Rebate Mechanism for fair and global carbon pricing of International Transport

FACT SHEET, focused on aviation

International Aviation Fund for Sustainable Development, IA Fund

Proposals in 140 characters:

Rebate Mechanism (RM)	**Shipping, IMERS**	**Aviation, IA Fund**
All ships/planes pay for their emissions. Certain countries obtain rebates, and the remaining finance goes to climate change action.	A global levy on fuel for international shipping, with the RM, likely to contribute $10bn to climate change action, including in the sector.	A global levy on fuel for international aviation, with the RM, likely to contribute $5bn to climate change action, including in the sector.

TWO PROBLEMS

1. There is **no mechanism to reduce CO2 emissions from international aviation** (and shipping), yet emissions are significant, and fuels are under-charged as they are tax-exempt.
2. **Current mechanisms to finance** climate change **adaptation** in developing countries **are inadequate**, both in scale and predictability.

Solutions to both problems **should be global**, and respect the UNFCCC principles and provisions.

THE SOLUTION

Fair carbon pricing of emissions from international aviation and maritime transport is proposed to effectively address the above two problems. To catalyze its global application, the UNFCCC principles are operationalized through a Rebate Mechanism (RM) in which developing countries can be rebated the cost of the scheme, and the remaining finance is used for climate change action, **including in the sector**. RM can be combined with any carbon pricing proposal, such as the GHG Fund and Emission Trading System (ETS). An integrated scheme for shipping is called International Maritime Emission Reduction Scheme (IMERS), and has been submitted to the International Maritime Organization (IMO). An integrated proposal for aviation could be called International Aviation Fund for Sustainable Development (IA Fund).[i]

QUESTIONS on RM

1. What is the RM and how does it address equity and various national circumstances in a global scheme?

The RM is a mechanism to relate the principles of international transport and climate conventions through the uses of finance generated. Under the RM:

- Non developed countries are entitled to annual rebates;
- Developed countries are not entitled to such rebates.

Rebates attributable to developed countries go towards climate change action. Any rebate-entitled country, based on its circumstances, may decide to forego its rebate, or part of it, towards global cooperation.

2. How does the RM work?

The mechanism calculates an apportioned rebate using the global cost of the scheme and a key, country-by-country. Each rebate-entitled country would receive the rebate, unless it decides to forego it. The country that would forego its rebate, or part of it, would be internationally recognized for such action, and the foregone rebate would go towards agreed international collaboration goals. Developed countries are credited for the amount of financing raised through the scheme, based on the same key. Consequently, the net finance raised, after rebates have been issued, would come from customers in developed countries only, thereby respecting the principles of the UNFCCC.

3. What definition of developed countries is used by the RM?

In RM, developed countries are considered to be countries included in Annex II of the UNFCCC, or in any successor annex, or arrangement.

4. Why not implement a scheme for UNFCCC Annex I countries only?

A scheme limited to Annex I countries only is not a workable proposition due to the inherently global nature of international transport. Such a scheme would lead to competitive distortions and carbon leakage. Under RM all planes (or ships) active in international transport pay for their emissions, irrespective of the flag they fly and the nationality of the owner.

5. Why not just agree on a uniform scheme without any rebates?

Addressing developing countries' concerns about the extra cost burden a scheme for international transport could place on them is essential – from both a social justice and political perspective. Although the cost burden would be small, the impact will be relatively greater on countries more dependent on international transport, a category

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in which Least Developed Countries (LDCs) and Small Island Developing States (SIDS) feature heavily.[ii] In other words, the rebates ensure no net burden on poorer countries, in accordance with the core equity principle of the UNFCCC.[iii]

6. How are the rebates calculated?

The apportioned rebate for the previous year is calculated as:

gross cost x country's rebate key

The country's rebate key would equal a verifiable proxy for the country's share of gross cost burden arising from the scheme (excluding any short- and long-term benefits).

For aviation the proposed proxy is a country's share of fuel uplifted for international flights. The calculated aviation rebate keys for nearly 200 countries are set out in the annex.[iv]

For illustration only, if the total annual cost of the aviation scheme is $10bn, Ethiopia would receive a rebate of $26 million the following year, based on the aviation rebate key of 0.26 percent (see annex).

7. How could a legal text look like?

The entitlements to rebates, cooperative contribution, and credit for mobilized finance could be defined in relation to the prevailing Party obligations as follows:

1. Each Party not included in Annex II of the UNFCCC, or in any successor annex, or arrangement, shall be eligible to an apportioned rebate, and shall obtain the rebate unless paragraph 2 applies.
2. Cooperative contribution:
   2.1 Any rebate-eligible Party may decide to forego its apportioned rebate, or part of the rebate, as its contribution to international cooperation.
   2.2 Each such Party shall record its decision in advance in Annex A to this [Instrument], and shall be recognized for its decision and the amount contributed.
3. Parties included in Annex II of the UNFCCC, or in any successor annex, or arrangement, shall not be eligible for rebates.
4. Credit for mobilized finance:
   4.1 Each Party not eligible for a rebate shall be credited for finance mobilized through this [Instrument].[v]

8. Should high-income non-Annex II countries forego their rebates?

The cooperative contribution does not preclude this. Such countries could for instance agree to a following paragraph 2.1:

> 2.1 Each rebate-eligible high-income Party undertakes to forego its apportioned rebate, and any other rebate-eligible Party may decide to forego its apportioned rebate, or part of the rebate, as its contribution to international cooperation.[vi]

9. How much would rebates cost?

The cost of actual rebates may be relatively small, and would depend on the RM agreement, and decisions of the rebate-eligible countries.

The burden distribution arising from a uniform scheme, ignoring any potential rebates and benefits, is provided for an illustrative group of countries in Table 1, based on data in annex. The results show that 70 percent of burden would fall on countries in groups 1, 2, and 3, or in short on the high-income countries.

Table 1: Share of burden, 2012 data

#	Group of countries	% of cost
1	Annex II of UNFCCC	52.1
2	High-income, in Annex I, not in Annex II	4.5
3	High-income, not in Annex I	13.5
4	LDCs	1.8
5	SIDS (not high-income)	1.4
6	Other countries	26.7

For illustration, if the rebate-eligible high income countries (i.e. countries in groups 2 and 3) would forego their apportioned rebates as their contribution to international cooperation, then the cost of actual rebates would be somewhere between 3 and 30 percent of the scheme costs, depending on how many countries in group 6 decided likewise to forego their rebates, or part of them (for additional detail see questions 5 and 12).

10. How & where can it be agreed?

Proposals for a market-based measure (MBM) have been under consideration at the International Civil Aviation Organization (ICAO) for over ten years.[vii] It seems that progress can only be made if the ICAO member-Parties agree to take into account the principles and provisions of the UNFCCC through the uses of generated finance, as other options have proved unworkable.[viii] Such agreement could and should be done at the ICAO Assembly in 2013, giving the upcoming deadline to agree a new climate change regime by 2015.

11. Would an agreement on RM not prejudge the post 2015 outcome?

Given the unique character of the international transport, the agreement on RM would in no way prejudge the negotiations held at the UNFCCC, nor affect the positions of the participating countries.

The international aviation and maritime transport are unique, inherently global sectors, regulated by the UN's ICAO and IMO respectively. They require global solutions, as unilateral approaches will not work. Operationalizing equity in these sectors in a workable manner, without distorting competition or carbon leakage, will enable increased ambition and action on climate change in these sectors. This could lead to reduced not increased cost of international transport, which is of particular importance to developing countries. Finally, there is growing support for the RM approach.[ix]

12. Which countries would be impacted most, without the RM?

Most of international aviation is concentrated in North, as shown in Fig. 1. Yet various countries in South may be most impacted, as shown in Fig. 2. Without any rebates for its burden, carbon pricing of international aviation would be regressive, as it would impose a larger cost burden relative to GDP on many poorer countries that rely heavily on international aviation. The biggest impact would be on some small island developing states and least developed countries (see Fig. 2 and Table 2). The potential impact on large countries, including many G20 countries, would be negligible as their economies are less reliant on international aviation, as a share of GDP (see Table 3).

Table 2: Burden – top 10 countries*

Rank	Country/Region	% of GDP	Notes
1	Maldives	0.196	1,2
2	Palau	0.153	2
3	Cook Islands	0.149	2
4	Antigua & Barbuda	0.125	2
5	St. Lucia	0.120	2
6	Seychelles	0.107	2
7	Fiji	0.077	2
8	Barbados	0.074	2
9	Sao Tome and Principe	0.059	1,2
10	Cape Verde	0.056	2

Table 3: Burden – ten G20 countries*

Rank	Country/Region	% of GDP	Notes
150	Canada	0.005	3
163	India	0.004	
166	Indonesia	0.004	
170	Mexico	0.003	
171	Italy	0.003	3
172	United States	0.003	3
175	Russian Federation	0.003	
184	Brazil	0.002	
185	Japan	0.002	3
189	China	0.002	

Notes for Tables 2 and 3:

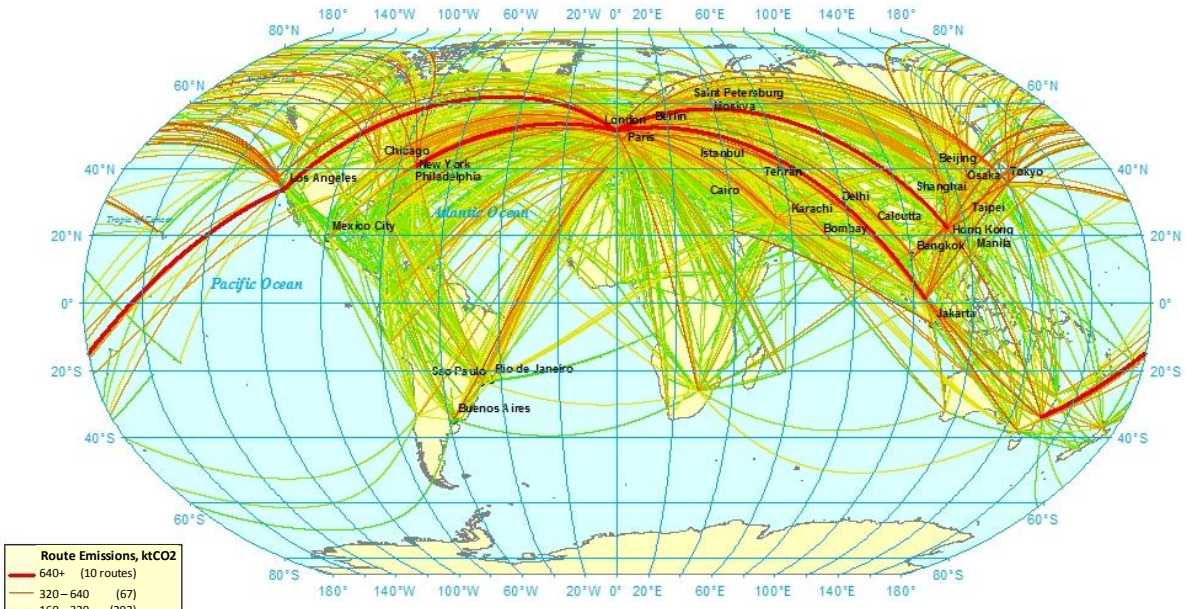
* Estimated for 2011-12 & $10/tCO$_2$[x]

[1] Least Developed Country, LDC

[2] Small Island Developing State, SIDS

[3] High-income country

Figure 1: Emissions

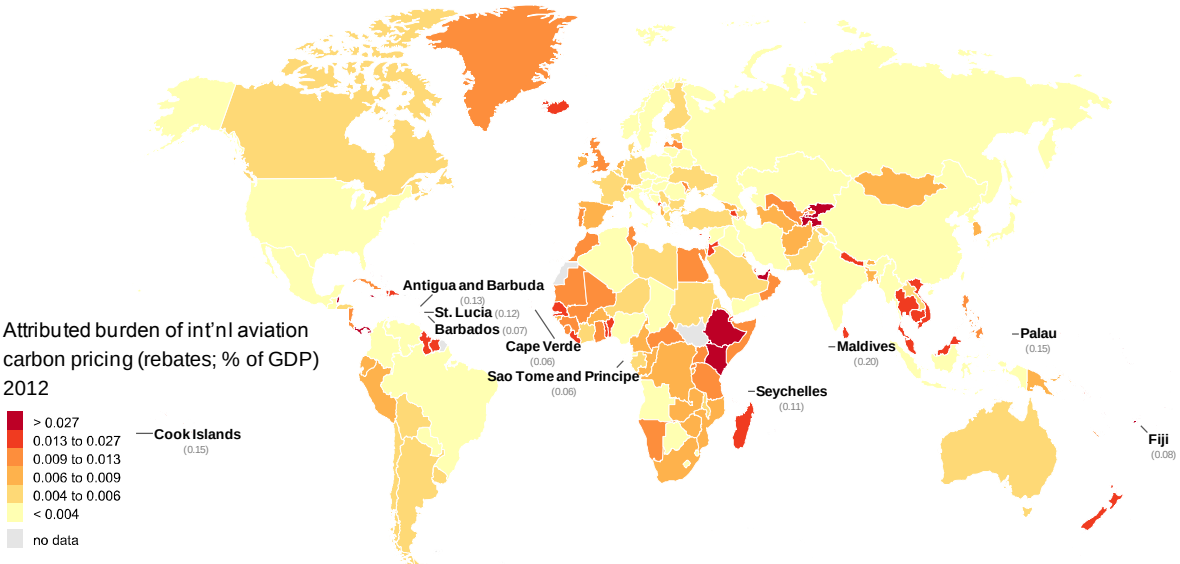


International aviation emissions, 2012

Emissions from scheduled flights only, by routes/city pairs
Shown 3,800 main routes out of circa 24,000 international routes
The routes shown contributed nearly 80% to the emissions' total

By Andre Stochniol; based on emissions data from the "Aviation Carbon Footprint, Global Scheduled International Passenger Flights – 2012", by and courtesy of Dave Southgate.

Figure 2: Burden (assuming no RM or similar)



Calculations: Andre Stochniol, based on "Aviation Carbon Footprint, Global Scheduled International Flights – 2012" by Dave Southgate, US$10/tCO2, and GDP data for 2011; visualisation based on eAtlas

QUESTIONS on IA Fund

13. What is the IA Fund proposal?
IA Fund integrates RM with a levy on CO2 emissions from international aviation. It is not an official proposal at the ICAO, but a similar, in-depth proposal has been submitted at the IMO for international shipping.[xi]

14. Why should a developed /developing country support it?
IA Fund, or similar, would:

- Reduce GHG emissions from international aviation (and thus reduce cost of international transport/trade);
- Promote fairness and efficiency in addressing the collective challenge of mitigating and adapting to climate change.

15. Would any finance be generated, and if so, what for?
Yes. Finance generated will be used to support global action on climate change, **including in the aviation sector, taking into account equity and national circumstances** of various countries.

16. How would the solution work?
Under the IA Fund, a market-driven levy is established on fuel uplifted for international flights, as an alternative for a levy on greenhouse gas emissions. The levy would apply to all aircraft over a predetermined size, engaged in international aviation, irrespective of flag and airline/operator (say 5,700 kg MTOW).

17. How is fairness for the sector ensured, i.e. paying what is fair?
In order to ensure proportionality and predictability of the aviation effort to combating climate change, the emission levy will be calculated from an average carbon price, established by the largest economy-wide emission reduction scheme, and set constant for a year. To increase investment certainty, a price floor and ceiling will apply.

18. How will it be enforced?
The scheme will be enforced by air traffic control, which would have access to a central emissions repository. Each aircraft will have an account in the repository to track the type and quantity of fuel uplifted for international flights, and payments of emission levy for said fuel.[xii]

19. What would the consumer see?
The anticipated cost of the scheme to passengers is marginal, only circa 1% increase in the ticket price. When the technical, operational and infrastructure improvements unlocked by the scheme are included, **passengers would see net benefits** due to reduced cost of transport over longer term.[xiii]

20. When can the scheme start?
The instrument for a global aviation scheme could be ready for adoption by 2015-2016, assuming there is political will to complete the substantive work already undertaken at the ICAO. It could enter into force by 2018, subject to the conditions that are agreed at the time of adoption.

21. How will the levy be collected?
The levy will be obtained worldwide directly from aircraft operators/airlines, which will pay the levy periodically based on fuel consumption to the aircraft central carbon accounts.

22. What if a country could not agree to a global levy collection?
Such a country could decide to opt out from the global collection, and declare that it assumes collection of the emission levy on fuel uplifted for international flights in its territory. The declaration will specify how the various obligations are delivered. For each aircraft the total payments obtained from direct and indirect mechanisms will have to cover its emissions.

23. Any legal precedent for IAFund?
The International Oil Pollution Compensation Funds (IOPC Funds) provide a precedent for direct, international collection of a levy from commercial entities, in over 100 countries.[xiv]

24. How does it comply with the WTO and GATT rules?
It does not discriminate imports or services from any country.

25. How much could be generated to the Green Climate Fund and how much for the sector improvements?
A carbon charge of $20 per tonne of CO2 on aircraft fuels would generate circa $10 billion annually from 2018, given the emissions from international aviation of circa 0.5Gt CO2. Depending on the RM agreement and relevant decisions, circa $4bn could be contributed to the GCF, and a similar amount for industry improvements and mitigation in such an illustrative scenario.[xv]

26. Will the scheme galvanize international cooperation?
Due to the financial and debt crisis, generating additional funding from domestic budgets will be challenging in many countries. Therefore IAFund - or similar - will not only address the most difficult to regulate source of emissions and, with time, reduce the cost of international transport/trade, **it will secure one of the most effective ways to generate significant additional financing** for climate change action, including in the sector.

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ANNEX
AVIATION REBATE AND CREDIT KEYS FOR COUNTRIES/REGIONS
Calculated as a country's share of fuel uplifted
for scheduled international passenger flights in 2012[1]

Country/region	iso3	Key, %		Country/region	Key, %		Country/region	Key, %	
Afghanistan	AFG	0.0374		Georgia	0.0349		Norway	0.3537	2, 3
Albania	ALB	0.0274		Germany	5.1995	2, 3	Oman	0.2279	3
Algeria	DZA	0.1466		Ghana	0.1214		Pakistan	0.3554	
Andorra	AND	0.0000	3	Greece	0.3859	2, 3	Palau	0.0097	
Angola	AGO	0.1253		Grenada	0.0069		Panama	0.3401	
Antigua and Barbuda	ATG	0.0388		Guatemala	0.0499		Papua New Guinea	0.0241	
Argentina	ARG	0.6875		Guinea	0.0147		Paraguay	0.0205	
Armenia	ARM	0.0541		Guinea-Bissau	0.0022		Peru	0.3909	
Australia	AUS	2.6326	2, 3	Guyana	0.0130		Philippines	0.7299	
Austria	AUT	0.5125	2, 3	Haiti	0.0274		Poland	0.3124	3
Azerbaijan	AZE	0.0873		Honduras	0.0305		Portugal	0.6919	2, 3
Bahamas	BHS	0.0715	3	Hungary	0.1356	3	Qatar	1.0758	3
Bahrain	BHR	0.2722	3	Iceland	0.0940	2, 3	Romania	0.1821	
Bangladesh	BGD	0.2281		India	1.9909		Russian Federation	1.5900	
Barbados	BRB	0.0887	3	Indonesia	0.8496		Rwanda	0.0222	
Belarus	BLR	0.0374		Iran (Islamic Rep. of)	0.1932		Saint Kitts and Nevis	0.0055	
Belgium	BEL	0.6872	2, 3	Iraq	0.0507		Saint Lucia	0.0416	
Belize	BLZ	0.0122		Ireland	0.4391	2, 3	Saint Vincent and the Grenadines	0.0019	
Benin	BEN	0.0310		Israel	0.5411	3	Samoa	0.0100	
Bhutan	BTN	0.0033		Italy	2.0757	2, 3	San Marino	0.0000	3
Bolivia	BOL	0.0416		Jamaica	0.1328		Sao Tome and Principe	0.0042	
Bosnia and Herzegovina	BIH	0.0075		Japan	3.8698	2, 3	Saudi Arabia	1.0692	3
Botswana	BWA	0.0064		Jordan	0.2015		Senegal	0.0979	
Brazil	BRA	1.6444		Kazakhstan	0.1364		Serbia	0.0724	
Brunei Darussalam	BRN	0.0571	3	Kenya	0.3102		Seychelles	0.0302	
Bulgaria	BGR	0.0809		Kiribati	0.0017		Sierra Leone	0.0094	
Burkina Faso	BFA	0.0219		Korea, Dem. People's Rep. of	0.0042		Singapore	2.7210	3
Burundi	BDI	0.0061		Korea, Rep. of	2.2986	3	Slovakia	0.0166	3
Cambodia	KHM	0.0671		Kuwait	0.3008	3	Slovenia	0.0172	3
Cameroon	CMR	0.0538		Kyrgyzstan	0.0482		Solomon Islands	0.0044	
Canada	CAN	2.3191	2, 3	Lao People's Democratic Republic	0.0136		Somalia	0.0036	
Cape Verde	CPV	0.0291		Latvia	0.0879		South Africa	1.0024	
Central African Republic	CAF	0.0061		Lebanon	0.1708		Spain	2.9517	2, 3
Chad	TCD	0.0105		Lesotho	0.0008		Sri Lanka	0.2766	
Chile	CHL	0.3812		Liberia	0.0078		Sudan	0.1098	
China	CHN	3.8454		Libyan Arab Jamahiriya	0.0499		Suriname	0.0291	
China, Hong Kong SAR	HKG	2.8727	3	Lithuania	0.0493		Swaziland	0.0011	
China, Macao SAR	MAC	0.0923	3	Luxembourg	0.0347	2, 3	Sweden	0.4291	2, 3
Colombia	COL	0.3534		Macedonia (the former Yugoslav Rep. of	0.0103		Switzerland	1.2189	2, 3
Comoros	COM	0.0044		Madagascar	0.0485		Syrian Arab Republic	0.0399	
Congo	COG	0.0338		Malawi	0.0075		Taiwan Province of China	1.1898	3
Congo (Democratic Rep. of the)	ZAR	0.0376		Malaysia	1.2458		Tajikistan	0.0607	
Cook Islands	COK	0.0114		Maldives	0.1112		Tanzania, United Rep. of	0.0821	
Costa Rica	CRI	0.1342		Mali	0.0330		Thailand	2.2756	
Côte d'Ivoire	CIV	0.0421		Malta	0.0674	3	Timor-Leste	0.0042	
Croatia	HRV	0.0696	3	Marshall Islands	0.0022		Togo	0.0208	
Cuba	CUB	0.2154		Mauritania	0.0128		Tonga	0.0042	
Cyprus	CYP	0.1769	3	Mauritius	0.1680		Trinidad and Tobago	0.0665	3
Czech Republic	CZE	0.2137	3	Mexico	1.0950		Tunisia	0.1636	
Denmark	DNK	0.5281	2, 3	Micronesia (Federated States of)	0.0017		Turkey	1.3932	
Djibouti	DJI	0.0089		Moldova, Rep. of	0.0188		Turkmenistan	0.0477	
Dominica	DMA	0.0022		Mongolia	0.0222		Tuvalu	0.0000	
Dominican Republic	DOM	0.3412		Montenegro	0.0197		Uganda	0.0552	
Ecuador	ECU	0.1450		Morocco	0.3678		Ukraine	0.2428	
Egypt	EGY	0.6403		Mozambique	0.0238		United Arab Emirates	4.0325	3
El Salvador	SLV	0.0884		Myanmar	0.0407		United Kingdom	6.8777	2, 3
Equatorial Guinea	GNQ	0.0144	3	Namibia	0.0438		United States of America	13.8461	2, 3
Eritrea	ERI	0.0033		Nauru	0.0008		Uruguay	0.0624	
Estonia	EST	0.0299	3	Nepal	0.0906		Uzbekistan	0.1361	
Ethiopia	ETH	0.2603		Netherlands	2.0898	2, 3	Vanuatu	0.0072	
Fiji	FJI	0.0815		New Zealand	0.6098	2, 3	Venezuela (Bolivarian Rep. of)	0.2143	
Finland	FIN	0.3917	2, 3	Nicaragua	0.0225		Viet Nam	0.4732	
France	FRA	3.8312	2, 3	Niger	0.0100		Yemen	0.0383	
Gabon	GAB	0.0308		Nigeria	0.2864		Zambia	0.0485	
Gambia	GMB	0.0097		Niue	0.0003		Zimbabwe	0.0200	

SAR = Special Administrative Region

[1] Credit keys are for Parties in Annex II to the UNFCCC, or in any successor annex, or arrangement (author's calculations based on data from the "Aviation Carbon Footprint, Global Scheduled International Passenger Flights – 2012", by Dave Southgate)

[2] Country in Annex II to the UNFCCC.

[3] High-income country/region, as per World Bank.

Notes:

[i] RM and IMERS were proposed in submissions to the IMO contained in documents MEPC 60/4/55 and MEPC 61/5/33 (submitted by the IUCN). Technical details were provided to the IMO Expert Group on Feasibility Study and Impact Assessment of possible Market-based Measures (MBM-EG). The MBM-EG report of 2010 contains details of the MBMs being considered at the IMO. IA Fund is not a formal proposal, as yet.

[ii] See the Fair Finance briefing, published by CAFOD in 2011. A 2-page summary is also available. The value of imports by sea and air for the top 10 countries shown there is approximately equivalent to their GDP, circa six times greater than the world average (estimated at 17% of GDP). Many LDCs and SIDS, such as the Maldives and Seychelles, also heavily rely on tourists arriving by air.

[iii] The High-level Advisory Group on Climate Change Financing (AGF), established by the United Nations Secretary-General, found that the application of a carbon-pricing mechanism to international transport emissions is an important potential source of climate financing that could contribute towards mobilizing US$100 billion per year by 2020 to address the needs of developing countries. The AGF's assumption was that any mechanism raising climate finance would have no net incidence on developing countries. The same assumption is used in the 2011 report for the G20 finance ministers on Mobilizing Climate Finance. Both reports highlight the Rebate Mechanism proposal, including in the background paper by the IMF/World Bank entitled Market Based Instruments for International Aviation and Shipping as a Source of Climate Finance. The report on the UNFCCC workshops of the work programme on the long-term finance in 2012, LTF 2012 report, also refers to pricing of emissions from international aviation and shipping, with rebates for adverse economic impacts on developing countries.

[iv] Finding a *precise* proxy for country's share of cost burden arising from carbon pricing of international transport is impossible. Such pricing may add some cost, albeit likely at a very small level, to international travel, trade, and tourism, differently for each country. However, given that majority of international passengers are from developed countries, using a country's share of fuel uplifted for international flights as a proxy for such impact is appealing for equity reasons. Such proxy is unlikely to underestimate the impact on the developing countries, and thus rebating the cost burden according to it would ensure that the poor countries are at least not worse off and likely better off. This was also the conclusion in the IMF/WB report for G20, supported by a background paper. The proxy based on fuel uplifted is simple and practical as the airlines already collect fuel data, which can be validated by calculating the nominal amount of fuel needed for any given aircraft and route. The calculation approach has already been used to produce a detailed footprint of international aviation by every country, airline, route, and region (by Dave Southgate, for 2012). From these country footprints the author has calculated the country rebates and credit keys, as set out in annex. Such keys could be further improved and calculated annually.

[v] See the draft legal text for the Rebate Mechanism contained in document MEPC 64/5/10 submitted to the IMO (by WWF). It contains RM additions to a potential Convention under the IMO, that would establish the overall mechanism. A very similar text could apply to an aviation instrument, rather than a Convention, to be established by ICAO Assembly decision, or similar.

[vi] ibid.

[vii] In 2001, the ICAO Assembly requested the Council to continue to develop guidance for States on the application of market-based measures aimed at mitigating the impact of aviation on climate change. Three market-based measures have been under consideration: emissions trading, voluntary measures, and emissions-related charges. The key issue proved to be how to relate the UNFCCC principle of CBDRRC to inherently global aviation. The same is true for shipping (see for instance "A rebate mechanism for an equitable maritime emission reduction scheme", pp. 112-147, and "Climate change: A challenge for IMO too", pp75-111, in Maritime Transport and the Climate Change Challenge, 2012).

[viii] The idea to differentiate through a de-minimis criterion to exclude some destinations proved to be unworkable as many routes would be excluded, including to some rich countries, and it could lead to competitive distortions and carbon leakage. For a systematic analysis on why there is no feasible way to differentiate carbon pricing of ships (or planes), without distorting competition or carbon leakage, see document GHG-WG 3/3/3. The document examines four ways in which differentiated application could potentially be achieved, namely differentiation by flag, country of genuine control, route of ship and final destination of cargo. It concludes that all have serious drawbacks. Out of the two potential options that would apply to all shipping activities but where the finance raised would be distributed in a differentiated manner to the benefit of developing countries, the analysis favoured global application with a RM. Similar analysis applies to aviation.

[ix] See for instance an analysis in document MEPC 63/5/6 (by WWF). At the IMO MEPC 63rd session "a number of delegations stated that the RM is an innovative and constructive proposal that addresses the CBDR principle and should be analysed and considered further". Negotiators from various countries have been interested in application of the RM to aviation.

[x] CO2 emissions from the scheduled international passenger flights for 2012 and GDP data for 2011 were used, country-by-country. Emissions data, reflecting notional aviation fuel uplifted in a country, were obtained from the comprehensive "Aviation Carbon Footprint, Global Scheduled International Passenger Flights – 2012", by Dave Southgate. GDP data were obtained from UNCTAD statistics. The emissions have been converted to cost by using an illustrative carbon price of $10/tCO2. The attributed impact (or rebate/credit key) was calculated by dividing the attributed cost by the country GDP.

[xi] For further details on the various proposals see for instance the IMO note to the first meeting of the Transitional Committee for the design of the Green Climate Fund entitled "Market-based measures for international shipping", and a comprehensive report from the work undertaken by the Expert Group on Feasibility Study and Impact Assessment of possible Market-based Measures (MBM-EG).

[xii] The enforcement is to rely on standard procedures and an aircraft specific emissions Registry. A computer-based system would be implemented to ensure robust, efficient and continuous operations. The system would be accessible globally, be secure and reliable. It may comprise a central Registry, and payment accounts for all aircraft, and should implement the following key processes: (1) Registering of aircraft, in the Registry; (2) Reporting of fuel uplifted for international flights, by aircraft, to the Registry; (3) Payment of the emission levy, for the aircraft, to the Fund; (4) Status check of aircraft's compliance, by Air Traffic Control, through querying the Registry. See presentation for a diagram and other details, also available at imers.org/bonn13.

[xiii] The average ticket price increase can be calculated by dividing the emission charge (per ton of fuel, say $30 for the carbon price of $10/tCO2) by the price of aviation fuel ($1,000 per ton), and multiplied by the share of fuel cost in the air ticket price (say 1/3). This simple calculation gives 1%. (=30/1000 x 1/3). In the above example the scheme cost is 3% of the cost of aviation fuel. Thus it would be dwarfed by the increase in fuel prices over the last few years, as these prices nearly trebled.

[xiv] The United States is not part of the IOPC Funds mostly because its national approach for compensation from spills of oil from ships is more stringent. For additional detail and analysis see: "Liability and compensation for ship source oil pollution: An overview of the international legal framework for oil pollution damage from tankers", UNCTAD, 2012.

[xv] The amount of finance available for international purposes would depend on the RM agreement and country decisions on their entitlements to rebates, as well as on the agreement where the cooperative contributions would go. In one illustrative scenario, 20% ($2billion) of the total amount may be sufficient for the actual rebates distributed primarily to the poorer countries and most impacted countries. Out of the remaining 80% of total ($8bn), half ($4bn), could be contributed to the Green Climate Fund, if so decided. The other half of the remaining funds ($4bn) could be used for technology and infrastructure improvements, mitigation and other purposes, including for R&D projects & technical cooperation to reduce the GHG emissions from aviation. This would ensure the carbon neutral growth from 2020, or any other agreed target, and would help bringing the emissions down earlier and faster. Only relevant shares of financing generated should count towards the financial commitments of developed countries. The above figures are illustrative, and for a lower carbon price the financing would be lower. The split between GCF and aviation financing could also change with time.

Version: 130709; Most recent version of this document is available at: http://imers.org/docs/RM_Aviation_Fact_Sheet.pdf.

The fact sheet focused on shipping is available at: http://imers.org/docs/RM_Fact_Sheet.pdf.