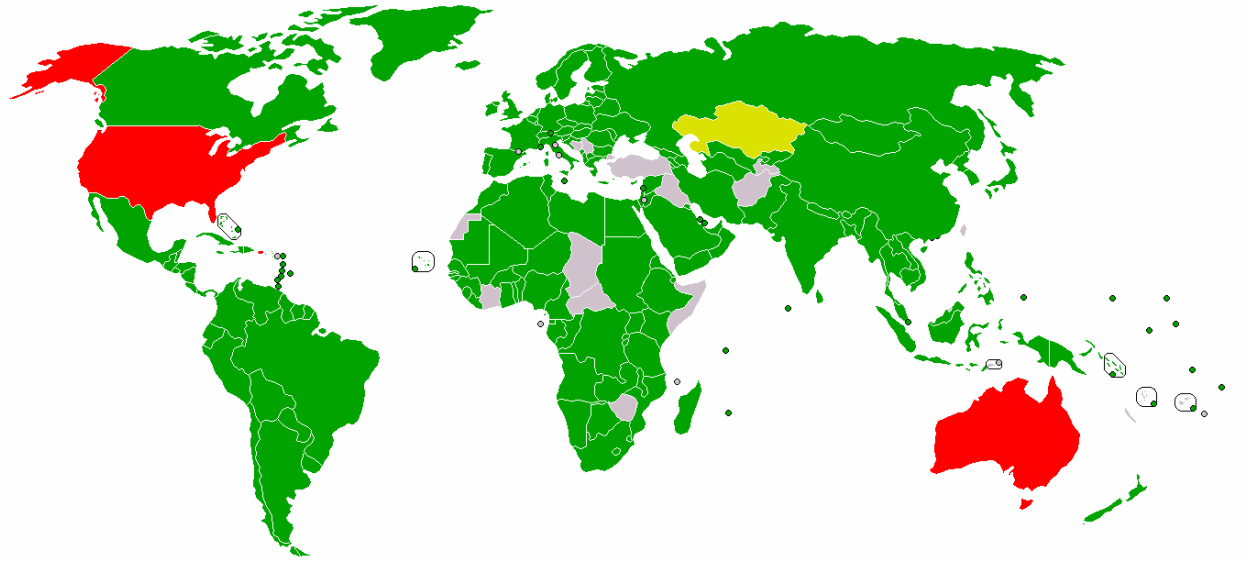
Post Kyoto Discussion



- 175 Parties have ratified the Protocol.
- 36 countries and the EEC are required to significantly reduce greenhouse gas emissions
- Notable exceptions include the United States and Australia
- 137 countries have ratified the protocol, but have no obligation beyond monitoring and reporting emissions

Countries that have signed the Kyoto Protocol and
- ratified it
- hope to ratify it
- not ratified it

Source: Wikimedia Commons.

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The Kyoto situation

While the Kyoto protocol has been widely signed, there are two issues with the current situation

1. One of the largest CO_2 emitters, the United States, has not ratified the agreement

2. 137 countries have ratified the protocol, but have no obligation to reduce emissions, among them heavy CO_2 emitters like China and India

This significantly limits the overall CO_2 emission reduction.

Post Kyoto discussion

The discussion about the Kyoto successor is in full swing. Two of the main, intertwined discussion points are

- How to bring the US and Australia on board?
- How steer developing nations, specifically China and India, towards reductions in their emissions?

The discussion is often focused on the two largest CO_2 emitters: USA and China. Some of the commonly voiced arguments include the following ones (stated in an oversimplified form):

- USA: we only reduce if China reduces.
- China: we still need to develop our economy.

On the next page, we propose an investigation, using China as an example, on the ownership and responsibilities of foreign of CO_2 emissions.

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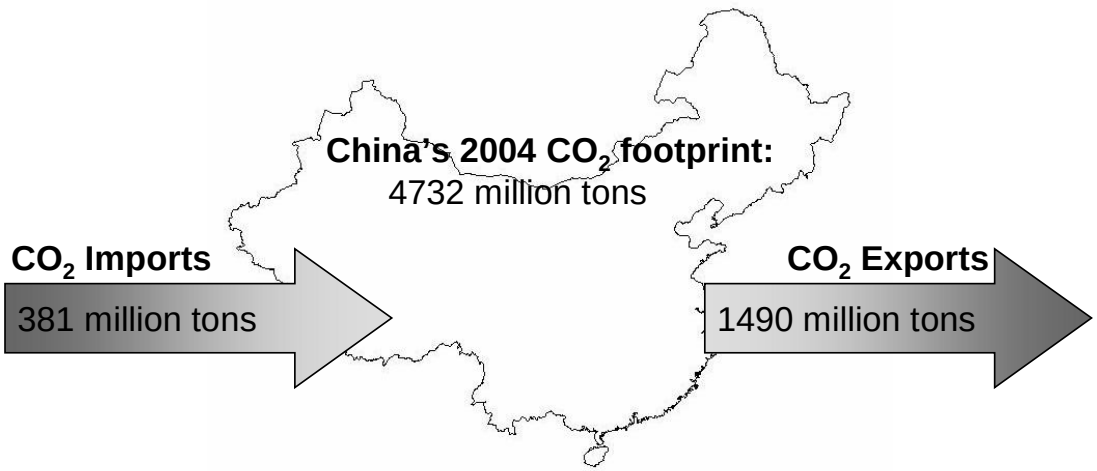
Who Owns China's Carbon Emissions?



2004 net CO_2 export was **1109 million tons**
Representing **23%** of China's total CO_2 footprint:

Source: Tyndall Briefing Note No. 23 by Tao Wang and Jim Watson

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The imbalance of the carbon world

According to a study[1] by the Netherlands Environmental Assessment Agency, China overtook the US as the world largest emitter of CO_2 in 2007.

China and more than 130 developing nations who signed and ratified the Kyoto Protocol are under no obligation to monitor and to reduce their greenhouse gas emissions.

The rationale behind this is that the developed nations should not deny the developing nations the same growth opportunities they themselves enjoyed through the past decades.

However, a lot of the manufacturing industries moved from their original locations to the developing nations which are offering a lower-cost workforce and often less stringent environmental regulations while the bulk of the manufactured goods are still consumed in the developed world.

The Tyndall Briefing Note No. 23[2] studies and quantifies this phenomenon using statistical data about China's economy of 2004. More than 1 billion tons of CO_2 representing roughly ¼ of China's carbon footprint have been produced for goods and services which have been exported.

Who owns the exported CO_2 footprint?

A reasonable answer seems to be the consumer of the products, i.e. the importing nations.

Ownership comes with responsibilities

Let's assume that the importing nations accept the responsibility for the CO2 emissions produced abroad. The economic models currently being used to underpin the Kyoto Protocol and EU ETS[3] are not equipped to address this situation.

SAP Research will be focused on investigating new economic models suited to handle these questions.

[1] http://www.mnp.nl/en/dossiers/Climatechange/moreinfo/Chinanowno1inCO2emissionsUSAinsecondposition.html
[2] http://tyndall.webapp1.uea.ac.uk/publications/briefing_notes/bn23.pdf
[3] European Union Emission Trading Scheme

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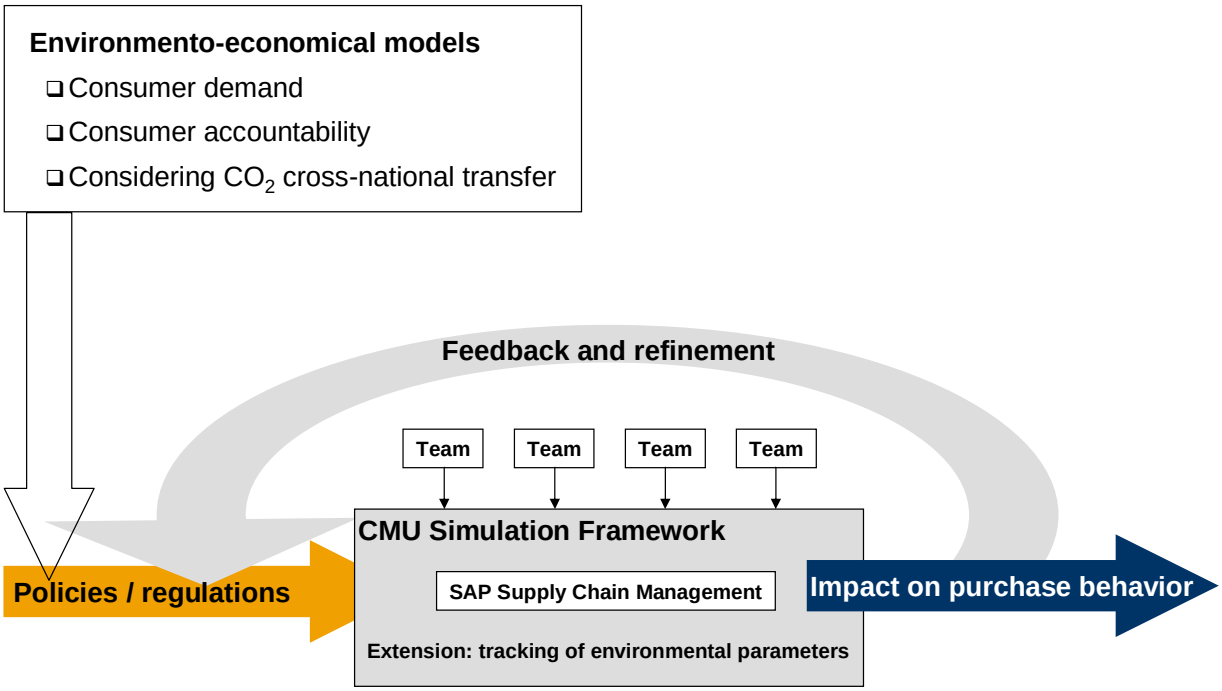

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Background

As we discussed above in the context of the China example, there are significant amounts CO_2 emissions being produced in creating of goods and services which are being exported.

Common sense suggest that the importer is “somewhat” responsible for the emissions produced. But what does this responsibility mean?

This situation is specifically interesting if the exporter may not be bond to CO2 emissions, but the importing nation is subject to reductions under the Kyoto protocol.

Goal

First, we want to create and refine environmento-economical models which consider this situation into account. Second, we want to investigate suitable means transform the responsibility of the consuming nation into an reduction of the CO2 emissions in the exporting nations. Third we want to study the impact of potential policies and regulations in a simulation environment.

Approach

While the first and second topic are theoretical work in environmental economics and in policy making.

The third topic will be based on Carnegie-Mellon’s supply chain simulation test bed. We plan to extend the system so that environmental parameters are being tracked and that environmental-specific policies and regulations can be fed into the systems. Teams of purchasers will then play supply chain games which will provide feedback on the impact of the policies and regulations.

We envision this system to act as a test bed for policy makers to simulate the outcome of potential new regulations.

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