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Operationalising an equity reference framework in the climate change regime

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1. INTRODUCTION

There is an emerging understanding that if the 2015 climate agreement is to be one that is stable, durable, effective in achieving the mitigation and adaptation objectives of the FCCC¹, and capable of attracting broad participation by all Parties in accordance with their differentiated treaty obligations, it must be one that is effective and equitable. One increasingly salient proposal for addressing the imperatives of effectiveness and equity in the 2015 agreement is the Equity Reference Framework (ERF), first alluded to by BASIC Experts (2011), and later fleshed out by Ngwadla (2012). The ERF comprises three elements: a definition of the required global effort as informed by a temperature goal—how much needs to be done in aggregate; a definition of relative fair effort by Parties— who does what; and an assessment process for adequacy of commitments by Parties relative to their fair effort, as well as in aggregate compared to the required aggregate effort.

This proposal for an ERF has gained traction in the climate negotiations. In the lead up to the 19th UNFCCC Conference of Parties (COP) in Warsaw in 2013, the Africa Group proposed the adoption of a principle-based reference framework or an ERF.² The Africa Group's proposal for an ERF was discussed in broad conceptual terms at Warsaw, albeit within a political frame. The ERF was welcomed by the Least Developed Countries (LDCs). Several other countries and groups were broadly in favour of a multilateral assessment process to assess national contributions, although there were divergences amongst them on the substance of, and metrics used in, such an assessment. The group of Like-Minded Developing Countries (LMDCs),³ however, resisted a discussion on the ERF as they perceived the ERF as eroding the conventional balance of responsibilities based on a strict division of Parties into annexes.

In a reflection of the need for further deliberation on the ERF, among other proposals, the Warsaw ADP decision on the work of the Ad Hoc Working Group on the Durban Platform (ADP) in operative part invites Parties 'to initiate or intensify domestic preparations for their intended nationally determined contributions, without prejudice to the legal nature of the contributions.'⁴ This open-textured formulation leaves several issues open. First, and relevant to the ERF, the use of the word 'intended' suggests that the intended contribution may not be the eventual contribution inscribed in the 2015 agreement. This creates two possibilities: that the intended contribution could either be revised by the Party itself, or as a result of a multilateral assessment process. This ex-ante multilateral assessment process could be informed by an ERF. Second, the term 'nationally-determined' endorses a bottom-up or facilitative approach, leaving the framing of contributions, at least in the first instance, solely to nations. This is one of the premises of the ERF: that Parties would submit their contributions or pledges based on national circumstances that would then be assessed in relation to an ERF. Third, the term 'contributions' leaves their nature open; whether commitments or actions, or commitments for some and actions for others. This provides the necessary flexibility for differing contributions for differing Parties, another operating premise of the ERF. Fourth, the text leaves the legal form of the contributions unresolved. Indeed, the clause 'without prejudice to the legal nature of the contributions,' occurs twice in a nine-line sentence. However, since the term

¹ The term includes the United Nations Framework Convention on Climate Change and the Kyoto Protocol, as well ongoing processes under these instruments. See United Nations Framework Convention on Climate Change, 29 May 1992, 1771 UNTS 107, reprinted in (1992) 31 ILM 849 [hereinafter FCCC] and the Kyoto Protocol to the United Nations Framework Convention on Climate Change, 10 December 1997, FCCC/CP/1997/L.7/add.1, reprinted in (1998) 37 ILM 22 [hereinafter Kyoto Protocol].

² Submission by Swaziland, Submission by Swaziland on behalf of the African Group Under Workstream I of the ADP (8 October 2013). Available from: <https://unfccc.int/files/documentation/submissions_from_parties/adp/application/pdf/adp_african_group_workstream_1_20131008.pdf>. [Accessed 29 June 2014].

³ The LMDCs are a recently formed coalition of which India and China are a vocal part. It contains among others Cuba, Ecuador, Egypt, Nicaragua, Saudi Arabia and Venezuela.

⁴ Decision 1/CP.19, 'Further advancing the Durban Platform', FCCC/CP/2013/10/Add.1 (31 January 2014) [hereinafter Warsaw ADP Decision], para 2(b)

'contributions' is not qualified by 'mitigation', contributions could be in relation to adaptation, finance, technology transfer or capacity building. Such a holistic approach is integral to the ERF that seeks to factor in contributions such as developing country investments in adaptation, as well as developed countries' support for developing countries in financial or and technological terms in assessing their respective fair shares. The Warsaw ADP decision can thus be understood as providing an adequate springboard, or the flexibility, for the inclusion of an ERF into the 2015 climate agreement.

This paper identifies legal, architectural and technical options for the operationalisation of the ERF in climate change regime. Section 2 of this paper outlines the design of the process by which the ERF, which contains technical and diplomatic components, into the options currently being discussed for an ex-ante assessment process in the negotiations. Section 3 lays out a range of legal and architectural options for incorporating the ERF into the 2015 agreement or the outcomes of Paris, so as to ensure that science and equity play a role in the framing of nationally determined contributions by Parties. Section 4 provides illustrative examples of how the ERF can operate to ensure science and equity play a role in the framing of nationally determined contributions. It identifies and explores various metrics that speak to adequacy and equity and harmonises them so as to create benchmarks to assess the required global effort from states as well as relative fair efforts between states in addressing climate change. Section 5 concludes by suggesting that the legal, architectural and technical adaptability of the ERF, while still maintaining a degree of integrity. Its ability to anchor the 2015 agreement and outcomes of Paris in science and equity render it an attractive and desirable element of the 2015 agreement.

2. DESIGN OF THE PROCESS FOR APPLYING AN ERF

In the ongoing negotiations, Parties are considering numerous design options for an ex-ante, multilateral assessment process to consider Parties intended nationally determined contributions. These range from the more rigorous options favoured by the African Group and the Alliance of Small Island States, to the information exchanges suggested by some others. The ERF is designed to form part of a multilateral assessment process that would consider Parties' intended nationally determined contributions with a view to determining the extent to which it conforms to ambition (science) and equity (fairness) benchmarks. The ERF, so conceived, is one of several approaches to equity and differentiation proposed by Parties. Parties' proposals range from those proposed by the LMDCs that retain conventional categories of Parties and map onto a prescriptive framework for commitments,⁵ to those proposed by the umbrella group that bypass conventional categories of Parties and map onto a facilitative framework for commitments.⁶ While these are caricatured ends of the spectrum of views put forward by Parties, they do serve to illustrate the fact that the ERF fits squarely in the middle of this spectrum of views. The ERF neither bypasses conventional categories of Parties, nor does it use them as the sole differentiating criteria between Parties/categories of Parties. The ERF, by using intended nationally determined contributions as the starting point, respects national circumstances and constraints. Yet, in so far as the ERF is designed to be part of a multilateral assessment process to assess conformity with science and equity, it recognises the value of multilateral, deliberative decision making. It seeks to occupy the intersection between the prescriptive and the facilitative, the 'top-down' and the 'bottom-up.'

The process of applying the ERF comprises of both an expert process as well as a diplomatic process. A purely expert process may not lead to political buy-in. A purely diplomatic negotiating process may not garner the necessary legitimacy and will suffer from the power distortions intrinsic to such political processes. A hybrid process consisting of an expert phase and a diplomatic phase offers the most promise. The ERF process, so designed, is intrinsically adaptable. It is conceived of as comprising of both technical as well as diplomatic phases. However, if the ongoing negotiations on a multilateral assessment process for intended nationally determined contributions yield agreement, the process so agreed could take the place of the diplomatic phase envisaged as part of the ERF.

The expert phase could take the form of a workshop convened by the Intergovernmental Panel on Climate Change (IPCC) at the request of the COP, an expert group/panel established by the COP, or an expert workshop convened by the Subsidiary Body for Scientific and Technological Advice (SBSTA) or the ADP. The expert workshop could be tasked with the process of both identifying the various metrics relating to the agreed indicators/dimensions of equity (historical responsibility, current capability and development needs), thereby creating an envelope of responsibility, as well as assessing intended nationally determined contributions put forth by Parties in relation to these indicators and metrics. The choice of indicators informing such an assessment shall be drawn principally from Parties' submissions and observer organisations, in response to the call

⁵ Submission by LMDCs, LMDC Views on Identification of Elements in ADP Workstream 1 (18 November 2013). Available from: <http://unfccc.int/files/documentation/submissions_from_parties/adp/application/pdf/adp2-3_lmcdc_workstream_1_20131118.pdf>. [Accessed 29 June 2014]

⁶ Submission by Australia, Submission under the Durban Platform for Enhanced Action, The 2015 climate change agreement, ADP (26 March 2013). Available from: <http://unfccc.int/files/documentation/submissions_from_parties/adp/application/pdf/adp_australia_workstream_1_20130326.pdf>. [Accessed 29 June 2014]; Submission by the Umbrella Group, ADP 2.2 – UG (Umbrella Group) closing statement (13 June 2013). Available from: <http://unfccc.int/files/meetings/bonn_jun_2013/in-session/application/pdf/adp2-2_closing_plenary_statement_ug.pdf>. [Accessed 29 June 2014]; and Submission by the United States, U.S. Submission on Elements of the 2015 Agreement (12 February 2014). Available from: <http://unfccc.int/files/documentation/submissions_from_parties/adp/application/pdf/u.s._submission_on_elements_of_the_2105_agreement.pdf>. [Accessed 29 June 2014].

for information to be identified by the ADP by COP-20,⁷ for Parties to provide). The data informing such indicators should be drawn from publicly available, verified data collated by relevant international and regional organisations.

The diplomatic phase could take the form of a multilateral assessment (or review, consultation, evaluation) of the intended nationally determined contributions Parties' have put forth. This process would provide Parties' an opportunity to justify their intended contributions against the benchmarks of, inter alia, science and equity, and explain any mitigating national circumstance and constraints. This consultation would be informed by the expert phase — comprising assessments, global and individual — and is expected to trigger adjustments in the final nationally determined contributions so as to better reflect equity and science.

⁷ Warsaw ADP Decision, see above n 4, para 2(c).

3. LEGAL FORM AND ARCHITECTURAL OPTIONS

3.1 (Legal) Form of the ERF

A key factor determining the acceptability of the ERF is the legal form that it assumes. Clearly the more integral it is to the 2015 agreement — and the more ‘legally binding,’ as it were — the more contested it will be. The following illustrative list of options for (legal) form signals the extent to which the form of the ERF is adaptable to the political winds in the negotiations.

3.1.1 ERF as an integral element of the 2015 agreement

The first option, and perhaps the most persuasive yet challenging option, is for the ERF to form an integral element of the 2015 agreement which, arguably, will be a legally binding instrument. The ERF could be established in a stand-alone provision that will, first, indicate the role that the ERF will play in achieving the objective of the convention as well as operationalising equity in the 2015 agreement and, next, outline the two-phase (the expert and the diplomatic phases) multilateral assessment process, the outcome of this assessment process and the influence such an outcome will have on the final nationally determined contributions of Parties. In this option the ERF, since it will be an integral element of the 2015 agreement, will need to be accepted in toto by Parties. It will be legally binding insofar as it is contained in an operational provision of a legally binding instrument. However, it could be couched in soft contextual language permitting discretionary application by Parties.

The term ‘legally binding’ is typically applied to negotiated legal instruments that both render a particular state conduct mandatory as well as, at least in principle, judicially enforceable (Brunnée 2002, p. 32).⁸ Such instruments are characterised in the literature as ‘hard law.’ Treaties such as the FCCC and the Kyoto Protocol are binding in this sense. However, compliance with these treaties rests on numerous factors, including the normative content as well as precision of the provisions within these treaties. The FCCC has numerous provisions that are couched in discretionary and contextual language. For instance, the commitments of developed countries relating to financial resources and technology transfer are peppered with phrases such as ‘as appropriate,’ ‘if necessary,’ ‘insofar as possible,’ and ‘all practicable steps.’⁹ Although the discretion provided is with regard to the manner or timeframe of performance of a particular obligation, rather than as to performance or non-performance, it nevertheless renders the setting of a standard, the finding of compliance or non-compliance and the resulting visitation of consequences, difficult.

Such provisions are often perceived as problematic and undesirable as they militate against compliance and effectiveness of these provisions, but they can also perform a positive function. These provisions do not represent the end-point of negotiations, but are instead reflective of a work in progress in that they permit countries that are not yet in a position to accept precise, unambiguous commitments to nevertheless accept commitments, as they retain some degree of discretion in complying with them. The ERF could, thus, be couched in language that, while binding countries broadly to the goals and process outlined, will nevertheless permit countries considerable discretion in application such as in the influence the outcome of the ERF process will have on a Party’s final nationally determined contribution.

⁸ Noting however that most norms that are enforceable in principle are often not enforced in practice.

⁹ FCCC, Article 4(5).

3.1.2 ERF as an optional element of the 2015 agreement

The second option is for the ERF to form an optional element of the 2015 agreement. As in the first option discussed above, the ERF could be established in a stand-alone provision. Unlike the first option, the ERF would be applicable only to those Parties who consent to its application to themselves. In this option the ERF would be severable from the core deal in that the rest of the agreement must be capable of being implemented with or without the ERF. There are two further possibilities in this option: The ERF could apply to those who opt-in to it, or the ERF could apply to all except those who opt-out of it.¹⁰ An opt-in clause will likely result in fewer Parties accepting the ERF than an opt-out clause. The former creates a presumption against the ERF and the latter a presumption in favour of the ERF. However, both possibilities provide Parties the flexibility to tailor their consent to a 2015 agreement that is politically acceptable to them.

It is worth noting that the two phases of the ERF can be separated if necessary. If for instance the 2015 agreement contains an ex-ante assessment process to consider intended, nationally determined contributions, it would be only the technical phase of the ERF that would form the optional element. That is, Parties would be bound to engage in an ex-ante assessment process. Only those Parties that opt-in, or don't opt-out, would be bound to apply the findings of the ERF. If, on the other hand, Parties are unable to agree on an assessment process the ERF in its totality, both its technical as well as its diplomatic phases, could form the optional element.

Opt-in and opt-out clauses allow Parties to opt-in or opt-out during the life of the treaty. Opt-in and opt-out clauses also offer advantages in the context of the politically charged climate change negotiations. First, they permit countries with crippling political constraints in relation to particular (severable) aspects of a treaty to nevertheless participate in the rest of the treaty. Second, they offer countries the gift of time in that even if countries are not politically able to accept certain parts of the treaty at the moment of its adoption they can, when the conditions are right, accept the once-contentious parts of the treaty. In the context of the ERF opt-in and opt-out clauses allow those Parties that are sceptical of its neutrality, or reluctant to accept it as it appears too prescriptive, to observe the ERF operate in relation to those Parties that have accepted it. Over time, if the ERF is seen to function in an objective, transparent and non-threatening manner, others may choose to opt-in (or to reverse their opt-out) to it as well.¹¹

Such opt-in and opt-out clauses in relation to the ERF, while they may make the ERF politically palatable in the near term, do in theory militate against some of its core objectives, i.e. to offer Parties who are shouldering onerous burdens comfort that others are doing their fair share. If too many Parties opt-out, there would be no sense of collective action and no ability to assess against the global temperature or other goals. Nevertheless, given the unattractiveness for many of a regime that contains no multilateral assessment of efforts at all, the ERF opt-in or opt-out option at least leaves the possibility of multilateral assessment open and there is cause for optimism. As long as there is sufficient momentum generated by civil society¹² and buy-in from groups of countries (applied in a facilitative manner), only a few countries that have serious domestic constraints are likely to opt-out of the ERF.

¹⁰ There are numerous examples of opt-in and opt-out clauses in international treaties. Examples of an opt-in clause include Article 36(2), the Statute of the International Court of Justice, 39 AJIL Supp. 215 (1945) and opt-out clause include Article 35, United Nations Convention against Transnational Organized Crime, 15 November 2000, 2225 UNTS 209, *reprinted in* (2001) 40 ILM 335. See also, International Covenant on Civil and Political Rights, 16 December, 1966, 999 UNTS 171, *reprinted in* (1967) 6 ILM 368, Article 41(1).

¹¹ The European Convention on Human Rights, which contains opt-in clauses in relation to the compulsory jurisdiction of the European Court of Human Rights, offers an example of this. See, Convention for the Protection of Human Rights and Fundamental Freedoms, 4 November 1950, Article 33. Available from: <http://www.echr.coe.int/Documents/Convention_ENG.pdf>. [Accessed 29 June 2014]. Bodansky D & Diringer E 2010, *The Evolution of Multilateral Regimes: Implications for Climate Change*, Pew Centre on Global Climate Change.

¹² See, Climate Action Network 2013, *Equity Reference Frameworks at the UNFCCC process – a CAN Discussion Paper*. Available from: <http://www.climateactionnetwork.org/sites/default/files/can_erf_discussion_paper_-_05062013.pdf>. [Accessed 29 June 2014].

3.1.3. ERF as a technical process informing the 2015 agreement

The third option is to retain only the technical phase of the ERF. In this option the ERF will take the form of a technical process that informs the 2015 agreement. This may render the ERF more politically acceptable than the options considered thus far because technical processes signal objectivity and their outcomes may inform or even influence, but are not determinative in, political processes. A range of options exists for locating such a technical process: First, the COP could request the IPCC to convene an expert workshop on the ERF and produce a workshop report that would be presented to the Subsidiary Bodies. Second, the ERF could constitute a separate item on the agenda of the Subsidiary Bodies. It could feed into the Structured Expert Dialogue under the ex post 2013-2015 Review which, in turn, will inform the ADP process. The latter may be a particularly fruitful avenue to explore.

The Cancun Agreements (2010) agreed on a long-term global temperature goal of below 2°C above pre-industrial levels. Parties also agreed to periodically review the goal, including to limit a temperature increase to 1.5 degrees Celsius.¹³ At Doha, in 2012, Parties defined the scope of the review as encompassing both the adequacy of the long-term global goal, as well as the adequacy of the overall progress towards the long-term global goal.¹⁴ Parties also established a structured expert dialogue to provide scientific inputs into the review process.¹⁵ The ERF as a technical process that seeks to assess progress towards the long-term temperature goal, equitable progress, could be taken within the fold of the structured expert dialogue that feeds into the 2013-2015 Review. The outcomes and work of the 2013-2015 Review will in any case inform the work of the ADP.¹⁶

Another possibility is for the COP to establish an independent technical process through a COP decision that would assess intended nationally determined contributions under the 2015 agreement. Such a process would have life outside of the 2015 agreement, but it would inform the ADP negotiations and the 2015 agreement.

In both these options it is an open question what concrete influence, if any, the outcomes of such a technical ERF process will have on the final nationally determined contributions of Parties. Although outcomes could be automatically applied should Parties consent, it is unlikely that Parties will consent to such automatic application. Parties will likely apply the outcomes of the ERF process only if they so choose. The outcomes will nevertheless function as a legitimate benchmark, as it emanates from a process sanctioned by Parties, against which Parties can judge themselves and others.

3.1.4. ERF as an external process

The ERF could also take the form of an independent process that is external to the climate change regime. While this is clearly a less desirable option, because assessments of science and equity must be central to the climate regime, it is nevertheless worth considering given the contestations that plague interpretations of equity within the climate regime. An independent external process could be created in several ways. The ERF process (the technical and the diplomatic phases) could be established through a declaration or resolution by a subset of Parties to the FCCC. The declaration or resolution could be negotiated and entered into at the heads of state, ministerial or diplomatic level. The declaration or resolution

¹³ Decision 1/CP.16, 'The Cancun Agreements: Outcome of the work of the Ad Hoc Working Group on long-term Cooperative Action under the Convention', in Report of the Conference of the Parties on its sixteenth session, Addendum, Part Two: Action taken by the Conference of the Parties, FCCC/CP/2010/7/Add.1 (15 March 2011) [hereinafter Cancun Agreements LCA], paras 4, 138 and 139.

¹⁴ Decision 1/CP.18, 'Agreed outcome pursuant to the Bali Action Plan', FCCC/CP/2012/8/Add.1 (28 February 2013) [hereinafter Doha LCA Decision], para 79.

¹⁵ *Ibid*, para 85.

¹⁶ Decision 1/CP.17, 'Establishment of an Ad Hoc Working Group on a Durban Platform for Enhanced Action, 2011', FCCC/CP/2011/9/Add.1 (15 March 2012) [hereinafter Durban Platform], and Doha LCA Decision, see above n 14.

would also need to put in place the institutional and financial arrangements to support the ERF process. In other words, the declaration or resolution will need, since it cannot be operationalised through the UNFCCC institutional architecture, to be an independent plurilateral agreement with its own operational structure and normative core. The results of the ERF process in such an external process would have limited legal gravitas, but it will have persuasive value and it could have considerable political gravitas.

There is a history of such political agreements in the climate change regime. The Copenhagen Accord, reached among heads of states of 28 Parties to the FCCC, was only 'take[n] note'¹⁷ of by the COP. The FCCC Secretariat made it clear that the Accord has 'no formal legal standing' in the climate change process.¹⁸ Yet the Accord is arguably one of the most influential documents to have emerged from the climate negotiations, albeit it[s] from the sideline[s], in the recent past. The true significance of the Accord lies not in its legal character or the consequences that follow its breach, but the use that Parties have put it to in the evolution of the climate regime (French & Rajamani 2013, p. 443). The ERF could similarly wield considerable influence in the regime, even if it is an external process, as long as it has political traction with the key players. Its outcomes would be applied on a voluntary basis, and could be used to 'name and shame' or identify and encourage Parties to ever more ambitious and equitable contributions.

If there is insufficient political traction for the ERF to be established through such a Declaration/Resolution, it could take the form of an independent external process run by a representative, in terms of geographical spread, diverse interest-groups and north-south, group of research and independent organisations. It could also be adopted by civil society. In this avatar the ERF would only comprise the technical process. The Climate Action Network, for instance, is working on a version of the ERF.¹⁹ The outcomes of ERF processes hosted and run by research organisations or civil society would be of persuasive value only but they may exert moral pull. They may also serve to highlight, synthesise and transmit information that may result in peer and civil society pressure on states that are doing less than their fair share. The UNEP Gap Report, first published in 2010 and regularly updated, offer a compelling example of an external technical assessment that wields influence, albeit in intangible ways, in the climate negotiations.

3.2 The ERF & the Architecture of the 2015 agreement

Having fleshed out various legal form options for ERF, it is worth considering how the ERF might slot into different architectural options currently under consideration for the 2015 agreement. There are at least three architectural approaches on the table in relation to the design of the 2015 agreement: the top-down, bottom-up and hybrid approaches. Different forms of the ERF can be adapted to fit into any of these, however, the negotiations appear poised to adopt a hybrid approach and the ERF would form an integral part of such an approach.

The top-down architectural approach is closely identified with the Kyoto Protocol. The Kyoto Protocol captures a top-down approach in that GHG targets are prescribed in the international agreement, albeit once offered and negotiated by the countries concerned, as well as a strong form of differentiation in favour of developing countries in that GHG targets and timetables are only for developed countries. The bottom-up approach, as noted above, is closely identified with the Copenhagen Accord (2009) and Cancun Agreements (2010). These initiated the climate regime's experiments with the bottom-up approach. The Cancun Agreements (2010) merely took note of commitments and actions by developed and

¹⁷ Decision 2/CP.15, 'Copenhagen Accord', FCCC/CP/2009/11/Add.1 (30 March 2010) [hereinafter Copenhagen Accord].

¹⁸ FCCC, 'Notification to Parties, Clarification relating to the Notification of 18 January 2010' (25 January 2010). Available from: <http://unfccc.int/files/parties_and_observers/notifications/application/pdf/100125_noti_clarification.pdf>. [Accessed 29 June 2014].

¹⁹ Climate Action Network, see above n 12.

developing countries, respectively. Although the agreements set up processes to clarify and understand these commitments and actions they did not prescribe the nature, type and stringency of commitments or actions to be taken by countries. Here the Cancun Agreements adopted a truly bottom-up approach that deferred to national autonomy in arriving at commitments/actions in the face of diverse national circumstances and constraints. These instruments also reflect differentiation++. By deferring to national circumstances and permitting every nation to chart its own course, and choose its own commitment/action, they recognise differentiation in favour of all countries (not just in favour of developing countries).

This resulted in a breathtaking array of commitments and actions replete with conditions, qualifications and caveats. It rapidly became evident such a bottom-up approach has its limits, at least to the extent that the regime needs the bottom-up to add up to what is required to reach the 2°C global temperature goal (UNEP 2011). As a result of this experience, and ongoing difficulties associated with clarifying and understanding current/pre-2020 commitments and actions, there is an effort to discipline or circumscribe the discretion available to countries in the negotiations for the 2015 agreement. That the bottom-up approach will be the starting point seems to be a given in light of the overlapping interests of states in protecting autonomy. The Warsaw decision inviting Parties to initiate/intensify domestic preparations for nationally determined contributions substantiates this point.²⁰ There is, however, an effort in the negotiations for the 2015 agreement to craft a hybrid approach where the top-down meets the bottom up.²¹

There are likely to be at least two top-down elements to the 2015 agreement in relation to countries' contributions: informational requirements that accompany their contributions so as to enhance their clarity, transparency and understanding and an assessment/consultation/evaluation process (although the extent to which this will function in a top-down or prescriptive manner is contested) to review countries' contributions. The Warsaw decision mandated the ADP to develop informational requirements for Parties' contributions.²² It also invited Parties to initiate or intensify their preparations for their intended nationally-determined contributions.²³ As discussed above the use of the word 'intended' offers a hook for an assessment process in the Warsaw decision. Both informational requirements as well as the assessment process, should one come to pass, could incorporate equity dimensions which would influence the extent of self-differentiation Parties permit themselves and that is recognised as legitimate. Parties could be asked to provide information, including objective criteria, justifying the fairness or equity of their contributions. Furthermore, the assessment process could incorporate an evaluation of countries' fair or equitable shares based on objective indicators relating, inter alia, to historical responsibility and development needs. The ERF thus fits squarely in the intersection between the top-down and the bottom-up approaches.

It may become politically expedient to provide for a longer lead in from the bottom-up to the hybrid approach. If this is the case Parties could adopt the ERF through a more phased approach. In the first phase Parties could self-select their contributions and the criteria to assess and justify them by in time for the 2015 agreement. In the second phase they could collect all these criteria/indicators/metrics into a basket and initiate a technical process within the negotiations that would lead to the formal adoption of the ERF.

²⁰ Warsaw ADP Decision, see above n 4,, para 2(c).

²¹ Summary of the round tables under workstream 1 ADP 2, part 2, Bonn, Germany, 4-13 June 2013, Note by the Co-Chairs (25 July 2013). Available from: <<http://unfccc.int/resource/docs/2013/adp2/eng/10infsum.pdf>>. [29 June 2014].

²² Warsaw ADP Decision, see above n 4, para 2(c).

²³ *Ibid*, para 2(b).

3.3. Timing, Phasing and Periodicity

The ERF could be applied in the lead up to the 2015 agreement (through the 2015 agreement) or periodically before and afterwards. Some of the legal form options — for instance those identified in 3.1.3, i.e. the ones that require the ERF to be applied through a SBSTA/SBI process or COP process — would allow the assessment process to be conducted and finalised, as well as its results applied to party contributions before the 2015 agreement is entered into. The intended nationally determined contributions could therefore be translated into final contributions in 2015 and captured in the 2015 agreement. Other legal form options — for instance those identified in 3.1.1 and 3.1.2., i.e. the ones that render the ERF a part (integral or optional) of the 2015 agreement — would require the 2015 agreement (and the ERF) to enter into force before the ERF can be applied and therefore they may not allow for finalised contributions to be captured in the 2015 agreement.

It may in such a case be possible to run a pilot phase of the ERF assessment process through a COP decision in the lead up to 2015. This would allow for the process to be run on a trial basis (a β test, as it were), for the results applied to party contributions made in the lead up to 2015, for any kinks in the process to be ironed out and for both the ERF and ‘numbers’ to be incorporated into the 2015 agreement. The ERF in all these options could also inform the finalising of contributions in 2015 such that they could be captured or inscribed later, perhaps in 2016 or 2017. Since the 2015 agreement is only slated to take effect from 2020,²⁴ such a delay would not be problematic, except insofar as the contributions or numbers would not be an integral part of the legal agreement. In any case some Parties have proposed that contributions should be captured in documents — misc. documents, independent schedules or similar that allow for ready revision — in 2015 and finalised after the assessment process is completed. The ERF can play a role in this case as well in the finalisation of the nationally determined contributions. Once the ERF assessment process is worked out, it could be applied periodically: for instance, for every commitment-period equivalent if any, for every new/altered set of contributions by Parties if permitted and for existing contributions should surrounding circumstances have fundamentally changed.

²⁴ Durban Platform, see above n 16, para 4.

4. TECHNICAL ASPECTS OF THE ERF

Having considered the legal form options for the ERF this paper now turns to the technical design aspects of the ERF. The ERF consists of science and equity benchmarks defined along the three elements of the framework. The first is an articulation of the required global effort, which is aggregate in nature. The second is an understanding of relative fair efforts by Parties and the third is an assessment of commitments presented by Parties in accordance with their legal obligations under the convention, including how they compare to the required aggregate effort. The perception of equity in the [climate change] negotiations finds expression in both the form (type of commitment and legal nature) and the magnitude of commitments. With the legal options having been discussed in the previous section the next section addresses some technical aspects of the type and magnitude considerations on equity perceptions.

4.1 The required global effort

In the last 20 years several studies seeking to quantify the magnitude of the global climate challenge have been published. Most of these adopt internally consistent methodologies for arriving at the required global mitigation and adaptation efforts, albeit yielding different results. The common thread is reflected in Figure 1 showing the GHG concentration/temperature/response nexus with the response addressing adaptation and mitigation, including their feedback. The stabilisation concentrations are built from socio-economic, demographic and technological considerations and they inform the plausible climate sensitivity. The latter informs an understanding of the required mitigation and adaptation efforts, including the finance and technology needs which, in turn, inform the plausible GHG concentration pathways. This nexus is fraught with complexity and uncertainty, however, it is sufficient to inform global and national policy discourse and as such responses to climate change.

This methodological approach is evident in the assessment of the required mitigation effort in the UNEP Gap Report (UNEP 2010), the conceptual and methodological approach to a global goal for adaptation, whose aim is to quantify the required global effort for adaptation (Ngwadla et al 2013) and the economics of climate change (Stern 2007). These cases are used to illustrate how the required global effort may be elaborated.

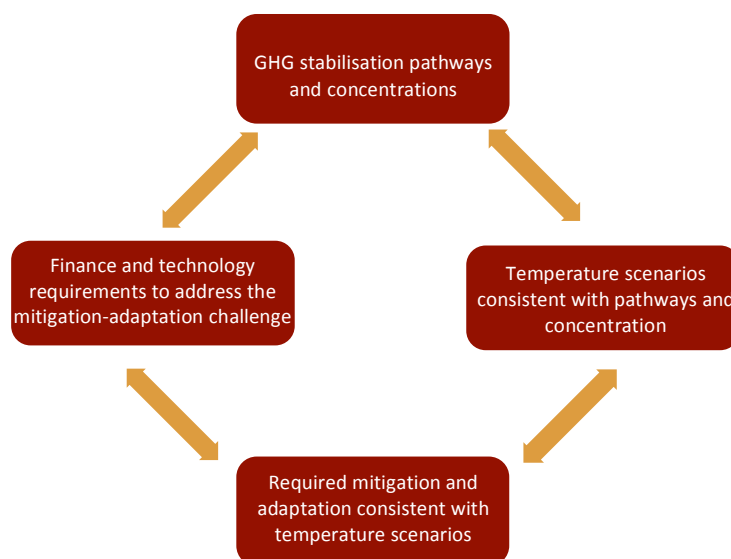


Figure 1: Climate change methodological nexus

It can be argued that, despite the complexity and empirical uncertainty, one accepted and defined element of this nexus provides a policy certainty that can empirically inform the articulation of the required global effort. Ngwadla (2014) suggests that the agreement on a temperature goal of keeping a temperature increase below 2°C from pre-industrial levels, with provisions for reviewing such a goal, is nothing less than seminal in the climate change negotiations. He further argues that it parameterises an abstract concept of ‘dangerous anthropogenic interference’ enshrined in the objective of the convention. This provides policy certainty on how the required global effort can be quantified in terms of mitigation, adaptation, finance and technology needs.

4.1.1 Methodological approach to the mitigation effort

The approach used in the UNEP Gap Reports (UNEP 2010), as shown in Figure 2, provides a basis from which the required global mitigation effort can be computed in the context of the ERF; however, stopping short of calculating the emissions gap, presenting policy options for closing the gap and attributing the required reductions from developed and developing countries. Rather the work would quantify the required emission reductions across the globe, consider a complete commitment period and incorporate the costing of reducing a ton of carbon dioxide during the period under consideration.

The first step is the assessment of plausible emission pathways consistent with pre-defined temperature limits of which the 5th assessment report of the Intergovernmental Panel on Climate Change — Representative Concentration Pathways (AR5-RCP) — and the 4th assessment report of the IPCC Pathways (AR4) would form a basis for the effort. It is important that a balance of results from Integrated Assessment Models (IAMs) with stylised pathways from multiple sources is considered so as to harness the strengths of pathway feasibility and temperature outcomes respectively. In harmonising the various scenarios, and dealing with uncertainty, the probabilistic nature of consistency with temperature scenarios should be clearly defined.

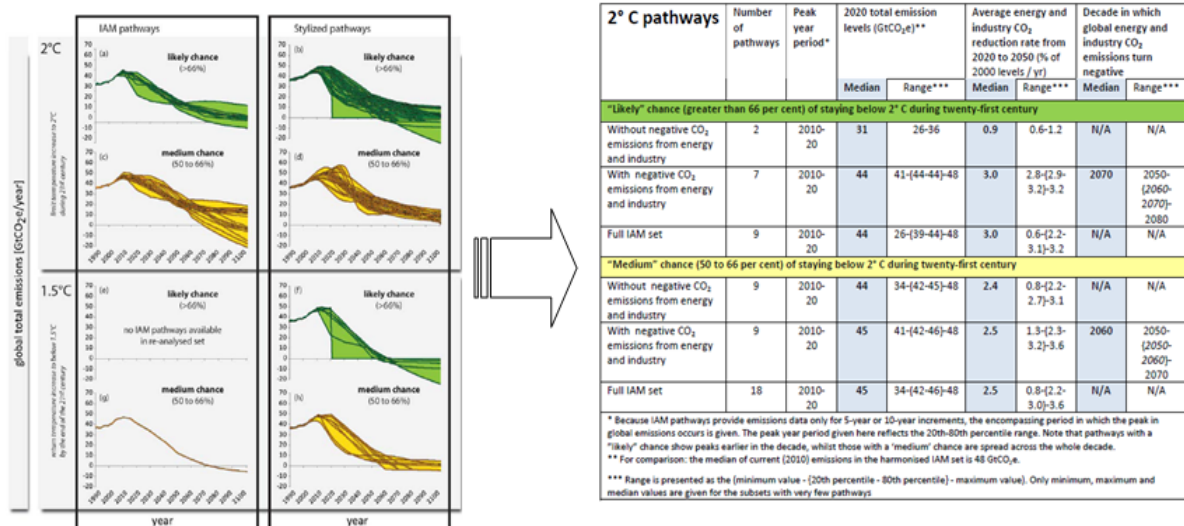


Figure 2: Methodological steps towards required mitigation effort by UNEP

Adapted from UNEP (2007)

With the pathways defined, the second step is the description of the appropriate GHG emission levels in GtCO₂e showing the median and range of such levels for the starting period — midpoint — endpoint, or starting point — end point²⁵ of a

²⁵ Depending on the length of the commitment period.

commitment period, i.e. the carbon budget for the commitment period. To provide for flexibility on how Parties reflect their commitments, secondary characteristics such as emission intensity, deviation from BAU, decarbonisation rate etc. are also taken into account.

The outputs of the International Assessment and Review (IAR) of developed country commitments and the International Consultation and Analysis (ICA) of developing country actions could further provide useful insights, not only to test the robustness of assumptions in harmonisation of emission pathway models, but also in discounting emissions from a preceding commitment period. The UNEP Gap Report suggests the median figure of 44 GtCO₂e (range: 26 - (39 - 44) - 48 GtCO₂e) reduction per annum by 2020 would be consistent with a likely chance of limiting temperature increase to below 2°C from preindustrial levels by end of the century.

The third step in elaborating the required global effort for mitigation is a presentation of median values from the various costing methods for mitigation action with a clear articulation of the range of costs as different approaches/methodologies present varying results. The approaches/methods for determining mitigation costs range from purely technology option costs such as NREL energy technology costs and performance data (NREL 2013), marginal abatement costs curves such as those from McKinsey which consider abatement potential based on technical potential of levers (primarily technological, including innovation in practices), as well as abatement costs informed by macro-economic factors, transactional costs and excluding behavioural changes²⁶ (McKinsey 2009).

The McKinsey report suggests a global average abatement costs by 2030 of €4 per ton of CO₂e, with a range of €5 - 10 including transaction costs. The McKinsey cost curves translate to €150 billion per annum by 2010. The same report touts as optimistic as it excludes transaction and programme costs, which are political decisions, as well as the assumption that levers will be chosen by governments in an optimal sequence based on costs. Ackerman & Bueno (2011) of the Stockholm Environment Institute caution against the negative cost theory²⁷ due to market failures and barriers as negative costs would mean all rational decision makers would have implemented the measures.

4.1.2 Methodological approach to adaptation effort

Recognising the multidimensional nature of adaptation, various approaches have been used in the estimation of adaptation costs. These approaches can be classified as either bottom-up or top-down approaches based on the methodology used.

Bottom-up approaches are based on spatially specific case studies and as such they adequately address the location-specific nature of adaptation, including both rapid- and slow-onset events, and non-economic losses. These approaches provide a sound basis for understanding adaptation costs as they reflect nationally determined response options to a pre-defined climate scenario and also take into account national development priorities. The weakness of these approaches is the subjective nature of response options which may not be palatable to other Parties.

Top-down approaches proceed from the physical science basis of temperature-climate relationship and, in some instances, sector-specific application modelling of the implications of climate change. These approaches provide a sound understanding of physical climate costs linked to an increase in high-impact climate events for a given temperature

²⁶ Recorded costs are a product of costs less a reference scenario rather than full costs.

²⁷ Some mitigation options such as hybrid cars have a negative cost due to the use of a payback period compared to alternatives.

scenario. The weakness of these approaches is the inability to effectively incorporate locality-specific peculiarities and choices even though they maintain strong and objective GHG — temperature — adaptation linkages.

An approach to the quantification of the required adaptation effort in an ERF is outlined in Ngwadla et al (2013) where costs both from bottom-up as well as top-down methodologies are considered, as such harnessing the strengths of the different methodologies. The various methodologies are reflected as a range with a median as shown in the example in Figure 3 for the African continent.

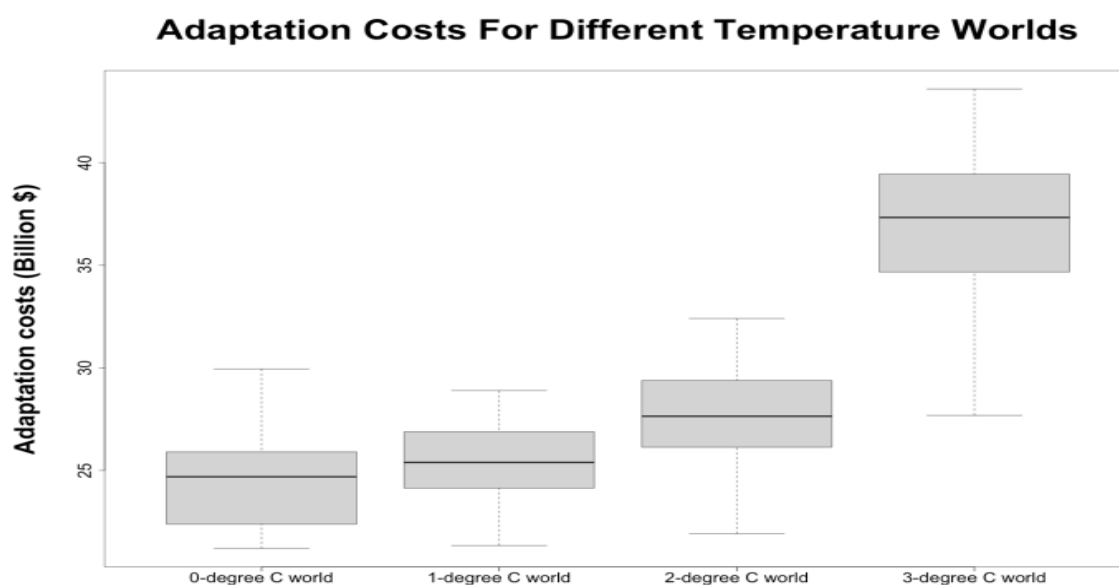


Figure 3: An envelope of adaptation needs for Africa (adapted from Ngwadla, et al. 2013)

The envelope of eight different studies by the AfDB (2011) shows that adaptation costs for Africa strongly converge around \$20 - 30 billion per annum by 2030 which is consistent with the approach in Figure 3. This could therefore provide a guide for assessing adequacy of the amount pledged by Annex II Parties for adaptation in Africa, whilst taking into account what African countries would have identified as adaptation needs in their adaptation strategies and plans, including domestic investment in adaptation to be recognised as their contribution to the required global effort. The approach can be replicated for Latin America developing countries and Asian developing countries, as such providing the required global effort for adaptation. From a global perspective, some studies have **suggested adaptation costs to be around \$75 - 100 billion per annum between 2010 and 2050**²⁸ in developing countries.

4.1.3 The required global effort equivalent

The expert phase of the assessment process, which is technical in nature, requires a presentation of what is understood to be the mitigation effort required for the commitment period and the corresponding adaptation burden. The outcome of the mitigation envelope reflected in both GtCO₂e as well as harmonised costs as outlined in section 3.1.1, in this illustrative example based on the UNEP Report case 44 GtCO₂e with a range of 39 - 44 GtCO₂e per annum by 2020, hence the

²⁸ World Bank 2010, Economics of climate change adaptation. Available from: <http://www-wds.worldbank.org/external/default/WDSContentServer/WDSP/IB/2012/06/27/000425970_20120627163039/Rendered/PDF/702670ESW0P10800EACCSynthesisReport.pdf>. [Accessed 29 June 2014].

mitigation costs would be **\$154 billion per annum**²⁹ by 2020 with a range of \$137 - 154 trillion at an average mitigation cost of \$35 per ton.³⁰ On the other hand, the global adaptation costs in developing countries are estimated at \$75 - 100 billion per annum³¹ by 2020. This therefore suggests that the **required global effort for adaptation and mitigation is an estimated \$242 billion dollars per annum, adding to \$2, 42 trillion over a 2020 to 2030 commitment period.**

The response options with regards to mitigation and adaptation inform the finance and technology needs. Further taking into account that technology needs can also be expressed in financial terms, it is important to note that some methodologies, such as abatement cost curves and bottom-up adaptation approaches have an implicit consideration of technology. However, not all technology support by Annex II can be expressed in financial terms, in some cases technologies can be made available on a licensing arrangement, in which case the concessionaire can be recognised on the value of that concession. Some of this information can however be gleaned from Technology Needs Assessments, National Adaptation Plans, Nationally Appropriate Mitigation Actions.

4.2 Relative fair efforts by Parties

With a required global effort having been defined, as described in section 3.1 of this paper, the perception of fairness lies in whether all Parties are perceived to be pulling their weight by their peers. Responding to what he terms a false dichotomy between distributive and corrective justice approaches, Ngwadla (2012) argues that the philosophical egalitarian principle — as well as recognising the fact that distributive justice cannot be seen outside the context of corrective justice — is central to the definition of a basis for fairness in the climate change regime. Ngwadla (2012) also argues that since principle seven of the Rio declaration identifies elements of common, but differentiated responsibilities as historical responsibility, current capability and development needs, any basis for assessing fair efforts by Parties should reflect these three dimensions. This can also be gleaned from analyses of FCCC Article 3(1) (Rajamani 2006).

The ERF provides for a consideration of the metrics Parties may propose along each of these three dimensions of CBDR&RC. These will subsequently be presented in an envelope of outputs showing the relative efforts Parties should contribute to the required global effort; the required global effort being defined in terms of both mitigation as well as adaptation. This paper presents a limited selection of countries, with a limited selection of metrics for each of the three dimensions equally weighted. The final computation of relative fair efforts is intended to demonstrate the computation process of the ERF.

For each of the dimensions, i.e. historical responsibility, current capability and development needs, three metrics are used in the following illustrative examples even though the approach can accommodate an unlimited number of metrics Parties may propose. The computation follows the following stepwise process:

- a. The sum for the population is calculated where the population is that of countries considered in the assessment, e.g. the sum of GDP for all countries is computed as such a global GDP.
- b. The proportion attributable to a country is calculated on the basis of the population sum, e.g. country GDP divided by sum of GDP as such gives the percentage responsibility on this metric.

²⁹ If a 10 year commitment period is envisaged, therefore the mitigation costs over the period can be expected to be in the order of \$1.54 trillion with no discounting and assuming constant abatement costs.

³⁰ If \$35 cost of carbon per ton is used, based on IPCC (2007) assertion that carbon price of \$20-50 per ton if sustained for the period 2020-2030 would be consistent with stabilisation levels of 550ppm CO₂eq by mid century. Barker, T. *et al* (2007)

³¹ An average cost of \$88 billion is used.

- c. The previous steps in a) and b) above are repeated for all metrics identified for a specific dimension, the result being three levels of responsibility based on the 3 metrics identified per dimension in the illustrative examples below.
- d. The three levels of responsibility for each of the metrics are then used to establish the median, 25th and 75th percentile for each country for a dimension; in this case historical responsibility, current capability and development needs.

The countries are treated as the ‘world’ population in the computations. As such a consideration of all Parties would lead to different conclusion of what the fair efforts should be. The same can be said about the selection of metrics, as consideration of more metrics would lead to different levels of responsibility.

The results are presented as 25th percentile value represented by the bottom-end of the box - the mean value as a solid line in the box 75th percentile value³² as top-end of the box, with minimum value from a single metric and maximum value being shown by the whiskers of the box-whisker plot. The metrics selected for historical responsibility are emissions per capita, expressed as mean population and emissions for 1990 to 2010,³³ cumulative emissions³⁴ from 1960 to 2010, as well as cumulative emissions from 1990 to 2010; in both cases excluding LULUCF.³⁵

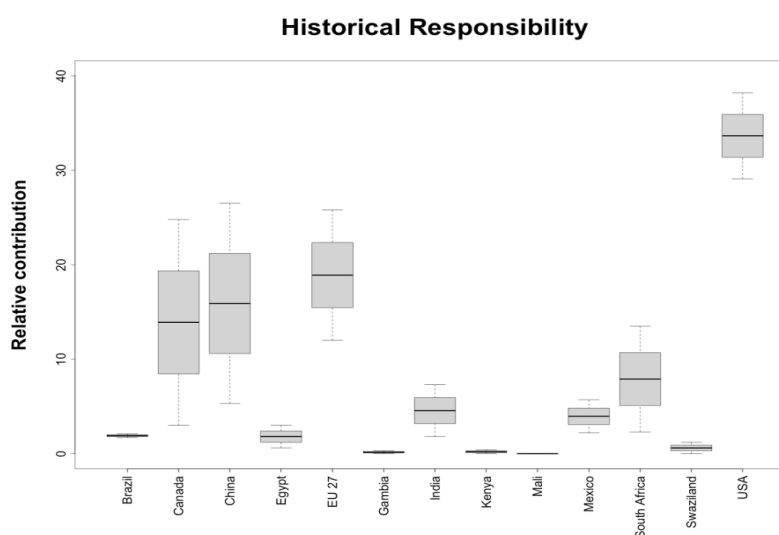


Figure 4: Envelope of metrics for Historical Responsibility

³² The percentiles provide meaning of where the various indicators position a specific country in relation to the dimension, e.g. the 75th percentile of historical responsibility gives a value consistent with where 75% weighting of the metrics lie; whereas a mean value is used so as to ensure that the sum total of the indicators is a 100.

³³ Emissions per capita provide a most appropriate proxy for an operational egalitarian principle, however mask the magnitude of contribution to the GHG in the atmosphere, e.g. India is 1.4 times average emissions per capita for 1990-2010 as compared to Swaziland, however the cumulative emissions are 1,437 times for the same period.

³⁴ Cumulative emissions provide the best proxy for contribution to the problem, especially if corrected for GHG persistence characteristics; however the choice of period under consideration can lead to significant changes in responsibility depending on when the economy pursued industrialisation, e.g. emissions for the US have been consistently increasing since 1960, however in relative contribution decreasing due to industrialisation of many developing countries.

³⁵ The land use and forestry sectors are an important source/sink for GHG emissions albeit not factored in this choice of metric, as such the responsibility would be markedly different should it be considered, e.g. Brazil was the biggest source in 2005 at 1,328Mt CO₂e whereas the US was the biggest net sink at -1,027328Mt CO₂e for the same period.

In this illustrative example, considering median values, the contribution due to historical responsibility by the USA is about 1.8 times that of the EU₂₇ and about 2.2 times that of China, whilst about 14 times that of most African countries with the exception of South Africa. On the other hand the EU₂₇ has a responsibility that is 1.3 times that of China and 5 times that of India and 2.5 times that of South Africa.

Other analyses consider emissions since the 1850s, as the rough start of industrialisation and due to the persistent nature of GHG concentrations in the atmosphere, as well as net emissions/removals from the LULUCF as these can be considerable for countries with significant land use or forestry sectors. Computations based on an earlier start year would affect the results for historical responsibility and produce a different pattern compared to Figure 3.

The illustrative example shows a fair balanced output from the various metrics (albeit the 25 to 75 percentile range is higher for Canada, China, the EU₂₇ and South Africa) and potentially limited bias of outputs as the whiskers do not show metrics that either underplay or overplay the historical responsibility of any country. The emission per capita metric by its nature represents an ‘emissions contraction and convergence thinking’ aspect of the responsibility, which is both historical and forward looking in its output.

The metrics selected for current capability are GDP per capita³⁶ — PPP mean for the period 1980 to 2010 and the second is GDP per capita³⁷ — PPP mean for the period for 1990 to 2010, as well as Gross Capital Formation (GCF) as % of GDP³⁸ as of 2010. Using the median values, the USA is 1.7 times more capable than the EU₂₇ whereas Canada is 6 times more capable than Kenya. On the other hand, India and China are comparable to most African countries.

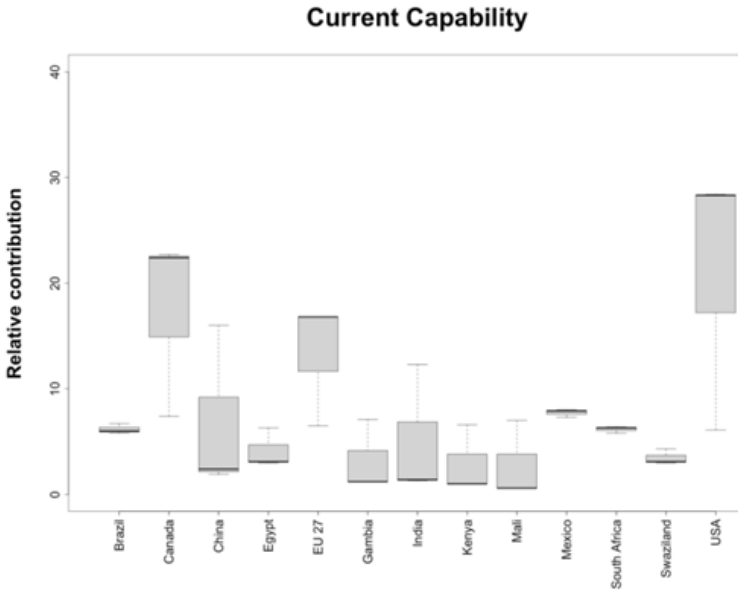


Figure 5: Envelope of metrics for Current Capability

³⁶ GDP per capita, similarly to emissions per capita does not reflect the global economic share of a country, whilst at the same time does not show inequalities and structural limitations of an economy.

³⁷ Ibid.

³⁸ GCF as %GDP measures additions of national fixed asset inventories, including changes in those inventories, such as railways, roads, power stations, hospitals etc., as such a good measure of productive potential of an economy, however industrialising countries and resource intensive countries may disproportionately have higher figures despite a lower productive potential



However, it is important to note that the selected metrics are predominantly on a per capita basis. As such population size plays a significant role, whereas % contribution to the global GDP could capture the differing sizes of the various economies.

It is however observable that most developed countries have a lower GCF as % of GDP due to a longer history of capital investment in basic economic infrastructure, whereas poorer countries may have low GCF as % of GDP due to lack of capital to invest. This might lead to an under-valuation of developed country responsibility as the metric measures changes in capital stock rather than established stock, the latter being a better representation of productive potential and productivity.

The metrics selected for development needs are the Human Development Index³⁹ (HDI), the non-income metrics of HDI as well as the electrification rate. In terms of the median values, developed countries have comparable development needs that consistently show a higher score than developing countries. Since the ERF reflects responsibility, the higher score suggests a higher responsibility for developed countries as a result of their development levels. Mali would contribute an equivalent of 0.5 compared to what developed countries will, whereas Kenya and Swaziland have a development gap of about 0.6 compared to developed countries.

Development Needs

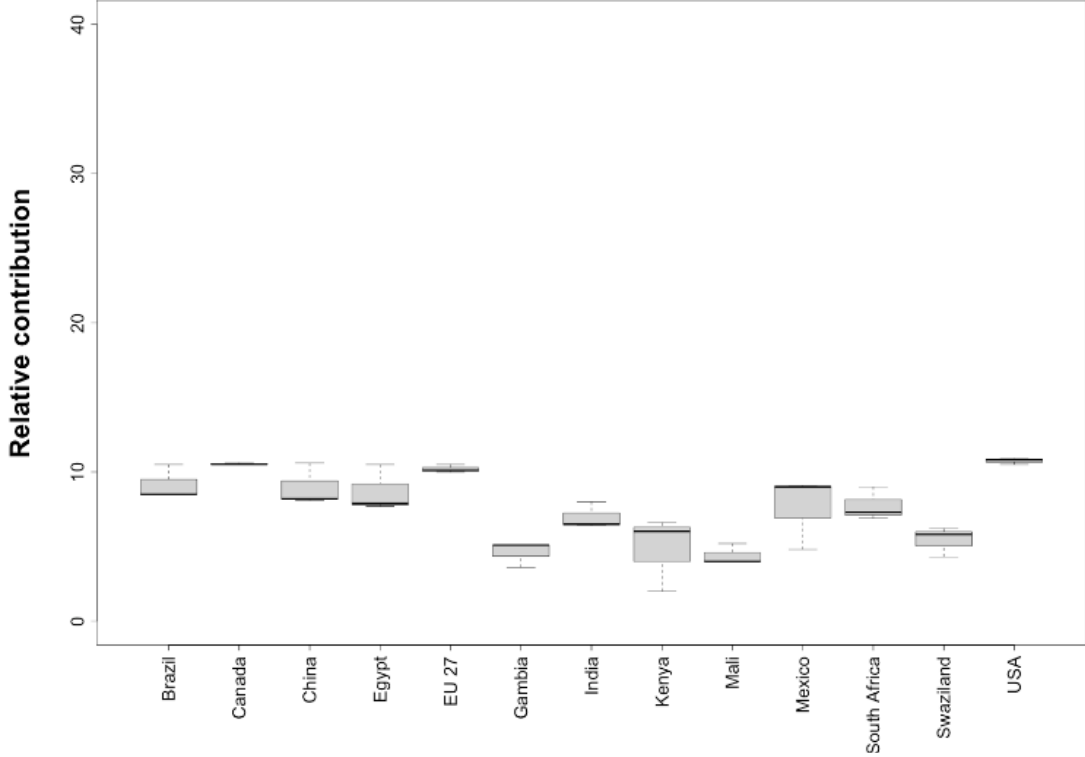


Figure 6: Envelope of metrics for development needs

The electrification rate metric is the biggest discriminating metric amongst developing countries. Most African countries score the lowest in it, whilst industrialising countries, with the exception of Mexico, score higher. This leads to an upward bias in these countries due to their higher levels of electrification.

³⁹ HDI measures education levels, life expectancy, wealth and decent standard of living, with the last two components primarily drawing from income statistics, which are closely related to GDP as such can be seen as repetitive of the capability metrics in the ERF.



In order to arrive at the envelope of relative fair efforts, the three dimensions—historical responsibility, current capability and development needs—illustrated above are then combined on an equal weighting to compute the median from median values of historical responsibility, current capability and development needs (including the 25th and 75th percentiles from the respective data of historical responsibility, current capability and development needs), whereas the minimum and maximum values are from the individual metric rankings. In Figure 5(a) the outputs are presented to reflect absolute responsibility, whereas 5(b) reflects relative contribution to the highest contributor (US). In terms of relative fair efforts, 5(a), the results suggest that the US should shoulder 24% of the required global effort, translating to \$58 billion dollars equivalent per annum through 2020 to 2030; whereas the EU should shoulder a 17% responsibility of the required global effort which is a \$41 billion dollar equivalent as outlined in section 3.1. The use of this metric underlies the scientific basis of the assessment as the aggregate effort of all Parties should add to the required global effort. The ERF presupposes in its process a step where peers can assess contributions by their peers.

Figure 5(b) represents fair efforts relative to the US showing the US effort should be 1.4, 1.6 and 3.6 times that of the EU₂₇, Canada and Mexico respectively. The US effort should be 1.7, 3.8, 4.1 and 7.1 times that of China, Brazil, Egypt and Gambia respectively. It is worth noting that Brazil and India, Egypt and South Africa and Gambia, Kenya and Mali have comparable levels of responsibility. The use of this metric should demonstrate perceived fairness and equity amongst Parties.

The range of responsibility can also be defined for various Parties if the 25th and 75th percentiles are considered. The responsibility for the required global effort can be described as 3.5 - 6.5% for Brazil, 11 - 19% for China, 4.5 - 5.5% for India and 4 - 5.5% for South Africa. For developed countries responsibilities would be 6.5 - 14.5% for Canada, 14.5 - 21% for EU₂₇, 18 - 27% for the US.

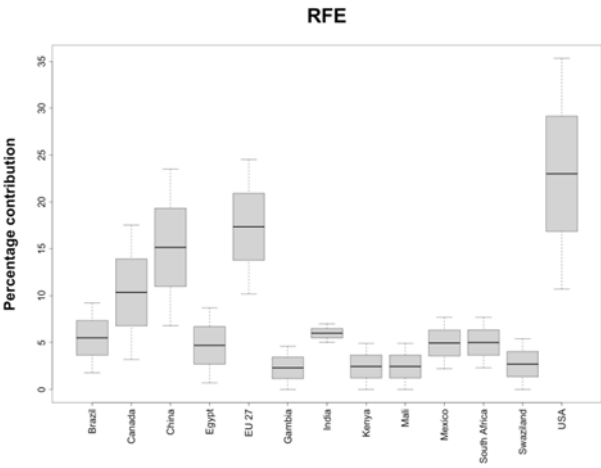


Figure 7a: Envelope of relative fair efforts by Parties

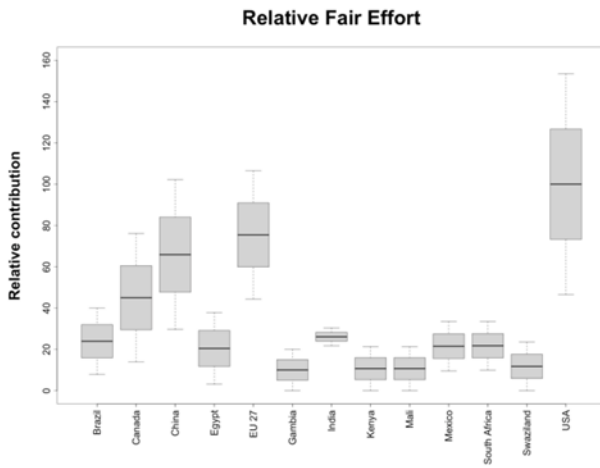


Figure 7b: Envelope of relative fair efforts by Parties relative to the US

The convention, however, provides for differentiated treaty obligations as an expression of fairness in the climate change regime. All Parties have a responsibility to act. As such non-Annex I Parties can discharge their responsibility through policies and measures relating to emission reductions and investments in adaptation within their economies, or in cooperation with other Parties. Developed country Parties in Annex I are required to lead in meeting the required

mitigation effort in quantitative emission reductions by applying the assessment process as well as revising their ambition on the basis of its outputs. Those in Annex II will provide technological and financial support to developing countries.

4.3. Assessment of commitments

The ERF is premised on an initial submission of commitments or contributions by Parties which are then assessed for adequacy; whether in aggregate such commitments approximate the required global effort as well as fairness, or whether such individual commitments approximate the relative fair effort each Party should make in relation to other Parties. The various options reflected in section 2 on process and technical considerations envisage a role for both expert and diplomatic processes. Of course this may vary depending on which of the architectural and legal options outlined in section 3 of this paper are chosen.

For the assessment process developed countries, in line with their treaty obligations, will be expected to provide information on their economy-wide emission reductions which should be a minimum of the 25th percentile of their relative fair effort. In addition Annex II Parties would be expected to provide information on the finance and technology support they will offer for adaptation (in line with the Global Goal for Adaptation) as well as for emission reductions by supporting developing country mitigation actions (see section 3.1 of this paper). In relation to the provision of technology support Annex II Parties could engage a public/private or private technology holder to make it available through the Climate Technology Centre and Network (CTCN),⁴⁰ with the value of such support evaluated.

In line with their treaty obligations, developing countries for their part would be expected to present their contribution for the assessment process, bearing in mind that the minimum mitigation effort is in the range of the minimum metric as reflected in the bottom whisker and the 25th percentile of the relative fair effort. Domestic adaptation investment will also be recognised as a contribution towards the required global effort, including any cooperative action investments with other Parties. These contributions would therefore be informed by Nationally Appropriate Mitigation Actions (NAMAs) and National Adaptation Plans (NAPs)⁴¹/National Adaptation Programmes of Action (NAPAs)⁴² that developing country Parties have developed as well as by additional information presented in the 'required global effort' outcomes from an expert body.

The Warsaw ADP decision, with its use of the language 'intended nationally determined contributions,' reflects the provisional nature of national contributions, leaving open, as discussed above, the possibility of a multilateral adequacy assessment against the objective of convention. The objective of the convention could, as also discussed above, be defined in terms of the 'required global effort.' An inscription process of these contributions would therefore only follow thereafter. The necessary information that would enable an assessment is reflected in Figure 6, in line with various commitments in Article 4 of the convention. The mix of such efforts would consequently be used to assess how those contributions approximate the relative fair effort of Parties in relation to the required effort.

⁴⁰ Decision 1/CP.16, 'The Cancun Agreements: Outcome of the work of the Ad Hoc Working Group on Long-term Cooperative Action under the Convention', FCCC/CP/2010/7/Add.1 (15 March 2011) [hereinafter Cancun LCA Decision], para 117(b).

⁴¹ *Ibid*, paras 15 and 16.

⁴² Decision 5/CP.7, 'Implementation of Article 4, paragraphs 8 and 9, of the Convention (decision 3/CP.3 and Article 2, paragraph 3, and Article 3, paragraph 14, of the Kyoto Protocol)', FCCC/CP/2001/13/Add.1 (21 January 2002), para 15.

It is, however, plausible that the 25th percentile required minimum commitment for Annex I Parties, and up to the 25th percentile mitigation commitment by non-Annex I and Annex II Parties, do not match the required global effort as these may create mitigation, adaptation and finance gaps. In demonstrating leadership Annex I Parties would be expected to raise their mitigation ambition, whilst Annex II Parties would be expected to pledge additional support including through the NAMA Registry.⁴³ The UNEP approach of identifying areas of mitigation potential would inform developing country

Adaptation commitment for non-Annex I

Projected impacts	Methodology used, Assumptions	Associated costs
Adaptation options	Approaches and technology needs	Associated costs
Programmes - Projects	Finance and Technology needs	Value of action for recognition

Adaptation commitment for Annex II

Finance	Sector, Region	Sources, Assumptions, Delivery Mechanism
Technology	Sector, Description of tech.	Assumptions, Delivery Mechanism
Capacity building	Description	Assumptions, Delivery Mechanism

Mitigation commitment format

	Annex I	Annex II
Minimum information ³	<ul style="list-style-type: none"> • QELRO/QEERT • Gases covered • Sectors • Sources • Length of commitment 	<ul style="list-style-type: none"> • Commitment to action, deviation from BAU, emissions intensity, etc. • Gases covered • GWP • Base Year • Length of commitment
Rules ⁴	<ul style="list-style-type: none"> • LULUCF, • Markets, 	<ul style="list-style-type: none"> • LULUCF, • Markets
Transparency, Adequacy, Fairness	<ul style="list-style-type: none"> • IAR • Relative fair effort 	<ul style="list-style-type: none"> • ICA • Relative fair effort

Finance and Technology commitment for Annex II

Type of Support	Information provided	Commitment details
a. Finance support where the various sources are described; <ul style="list-style-type: none"> • Grant, • Concessional loan, • Guarantees, • Private finance • Payment for offset 	<ul style="list-style-type: none"> • Assumptions used in counting of the level of support, e.g. full capital amount, interest, value, cost, etc. • Mechanism by which the finance will be delivered, e.g. GCF, AF, Bilateral, Private sector leverage costs, etc. • Sectors supported and geographies targeted, e.g. mitigation-industry, mitigation-energy, adaptation-agriculture, adaptation-water, etc. 	<ul style="list-style-type: none"> • Value of the support from each of the sources • Timelines for the delivery of the support
b. Technology support for, <ul style="list-style-type: none"> • Mitigation • Adaptation 	<ul style="list-style-type: none"> • Description of the technology, and sector of application, such energy for mitigation and/or adaptation • Support mechanism, such as licence, finance, private sector IP leverage, support to - including indigenous- tech development • Delivery mechanism, such as the CTQI, ODA mechanism, etc. 	<ul style="list-style-type: none"> • Value of the support, and delivery timelines • If support is finance, as in a) above

submissions to the registry as well additional opportunities for raising ambition by all Parties.

Figure 8: Indicative information required for assessing science and fairness

A mitigation gap will create an adaptation gap which can be quantified through a calculation of adaptation needs that are consistent with the realisable temperature scenario as follows:

$$[G_n = C_{n(x)} + C_{n(y-x)}]$$

where; G = adaptation cost for n year time slice; C_n = cumulative cost of events over period n; x = agreed temperature goal; y = temperature associated with realised emission commitments; n = types of events, floods, droughts etc.

Annex II Parties would therefore re-pledge their adaptation support in line with the adaptation needs for the commitment period.

⁴³ A facility for recording NAMAs seeking international support, facilitate matching with support, including those NAMAs recorded only for recognition as envisaged in Cancun LCA Decision, see above n 40, para 53.

5. CONCLUSION

Many believe that multilateral assessments, and consequent modifications, of national contributions by Parties is not only essential for an effective and equitable climate agreement but also the *raison d'être* for an international legal regime on climate change. The Warsaw ADP decision leaves room for the introduction of a multilateral process for assessing national contributions. It also hints at the basis for such an assessment in its reference to the objective of the convention, which has been further interpreted to include a temperature goal. This paper makes the case that science (the question of adequacy of contributions in meeting the temperature goal) and equity (the question of fair burden sharing amongst states) must underpin such a multilateral assessment. This paper argues that the ERF, a multilateral assessment process that does precisely this, can play a critical role in shaping the contours of the 2015 agreement. The ERF, as this paper demonstrates, is highly adaptable on substantive assessment inputs, legal form and architectural options. It may thus prove to be an invaluable framework in a highly contested environment with divergent views.

This paper sought to flesh out legal and technical aspects of the ERF, but needless to say, many open questions remain. The debates on the metrics to be captured to assess science and equity, and how these might be reflected, will intensify in the run-up to 2015. There are also other open questions such as: What would constitute an optimal and minimum contribution per contribution type, by Parties in line with their treaty obligations, that have a likely chance of approximating the required global effort? Also: How can the ERF interface with the existing institutional architecture of the convention without duplication, whilst at the same time bringing coherence to the regime? These and other such questions merit further examination. It is clear, however, that the ERF as proposed by the African Group, welcomed by the LDCs and gaining traction with others, needs to be taken seriously in the lead up to the 2015 agreement.

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