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# Trade & Climate Change:

Quantitative Assessment of the Best Policy Tools to Achieve Climate Neutrality and Competitiveness



## Study Objectives

- Development of **an analytical framework** for empirically assessing the **interaction between international trade and climate change**  
| Tier 1
- Evaluation of the **environmental and economic impacts** associated with **various policies** that may be pursued by the EU towards **achieving its climate goals and strengthening competitiveness**  
| Tier 2



## Tier 1 | Scenarios

	EU GHG Emission Reductions (% change / 1990 levels)	
	2030	2050
<b>Baseline Scenario</b>	40%	80%
<b>EU Climate Neutrality Scenario</b>	55%	90% / Net zero

- **Baseline Scenario** provides a point of reference for the assessment of greater emissions reductions efforts and carbon leakage under the EU Climate Neutrality Scenario
- **EU Climate Neutrality Scenario** serves as reference point to assess impacts from Policy Scenarios (Tier 2)
- **Non-EU Countries in both scenarios** are assumed to implement their NDCs until 2030, then held constant to 2050
- The model calculates the **de facto carbon prices** for each jurisdiction to meet their stated GHG emissions reductions targets.



## Tier 1 | Drivers Affecting Carbon Leakage in the Modelling Framework

- Carbon leakage is calculated using the **difference in non-EU GHG emissions between the Baseline Scenario and Climate Neutrality Scenario**. It is an **additional** carbon leakage.
- The modelling approach captures the industry channel of carbon leakage. **The scale and direction of carbon leakage is affected by the following factors:**
  - i) The baseline **projection of economic activity**
  - ii) The baseline **projection of technology costs and energy prices**
  - iii) The **carbon price differential** between the Baseline Scenario and the Climate Neutrality scenario
  - iv) **Elasticities:** Trade – Armington & Substitution elasticities



## Tier 1 | Results of EU Climate Neutrality Scenario vs. Baseline

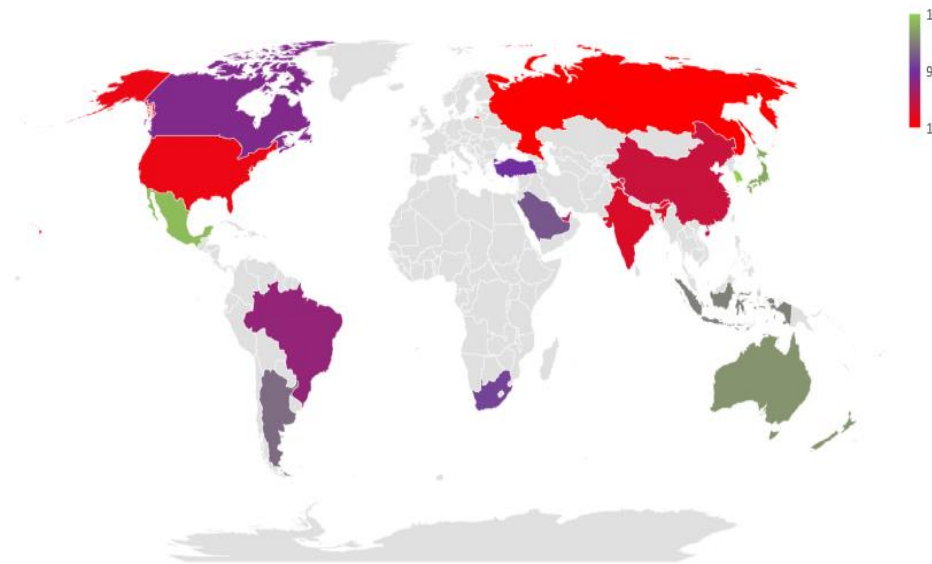
EU Carbon Price per tonne of CO <sub>2</sub> (2014 prices – USD)	2020	2030	2040	2050
EU Climate Neutrality Scenario (\$ per tonne of CO <sub>2</sub> )	33	74	380	590
Difference from Baseline Scenario (\$ per tonne of CO <sub>2</sub> )	/	+35	+167	+356

Carbon Leakage under EU Climate Neutrality Scenario	Additional Carbon Leakage rate / Baseline scenario
2030	+ 9%
2050	+ 23%

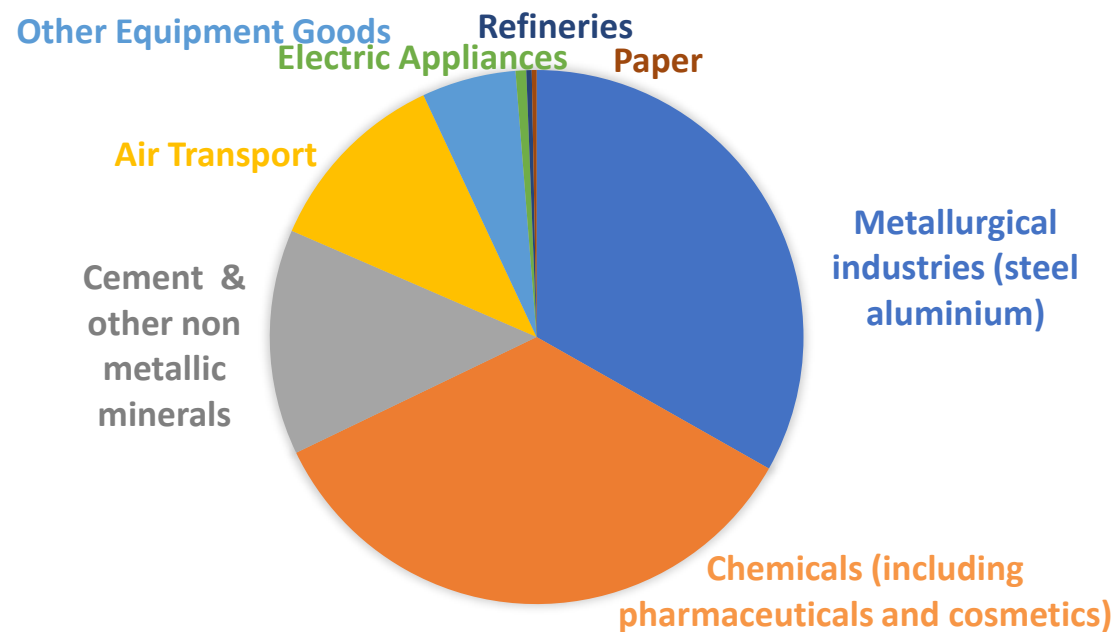


## Tier 1 | Geographic Distribution of Carbon Leakage

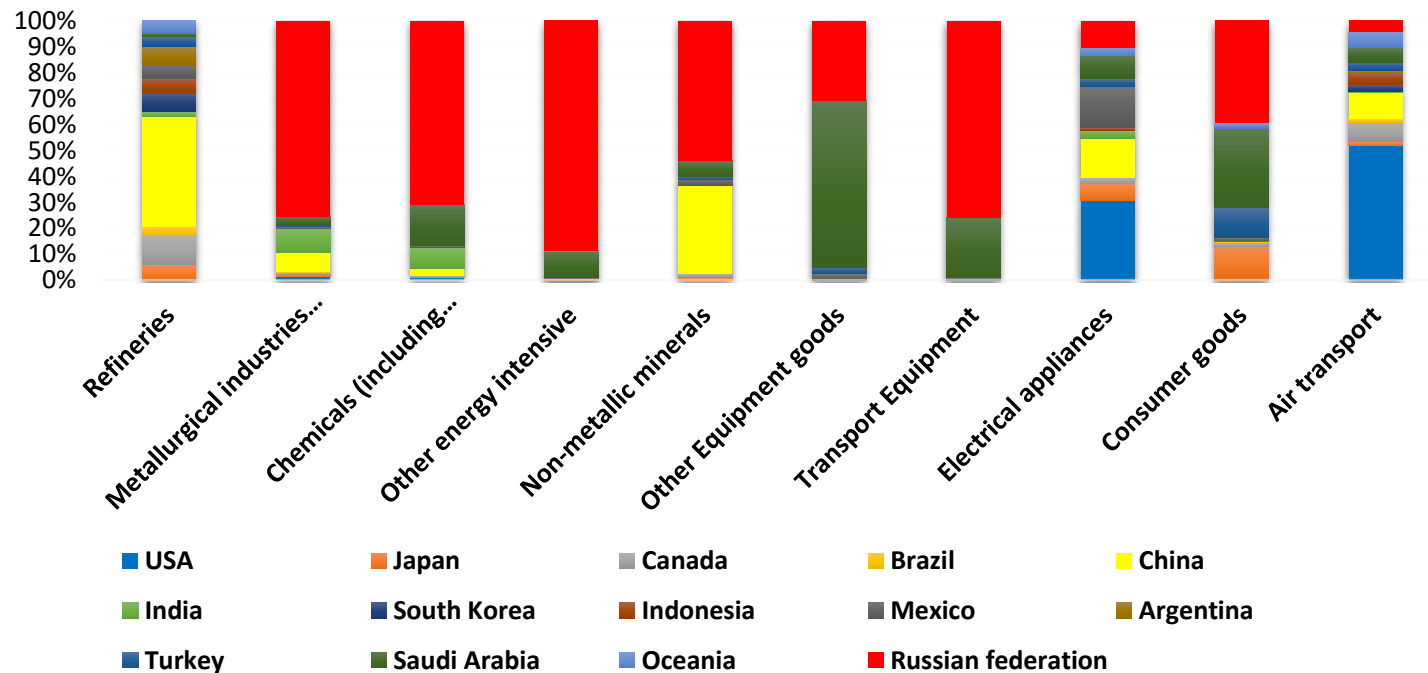
Distribution of Carbon Leakage from the EU with Selected Trading Partners (2025-2050)



## Tier 1 | Sectoral distribution of the carbon leakage, increase in Non-EU GHG Emissions (MteCO<sub>2</sub>, 2025-2050)



## Tier 1 | Sectoral distribution of the carbon leakage by Non-EU trading partner (2025 -2050)





## Tier 2

1. **Policy instruments applied**
2. **Key findings** based on the **results of individual and combined instruments**, using 4 to 5 macro-economic parameters: reduction of carbon leakage, growth, employment, welfare and trade



## Tier 2 | Policy instruments assessed

1. Carbon Border Adjustment Mechanism (**CBAM**)
2. EU-wide **final consumption tax** on Carbon Content (domestic and imported products)
3. Carbon content-modulated Tariffs & Zero Duties on **Environmental Goods** List
4. Plurilateral Agreement on the Reduction of **Industrial Subsidies**
5. Plurilateral Agreement on the Reduction of **Fossil Fuel Subsidies**



## ■ Policy combinations

Multiple instruments likely to be pursued by the EU to reach GHG emission reduction targets

Policy Combinations		Comprising Measures
1	<b>All international trade disciplines (COMBO – aii)</b>	<ul style="list-style-type: none"> <li>✓ Carbon content-modulated Tariffs + Zero duties on EGs</li> <li>✓ Removal of Industrial Subsidies</li> <li>✓ Removal of Fossil Fuel Subsidies</li> </ul>
2	<b>All international trade disciplines plus CBAM (COMBO - CBAM &amp; aii)</b>	<ul style="list-style-type: none"> <li>✓ Carbon content-modulated Tariffs + Zero duties on EGs</li> <li>✓ Removal of Industrial Subsidies</li> <li>✓ Removal of Fossil Fuel Subsidies</li> <li>✓ Carbon Border Adjustment Mechanism</li> </ul>
3	<b>All international trade disciplines apart from reduction of fossil fuel subsidies plus CBAM (COMBO - CBAM &amp; aii minus Reduction of Fossil Fuel Subsidies)</b>	<ul style="list-style-type: none"> <li>✓ Carbon content-modulated Tariffs + Zero duties on EGs</li> <li>✓ Removal of Industrial Subsidies</li> <li>✓ Carbon Border Adjustment Mechanism</li> </ul>
4	<b>All international trade disciplines plus CBAM without Preferential Tariffs on Environmental Goods (COMBO – CBAM &amp; aii without Carbon Content-modulated Preferential Tariffs + Environmental Goods List)</b>	<ul style="list-style-type: none"> <li>✓ Removal of Industrial Subsidies</li> <li>✓ Removal of Fossil Fuel Subsidies</li> <li>✓ Carbon Border Adjustment Mechanism</li> </ul>
5	<b>All international trade disciplines plus Final Consumption Tax (COMBO – Final Consumption Tax &amp; aii)</b>	<ul style="list-style-type: none"> <li>✓ Carbon content-modulated Tariffs + Zero duties on EGs</li> <li>✓ Removal of Industrial Subsidies</li> <li>✓ Removal of Fossil Fuel Subsidies</li> <li>✓ Final Consumption Tax</li> </ul>



## CBAM

- **Tax-based CBAM** : a tax is imposed on imported goods (belonging on the ETS list) from non-EU countries. **Results are also relevant for an ETS separated market for imported products.**
- **Tax calculation** : multiplying the carbon content of the imported good by ETS carbon price difference between the Baseline and the Climate Neutrality Scenario.
- **8 CBAM variants** simulated to take into account **5 main parameters** : recycling, subsidies, retaliation, full ETS or three sector-CBAM and EU 28/EU 27



## CBAM can well perform

- Implementation of this measure can be effective in balancing out changes in competitiveness and eliminating carbon leakage – this is the **individual measure presenting the best outcome for reducing GHG emissions**

	No recycling, No retaliation	With recycling, With retaliation	With recycling No retaliation	No Recycling, With Retaliation	3 sectors (no recycling, no retaliation)
GDP	-0.08%	0.09%	0.10%	-0.09%	-0.07%
Employment rate	-0.11%	0.06%	0.07%	-0.11%	-0.09%
Change in non-EU GHG (Mt, 2025-2050)	-4 642	-4 328	-4 819	-4 153	-4 499

- Recycling CBAM revenues into supporting subsidies is key for growth and employment.** Implementation of CBAM without recycling has small negative effects on GDP whereas the use of ETS and CBAM revenues to promote R&D in clean energy technologies and energy efficiency **brings benefits to the economy.**
- Where **retaliation** occurs, small impacts on GDP and employment in, but increases to leakage.
- Best option: with recycling and no retaliation**



## CBAM can even better perform when coupled with EU wide subsidies

- Designed as a policy intervention **to lower the cost of energy transition** for households and producers and to address potential disadvantages to EU producers that result from being subject to costlier environmental regulations.
- **50% of ETS revenues are recycled back into the economy to subsidise low-carbon technologies.**  
 (i) 60% used to subsidise energy efficiency technologies; (ii) 40% used to subsidise R&D in renewable energy and battery technologies.

	EU-wide subsidies in support of low-carbon technologies & CBAM (with recycling, no retaliation)	CBAM only (with recycling, no retaliation)
GDP	0.29%	0.10%
Employment rate	0.18%	0.07%
Change in non-EU GHG (Mt, 2025-2050)	-5 019	-4 819

- **Notable improvements** in GDP & Employment projected as well as reductions in leakage.



## An EU-wide final consumption tax on carbon content does not perform so well

- Adoption of an EU-wide final consumption tax on the carbon embodied in goods regardless of origin (EU and imports).
- Level of taxation on goods is **calculated using EU ETS carbon pricing as well as the carbon intensity profiles of the products covered by the ETS**
- The final consumption tax is effective in reducing leakage/GHG emissions but **not to the scale of CBAM : only -1077 mt compared with -4153 mt**
- **Negative impact on economic activity and welfare in the EU is observed in the form of higher consumer prices and reduced disposable income.**



## International trade rules also perform to a certain extent

- Reduction of fossil fuel subsidies, tariff erosion on green goods and reduction of industrial subsidies would **reduce GHG emissions by respectively 660, 1117 and 1738 mt**
- Their impact on growth and employment is **neutral or slightly positive**  
Reduction of fossil fuel subsidies would trigger **potential adverse effects**, notably with an increased use of solid fuel
- An agreement reducing industrial subsidies would be the **most effective individual instrument among these trade rules**





## ■ Combined trade agreements perform better both on carbon leakage and growth

- When combining the **3 trade agreements**, GHG emissions would be reduced by **3 731 mt**
- Growth and employment would be improved respectively by **0.04 %** and **0.03 %**



## ■ Combining trade rules and CBAM + makes the real difference

- Combinations between CBAM and trade rules **all significantly improve both carbon leakage reduction and growth**
- Reductions of GHG emissions are comprised between **7460 and 8709 mt**, while growth and employment could be improved up to 0.33% and 0.22 %
- Combination between FC tax and trade rules achieve the same performance as the CBAM + on GHG emissions but has still **a recessive effect**



## Combining trade rules and CBAM + makes the real difference

	1. All international trade disciplines	2. CBAM, all international trade disciplines	3. CBAM, industrial subsidies, preferential tariffs	4. CBAM, industrial subsidies, fossil fuel subsidies	5. All international trade disciplines & EU-wide final consumption tax
<b>GDP</b>	0.10%	0.33%	0.32%	0.31%	-0.09%
<b>Employment rate</b>	0.07%	0.22%	0.21%	0.20%	-0.11%
<b>Change in non-EU GHG (Mt, 2025-2050)</b>	-3 731	-8 708	-6 085	-7 460	-5 290



## Ranking Matrix of Policies

Weighting Distribution (1) : Equal Weighting					
Indicator	Employment	Welfare	Economy	Leakage	Rank
Equal Weights =	0.25	0.25	0.25	0.25	
COMBO - CBAM & aii	16	16	16	16	1
COMBO - CBAM & aii without fossil fuel subsidies	15	14	15	15	2
COMBO - CBAM & aii without tariffs	14	15	14	14	3
CBAM + Domestic Subsidies, With Recycling, No Retaliation	13	12	13	12	4
CBAM, With Recycling, No Retaliation	12	9	12	11	5
CBAM, With Recycling, With Retaliation	11	8	11	8	6
COMBO - Aii	10	10	10	6	7
COMBO - Final Consumption & Aii	5	11	6	13	8
Industrial Subsidies	8	7	8	5	9
Tariffs + ENG's	9	5	9	4	10
CBAM on three sectors, No Recycling, No Retaliation	6	4	5	9	11
CBAM, No Recycling, No Retaliation	4	3	4	10	12
Fossil Fuel Subsidies	7	6	7	1	12
Final Consumption & Recycling	2	13	2	2	14
CBAM, No Recycling, With Retaliation	3	2	3	7	15
Final Consumption	1	1	1	3	16



## Conclusions

- CBAM that includes **recycling of CBAM and ETS revenues** appears as being the **most effective single policy**.
- Careful consideration should be given to **CBAM design** (usage of funds and WTO compliance)
- The EU should pursue **multiple policies** in order to maximise potential gains to employment and GDP and minimise carbon leakage
- There is an **added value** in combining **CBAM with international trade agreements** that could be politically at reach (industrial subsidies and tariff erosion on green goods)

