Projections of consumption-based emissions for the EU and globally

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In recent years, researchers have used multi-regional input-output (MRIO) analysis to estimate the carbon dioxide emissions linked to a countryâ€™s consumption, sometimes referred to as the â€˜carbon footprintâ€™. These consumption-based indicators have complemented the more standard production measure of production-based emissions that is reported in national inventories. In this paper we use the same approach to provide projections of consumption-based emissions out to 2050.

To carry out the projections, we use the E3ME macro-econometric model and link it to an MRIO framework that is based on the modelâ€™s own data. We apply this combined tool to three different scenarios of future climate policy in which first the EU and then the rest of the world implement measures to meet global carbon targets. We estimate emissions in each case on a consumption basis and also on a technology-adjusted consumption basis, drawing on the recent literature.

After assessing historical trends in our modelling framework, we present forward-looking results for the EU, the US and China in terms of absolute levels of emissions and â€˜net tradeâ€™ in emissions. We find that there may be substantial differences between both current levels and future trends in consumption-based and technology-adjusted consumption-based emissions. This leads to a discussion of how best to measure national carbon footprints in a world where the pace of decarbonisation varies substantially between countries.