monitoring and Evaluation](#) work, the Trade and Agriculture Directorate also maintains, updates and expands every year its database on agriculture support. In 2022, the database covered 54 countries (the 38 OECD Members + 5 non-OECD EU Member States + 11 emerging economies). This database is used by the GTAP Center to represent in the GTAP database the Producer Support Estimate (PSE).

In 2022, the OECD constructed a new version of the database in connection with the development of the agriculture sector in the METRO model (see further below on METRO-PEM). That version was built paying particular attention to support allocation across GTAP sectors, as well as the treatment of input subsidies. Data processed cover all the time period available in the PSE database, i.e. 1986-2022.

The METRO model is the OECD in-house CGE model used at TAD. There are two versions of the model.

- The standard METRO model, first developed in 2014 and based on the [Globe CGE model](#), is dedicated to trade analysis. This model version relies on an extensive library of trade-related policies, including current border tariff rates, non-tariff measures, export restrictions, domestic taxes and support programmes. Emphasis has been put around the model development on modularity, documentation and accessibility, notably through a graphical user interface, in order to develop a community of users.

- The METRO-PEM model, dedicated to agricultural policy analysis. This version is more recent and still under development. It is an extended version of METRO with a focus on the agricultural sector, for which GTAP data are also complemented with other sources such as FAOSTAT and the OECD database on Producer Support Estimates. The model structure has been expanded with features from the Policy Evaluation Model, a partial equilibrium model traditionally used at the OECD for the assessment of agricultural policy reforms.

What follows are updates on work related to the standard METRO trade model and METRO-PEM.

Updates on the METRO model

Publications and papers incorporating METRO model analyses

The model has been used for various trade policy assessments, resulting in policy briefs and working papers, several of which were in partnership with colleagues in other OECD Directorates. Highlights of the last year include analyses on the economic impact of the Russian oil ban and sanctions (Arriola et al., 2023), distributional effects of trade (OECD, 2022b), and Latin America's exposure to production shock (Arnold et al., 2023). The list of publications and papers incorporating METRO analysis between July 2022 – May 2023 follows.

1. OECD (2022a), OECD Economic Surveys: Tunisia 2022, OECD Publishing, Paris, https://doi.org/10.1787/7f9459cf-en.
2. OECD (2022b), Trade and Gender Review of New Zealand, OECD Publishing, Paris, https://doi.org/10.1787/923576ea-en.
3. Arnold, J., Arriola, C., Kowalski, P., Schwellnus, C. and Webb, C. (2023), "Post-COVID-19 trade scenarios and priorities for Latin America", OECD Trade Policy Papers, No. 266, OECD Publishing, Paris, https://doi.org/10.1787/ea76ade5-en.
4. Arriola, C., Cadestin, C., Kowalski, P., Martins Guilhoto, J., Miroudot, J., van Tongeren, F. (2023), "Challenges to international trade and the global economy: Recovery from COVID-19 and Russia's war of aggression against Ukraine", OECD Trade Policy Papers, No. 265, OECD Publishing, Paris, https://doi.org/10.1787/5c561274-en.

Other Activities related to the METRO model

Model hands on Trainings

The Secretariat organised two trainings on the METRO model. A weeklong hands-on training was organised in March. Researchers from trade, agriculture, and development ministries of OECD and key partners at the OECD headquarters in Paris. A similar training was organised by Chile's Department of Foreign Affairs in Santiago. Both sessions be a mixture of hands-on exercises and

lectures aimed at providing a better understanding of the economic theories underlying the METRO model as well as to gain experience using the model and interface to analyse various trade policy scenarios, and both were kicked off by an introductory lecture on quantitative trade policy analysis for non- economists as an introduction to CGE modelling.

New METRO model version 4

In anticipation of the March hands-on training, a METRO model version 4 was released. This new version includes a new feature allowing users to calibrate a policy shock, such as an import or export ban. This version also includes an additional short term factor market closure option that keeps land and capital immobile but allows labour to remain mobile, as well as other corrections and enhancements.

Future developments

Two potential model developments are being considered for this year. The Secretariat is working on incorporating emissions coefficients into the model interface to track emissions embodied in trade, similar to the trade in value-added module in METRO. The Secretariat considering enhancing the labour markets in the model by distinguishing foreign and domestic labour.

Updates on the METRO-PEM model

Publications and papers based on METRO-PEM

First analyses using METRO-PEM are still under way but a first paper is expected to be published during the summer 2023 looking at agricultural policy reform and climate change mitigation. A first snapshot of the paper is available on the GTAP website here as the work will be presented at the GTAP conference, in the context of a session on agricultural policy reform organised by the Secretariat.

Planned developments for METRO-PEM

The development of METRO-PEM will continue in 2023-24 with particular emphasis on pursuing the development of biophysical and environmental satellite accounts, as well as improving the representation of the various forms of producer support in the model. Strong emphasis will also be placed on model consolidation, documentation and accessibility.