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Introduction to consumption-based carbon accounting and policies

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Concept: link territorial emission to a picture of global economic relations

- For now, we don't manage the 2° degree goal
- We now rely on industry perspective emission accounts and policies
- A consumption / value chain perspective can give additional levers to reach the goal

		Industries				$Y_{*,A}$	$Y_{*,B}$	$Y_{*,C}$	$Y_{*,D}$	q
Products		$Z_{A,A}$	$Z_{A,B}$	$Z_{A,C}$	$Z_{A,D}$	$Y_{A,A}$	$Y_{A,B}$	$Y_{A,C}$	$Y_{A,D}$	q_A
		$Z_{B,A}$	$Z_{B,B}$	$Z_{B,C}$	$Z_{B,D}$	$Y_{B,A}$	$Y_{B,B}$	$Y_{B,C}$	$Y_{B,D}$	q_B
		$Z_{C,A}$	$Z_{C,B}$	$Z_{C,C}$	$Z_{C,D}$	$Y_{C,A}$	$Y_{C,B}$	$Y_{C,C}$	$Y_{C,D}$	q_C
		$Z_{D,A}$	$Z_{D,B}$	$Z_{D,C}$	$Z_{D,D}$	$Y_{D,A}$	$Y_{D,B}$	$Y_{D,C}$	$Y_{D,D}$	q_D
W		W_A	W_B	W_C	W_D					
g		g_A	g_B	g_C	g_D					
C & L		$Capital_A$	C_A	C_B	C_C	C_D				
		$Labor_A$	L_B	L_C	L_D					
Environ Ext		$NAMEA_A$	$NAMEA_B$	$NAMEA_C$	$NAMEA_D$					
		$Agric_A$	$Agric_B$	$Agric_C$	$Agric_D$					
		$Energy_A$	$Energy_B$	$Energy_C$	$Energy_D$					
		$Metal_A$	$Metal_B$	$Metal_C$	$Metal_D$					
		$Mineral_A$	$Mineral_B$	$Mineral_C$	$Mineral_D$					
		$Land_A$	$Land_B$	$Land_C$	$Land_D$					

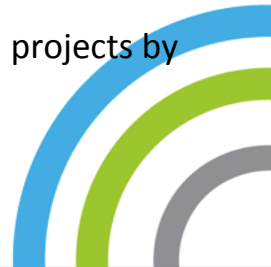
Consumption/Value chain perspective:

- Consumption product $x = VA$ sector 1 + VA sector 2...
- Per sector we have CO2 emissions and production
- Emissions product $x = \text{Sum emissions per unit } VA$

...is hence simply re-distributing territorial emissions to final consumption categories

We use for this EXIOBASE, build in 4 major EU projects by my team including Carbon CAP

Territorial/Industry perspective:
Emissions & policies by sector

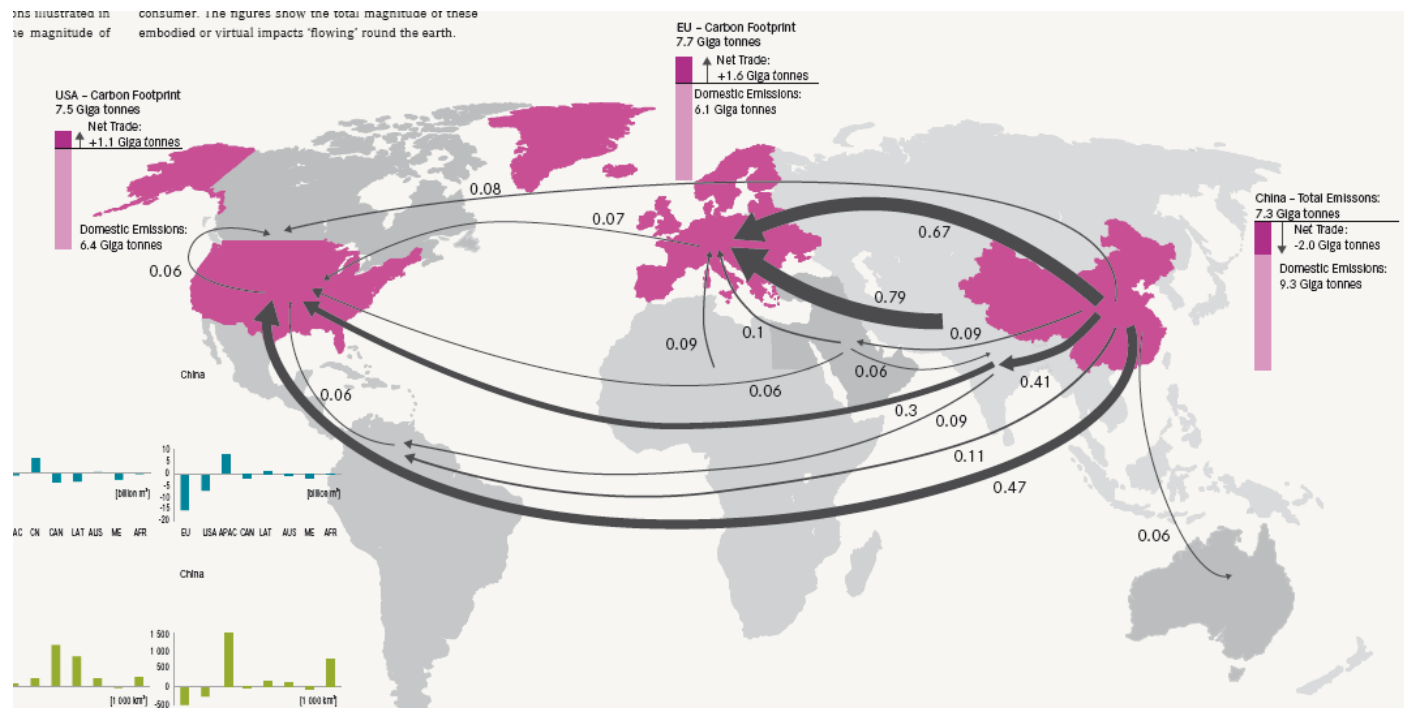


- Added value:
 - New perspective -> additional policies
 - Addressing consumption as a driver
 - Additional perspective on dividing responsibilities
- Relevance:
 - Consumption drives CO₂ emissions
 - Trade and embodied CO₂ grow quicker as GDP

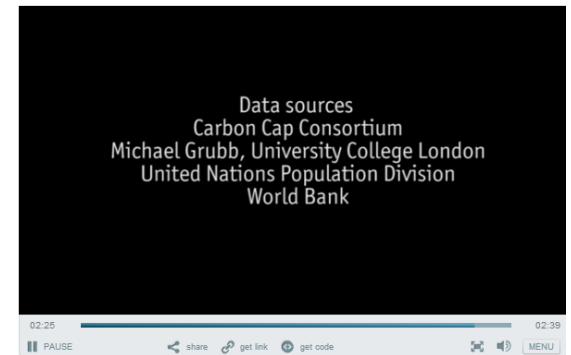


Example: carbon embodied in trade

- China exports 2 Gt embodied carbon...
- ..imported by the EU and US....
- ..but produced by often less resource-efficient industries and with high-carbon energy systems...



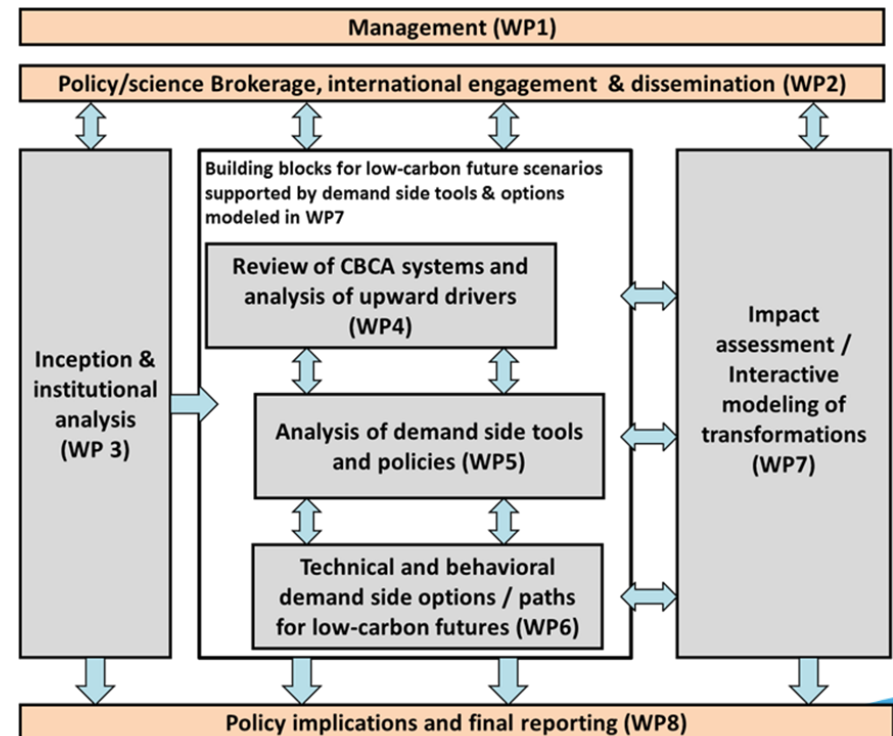
Carbon footprint per capita vs. GDP



<http://www.economist.com/news/international/21679288-china-and-india-are-perceived-be-worst-emitters-carbon-dioxide-see-what-happens-when-we>

Challenges and answers of Carbon CAP

- Uncertainty in accounting is unknown -> WP4
- Consumption – based policies are new and unknown -> WP5, WP6
- Added value of such policies is unknown -> WP7
- Hence not (yet) accepted for use in official contexts (UNFCCC, COP) -> WP2
- Indeed, fear uncertainties may block progress in negotiations



- In this session we hope to show
 - It is not fundamentally new
 - We re-distribute emissions per sector to consumption
 - Uncertainty is manageable: territorial emissions (!) and GDP dominate
 - This new perspective can lead to useful, additional policies
 - That Carbon CAP results may enhance acceptance of the consumption-based perspective...
 - ...supporting the 2^o goal

Uncertainties (work of Anne Owen, Leeds University)

Transactions within countries 20-30 %

Trade between countries 10-20%

		Industries				$Y_{*,A}$	$Y_{*,B}$	$Y_{*,C}$	$Y_{*,D}$	q
Products		$Z_{A,A}$	$Z_{A,B}$	$Z_{A,C}$	$Z_{A,D}$	$Y_{A,A}$	$Y_{A,B}$	$Y_{A,C}$	$Y_{A,D}$	q_A
		$Z_{B,A}$	$Z_{B,B}$	$Z_{B,C}$	$Z_{B,D}$	$Y_{B,A}$	$Y_{B,B}$	$Y_{B,C}$	$Y_{B,D}$	q_B
		$Z_{C,A}$	$Z_{C,B}$	$Z_{C,C}$	$Z_{C,D}$	$Y_{C,A}$	$Y_{C,B}$	$Y_{C,C}$	$Y_{C,D}$	q_C
		$Z_{D,A}$	$Z_{D,B}$	$Z_{D,C}$	$Z_{D,D}$	$Y_{D,A}$	$Y_{D,B}$	$Y_{D,C}$	$Y_{D,D}$	q_D
W		W_A	W_B	W_C	W_D					
		B_A	B_B	B_C	B_D					
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		$Metal_A$	$Metal_B$	$Metal_C$	$Metal_D$					
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		$Land_A$	$Land_B$	$Land_C$	$Land_D$					

CO2 emissions by country, sector: 30-40%

GDP by country as % of global GDP: 20-30%

Thank you for being here today!

