

**UNCTAD Multiyear Expert Meeting on Transport,  
Trade Logistics and Trade Facilitation**

21-23 November 2018, Geneva

**“Sustainable freight transport in support  
of the 2030 Agenda for Sustainable  
Development”**

**What do we know about the potential  
impacts on states arising from shipping  
GFG reduction**

by

Tristan Smith – UCL/UMAS  
Ronald Halim – World Bank  
Isabelle Rojon – UCL/UMAS  
Dominik Englert – World Bank

# WHAT DO WE KNOW ABOUT THE POTENTIAL IMPACTS ON STATES ARISING FROM SHIPPING GHG REDUCTION

TRISTAN SMITH – UCL/UMAS  
RONALD HALIM – WORLD BANK  
ISABELLE ROJON – UCL/UMAS  
DOMINIK ENGLERT – WORLD BANK



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## OUTLINE

1. Impacts on states
2. Relationship between shipping's GHG reduction and transport costs
3. Wider relationships between GHG reduction, trade and development
4. Findings from literature on impacts on import costs
5. Relationships between impacts on import costs, trade and GDP
6. Summary of wider impacts



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## WHAT DO WE MEAN BY IMPACTS ON STATES?

- 1 geographic remoteness of and connectivity to main markets;
- 2 cargo value and type;
- 3 transport dependency;
- 4 transport costs;
- 5 food security;
- 6 disaster response;
- 7 cost-effectiveness; and
- 8 socio-economic progress and development.

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## WHAT ARE WE NOT COVERING IN THIS PRESENTATION?

- 1 geographic remoteness of and connectivity to main markets;
- 2 cargo value and type;
- 3 **transport dependency**;
- 4 transport costs;
- 5 **food security**;
- 6 **disaster response**;
- 7 cost-effectiveness; and
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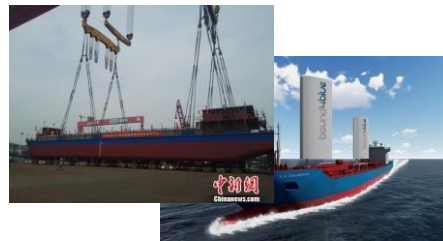
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## TECHNOLOGY CHANGES ASSOCIATED WITH DECARBONISING SEA TRANSPORT, MAY OR MAY NOT INCREASE TRANSPORT COST



Increased capital costs  
and fuel costs -  
increase in transport  
cost



Increased capital costs but lower  
operating cost - no net increase or even  
a decrease in transport costs

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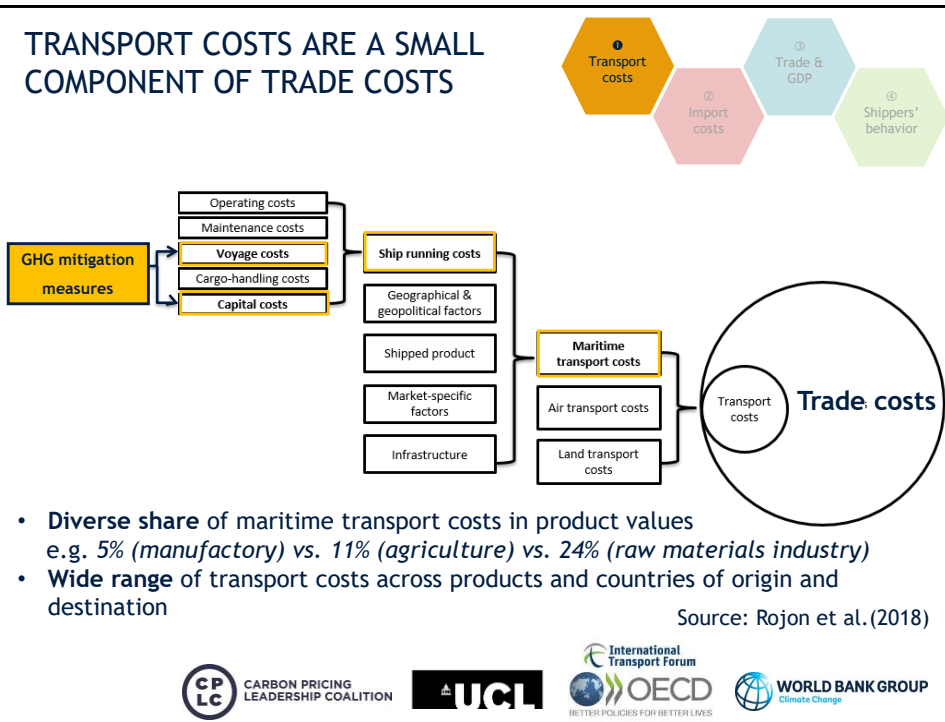
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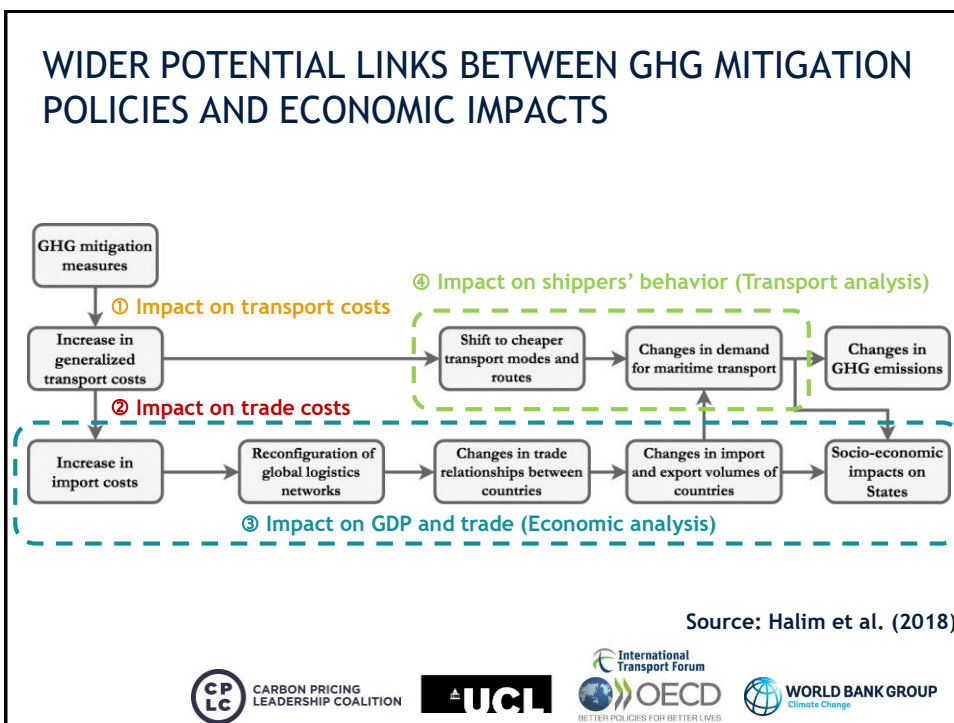
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## TRANSPORT COSTS ARE A SMALL COMPONENT OF TRADE COSTS

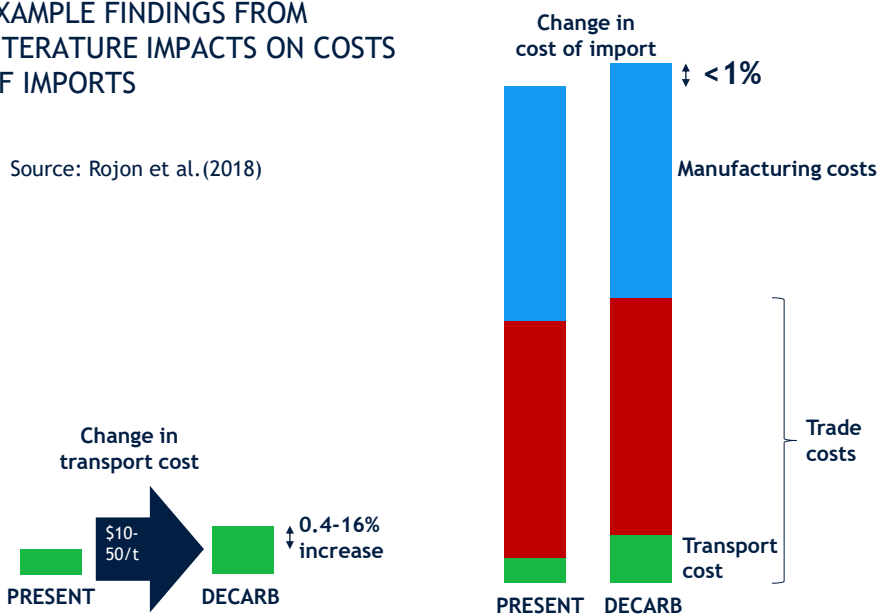


## WIDER POTENTIAL LINKS BETWEEN GHG MITIGATION POLICIES AND ECONOMIC IMPACTS



### EXAMPLE FINDINGS FROM LITERATURE IMPACTS ON COSTS OF IMPORTS

Source: Rojon et al. (2018)



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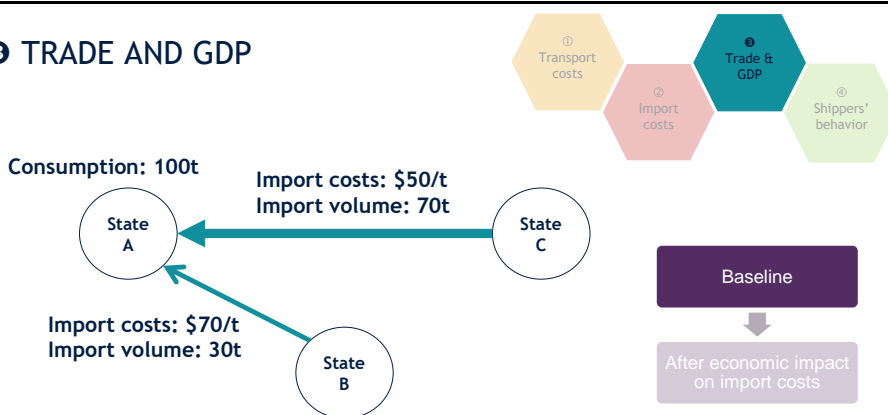


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### 3 TRADE AND GDP



- Consumers will substitute products from different producers depending on the changes in import prices
- States with higher import costs might not be favorable over states with lower import costs anymore causing shift of volume of demand.

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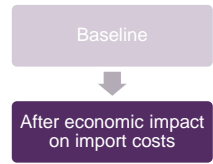
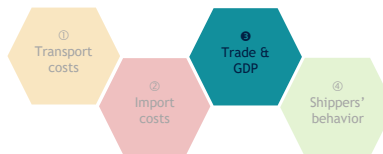
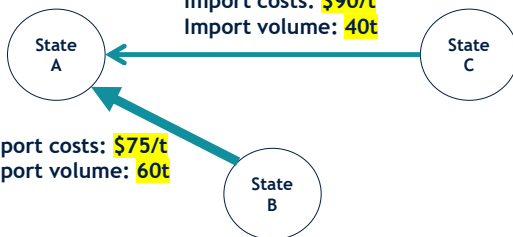
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### 3 TRADE AND GDP

Consumption: 100t



Potential asymmetric increase in import costs due to GHG mitigation measures could lead to:

- Decline of export in State C which could lead to decline in GDP
- Increase of export in State B could lead to increase in GDP

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### SUBSTITUTION CAN ALSO OCCUR TO DOMESTIC PRODUCTION

Consumption: 100t  
Production: 0t



Consumption: 70t  
Production: 30t

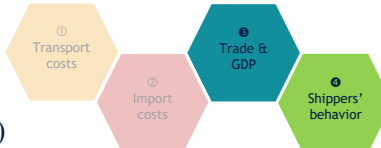


Depending on the commodity and state, an increase in trade costs can also result in a shift to increased domestic production, which can increase employment, reduce trade imbalance and increase welfare

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### ③④: TRADE, GDP AND SHIPPERS' BEHAVIOUR



Generally, modest impact on:

- GDP of individual countries (-0.02% to -1%)
- Mode shift from sea to land based transport (-0.16%)

Literature	GHG mitigation measures	Economic Indicators	Findings
Lee et al. (2013)	Carbon price 30, 60, 90 USD/ton CO2 for the year 2007	Real GDP	-0.002% to +0.004%, Global average : -0.0003%
		Volume of container flows	Reduction of 925 KTEU (Twenty-Foot Equivalent Units) globally
Sheng et al. (2018)	Carbon price 40 USD/ton CO2 by 2030	Real GDP	-0.06% to +0.001%
		GDP growth	-0.17% to +0.01%
L.A. Tavasszy et al. (2014)	Carbon price 49 euros/ton CO2 by 2040	Global trade flows	- 0.9% in total trade flows
		Commodity trade flows	-0.2% (food) to- 4.2% (agriculture)
Anger et al. (2013)	Carbon price 10,30,50 euros/ton CO2 by 2025	Real GDP	<-0.01% in global GDP
		real GDP changes for developing countries	-1% GDP for one country <-0.2% for majority
Halim et al. (2018)	Slow steaming (25-65% speed reduction), and carbon price on maritime transport with 100% increase in maritime transport by 2030	Volume of international maritime transport	-34 Mtonnes in demand for maritime transport
		Shift to freight rail mode (e.g. Eurasian railways)	-0.16% in modal share of maritime transport.

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## SUMMARY

- There are a number of apotential impacts on states arising from GHG reductions in shipping
- The most obvious impacts relate to risks of increase transport costs, and related impacts on trade - relevant to both importers and exporters
- Other types of potential impact include risks to food security, disaster response provisions
- Generally, even a modest increase in transport cost will only have a small to negligible impact on total import costs (as a % change in the price of a good)
- When also taking into account potential reconfiguration of trade, overall impacts on GDP are mostly expected to be small
- Risks are normally greatest to flows of low value commodity over long distances and where trade is a key influence on costs of living or economic development, and particular attention should be paid to assess impacts in these cases





# UNDERSTANDING THE ECONOMIC IMPACTS OF GHG MITIGATION POLICIES ON SHIPPING

## WHAT IS THE STATE OF THE ART OF CURRENT MODELLING APPROACHES?

Understanding the economic impact of GHG mitigation policies on shipping: what is the state of the art of current modelling approaches?  
Klaus Hanisch, Alexander Jansen, January 2018 (17)

Executive Summary

**What we did**  
Global impact of the report and its content related to 2050 total energy demand.  
This paper reviews the state of the art modelling for assessing the impact of GHG mitigation policies on shipping and its contribution to the overall GHG emissions. The paper also identifies the main challenges and opportunities for modelling shipping emissions and their contribution to the overall GHG emissions.  
**Key findings of the report by sector of emissions**  
The shipping sector is a significant source of GHG emissions, particularly in the context of global climate change. Shipping emissions are projected to increase significantly in the coming decades, driven by the growth of global trade and the expansion of shipping routes.  
**Key findings of the report by region**  
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**What we found**  
Shipping emissions are a significant source of GHG emissions, particularly in the context of global climate change. Shipping emissions are projected to increase significantly in the coming decades, driven by the growth of global trade and the expansion of shipping routes.

Full research paper forthcoming, currently being finalized and reviewed with support from

