



Geneva Environment Network

Equity Considerations in NDCs, December 07, 2020

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Fairness critically conditions the carbon
budget allocation across countries

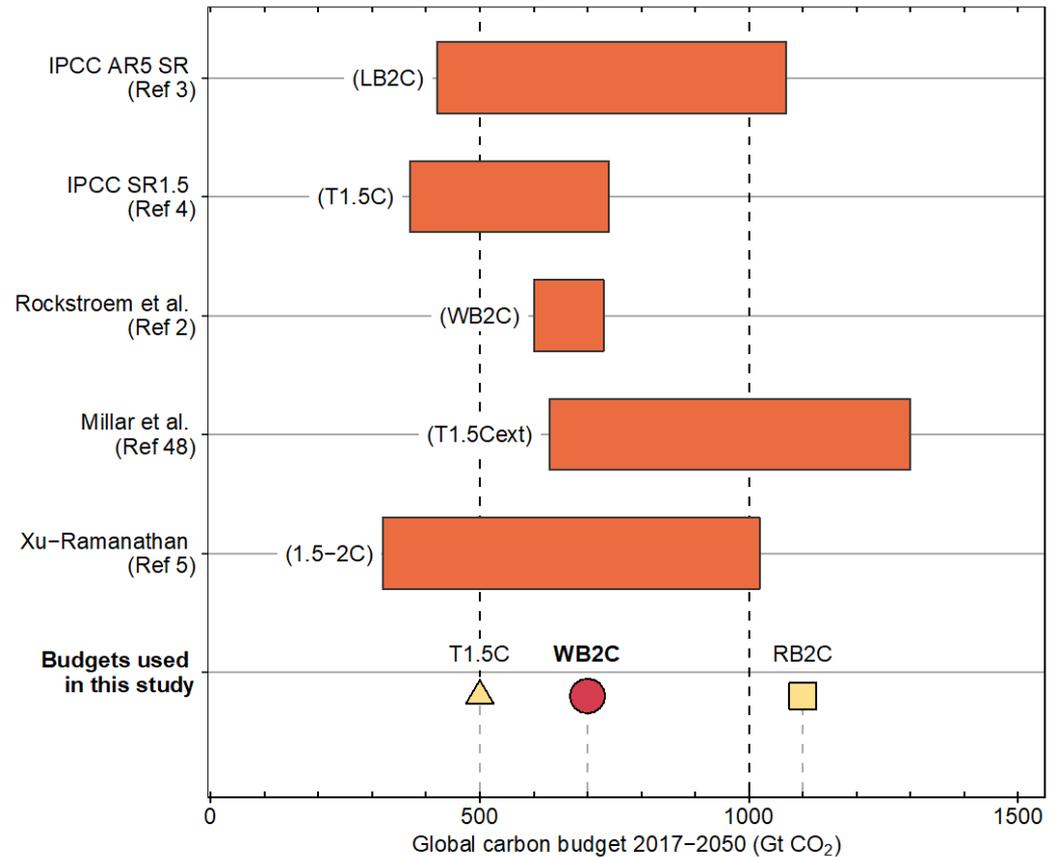
Based on a draft article by Keith
Williges, Lukas H. Meyer, Karl W.
Steininger, Gottfried Kirchengast

The overall global carbon budget

Building on my explication of climate justice (in Meyer 2009, 2013, Meyer & Sanklecha 2014, 2017) we assess how a carbon budget complying with the climate goals of the Paris agreement could be distributed, and the implications of justice considerations.

We begin by establishing an estimate for the remaining global carbon budget (GCB) as seen in the Figure.

We then distribute the budget from now until 2050, based on two main burden-sharing mechanisms and three qualifications to address their shortcomings.



Burden-sharing mechanisms

1. Contraction and convergence (CAC)
2. Equal per capita (EPC)

Burden-sharing mechanisms

1. Contraction and convergence (CAC)

- Every country begins with their current per-person emissions and converge on a common future level of emissions by 2050
- Historical emissions disregarded
- A form of grandfathering (while countries don't explicitly argue in this way, Paris NDCs can be shown to effectively be based on grandfathering)
- Highly-industrialized countries will have more emissions rights in the transition phase to a low-carbon society

Burden-sharing mechanisms

2. Equal per capita (EPC)

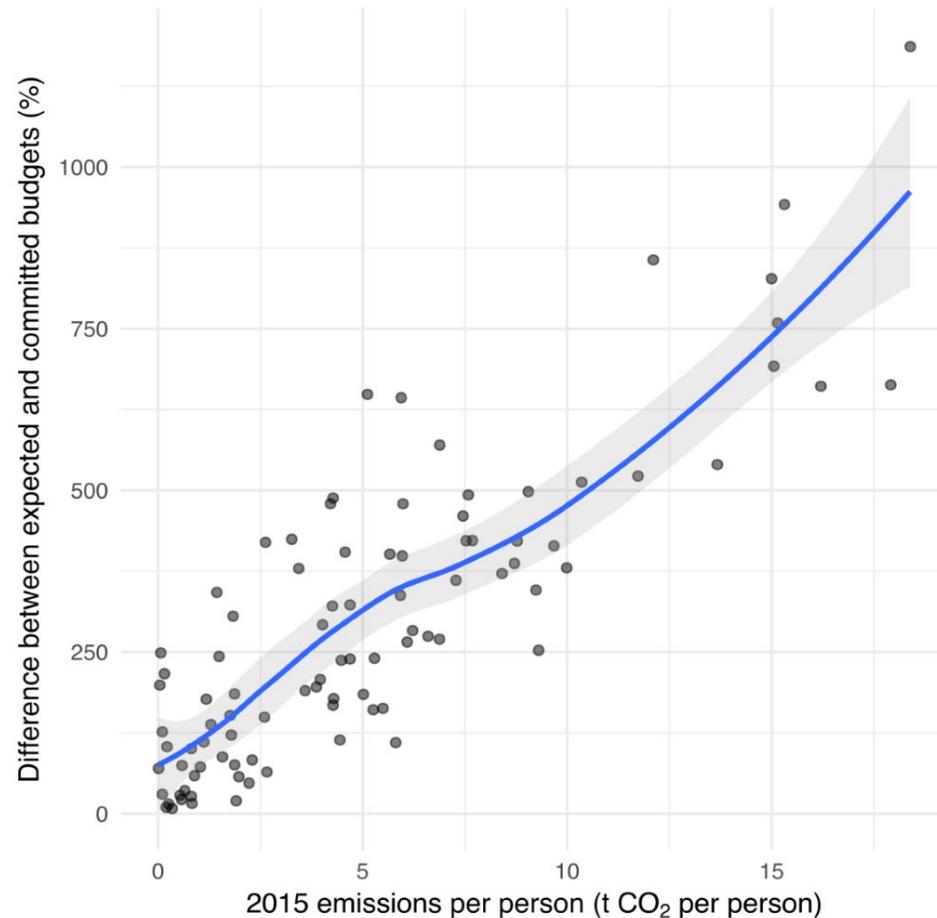
- Starting today, all countries are allocated an equal amount of emissions per person, for the time horizon up to 2050
- Historical emissions again disregarded
- However, no grandfathering

Paris NDCs and Grandfathering

Paris NDCs can be shown to effectively be based on grandfathering:

Countries with higher per person emissions have committed to NDCs which are much higher than what their EPC-derived budget would be.

The difference between Paris NDCs and to-be-expected EPC-motivated pledges increases as countries past emissions per person increase: higher past emitters rely more heavily on grandfathering.



Qualifying CAC and EPC

Beyond these two simple mechanisms, we can qualify the approaches to take into account fairness concerns or justice principles

- securing basic needs,
- attributing historical responsibility for historical emissions
- accounting for benefits from past emissions
- not exceeding feasible reduction rates

Qualifying burden-sharing mechanisms

1. Introducing a sufficiency threshold (*N-qualified*)

Qualifying burden-sharing mechanisms

1. Introducing a sufficiency threshold (*N-qualified*)

- Asserts that all people should be allocated emissions which can allow them to reach at least a certain level of well-being
- Comparing emissions in the past with indicators of well-being (the Human Development Index) we find a relationship between increasing emissions and increasing HDI
 - This then helps us to define an average level of emissions for a given level of HDI
- If a country's per person emissions are below a threshold, they are allocated an initial level of emissions to meet this level
- The remaining emissions are allocated via CAC or EPC as normal

Qualifications, continued

Taking into account historical emissions in two ways

Qualifications, continued

2. Moving back the point of accounting (acknowledging historical emissions) (*H-qualified*)
 - To address the issue that both simple approaches fail to take into account emissions prior to today, we can specify that countries should also be responsible for emissions they've caused in the past
 - We move the year of accounting back to 1995, the date of publication of the IPCC's Second Assessment Report
 - (Wrongless past) emissions prior to 1995 are still unaccounted for

Qualifications, continued

3. Accounting for the benefits of past emissions (*B-qualified*)
 - Emissions from before 1995 can be taken into account as long term consequences of their use in contributing to the benefits that currently-living people have now and will in the future
 - We estimate the carbon emissions embodied in the global capital stock in 1995, and add it to the initial carbon budget
 - This larger budget is then distributed to countries, minus their individual embodied emissions (according to the principle of equal benefits from emission-generating activities for currently living and future people)

A final qualification for EPC

Unlike CAC, EPC does not imply grandfathering. Two points (supposedly) speak in favor of some form of limited grandfathering:

A final qualification for EPC

1. Quickly reducing emissions from a high to very low level is more costly (in terms of costs of adaptation, substitution or giving up of certain goals) and leads to frustration of “legitimate expectations”
 - Critique: reduction costs may be less burdensome than the high damages and adaptation costs faced by low emitters. Even if costs are higher for high emitters, compensation or adaptive assistance should fall on states that played a constitutive role in forming these expectations rather than affect the distribution of the GCB

A final qualification for EPC

2. Too high rates of reduction may be infeasible (in terms of economic, technological, institutional, socio-cultural or other dimensions)

Argument for a limit to be placed on the burden faced by individual countries in terms of reduction rates

A qualified EPC to limit overly-burdensome reduction

Based on Rockström et al (2017) we assume that reduction rates up to ca. 7% can be deemed feasible, and assume this to be the maximum yearly reduction possible (*C-qualified*)

- Given this limit we calculate the minimum possible cumulative budget a country would need to have
- We compare that limit to the budget allocation under an EPC simple approach
- If EPC is found wanting, countries are pre-allocated the difference between this minimum possible cumulative budget and their EPC simple allocation
- Distribution of the remaining budget follows this initial step, including the *N*, *H*, and *B* qualifications addressed previously

Results

Implications of NHB-qualified CAC (D) are similar to implications of Simple EPC (A):

- Qualifying CAC by HDI threshold leads to countries being granted a budget close to the simple EPC budget
- Past emissions are so high that taking them into account (in both ways) practically eliminates the difference between CAC and Simple EPC for below HDI-countries and most of the difference for the historically high emitting countries

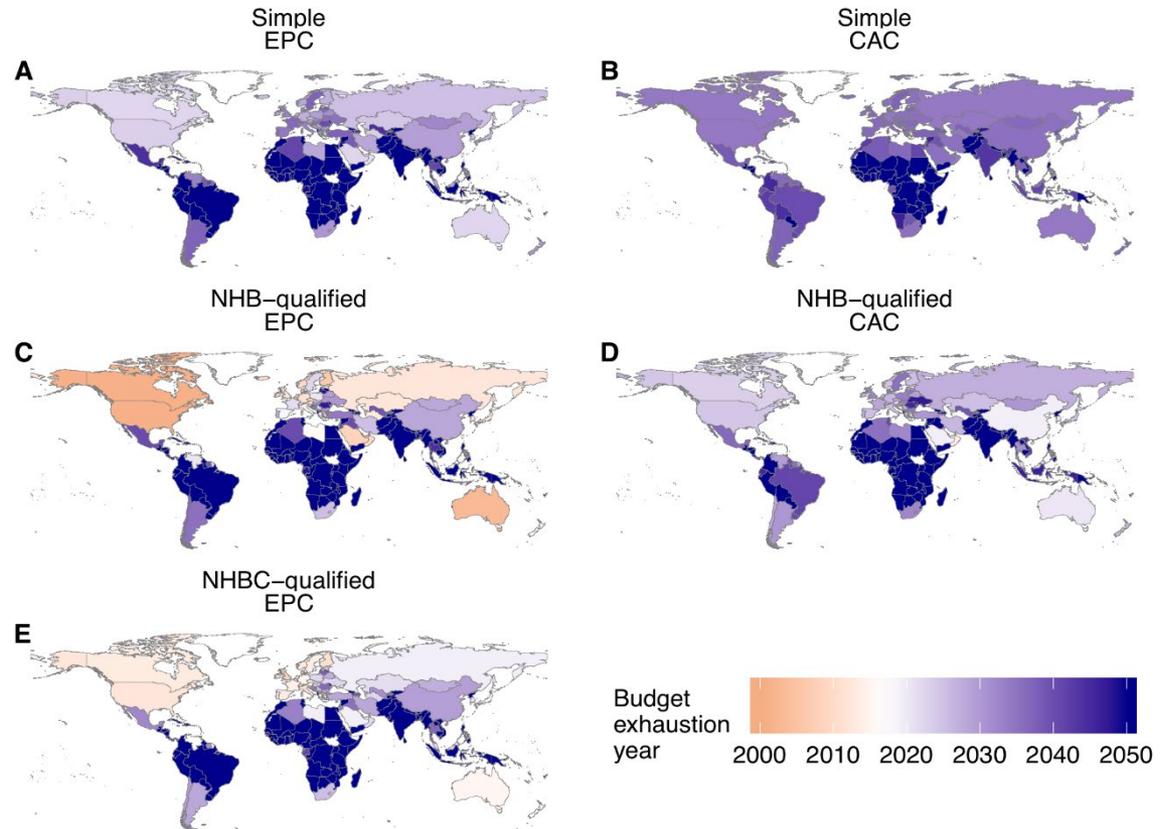


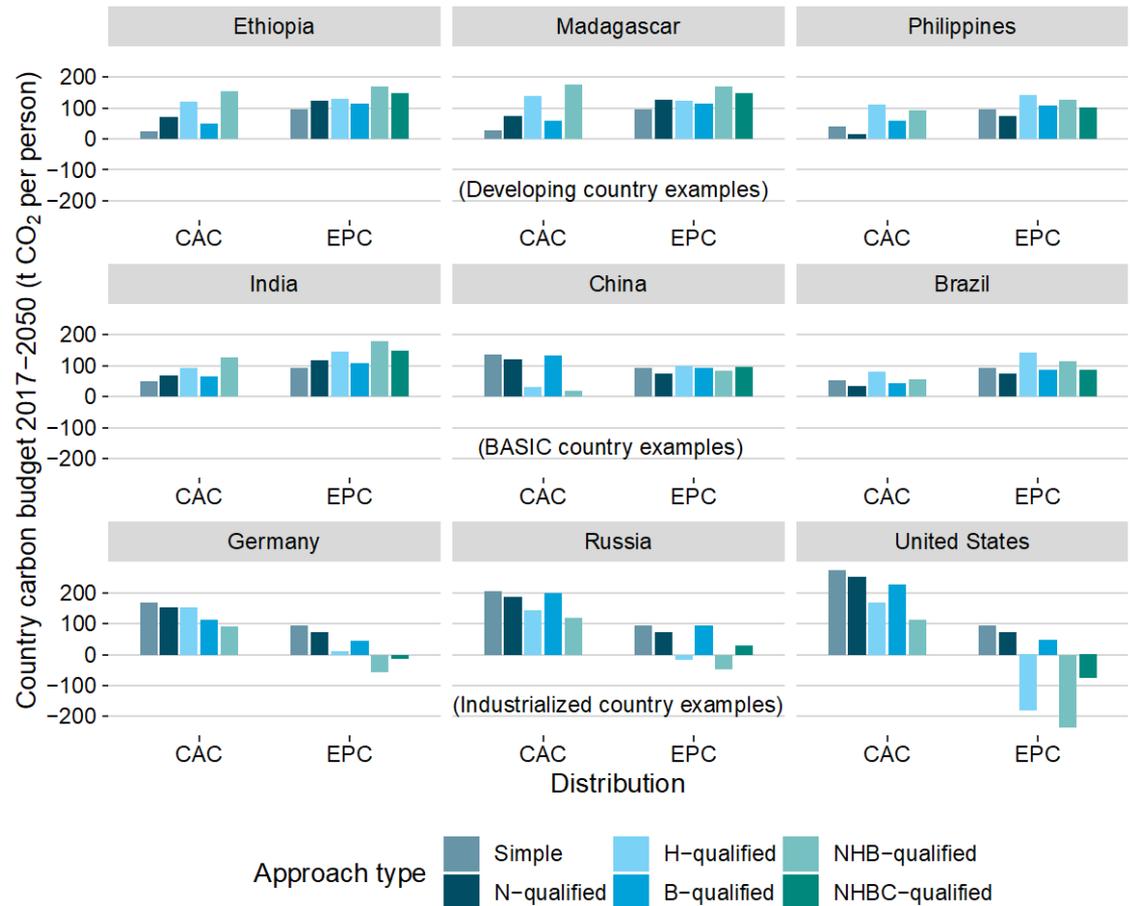
Figure 2: **Mitigation burden of differing budget allocation approaches.** Coloration indicates the years remaining until budget exhaustion, if countries would maintain their 2016 level of emissions. Blue shades indicate budget exhaustion at some point in the future, white indicates that countries have just used up their budgets (2016) and orange shades indicate countries which would have already exhausted their budget under such an allocation.

Results

Figure shows the per person budgets available given the various ways to distribute the remaining GCB

Stark differences can be seen in the consequences of a CAC and EPC simple approach between developing and industrialized examples

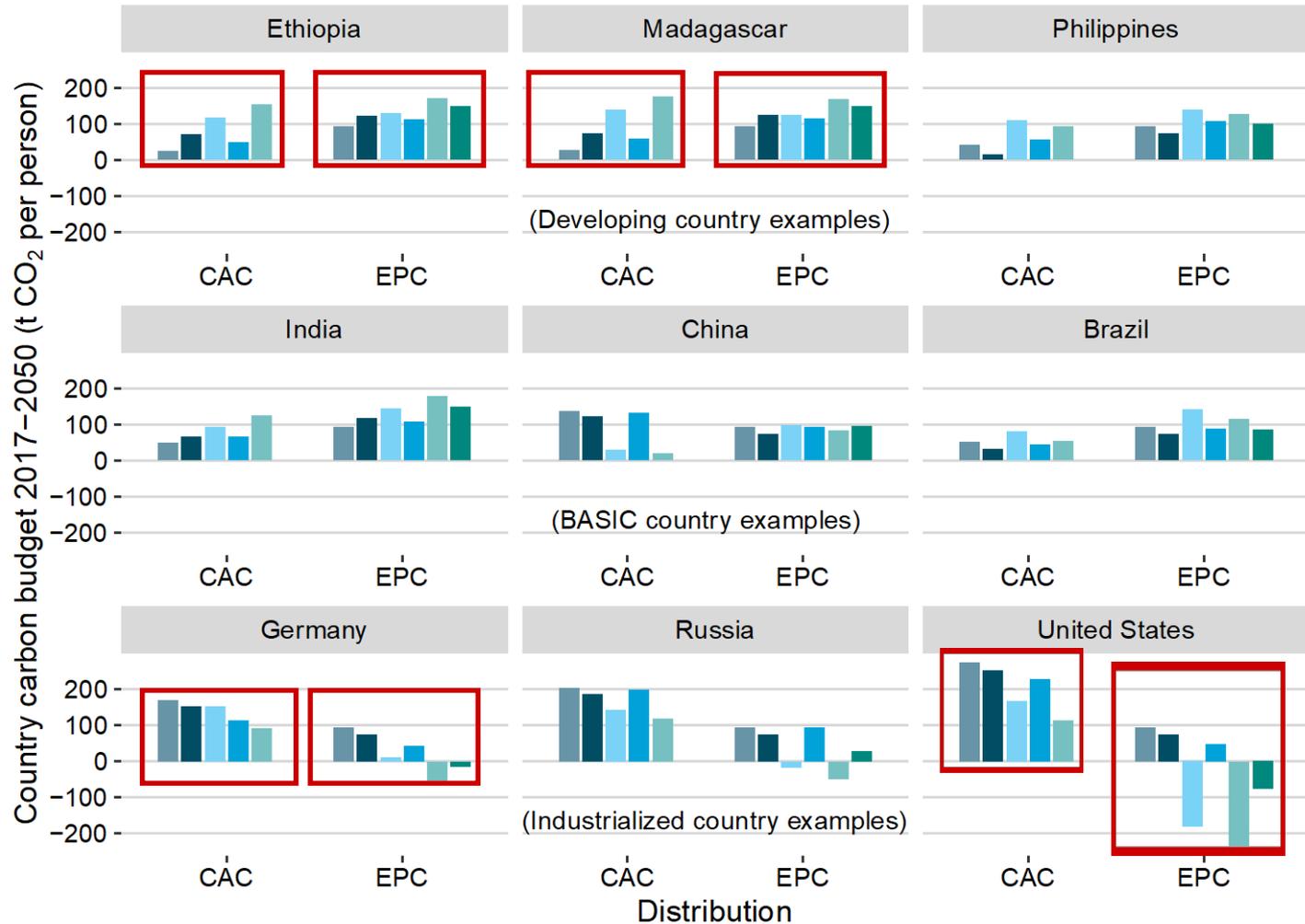
However, large variation also occurs due to qualifying criteria



Results

Considerations of historic emissions (H-qualification) changes budgets most dramatically for most countries (one exception Germany under CAC) and more so than adjusting for the ability to reach the HDI threshold (N-qualification).

For many countries fairness (N, H and B) modifications under EPC generally affect budgets to a smaller degree than under CAC, but not for G8 countries.



Approach type

- Simple
- N-qualified
- H-qualified
- B-qualified
- NHB-qualified
- NHBC-qualified

Conclusions

- Major fairness concerns are critical in determining how to allocate the remaining global carbon budget, more so than the choice between broad allocations such as CAC or EPC
- Only if we fulfil major and minimal fairness requirements, can we specify a plausible understanding of allocating the GCB across countries for the period of transformation to a low-carbon economy and society

Conclusions

- These requirements include securing basic needs (N), attributing historical responsibility for historical emissions (H), accounting for benefits from past emissions (B) and not exceeding feasible reduction rates (C)
- Addressing these minimal fairness requirements leads to a distribution which is at least equal to the implications of a EPC simple mechanism

Conclusions

- A critical interpretation of these fairness concerns allows us to identify a four-fold qualified EPC as the most plausible approach. By taking into account the legitimate reasons for grandfathering the thus-qualified EPC can be understood to reflect what is defensible in the rationale of CAC
- Such an EPC approach with all four qualifications (NHBC-qualified) is a promising proposal for reaching international agreement on the allocation of the remaining GCB

Fridays for Future, Stockholm, September 27, 2019

