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A LIFE CYCLE BASED CLIMATE INDICATOR IN SWEDISH ENVIRONMENTAL POLICY

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ABSTRACT

The Swedish parliament has decided that Swedish environmental policy must not lead to increasing environmental and health problems outside of Sweden. By monitoring GHG emissions from consumption, policy-makers and businesses get a better basis for developing and implementing environment and climate policy instruments and measures that actually lead to a reduction on a global level. In order to follow GHG emissions in Sweden and in other countries, caused by Swedish consumption over time, a national consumption based climate indicator has been developed (Swedish EPA, 2013) and applied in the latest in-depth assessment of the Swedish environmental quality objectives. The indicator shows considerable increased emissions during the period 2000 to 2008, at the same time as the national emissions have decreased.

INTRODUCTION

Traditionally, statistics on domestic greenhouse gas (GHG) emissions is used for the following-up of climate performance on a national level. This statistics is reported to the EU and UNFCCC and is also used for national following-up of the climate target. However, this statistics only makes up one piece of the puzzle (Wijkman and Rockström, 2012) as emissions caused outside the Swedish borders are not taken into account. In Sweden, and in many other European countries, a large part of the GHG emissions from consumption (around 40 percent in average), is occurring beyond their borders (EEA, 2010). The global environmental life-cycle impact from consumption in the EU outside its borders therefore needs to be reduced (COM 710 final, 2012).

METHODS

The consumption-based indicator consists of two parts, emissions in Sweden and emissions abroad, both caused by Swedish consumption.

The underlying data source for the emissions in Sweden is the official statistics on emissions reported to UNFCCC, the UN's climate change convention. These emissions are broken down by industry and processed by Environmental Accounts at Statistics Sweden and used in an environmentally extended input-output analysis (Swedish EPA, 2010). The main

difference between the domestic emissions caused by Swedish consumption and the domestic emissions reported to UNFCCC is that emissions caused when producing goods for exports are not a part of the emissions caused by consumption.

Emissions due to imported goods that are produced in other countries are estimated according to a model. The model for carbon dioxide emissions is based on how much - in economic terms - is imported from other countries (data from Statistics Sweden), emissions of carbon dioxide reported to Eurostat for EU countries and each country's emissions intensity in relation to GDP (data from World Resources Institute) for countries outside the EU. Emissions of methane and nitrous oxide in other countries are calculated as if they occurred in Sweden.

RESULTS

An indicator for emissions of greenhouse gases caused by Swedish consumption, in order to follow the negative environmental impact in other countries over time has been developed.

The indicator shows the total greenhouse gas emissions caused by Swedish consumption, consisting of emissions in Sweden and emissions in other countries.

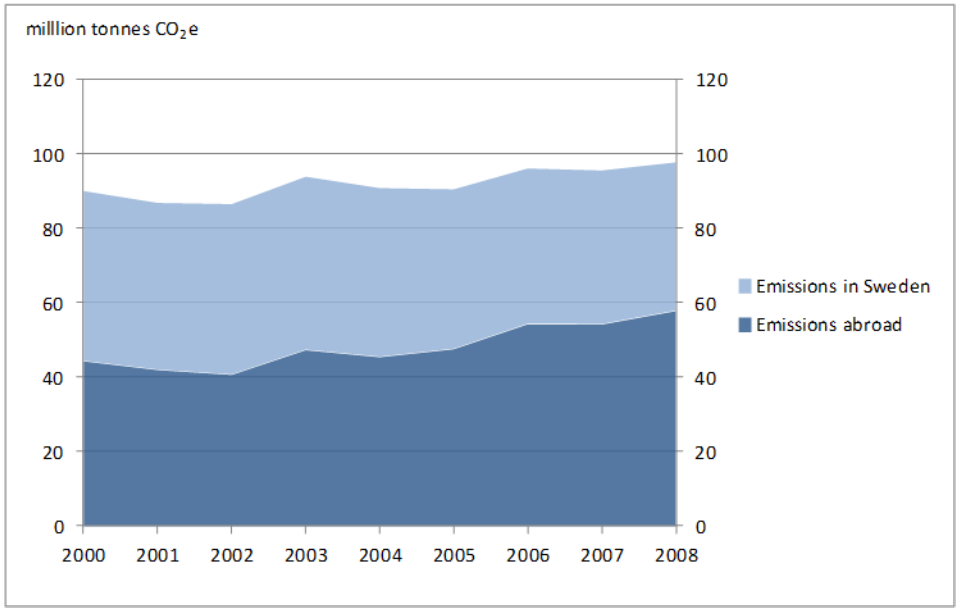

Figure 1. Model calculated emissions of greenhouse gases caused by Swedish consumption, in millions of tonnes of carbon dioxide equivalents (carbon dioxide, methane and nitrous oxide weighted together) 2000 to 2008.

The indicator shows that total emissions caused by Swedish consumption increased from 90 million tonnes carbon dioxide equivalents in 2000 to 98 million tonnes carbon dioxide equivalents in 2008. This implies an increase of 9 percent during the period.

The increase shown by the indicator of the total emissions is caused by an increase in emissions abroad and can be explained in the model by increased consumption met by increasing imports.

DISCUSSION

At the same time as the domestic emissions reported to UNFCCC, the UN's climate change convention, and to the EU have decreased, the consumption based indicator shows increasing emissions. The increase shown by the indicator of the total emissions is caused by an increase in emissions abroad and can be explained in the model by increased consumption met by increasing imports. An increase can also be the result if the composition of consumption changes, i.e. if other types of products are imported, product types that cause higher emissions, or if the production of imported goods takes place where higher emissions are caused in producing the same type of goods. Nearly half of the increase can be explained by the population growth during the period. To find out more about the driving forces behind the increased emissions, supplementary studies must be performed.

The consumption and life cycle based perspective on emissions require development of new methodologies and statistics to follow up and assess environmental impacts from Swedish consumption along the whole life-cycle. It could also be relevant for Sweden in taking part in work aiming to streamline the methods and data sources used internationally to assess consumptions based emissions.

CONCLUSIONS

The consumption and life cycle based climate indicator shows increasing emissions over time. The increase of the total level is explained by increasing emissions in other countries. The indicator gives a supplementary picture of the overall Swedish GHG emissions. The indicator can be used by policy-makers and businesses to get a better basis for developing and implementing environment and climate policy instruments and measures that actually lead to a reduction on a global level.

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