

Market-based measures for international transport

Impacts on developing countries

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UNFCCC COP19, 16 November 2013, Warsaw, Poland


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Funded by the UK Government



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Aim

- 1) to assess the economic impacts likely to be felt by selected case study countries and globally, as a result of global mechanisms to address CO₂ emissions in the international aviation and shipping sectors
- 2) to determine the possible and most effective and efficient tools to address or reduce these impacts, where appropriate

Background

- 1) International shipping and aviation amount for approximately 5% of anthropogenic CO₂ emissions
- 2) Emissions are projected to increase in the coming decades
- 3) Energy efficiency measures for ships agreed by IMO in 2011
- 4) Other global climate change policies for international shipping and aviation remain under discussion

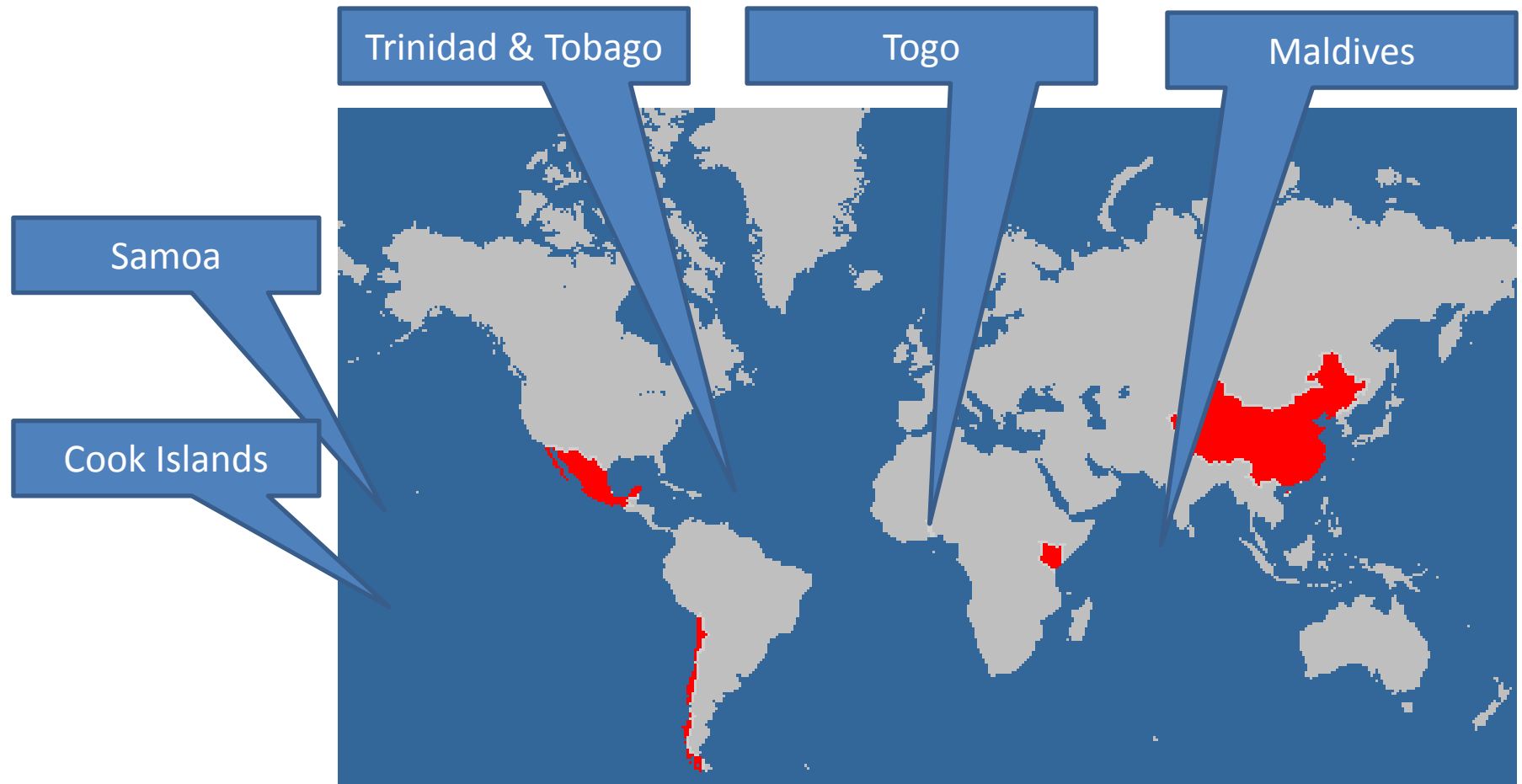
Policies assessed

- 1) Global Emissions Trading (for aviation and shipping)
- 2) Global Mandatory Offsetting complemented by a Revenue Generation Mechanism (aviation)
- 3) Greenhouse Gas Fund (shipping)
- 4) EU ETS (shipping and aviation)

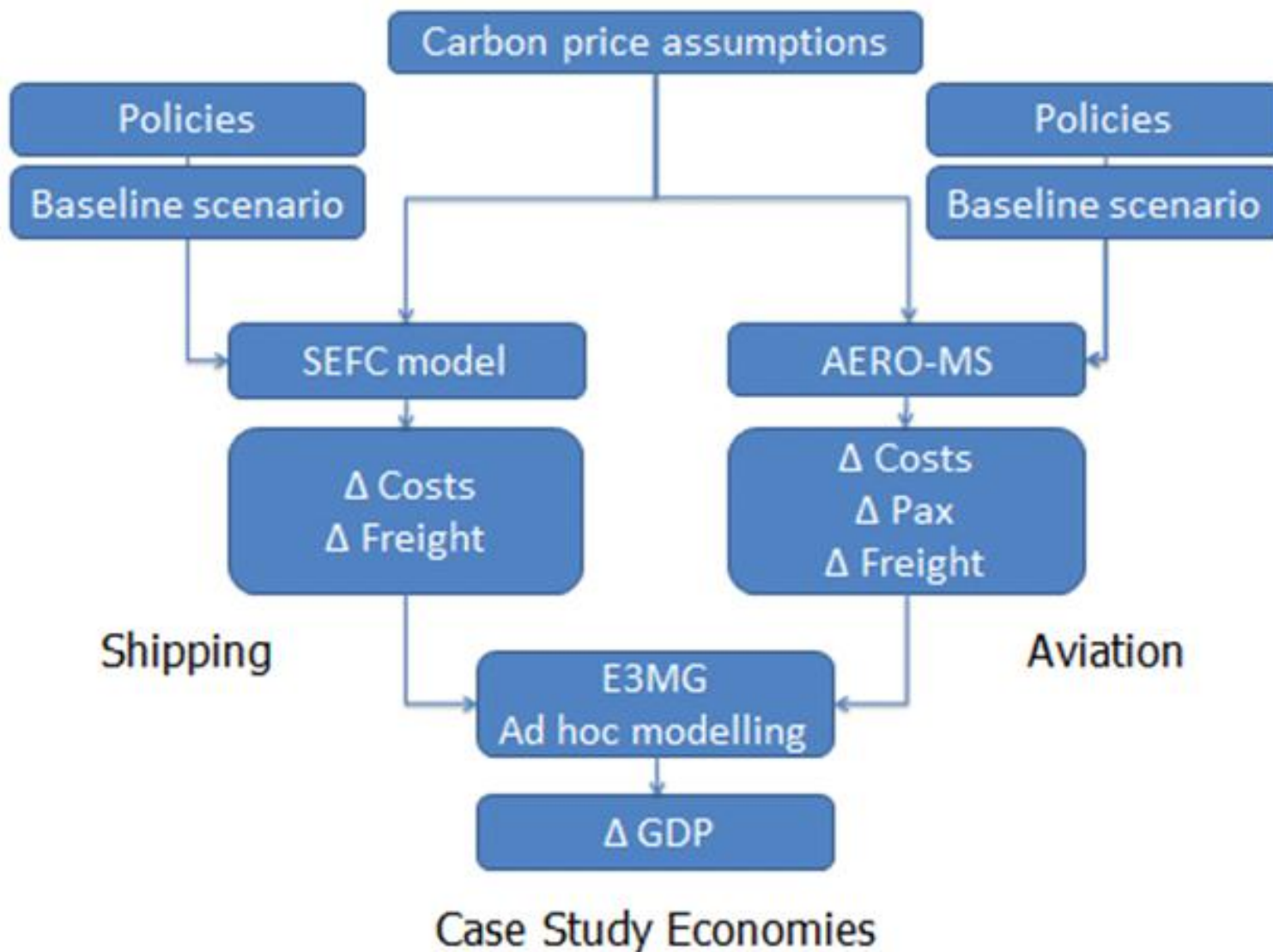
These policies are modelled after the proposals currently discussed at ICAO and IMO, but are not identical to these due to insufficient availability of details and data

Coverage

- 1) Global, Annex I, Non-Annex I
- 2) Case study countries - Mexico, China, India, Trinidad and Tobago, Togo, Kenya, Maldives, Samoa, Cook Islands and Chile



Methodology



Main assumptions (1)

- 1) The schemes run from 2015; impacts assessed for 2025
- 2) Global sectoral targets are 10% below 2005 emissions for aviation, 20% below 2005 emissions for shipping
- 3) Three carbon prices for each scheme - \$10, \$30 and \$50
- 4) Two pass through rates for the potential gains from free allowances for the emissions trading schemes – 0% and 100%
- 5) Two levels of auctioning for the global emissions trading schemes - 15% and 100% of the target emissions

Main assumptions (2)

- 6) 10% levy in offsetting schemes (GHG Fund for shipping and Global Mandatory Offsetting for aviation) in addition to offset costs to raise revenues
- 7) Auctioning revenues spent by countries to reduce personal taxes – there are other options for using the revenues
- 8) Offsetting used to complement the reductions from decreased demand and efficiency improvements
- 9) CDM projects distribution generally follows the current pattern up to 2025

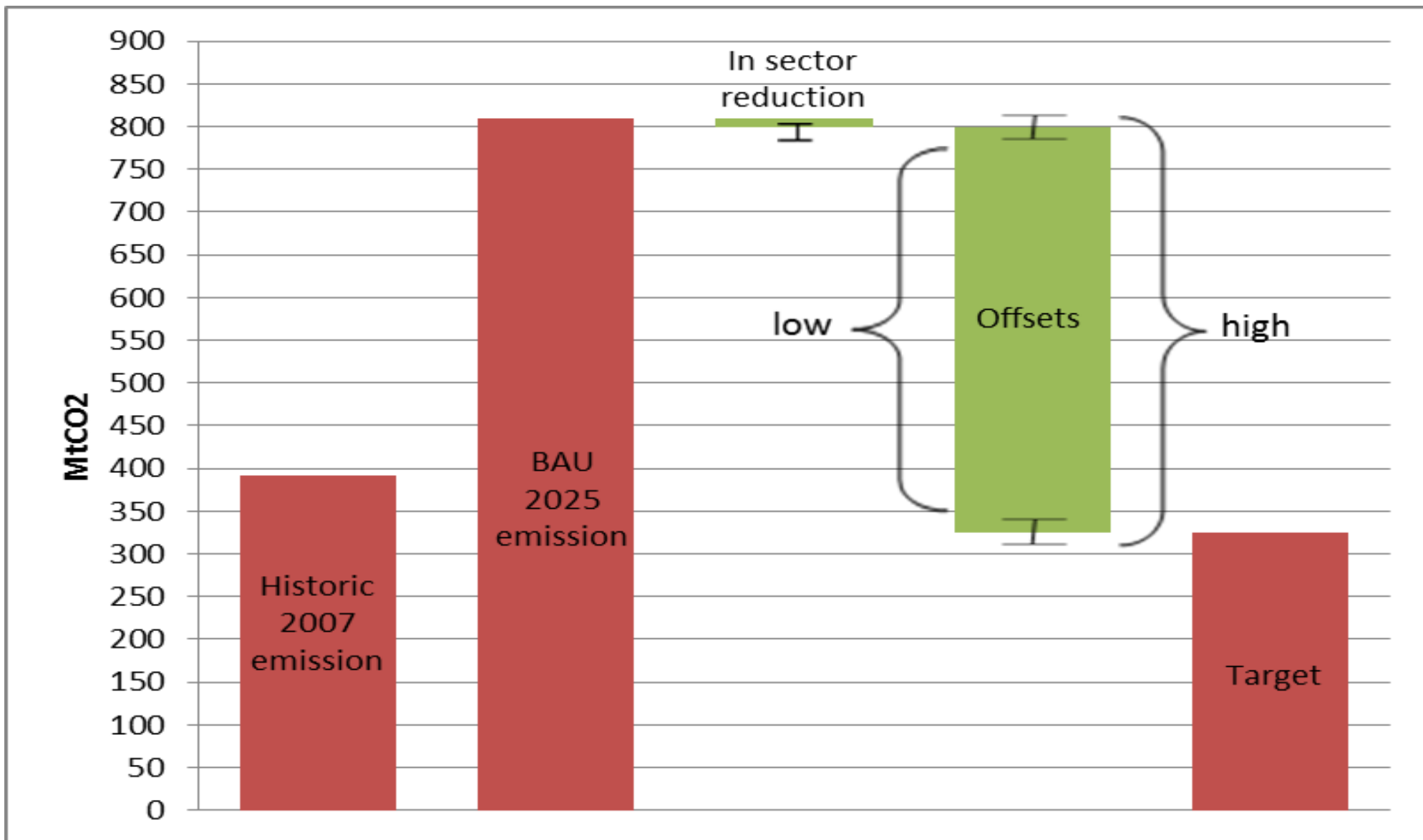
Main assumptions (3)

International transport CO₂ emissions and targets for global MBMs [MtCO₂]

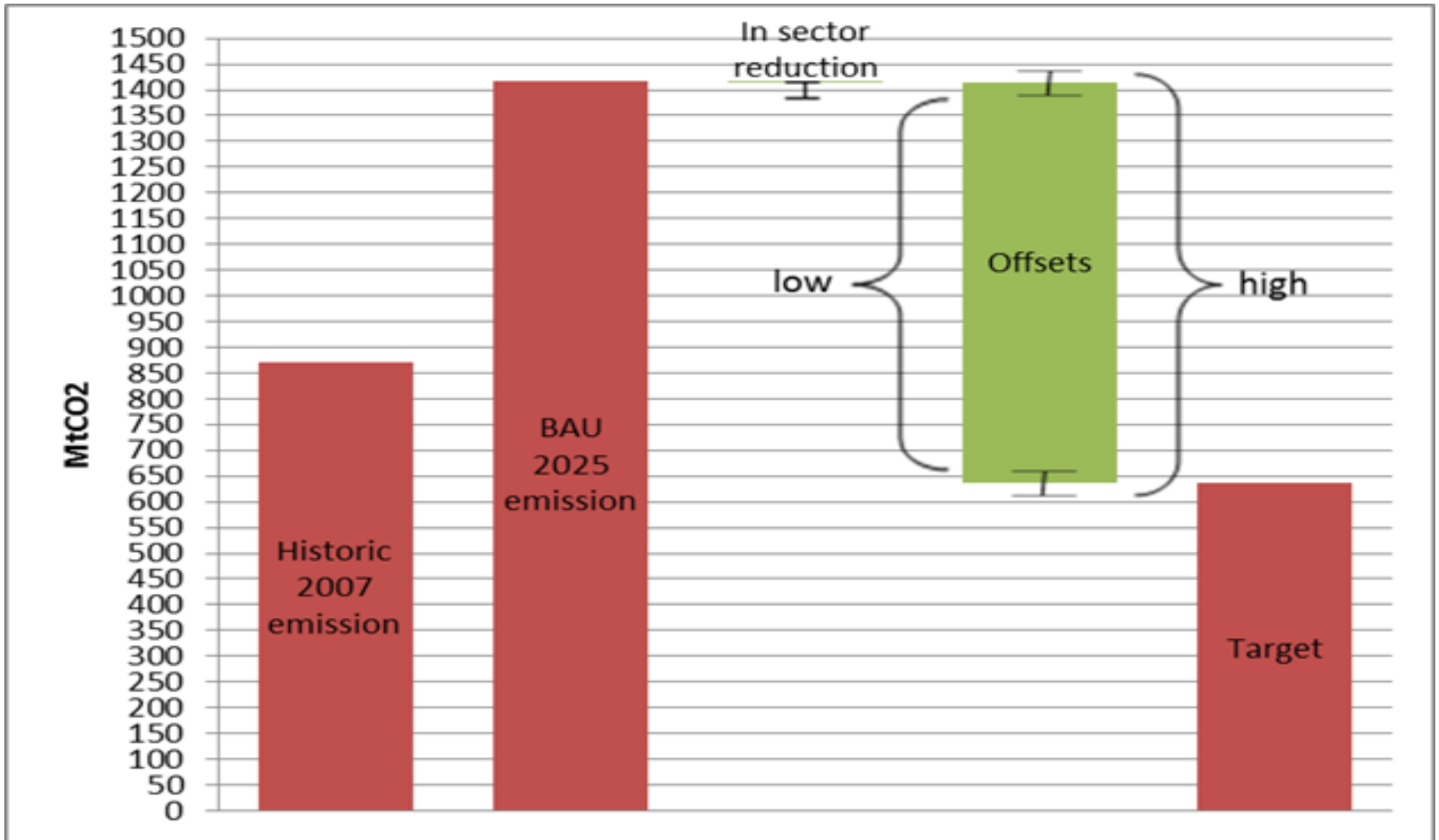
	Business as usual (BAU) in 2025	Target	Difference (BAU-target)
Aviation	810 (CAEP-M)	325 (10% below 2005)	485
Shipping	1485 (IMO A1B)	636 (20% below 2005)	849
Shipping +EEDI	1418	636 (20% below 2005)	782

The target is achieved in each scenario

Aviation



Shipping



Results

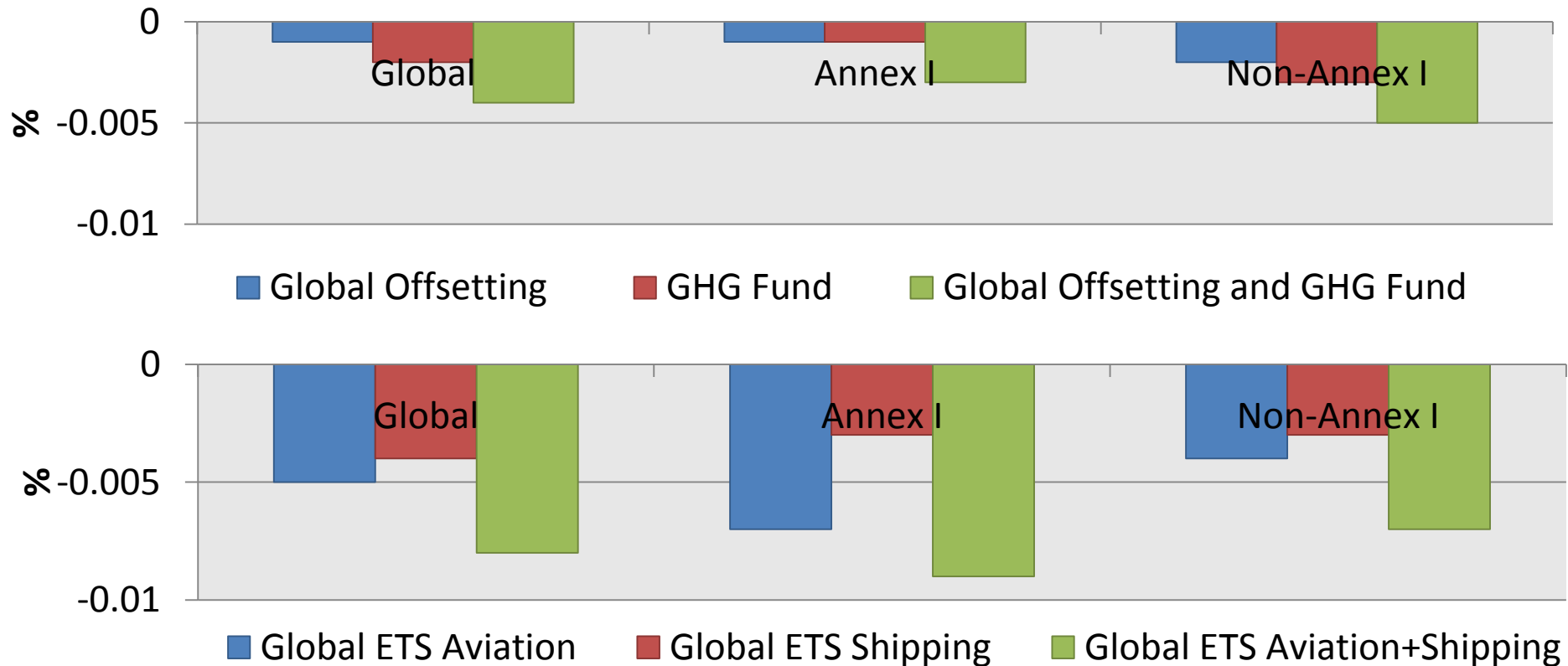
CO₂ emissions are reduced 51% compared to the BAU for international shipping and aviation due to the global schemes in 2025 [MtCO₂]

	Business as usual (BAU) emissions in 2025 [a]	Target [b]	Emission reduction [c] c=a-b c=d+e	In-sector emissions reductions [d]	Emissions offset [e] e=c-d
Aviation	810	325	485	3 - 19	466.- 482
Shipping	1418	636	782	1 – 10	772 - 781
Aviation+ Shipping	2228	961	1267	4 - 29	1238 - 1263

In 2025 revenues range from 0.5 to 16 billion USD for aviation and from 1 to 38 billion USD for shipping depending on the MBM design and carbon price (in 2010 USD)

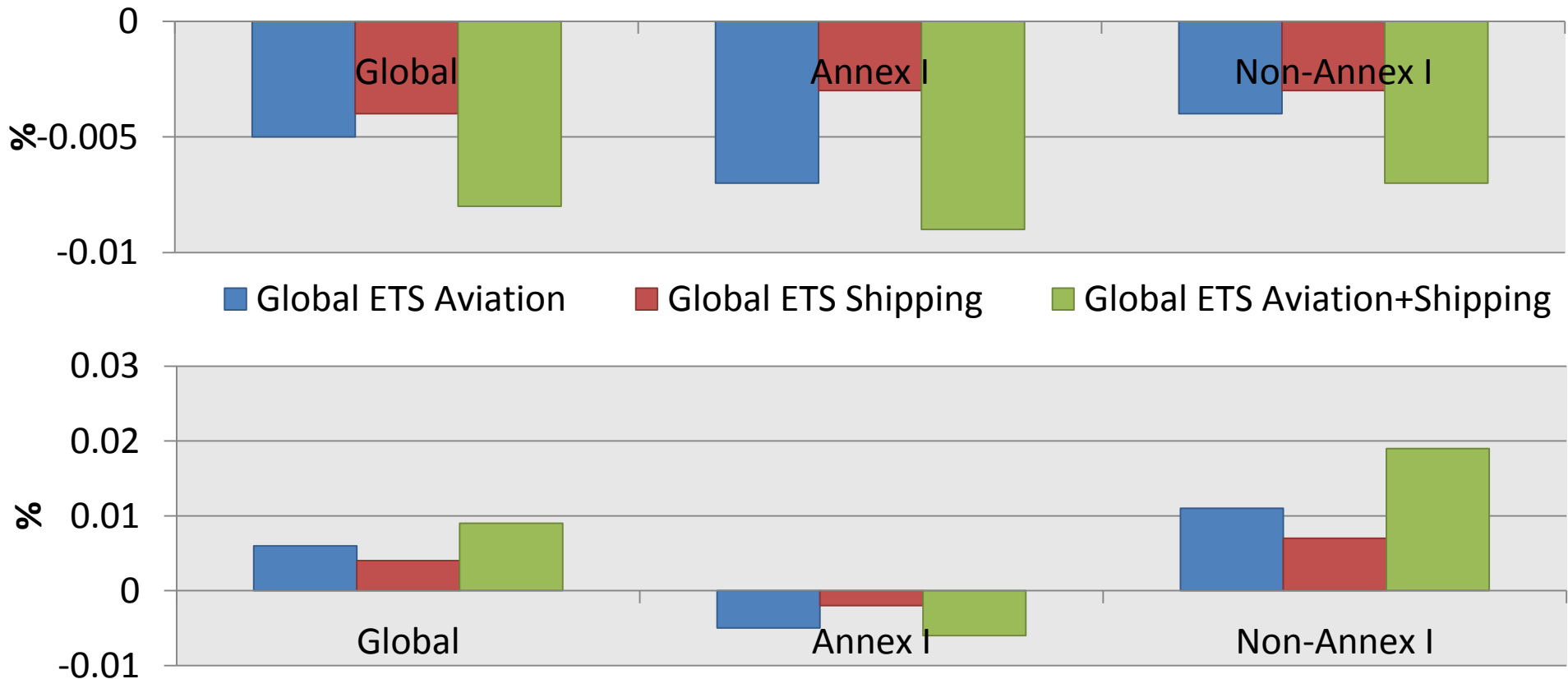
Results

GDP impacts in 2025 when revenues are used to reduce personal taxes [15% allowances are auctioned and 100% opportunity costs are passed through to consumers in ETS, carbon price \$30 tCO₂]



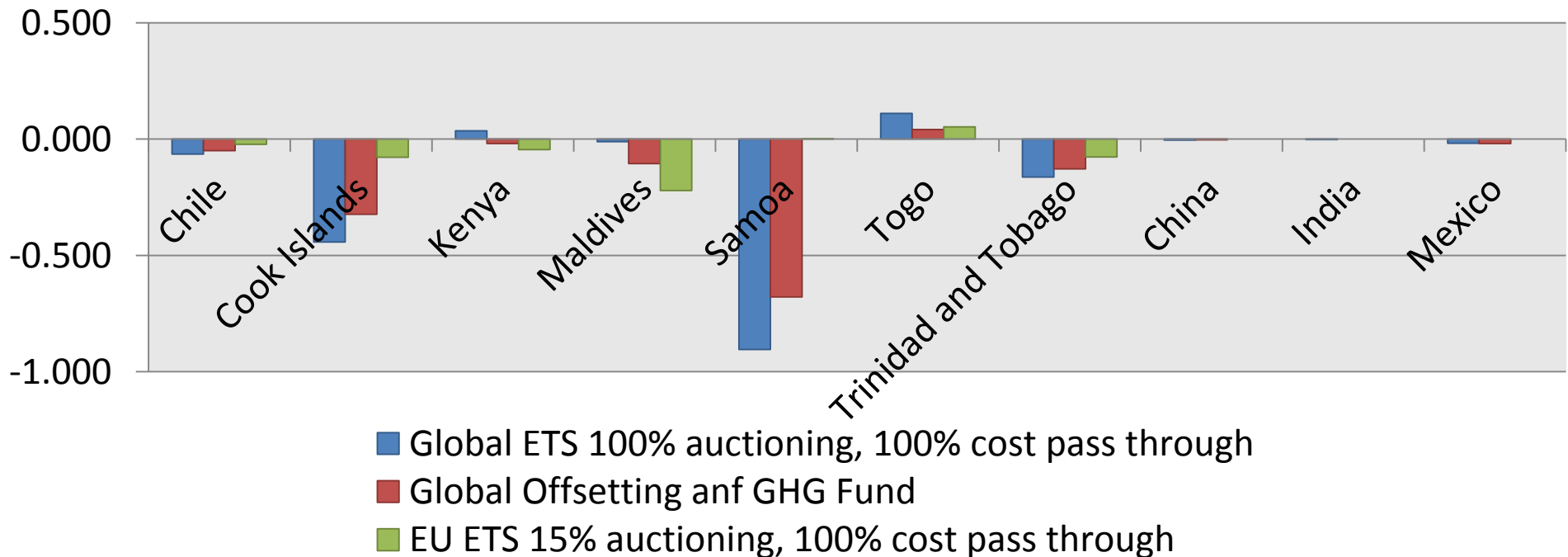
Results

GDP impacts in 2025 when revenues are used to reduce personal taxes [15% allowances are auctioned and 100% opportunity costs are passed through to consumers, carbon price \$30 tCO₂] without and with CDM revenues



Impacts on the case study economies

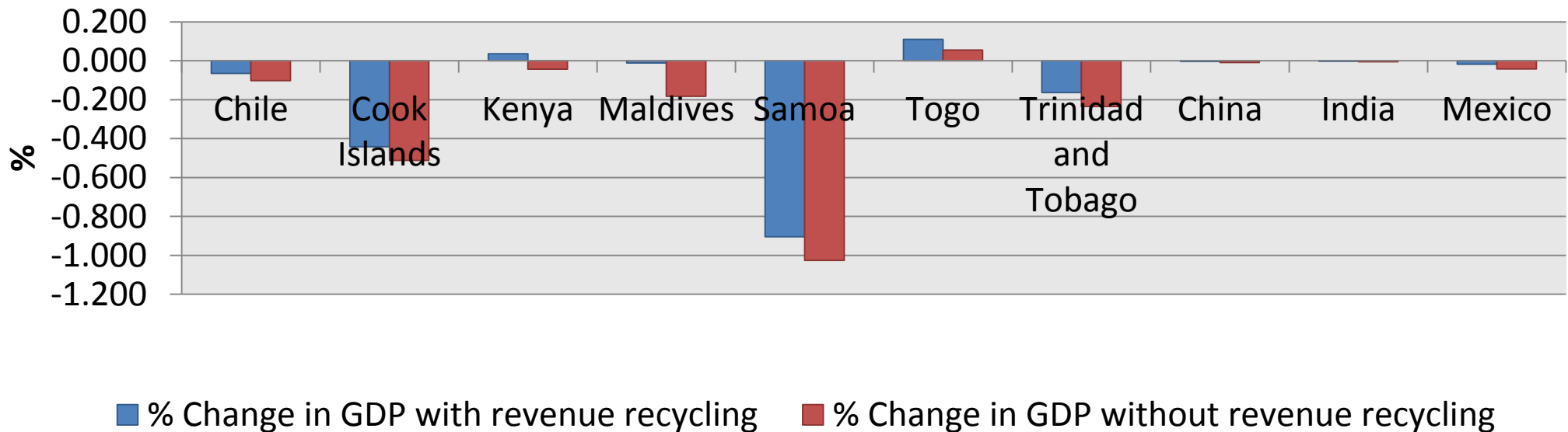
MBMs impacts (aviation + shipping) on case study economies (also globally and regionally) are relatively **small**, but differ from country to country depending on the shares of tourism expenditure and trade in their economy. Poverty levels are important to consider – impacts on domestic consumption.



\$30 (USD 2010) per tonne of CO₂, revenues used to reduce social security taxes, no CDM

Impacts on case study economies

Changes in GDP in 2025 due to a Global ETS for international shipping and aviation (100% auctioning, 100% cost pass through, \$30 (USD 2010) per tonne of CO₂, revenues used to reduce social security taxes, impacts of CDM receipts are not considered)



Mitigating impacts (1)

A range of measures to consider

Exemptions:

- 1) Exemptions of routes reduce cost increases
- 2) Only limited reductions for transshipments and transfers
- 3) Risk of avoidance by re-routing in shipping sector
- 4) Flag country based exemptions not possible for shipping due to ability to avoid measure

Mitigating impacts (2)

Revenue recycling:

- 1) Requires a metric for allocating emissions to countries.
Challenging to identify data to enable recycling, particularly for shipping
- 2) Challenging to identify a metric which is a good proxy for those who suffer the most and are least able to pay

Mitigating impacts (3)

Directing offsets:

- 1) Challenging to direct funds in proportion to impact
- 2) If mitigation of economic impacts was the primary aim, this could reduce the cost-effectiveness of achieving emission reductions

Mitigating impacts (4)

Lump sum revenue transfer to countries:

- 1) In principle sufficient revenues
- 2) Challenging to identify a metric which is a good proxy for those who suffer the most and are least able to pay
- 3) If spend on adaptation, how well aligned are impacts of MBM with impacts of climate change

Mitigating impacts (5)

Investment in increasing port/air transport management efficiency

- 1) Immediate effects in terms of reducing the cost of transport and emissions (saving fuel)
- 2) Only effective for countries with inefficient ports/air transport management

Investment in R&D for low-carbon technologies:

- 1) Global benefits
- 2) Gradual but long term effect

Mitigating impacts (6)

Impacts have multiple causes

Cannot be mitigated by a single measure without over- or undermitigating the impacts for some countries

Need a suite of measures to effectively reduce impacts on vulnerable countries

Key messages (1)

- 1) Economic impacts of the MBMs studied are relatively small
- 2) Environmental impacts of all MBMs studied are achieved mostly through offsetting the emissions
- 3) Aviation schemes tend to have in most cases greater economic impacts than shipping schemes (aviation has large impacts on tourism and shipping is more inelastic and less carbon intensive)

Key messages (2)

- 4) Countries with high tourism and trade dependency can experience larger economic impacts – some of these countries are SIDS that are vulnerable to climate change
- 5) There are measures to address these economic impacts – these could be used effectively in combination

- 1) More case study countries: 20-30 – see whether there are any patterns that allow to group the countries and define a key/(s) to address the impacts
- 2) Studies to quantify climate change impacts on the case study countries and compare the impacts
- 3) Studies including also non-revenue raising schemes
- 4) Dialog with countries: access to data, feedback

Thank you, contacts

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