

# **A quantification of energy and emissions embodied in Argentina's international trade: Results from a hybrid input-output model orientated to energy**

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**Topics: Energy and climate change, energy and macroeconomics.**

## **1. Overview: brief presentation of the topic including its background and potential significance**

Production of goods and services imply directly or indirectly consumption of energy and associated emissions of CO<sub>2</sub>. Argentina is an intensive country in terms of land and primary energy and its exports are primary intensive (17% of exports come from agriculture and livestock, and 34% from food products –including soybean oil-). On the other side, imports are concentrated in intermediate inputs and capital goods for investment. The aim of the paper is to quantify energy and emissions embodied in Argentine trade with the rest of the world. We also propose several shocks to trade patterns in order to observe the impact in the level of energy from the commodity balance and the emissions of CO<sub>2</sub> balance.

## **2. Methodology: how the matter was addressed, what techniques were used**

We address the issue using a hybrid input-output model with a detailed disaggregation of energy sectors. These disaggregation features two stages: i) we open the National Accounts energy sectors (one for upstream, one for refining and one for downstream) into specific energy sectors (three in upstream, 8 in refining and 3 for downstream) using sectoral data of prices and quantities from the Argentine Ministry of Energy and Mining; ii) we construct a hybrid matrix to compute energy related indicators in tonnes of oil equivalent and emissions indicators in tonnes of CO<sub>2</sub>. First, we compute energy embodied in trade and its corresponding emissions. Then we simulate different external shocks in terms of international demand of Argentine products showing how this bundle changes under different assumptions.

## **3. Expected results: Key findings & 4. Conclusions: Lessons learned and implications**

We expect to find that Argentina is an overall net exporter of energy and emissions given technology and endowments available in the country and its relative advantages. This may be in

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line with the famous Heckscher-Ohlin-Vanek theorem, as Argentina is relatively abundant in energy and land (both principal factors of emissions) and its exports products ought to be intensive in those factors/inputs, producing emissions in order to satisfy international demand. These findings would suggest that Argentine government may have to pay attention to the impacts that trade policies could have on energy use and CO2 emissions.