

Low-Greenhouse-Gas Consumption Strategies and Impacts on Developing Countries

Key Findings

- Shifts in consumer behaviour in high-income countries (e.g., buying less “stuff” and more services) while maintaining overall spending levels could lead to reductions in associated greenhouse gas (GHG) emissions of at least 10 per cent.
- Many of the goods consumed in high-income countries are produced in low-income countries, however, so shifts in consumption to reduce GHG emissions could also hurt poorer countries, for which international trade can be a critical source of income.
- Our analysis shows that if high-income countries were to shift spending to lower-GHG types of products and services, the average GDP of lower-income countries could drop by more than 4 per cent, and Least Developed Countries’ GDPs could drop by more than 5 per cent. Impacts on Least Developed Countries are driven most strongly by reduced purchases of clothing.
- International trade can help raise incomes and standards of living in developing countries. Measures that reduce trade – under the banner of low-GHG or “sustainable” consumption or in other ways, such as by promoting local purchasing – can hurt poorer countries that critically depend on that income. Further work is needed to identify specific opportunities to preferentially source products from low-GHG and low-income regions to jointly foster both GHG and development benefits.

The role of consumption in reducing GHG emissions

Limiting warming to 2°C or 1.5°C and averting the worst impacts of climate change may require broader shifts in what and how we consume. While widespread adoption of low-GHG technology will be essential, shifts to lower-GHG lifestyles are also needed. This realisation, coupled with the slow progress in international negotiations and within key countries, has heightened interest in consumption-based approaches for climate mitigation. Several recent bottom-up studies have shown that low-GHG consumption behaviours, such as eating less red meat or purchasing fewer goods, can contribute substantially to global GHG emissions abatement.

Our analysis explored how shifting to low-GHG consumption (with a focus on shifts in purchasing of goods and services), might contribute to – or detract from – another key sustainability objective: global development and poverty alleviation.

As international trade has grown substantially in the last couple decades, the links between consumption in high-income countries and development in lower-income exporter countries are ever more relevant. Low-income countries have become more reliant on trade – with exports accounting for 12 per cent of their GDPs, on average, in 1992; 20 per cent in 2010; and as much as 22 per cent immediately before the recent global recession, according to the World Bank. Research has also shown that increases in international trade have helped improve living standards in increasingly export-oriented countries, creating a dilemma: If high-consumption countries were to decrease trade in the course of pursuing low-GHG consumption, what would be the effect on their low-income trading partners?



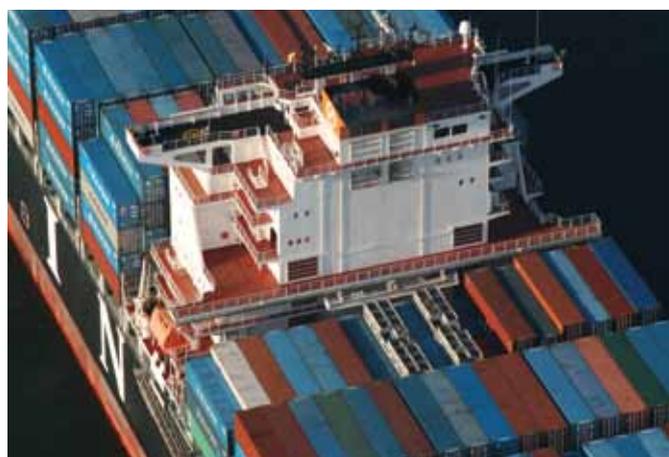
Aa YfjWb AddUfUY shirts ©Flickr/Juan Jose Richards Echeverria #JuanJose

Defining low-GHG consumption

We know of no widespread agreement (implicit or explicit) on what behaviour changes could have significant impacts on global GHGs and therefore constitute “low-GHG consumption”. Analyses of diets and food are perhaps most common; there have also been assessments that looked at different suites of measures and behaviour shifts, such as reduction in purchases of clothing. Studies that looked at measures addressing multiple categories (food, goods, and services) yielded GHG reductions in the range of 14 to 16 per cent (before considering rebound) combined from these measures.

For our analysis, we used a single, representative scenario of low-GHG consumption developed for the Waste & Resources Action Programme (WRAP) in 2009. The WRAP scenario charted the long-term (through 2050) GHG abatement potential of consumer behaviour change in the U.K., and was the most detailed accounting of the embodied GHGs in U.K.

consumption at the time. The changes considered included a reduction in food waste, shifts in diet, using goods (such as clothing and home furnishings) longer, and shifting from ownership to sharing services for certain goods, such as high-end clothing, household tools, and personal vehicles. The scenario found (after freed-up spending was redirected to low-GHG services, via the “rebound effect”) that aggressive implementation of these strategies could reduce the emissions associated with U.K. consumption by 10 per cent by 2050, compared with a baseline scenario.



Long Beach, California – containers ©Flickr/John Murphy kingair42

Modelling the economic impacts of shifts in behaviour

To model the trade-related impacts of the low-GHG behaviours identified, we used environmentally extended multi-regional input-output (MRIO) techniques, similar to those used in the original WRAP analysis. Instead of working with the exact model used in the WRAP study (which had a limited ability to distinguish between world regions), we use an updated MRIO model that allows us to better identify the countries (and sectors) in which trade impacts could occur.

MRIO models have become important tools for assessing the distribution of an industry’s product throughout the economy, including by country and economic sector. In recent years, these tools have been extended to cover global economies and focus on GHG impacts, leading to a number of assessments of the GHGs embodied in trade.

To implement the consumption shift in the MRIO model, we assumed that any change in consumption occurs equally for domestic and foreign components of demand. For example, if red meat expenditures are reduced by 87 per cent, we assumed that demand for both domestic and imported red meat drops by 87 per cent. Within the MRIO, we tracked how a change in spending on a product affects every contributing producing sector from every region throughout the product’s supply chain. Using this MRIO structure, we estimated changes in each country’s GDP (and greenhouse gas emissions) based on changes in consumption in the U.K. or in any other group of countries.

We analysed the impacts of shifting consumption in the U.K. on four country groupings:

- *The U.K.* itself, to look at domestic impacts of the behaviour changes;
- *High-income* countries (outside the U.K.);
- *Lower-income* countries;
- *Least Developed Countries (LDCs)*, or the world’s poorest countries, which are a subset of the lower-income countries.

Table 1. Change in GDP in U.K. and World Regions as a Result of the WRAP Scenario

Region	Change in GDP
U.K.	4.6%
High-income	-0.2%
Lower-income	-0.3%
LDCs	-0.7%

A disproportionate impact on the poorest countries

Our analysis found that implementing the WRAP scenario would have starkly different economic impacts in different world regions. As shown in Table 1, in the U.K., the WRAP scenario could be expected to lead to an *increase* in GDP. This is because under the scenario, consumer purchases shift from goods, for which considerable value is imported (e.g. vehicles, where an average of 59 per cent of the value is imported), to services, where most of the value is produced domestically (e.g. recreational and other services, where only 17 per cent of the value is imported). Since the U.K. produces its own services to a much greater extent than it produces its own food or goods, shifting spending from food and goods to services yields net benefits to the U.K.’s economy.

Yet the benefits to the U.K. come at the expense of trading partners. In particular, the table shows that high-income countries (outside the U.K.) would experience a 0.2 per cent decline in GDP, lower-income countries would experience a 0.3 per cent decline in GDP, and Least Developed Countries (LDCs) would experience a 0.7 per cent decline in GDP. This trend suggests that adopting low-GHG behaviours in the U.K. could lead to economic decline in trading partners, and that the decline could be proportionally worse in lower-income countries, especially LDCs.

This finding raises questions about the implications of the WRAP scenario for a key goal of sustainable development: poverty alleviation. Is a potential 1 per cent decline in the GDP of Least Developed Countries cause for concern? LDCs already have (by far) the lowest per-capita incomes, less than one-hundredth of per-capita incomes in the U.K. (\$310 vs. \$35,400 in 2004). While a 1 per cent decline may not seem large, it represents a further setback to what is already a gigantic disparity in livelihoods.

Furthermore, this nearly 1 per cent decline in per-capita incomes in LDCs is only due to a shift in consumption in a single country: the U.K. Discussions of low-GHG consumption are also advancing in Europe and, to a lesser extent, also in North America and other high-income countries. If these other high-income countries also adopted the same policies as the WRAP scenario, the impact on developing countries could be considerably greater: up to a 4.5 per cent decline in lower-income country GDP and up to 5.7 per cent in LDCs, as displayed in Table 2.

These findings raise a flag of caution: actions or policies that reduce high-income-country consumption of goods may have disproportionate negative impacts on lower-income countries. Sustainability may require shifts in consumption (and corresponding shifts in technologies and processes that produce goods and services), but it also requires giant strides in global

Table 2. Sensitivity Analysis: If the EU-27 and other High-Income Countries also Adopted WRAP Scenario

Region Affected	Change in GDP due to Switch to Low-GHG Consumption (WRAP scenario) in:		
	U.K.	EU-27	High-Income
U.K.	4.6%	3.3%	2.8%
High Income	-0.2%	0.2%	1.0%
Lower Income	-0.3%	-1.5%	-4.5%
LDCs	-0.7%	-3.4%	-5.7%

equity, so all people have access to basic security, human rights and social benefits. Individual actions need not necessarily support both environmental and development goals simultaneously, but taken all together, policies and behaviours will need to advance both. Based on our preliminary analysis here, low-GHG behaviours in high-income countries (at least as defined in the WRAP scenario) appear to do little to advance global economic equity.

In principle, other policy measures that reduce imports, such as border carbon adjustments, which would levy fees at national borders based on carbon content, could have similar effects on low-income countries. However, border carbon measures are more commonly discussed for energy-intensive raw materials such as cement, concrete, and steel, and less so for consumer goods, where the adjustments may be less effective or practical.

The findings displayed in Table 2 are the result of the broad suite of low-GHG behaviours defined in the U.K.'s WRAP scenario. However, trade patterns are not the same for all products. In our analysis, impacts on lower-income countries are driven most strongly by reduction in consumption of clothing and other manufactured goods, and the impacts on LDCs are driven overwhelmingly by reductions in clothing. By contrast, in general, diet shift, food waste reduction, and reduced purchase of vehicles have fewer impacts on lower-income countries, because (at present) high-income countries do not rely as strongly on lower-income countries to produce food and vehicles. These findings suggest that of the consumption shifts studied, reduced consumption of clothing and manufactured goods in high-income countries is likely to have the strongest negative impact on lower-income countries, at least given recent patterns of global trade and production. Of course, these findings are averages for relatively broad product groups, and the impacts for any individual product could vary, e.g. for

particular foods grown in poor countries and imported into high-income countries.

(For a discussion of the limitations of our analysis, including possible price effects that could lead to other, indirect adjustments in supply and demand for goods and services, please see the working paper on which this brief is based; details are at the end of the text).

Can low-GHG consumption also have development benefits?

Trade is a significant component of GDP in poor countries, and can be an important mechanism to increase global equity. Furthermore, "sustainable consumption" was originally envisioned as a means to help reduce poverty. In our view, it is therefore important to explore opportunities to use trade for both GHG and development benefit. The means to do this are not obvious, and further research is needed.

The box below describes some possible options. Some have argued, however, that negative impacts on poorer countries may be inevitable. If reductions in consumption in high-income countries are essential to avoid the worst impacts of climate change, low-income countries may need to rely less on trade with high-income countries, and instead build up their domestic markets or trade with other developing countries.

We believe low-GHG consumption strategies should be pursued, but further work is needed to find ways to produce both GHG and development benefits through trade between high-income and low-income countries. For example, as stated above, high-income countries could preferentially source products from low-GHG and low-income regions. Our preliminary calculation for clothing, using a multiregional input-output model, found that the GHG intensity of clothing production can vary by a factor of four or more between countries. If this is true, then sourcing clothes from countries with less GHG-intensive production could yield equal or bigger emission reductions than other commonly discussed measures, such as doubling the useful life of clothing.

In general, such shifts in consumer behaviour have not been well integrated into mainstream assessments of how to reduce global GHGs. As interest in behavioural measures, consumption, and lifestyles grows (and as other measures that may affect trade, such as border carbon adjustments, gain favour), analysts and policymakers should take care to explore measures that could have benefits both for the climate and for global development.



London - Secondhand boutique @Flickr/Duncan Harris

Policy options and considerations

As we have noted, further research is needed to explore possible new measures of low-GHG consumption that could bring both GHG and development benefits. Some options we considered in our analysis include:

- **Purchasing from poor and low-GHG-intensity countries.** Some countries may be able to produce certain goods with much lower GHGs than other countries, whether because they have abundant renewable electricity or because they use lower-GHG production practices. If these are also very poor countries, there could be significant GHG and development benefits from adopting purchasing practices or trade policies that enhance trade with these countries, perhaps by revisiting tariffs and other trade barriers.
- **Importing higher-cost, higher-quality, and value-added goods.** This could have both GHG and development benefits if these goods both last longer (meaning fewer new goods are needed), and if a large share of the added value is retained by the producing country. Further research is needed to determine how poor countries could capture the benefits of the added, higher value, e.g. by enhancing their expertise and/or investing in needed equipment; high-income countries could also help via technology transfer of manufacturing equipment and technical assistance.
- **Lowering the GHG intensity of production in poor countries.** Investments in technologies that reduce the GHG emissions associated with production in developing countries – through direct technology transfer or through financing mechanisms such as the new Green Climate Fund, would reduce the GHG-intensity of the resulting goods and may also bring economic benefits. Discussions are also advancing, particularly in Europe, about how to orient the Clean Development Mechanism (CDM) to focus on Least Developed Countries after 2012, providing another means to aid in emission reduction and development in poor countries. Other possibilities also exist, such as sectoral crediting that could use carbon offset markets to achieve reductions in particular sectors in particular countries.



India – Dharavi slum clothing factory ©Flickr/bbcworldservice

This policy brief is based on SEI Working Paper No. 2012-01, *Low-Greenhouse-Gas Consumption Strategies and Impacts on Developing Countries*, by Peter Erickson, Anne Owen and Ellie Dawkins, published by the Stockholm Environment Institute in March 2012 and available on the SEI website.

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