

FAIR FINANCE

ENSURING DEVELOPING COUNTRIES
BENEFIT FROM CARBON PRICING
OF INTERNATIONAL TRANSPORT

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EXECUTIVE SUMMARY

Developed countries have promised additional funds rising to US\$100 billion per year by 2020 to support climate action in developing countries. Countries will discuss how to meet this target at the UN climate talks in Durban, including through “innovative” ways of raising finance.

One innovative financing mechanism that CAFOD supports is carbon pricing of international shipping and aviation. It has the potential to reduce emissions and generate significant resources for climate action. However, it is essential that it does not have negative impacts on developing countries that are least responsible for climate change, in accordance with the fundamental principle of climate justice.

This briefing paper analyses the impact of carbon pricing of international transport for nearly 200 countries based on their imports by sea and air. The analysis shows that, without any compensation for its impacts, carbon pricing of international shipping would be regressive, as it would impose a larger cost burden relative to GDP on many poorer countries that rely heavily on imports. This includes some small island developing states and least developed countries.

It thus makes a strong case for compensating developing countries

Without any compensation for its impacts, carbon pricing of international shipping would be regressive.

A solar-powered, bore hole pump has revolutionized the lives of the people of Monze, Zambia, giving them a reliable source of clean water.



The ten countries or regions shown to be most reliant on imports by sea and air by this analysis are all developing countries.

for the potential adverse impacts of carbon pricing on international transport. If this occurs and the most vulnerable countries also receive finance from the revenue raised for climate change action, they would be net beneficiaries of carbon pricing on international transport.

Overall, the expected cost impact on global trade from such a mechanism in shipping is low, estimated at less than 0.2% of the trade value. Nevertheless, the relative impact on various countries will vary significantly in relation to how reliant a country is on imports by sea.

The ten countries or regions shown to be most reliant on imports by sea and air by this analysis are all developing countries, and eight of them are small island developing states or least developed countries. Their value of imports by sea and air is approximately equivalent to their GDP. The ten countries ranked least reliant on imports by sea and air include developed and developing countries, including larger economies such as United States and Brazil. Their value of imports by sea and air is approximately equivalent to 10% of their GDP. For the majority of G20 countries, imports by sea and air are less than the world average (estimated at 17% of GDP).

The additional impacts of trade-weighted distances and the structure of trade are not explored in the analysis. However, including these factors would most likely make the case for compensation even stronger.

BACKGROUND

At the UN climate talks in Copenhagen in 2009 and Cancun in 2010, developed countries promised to provide funds rising to US\$100 billion per year by 2020 to support climate action in developing countries,³ in addition to Fast Start Finance of \$30 billion for the period 2010-12. Although this is a good step, many doubt these amounts will be sufficient to meet the needs of developing countries.⁴

Climate finance is supposed to be new and additional to current financing commitments and also predictable and adequate to enable long-term planning by developing countries. In addition, allocation should be balanced between adaptation and mitigation, with priority given to the most vulnerable developing countries, such as the least developed countries (LDCs), small island developing states (SIDS), and Africa.

The *Cancun Adaptation Framework* was also agreed, with the objective of enhancing action on adaptation to climate change impacts in developing countries. Finally, a decision was also taken to establish a new *Green Climate Fund* (GCF) under the authority of the UN.⁵

CAFOD supports this new Fund as a way of centralizing and rationalizing the provision of resources so poorer countries can plan to build long-term resilience to climate change impacts and transition to clean development paths. Another key aspiration for the GCF is to rebalance the current climate finance regime, which has largely focused on mitigation projects in middle-income countries, to ensure sufficient funds flow to adaptation and to the most vulnerable and the least developed countries.⁶

Recently, EU Finance ministers highlighted “the readiness of the EU and Member States to contribute, together with other parties, its fair share to mobilise the \$100 billion per year by 2020”. They also recognised “the importance of public finance in supporting developing countries; including adaptation measures in the most vulnerable and least developed countries”. Furthermore, they invited “Parties to IMO/ICAO to consider within IMO and ICAO the work undertaken by the IMF and the World Bank on market-based instruments in aviation and maritime international transportation”.⁷

While this statement is welcome, a decision is needed at the upcoming climate talks in Durban, South Africa on a process to mobilize the required financial flows and ensure the 2020 target is met. This process must also



Already water-scarce countries such as Kenya are particularly vulnerable to climate change.

ensure that there is no “gap” in financing after the Fast Start Finance period ends in 2012 and have a credible trajectory for scaling up finance to 2020. It must also respect the fundamental principle of the UN Framework Convention on Climate Change (UNFCCC) that: “Parties should protect the climate system for the benefit of future and present generations of human kind on the basis of equity and in accordance with their common but differentiated responsibility and respective capabilities [CBDR]. Accordingly, developed countries should take the lead in combating climate change and the adverse effects thereof”.⁸

A considerable amount of analytical work has already been done on identifying potential sources of climate finance.⁹ Most recently, a World Bank Group report to the G20 Finance Ministers in November by international organizations, coordinated by the World Bank Group, discussed revenue raising instruments such as the removal of fossil fuel subsidies, comprehensive carbon pricing and the use of public finance to leverage private capital flows.¹⁰ One specific new or “innovative” way of raising finance is carbon pricing of fuel used by international transportation, discussed in detail by the IMF and World Bank.¹¹

CAFOD supports such a mechanism on shipping to raise revenues for climate action in developing countries – at the same time as spurring efficiency measures to cut emissions from the sector.¹² Carbon pricing of international maritime transport has the potential to both reduce emissions and generate significant financial resources for climate change action in the order of \$10 billion annually, as recognized by various countries and stakeholders.¹³ Such a mechanism is supported by the industry,¹⁴ and the International Maritime Organization (IMO) is currently considering proposals for its implementation.¹⁵

Carbon pricing of international maritime transport has the potential to both reduce emissions and generate significant financial resources for climate change action.



Figure 1
Imports by sea and air as a % of GDP (2007)

However, any such mechanism should ensure there are no negative impacts on developing countries, in line with the UNFCCC principle of CBDR. Poorer countries should be compensated to ensure that they are subject to no net incidence (cost burden) – an idea supported by the recent report by international organisations to the G20, which found that “the impact on developing countries of such charges would likely be modest and could be largely offset by explicit compensation schemes. Closer analysis of impacts is needed in order to design practicable compensation schemes, but enough has already been done to provide confidence that solutions can be found.”¹⁶

However, one important factor not analysed by the IMF and World Bank is the relative importance to the wider economy of the goods

affected by such a measure (as a percentage of a country’s GDP).¹⁷ At the same time, the report acknowledged that any measure on international transport that does not include compensation may be ‘regressive’, that is, it imposes a larger incidence relative to GDP on poorer countries that rely heavily on international transport.

This briefing note aims to fill this analytical gap by quantifying the relative impact on nearly 200 countries from carbon pricing of international shipping. This is the case irrespective of whether the carbon price is established through a levy on emissions or fuel, or an emissions trading system (ETS). The results clearly strengthen the case for any such mechanism to include compensation for poorer countries, in line with the demands of equity.

COST IMPACTS FROM A CARBON PRICE ON SHIPPING

The overall burden of setting a carbon price of \$25 per tonne of CO₂ for international shipping and aviation is likely to be small for both developed and developing countries.

For instance, the maximum potential increase in the total value of seaborne trade, due to such a pricing policy, is estimated at less than 0.2%, equivalent to \$2 for every \$1,000 value of imported goods.¹⁸

The impact on overall import prices to various countries is likely to be fairly uniform, estimated in the range of 0.2–0.3%.¹⁹

October 2011:
The United Nations launched an appeal to help an estimated 300,000 people in El Salvador after heavy rains caused widespread flooding.



Rank	Country (or Region)	Imports by sea & air (% of GDP)	Annex I	LDC	SIDS	High Income
1	Singapore	137			SIDS	High Income
2	Maldives	104		LDC	SIDS	
3	Palau	102			SIDS	
4	Kiribati	100		LDC	SIDS	
5	Hong Kong SAR, China	96				High Income
6	Lesotho	93		LDC		
7	Timor-Leste	93		LDC	SIDS	
8	Guyana	91			SIDS	
9	Iraq	89				
10	Seychelles	84			SIDS	

189	Switzerland	12	Annex I			High Income
190	United States	11	Annex I			High Income
191	Uzbekistan	11				
192	Russian Federation	10	Annex I			
193	Korea, Dem. Rep.	10				
194	Luxembourg	10	Annex I			High Income
195	Namibia	10				
196	France	10	Annex I			High Income
197	Libya	10				
198	Brazil	8				

Table 1
Estimated imports
by sea and air as % of
GDP – top and bottom
10 countries

Nevertheless, the overall impact on the economies of the most vulnerable countries, including many (but not all) least developed countries (LDCs) and small island developing states (SIDS), will generally be much greater than on other countries. This is because the most vulnerable countries typically rely heavily on imports by sea and air (i.e. they import a much higher number of goods in relative terms than other countries).

ASSESSING RELATIVE IMPACTS: METHODOLOGY

The relative value of a country's imports by sea and air, expressed as a percentage of gross domestic product (GDP), is used as the indicator of the relative impact of carbon pricing of international transport. The value of a country's imports by sea and air is calculated on the basis of its bilateral trade with non-adjacent partners, and divided by its GDP.²⁰ This is not disaggregated further into imports by sea and imports by air, due to a lack of data on the specific mode of transport for various trades and countries. The aggregated value is also useful in understanding the impact on a country of carbon pricing on transport of goods by both sea and air.²¹

Calculations of relative imports by sea and

air (as a percentage of GDP) were made for nearly 200 countries and regions, based on 2007 trade data. The world average was 17%. Partial results are shown in Table 1, for the top ten and bottom ten countries (ranked from the highest to the smallest value of the indicator). The table also includes details of whether a country/region is an Annex I party to the UNFCCC, an LDC, a SIDS or classified as a high-income country (according to the World Bank). The full version of the table comprising details for 198 countries can be found in Annex 1.

Most of the ten countries ranked as the most reliant on imports by sea and air are SIDS and LDCs (eight out of ten), there are two trade hubs, Singapore and Hong Kong SAR of China, and Iraq. The value of their imports by sea and air is approximately equivalent to their GDP, roughly six times greater than the world average.

The ten countries ranked least reliant include developed and developing countries, including larger countries such as United States and Brazil. The value of their imports by sea and air is approximately equivalent to 10% of their GDP, nearly 100% lower than the world average. The fact that some bigger economies are relatively less reliant on international air and sea imports is confirmed by detailed

Most of the ten countries ranked as the most reliant on imports by sea and air are SIDS and LDCs.

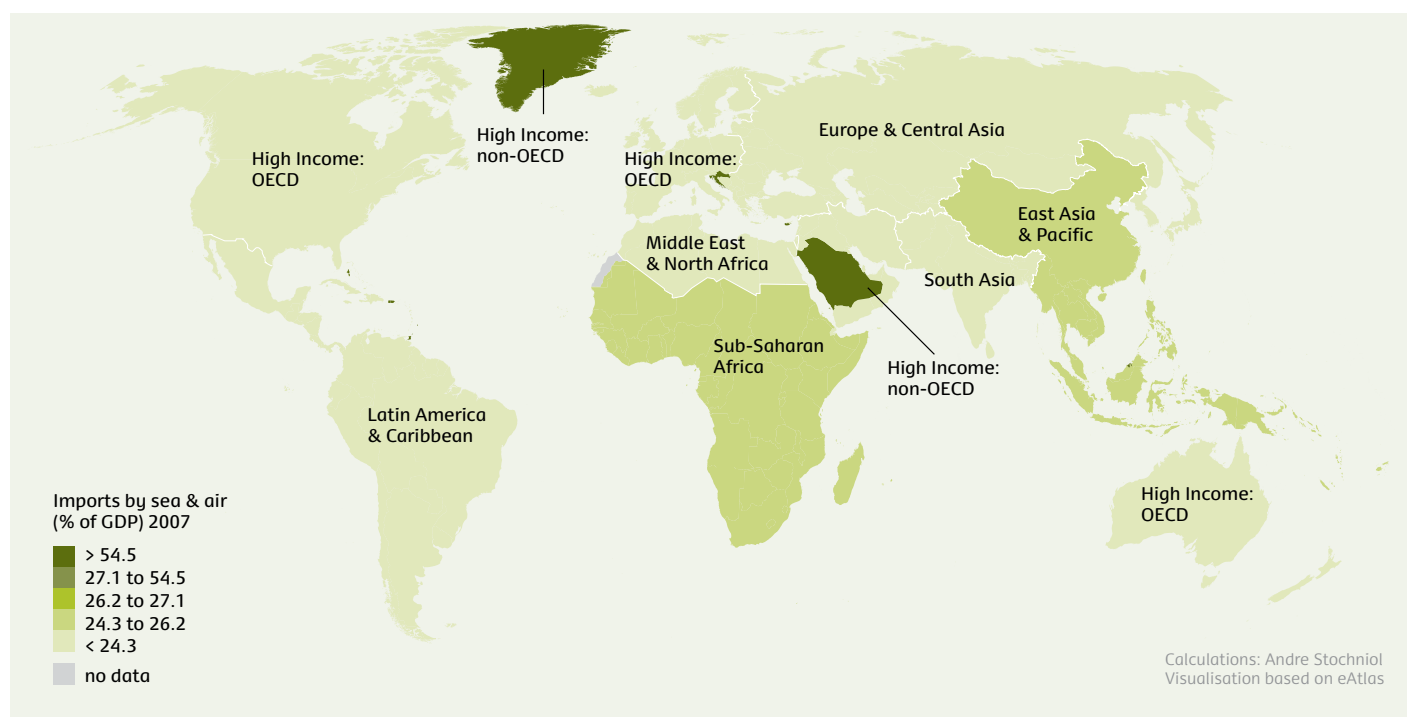


Figure 2
Imports by sea and air
as % of GDP (2007)
– by region

Generally,
developing
countries are
more reliant
on imports
than developed
countries.

analysis for the G20 countries: all but five have imports by sea and air that are lower than the world average (see Annex 1).

The results for all countries are illustrated on the world map in Figure 1, including the “top ten” countries most heavily reliant on imports by sea and air and the G20 member countries that have lower imports by sea and air than the world average.²²

Figure 1 clearly illustrates that the level of imports by sea and air varies significantly between countries. Generally, developing countries are more reliant on imports than developed countries (see Annex 1 for more details). Various poor or remote countries (including certain LDCs and SIDS) import relatively more than other developing countries, and thus would be impacted more by a uniform carbon price on international shipping (and aviation).

However, generalization about entire groups such as LDCs, SIDS or high income countries are not helpful, as certain countries in a given group may rely more heavily on international transport than others.

REGIONAL IMPACTS

To further illustrate the impacts on various countries and groups, Table 2 and Figure 2 illustrate the average imports by sea and air for eight regions or groups of countries: High Income (OECD member countries), High Income (non-OECD), Europe & Central Asia, East Asia & Pacific, South Asia, Middle East & North Africa, Sub-Saharan Africa, Latin America & Caribbean.²³

The High Income (non-OECD) region has the highest imports by sea and air (55% of the region’s GDP), three times higher than the world average. However, this includes countries with very diverse levels of imports by air and sea as a percentage of country GDP: Singapore (137%), Hong Kong SAR, China (96%), Saudi Arabia (22%), and Greenland (20%).²⁴

Latin America & the Caribbean is the region with the lowest imports by sea and air overall (15% of the region’s GDP). However, this includes various countries whose imports are significantly higher than the regional average, such as Guyana (91% of its GDP), Grenada (60%) and Costa Rica (47%). Thus the regional average should be used with care as it hides significant differences between countries, especially in relation to smaller countries (see Annex 1 for more details).

Analysis of the other regions confirms the significant diversity in countries’ reliance on international trade. Thus regional averages and approaches should not be used in this context, since they are not helpful in assessing the

impact on individual countries, especially those with small economies. The relative impact from carbon pricing of international transport will be country-specific. In conclusion, any compensation of potential impacts should be calculated on a per country basis, rather than on the basis of any group of countries, however the group is defined.

OTHER FACTORS INFLUENCING COUNTRY IMPACTS

The additional influence of trade-weighted distances and the structure of trade (namely the volume of low-value-to-weight goods) is not explored in this analysis. The reason is that these factors would complicate the analysis while probably not altering the conclusions. In fact, including them would most likely make the case for compensation *even stronger*, given that many poor countries import a greater amount of low-value-to-weight goods for which transport costs are higher than for high-value-to-weight goods (as a share of the final price). However, inclusion of these additional factors would change the relative country rankings, with some countries moving up or down in rank.

RECOMMENDATIONS: ENSURING THERE ARE NO NEGATIVE IMPACTS ON DEVELOPING COUNTRIES

The impacts on prices of imported goods from a carbon price on international shipping will be very small. Nevertheless, many vulnerable countries will be impacted more, given that their economies rely heavily on imports. For this reason, such a mechanism must adequately compensate these countries to ensure that they are not unfairly impacted.

The recent report on mobilizing climate finance for the G20 also highlights that, even though the overall burden of carbon pricing of international transport is likely to be small, there may be a need to provide compensation to developing countries. It concludes that enough has been done to give confidence that good proxies for this economic impact can be found, for instance through a rebate mechanism.²⁵

Finally, as this analysis illustrates, without any compensation for its impacts, carbon pricing of international shipping (and aviation) would be regressive, by imposing a larger cost burden relative to GDP on many poorer countries that rely heavily on international transport (including some SIDS). However, it should be noted that the impact would depend

Rank	Region	Imports by sea & air (US\$, millions)	Imports by sea & air (% of GDP)
1	High Income: non-OECD	776	55
2	East Asia & Pacific	1,246	27
3	Sub-Saharan Africa	218	26
4	Middle East & North Africa	210	24
5	Europe & Central Asia	489	18
6	South Asia	252	17
7	High Income: OECD	5,736	15
8	Latin America & Caribbean	506	14

on each country's individual trade patterns, and thus generalization by country categories or continents is not possible.

In conclusion, this analysis strengthens the case for compensating developing countries for the potential adverse impacts of carbon pricing on international transport. In the case of the proposal for a rebate mechanism (RM), a developing country would be entitled for a payment (rebate) equal to the attributed cost burden from the carbon pricing of international maritime transport. Furthermore, the most vulnerable countries would receive finance from the revenue raised from developed countries for climate change action. They would thus be net beneficiaries of carbon pricing on international transport.

Table 2
Estimated imports by sea and air as % of GDP – by region

This analysis strengthens the case for compensating developing countries for the potential adverse impacts of carbon pricing on international transport.



Climate change action: in Niger, water storage techniques are being used to stave off drought.

ANNEX 1

Table 3
Estimated imports by
sea and air (by value and
as % of GDP)

Rank	Country (or Region)	Imports by sea & air (US\$ millions)	Imports by sea & air (% of GDP)	Annex I	LDC	SIDS	High Income
1	Singapore	228.72	137			SIDS	High Income
2	Maldives	1.10	104		LDC	SIDS	
3	Palau	0.17	102			SIDS	
4	Kiribati	0.07	100		LDC	SIDS	
5	Hong Kong SAR, China	199.57	96				High Income
6	Lesotho	1.56	93		LDC		
7	Timor-Leste	0.42	93		LDC	SIDS	
8	Guyana	0.98	91			SIDS	
9	Iraq	18.93	89				
10	Seychelles	0.86	84			SIDS	
11	Turks and Caicos Islands	0.58	70				High Income
12	Vietnam	49.64	70				
13	Liberia	0.45	69		LDC		
14	Malta	4.95	66	Annex I			High Income
15	St. Lucia	0.61	64			SIDS	
16	Antigua and Barbuda	0.73	63			SIDS	
17	United Arab Emirates	123.00	62				High Income
18	Malaysia	113.95	61				
19	Grenada	0.37	60			SIDS	
20	St. Vincent and the Grenadines	0.33	60			SIDS	
21	Jordan	10.16	60				
22	Bahrain	10.96	59			SIDS	High Income
23	Bulgaria	23.27	59	Annex I			
24	Dominica	0.20	58			SIDS	
25	Moldova	2.55	58				
26	Tonga	0.14	57			SIDS	
27	Cambodia	4.77	55		LDC		
28	Sao Tome and Principe	0.08	55		LDC	SIDS	
29	Fiji	1.78	54			SIDS	
30	Tajikistan	1.23	54				
31	Thailand	130.33	53				
32	Jamaica	6.74	52			SIDS	
33	Estonia	10.89	52	Annex I			High Income
34	Tuvalu	0.02	52		LDC	SIDS	
35	Mauritius	3.90	52			SIDS	
36	St. Kitts and Nevis	0.27	52			SIDS	
37	Macedonia, FYR	4.08	51				
38	Tunisia	18.15	51				
39	Cape Verde	0.74	51			SIDS	
40	Nicaragua	3.15	50				
41	Djibouti	0.43	50		LDC		
42	Samoa	0.27	49		LDC	SIDS	
43	Solomon Islands	0.28	49		LDC	SIDS	
44	Eritrea	0.64	49		LDC		
45	Costa Rica	12.44	47				
46	Lebanon	11.61	47				
47	Ghana	7.05	47				
48	Bosnia and Herzegovina	7.00	46				
49	Marshall Islands	0.07	46			SIDS	
50	Mauritania	1.29	45		LDC		
51	Honduras	5.60	45				
52	Belize	0.57	45			SIDS	

Rank	Country (or Region)	Imports by sea & air (US\$ millions)	Imports by sea & air (% of GDP)	Annex I	LDC	SIDS	High Income
53	Faeroe Islands	1.02	45				High Income
54	Burundi	0.41	44		LDC		
55	Montenegro	1.60	44				
56	Aruba	1.11	43			SIDS	High Income
57	Senegal	4.87	43		LDC		
58	Bahamas, The	3.10	43			SIDS	High Income
59	Papua New Guinea	2.65	43			SIDS	
60	Kyrgyz Republic	1.63	43				
61	Slovak Republic	31.39	42	Annex I			High Income
62	Morocco	30.86	41				
63	Cyprus	8.75	41				High Income
64	Philippines	57.99	40				
65	Vanuatu	0.20	40		LDC	SIDS	
66	Cayman Islands	1.03	39				High Income
67	Serbia	15.32	39				
68	Suriname	0.94	39			SIDS	
69	Croatia	22.47	38	Annex I			High Income
70	Barbados	1.30	38			SIDS	High Income
71	Bhutan	0.47	38		LDC		
72	El Salvador	7.66	38				
73	French Polynesia	1.60	37			SIDS	High Income
74	Swaziland	1.14	37				
75	Belgium	162.00	35	Annex I			High Income
76	Trinidad and Tobago	7.66	35			SIDS	High Income
77	Sri Lanka	11.39	35				
78	Gambia, The	0.29	35		LDC		
79	Israel	56.47	34				High Income
80	Congo, Rep.	2.69	34				
81	Georgia	3.49	34				
82	Korea, Rep.	356.83	34				High Income
83	Guatemala	11.46	34				
84	Syrian Arab Republic	13.54	34				
85	Dominican Republic	13.72	33			SIDS	
86	Cote d'Ivoire	6.61	33				
87	Tanzania	5.77	33		LDC		
88	Chad	2.33	33		LDC		
89	Madagascar	2.45	33		LDC		
90	Iceland	6.69	33	Annex I			High Income
91	Kenya	8.80	33				
92	Panama	6.35	33				
93	Zambia	3.76	32		LDC		
94	Yemen, Rep.	8.02	32		LDC		
95	Latvia	9.29	32	Annex I			High Income
96	Romania	53.67	32	Annex I			
97	Malawi	1.10	32		LDC		
98	Hungary	43.44	31	Annex I			High Income
99	Botswana	3.59	31				
100	Albania	3.35	31				
101	New Caledonia	2.43	30			SIDS	High Income
102	Guinea	1.22	30		LDC		
103	Ethiopia	5.75	30		LDC		
104	Armenia	2.74	30				

Rank	Country (or Region)	Imports by sea & air (US\$ millions)	Imports by sea & air (% of GDP)	Annex I	LDC	SIDS	High Income
105	Andorra	0.96	30				High Income
106	Togo	0.75	29		LDC		
107	Netherlands	225.94	29	Annex I			High Income
108	Qatar	20.65	29				High Income
109	Angola	8.66	29		LDC		
110	Zimbabwe	1.26	29				
111	Lithuania	11.08	29	Annex I			
112	Guinea-Bissau	0.10	28		LDC	SIDS	
113	South Africa	78.33	28				
114	Congo, Dem. Rep.	2.66	28		LDC		
115	Oman	11.40	27				High Income
116	Paraguay	3.30	27				
117	Equatorial Guinea	2.79	26		LDC		High Income
118	Comoros	0.12	26		LDC	SIDS	
119	Ecuador	11.60	25				
120	Mozambique	2.03	25		LDC		
121	Turkey	158.90	24	Annex I			
122	Czech Republic	41.97	24	Annex I			High Income
123	Finland	58.36	24	Annex I			High Income
124	New Zealand	30.81	24	Annex I			High Income
125	Haiti	1.51	23		LDC	SIDS	
126	China	809.65	23				
127	Lao PDR	0.96	23		LDC		
128	Greece	71.39	23	Annex I			High Income
129	Afghanistan	2.31	23		LDC		
130	Burkina Faso	1.54	23		LDC		
131	Chile	36.68	22				
132	Saudi Arabia	85.83	22				High Income
133	Bangladesh	15.18	22		LDC		
134	Ireland	57.52	22	Annex I			High Income
135	Uganda	2.99	22		LDC		
136	Portugal	48.68	22	Annex I			High Income
137	Nepal	2.65	21		LDC		
138	Ukraine	30.30	21	Annex I			
139	Niger	0.87	21		LDC		
140	Sierra Leone	0.40	20		LDC		
141	Greenland	0.43	20				High Income
142	Algeria	27.35	20				
143	Spain	292.11	20	Annex I			High Income
144	Mali	1.42	20		LDC		
145	Slovenia	9.31	20	Annex I			High Income
146	Belarus	8.83	19	Annex I			
147	Sweden	88.37	19	Annex I			High Income
148	Nigeria	32.11	19				
149	Bermuda	1.13	19				High Income
150	Mongolia	0.73	19				
151	Cuba	10.89	19			SIDS	
152	Benin	1.00	18		LDC		
153	Kuwait	20.07	18				High Income
154	Egypt, Arab Rep.	24.24	18				
155	Gabon	1.98	17				
156	India	192.07	17				

Rank	Country (or Region)	Imports by sea & air (US\$ millions)	Imports by sea & air (% of GDP)	Annex I	LDC	SIDS	High Income
157	Sudan	9.40	17		LDC		
158	Micronesia, Fed. Sts.	0.04	17			SIDS	
159	Myanmar	2.95	17		LDC		
160	Poland	70.36	17	Annex I			High Income
161	Macao SAR, China	3.12	17				High Income
162	Cameroon	3.40	16				
163	Australia	155.00	16	Annex I			High Income
164	Somalia	0.43	16		LDC		
165	Rwanda	0.55	16		LDC		
166	Kazakhstan	16.77	16				
167	Indonesia	67.03	15				
168	Pakistan	26.64	15				
169	Brunei Darussalam	1.89	15				High Income
170	Venezuela, RB	35.10	15				
171	Peru	16.26	15				
172	Turkmenistan	1.14	14				
173	Japan	622.20	14	Annex I			High Income
174	Uruguay	3.43	14				
175	Iran, Islamic Rep.	40.50	14				
176	Mexico	141.53	14				
177	United Kingdom	384.45	14	Annex I			High Income
178	Italy	287.54	14	Annex I			High Income
179	Germany	446.23	13	Annex I			High Income
180	Canada	191.75	13	Annex I			High Income
181	Colombia	27.61	13				
182	Argentina	34.78	13				
183	Bolivia	1.71	13				
184	Denmark	38.70	12	Annex I			High Income
185	Norway	47.56	12	Annex I			High Income
186	Central African Republic	0.21	12		LDC		
187	Azerbaijan	3.92	12				
188	Austria	43.84	12	Annex I			High Income
189	Switzerland	49.74	12	Annex I			High Income
190	United States	1,549.38	11	Annex I			High Income
191	Uzbekistan	2.42	11				
192	Russian Federation	135.69	10	Annex I			
193	Korea, Dem. Rep.	1.48	10				
194	Luxembourg	4.91	10	Annex I			High Income
195	Namibia	0.86	10				
196	France	252.31	10	Annex I			High Income
197	Libya	6.08	10				
198	Brazil	109.27	8				

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ENDNOTES

1 See www.imers.org. The analysis of impacts done for this briefing is the sole responsibility and property of Dr Andre Stochniol.

2 CAFOD is the official relief and development agency of the Catholic Church in England and Wales. It works with partners in more than 40 countries, including with many vulnerable communities at the frontline of climate change, for instance in Kenya and Bangladesh. CAFOD campaigns for a fair, ambitious and global deal to cut carbon emissions and for sufficient resources to be mobilized to support poorer countries to adapt and build low carbon development paths. CAFOD is calling for the UK government, working with its EU partners, to proactively seek agreement on the mobilization of new sources of climate finance and on establishment of the new Green Climate Fund at the UN negotiations in Durban in December 2011.

3 See: UNFCCC, 2011. *The Cancun Agreements, Financial, technology and capacity-building support*. See: <http://cancun.unfccc.int/financial-technology-and-capacity-building-support/new-long-term-funding-arrangements>

4 There are numerous estimates ranging between \$100-275 billion year. UNFCCC, 2007. *Climate change: Impacts, vulnerabilities and adaptation in developing countries*. See: <http://unfccc.int/resource/docs/publications/impacts.pdf>

5 See: <http://cancun.unfccc.int/adaptation/> and <http://cancun.unfccc.int/financial-technology-and-capacity-building-support/new-long-term-funding-arrangements>

6 "[O]f major public funds dedicated to climate change only 7.45 per cent of disbursements to date have been for adaptation, 83.19 per cent for mitigation, 4.86 per cent for REDD-related mitigation, and 4.5 per cent multiple foci (October 2010, www.climatefundsupdate.org)". Oxfam, 2010. *Righting Two Wrongs: Making a new global climate fund work for poor people*, October. See: www.oxfam.org/en/policy/righting-two-wrongs

7 Council of the European Union, 2011. Brussels, 8 November. See: http://consilium.europa.eu/uedocs/cms_data/docs/pressdata/en/ecofin/125968.pdf

8 Article 3: 1, *UN Framework Convention on Climate Change*, 1997.

9 In 2010, the UN Secretary-General's High-level Advisory Group on Climate Change Financing (AGF) reported on a wide range of financial tools, including new or innovative sources of raising revenues, for financing mitigation and adaptation activities in developing countries. See: www.un.org/climatechange/aggf

10 World Bank-IMF-OECD-Regional Development Banks (WB-IMF-OECD-RDBs), 2011. *Mobilizing Climate Finance: A Paper prepared at the request of G20 Finance Ministers*, October 6, 2011.

11 IMF 2011, op. cit.

12 International shipping accounts for around 3% of global greenhouse gas emissions – which equates to more emissions than those of Germany and approximately twice those of Australia. It is estimated that shipping emissions could increase by 250% by 2050. See for instance Oxfam and WWF, 2011. *Out of the Bunker – Time for a fair deal on shipping emissions*, September. See: http://assets.wwf.org.uk/downloads/bn_out_of_the_bunker.pdf

13 To date, bunker fuels used by the international aviation and shipping industries have been largely exempt from taxation. Studies have found that a \$25 carbon price per tonne of shipping fuel would help cut emissions while raising \$25bn per year by 2020, but with only a 0.2% increase in the cost of shipping goods. See below, note 18.

14 2011. See for instance the statement by the International Chamber of Shipping (ICS), 6 July 2011. See: <http://www.marisec.org/pressreleases.htm>

15 See, for instance, the following submissions to the IMO by the World Wildlife Fund, Germany, and France, respectively: MEPC 62/5/14, MEPC 62/5/15, and MEPC 62/5/34

16 WB-IMF-OECD-RDBs, 2011.

17 The background paper (IMF 2011) recognized that projecting the incidence and welfare impacts on any country of charges on the fuels used in international transport is extremely difficult, given that it depends on three factors: the proportionate impact on transport costs; the relative importance to the wider economy of the goods affected (relative to GDP); and the elasticities of import demand and export supply both in the affected country and in the rest of the world. The paper focused on the first and the third factors, due to their considerable uncertainties. However, the relative importance of imports by sea and air to different countries seems the most important variable, since it can vary as much as tenfold between countries, as this briefing shows. IMF, 2011. *Market Based Instruments for International Aviation and Shipping as a Source of Climate Finance*, November. See: www.imf.org/external/np/g20/pdf/110411a.pdf

18 Based on total cost burden of US\$26 billion and seaborne trade of nearly US\$17 trillion (estimates for 2020; see Stochniol 2011c). The same data was used by Oxfam and WWF in their 2011 briefing, op.cit. *Out of the Bunker; Time for a fair deal on shipping emissions*. See also CAFOD, 2011. *Submission to the UK House of Commons Energy and Climate Change Committee on the EU Emissions Trading System: A global and equitable mechanism for carbon pricing of international maritime transport is a key building block to an effective EU climate policy*, 13 August. See: www.publications.parliament.uk/pa/cm201012/cmselect/cmenergy/writetv/1476/ets22.htm

19 See WB-IMF-OECD-RDBs, 2011.

20 This definition specifically reflects the imports of goods by sea and air (i.e. excludes imports by road, rail and pipe). Data for such indicators is not collected, however, and thus is calculated based on bilateral trade data with non-adjacent partners, as proposed and justified in Stochniol 2011a.

21 For further clarification, see discussion of the emission intensity of international transport per dollar of cargo carried in Stochniol 2011a. Given that for most countries imports by sea comprise roughly 70% to 80% of the combined imports by sea and air, this approach provides a practical indicator, as potential inaccuracies will be small. If needed, the country data can be disaggregated if the split between different modes of transport is known.

22 The base map, without the country names, has been created using the World Bank eAtlas of Global Development (Statistical Mapping Module copyright Collins Bartholomew Ltd; text and data copyright The World Bank Group). User data prepared by Andre Stochniol.

23 The regional map was created using the World Bank eAtlas of Global Development (Statistical Mapping Module copyright Collins Bartholomew Ltd; text and data copyright The World Bank Group)

24 Both Singapore and Hong Kong SAR, China are not visible on the large-scale/world map reproduced here, unless enlarged.

25 The rebate mechanism proposed by IUCN (2010) and WWF (2011) proposes to use share of imports. Stochniol (2011a) also provides country-specific estimates of the compensation implied by this scheme based on a country's share of imports by sea and air. For instance, Ethiopia's annual rebate would be \$6 million for total cost of carbon pricing of international maritime transport of \$10 billion (i.e. 0.06 percent of \$10 billion). The rebate and attribution keys for all countries have been submitted to the IMO in WWF (2011). The proposal was assessed alongside other proposals by the IMO's Expert Group on Market Based Measures (MBM) in IMO 2010, with further details provided in WWF 2011. Description of whether and how other MBM proposals being considered by the IMO may be integrated with the RM is provided in Stochniol 2011b and Stochniol 2011d.

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