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ORIGINAL PAPER

Tempering and enabling ambition: how equity is considered in domestic processes preparing NDCs

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Abstract

The considerations of how Nationally Determined Contributions (NDCs) to global climate action under the Paris Agreement are ambitious and fair, or equitable, is expected to guide countries' decisions with regards to the ambition and priorities of those contributions. This article investigates the equity aspect of the NDCs of four cases (Canada, the EU, Kenya, and South Africa) utilizing a combination of document analysis and expert interviews. It interrogates both the NDC documents themselves and, uniquely, the role of international and domestic equity considerations within the domestic policy processes that led to the formulation of the NDCs. For this, 30 participants and close observers of these processes were interviewed. We find countervailing effects of equity on ambition, with an enabling, or ambition-enhancing, effect resulting from international equity, in that these four Parties show willingness to do more if others do, too. In contrast, tempering effect appears to result from domestic equity concerns, for example with regards to real, perceived, or anticipated adverse distributional impacts of climate action across regions, sectors, and/or societal strata. Political cultures differ across the four case studies, as do the key actors that influence domestic policies and the preparations of NDCs. This paper also demonstrates that research on equity in NDCs can benefit from expanding its scope from the contents of NDC submissions to also examine the underlying decision-making processes, to generate insights that can contribute to future NDCs being both equitable and ambitious.

Keywords UNFCCC · Paris agreement · Equity · Ambition · NDCs · Nationally determined contributions · Global stocktake · Canada · European union · Kenya · South Africa

Abbreviations

AR4	Fourth Assessment Report (of the IPCC)
BAU	Business as Usual
COP	Conference of the Parties (here, of the UNFCCC)
EU	European Union

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GDP	Gross Domestic Product
GHG	Greenhouse Gas
INDC	Intended Nationally Determined Contribution
IPCC	Intergovernmental Panel on Climate Change
LDCs	Least Developed Countries
NAMA	Nationally Appropriate Mitigation Action
NDC	Nationally Determined Contribution
NGO	Non-Governmental Organization
PCF	Pan-Canadian Framework on Clean Growth and Climate Change
PPD	Peak, Plateau and Decline
SIDS	Small Island Developing State
UN	United Nations
UNFCCC	United Nations Framework Convention on Climate Change

1 Introduction

While countries are formally equal in the United Nations (UN) climate negotiations, they differ greatly in many dimensions relevant to climate change including their contribution to greenhouse gas (GHG) emissions, their development needs, and their vulnerability to climate change. While equity is enshrined in the principles of the United Nations Framework Convention on Climate Change (Article 3.1, UNFCCC, 1992) to address this diversity, its operationalisation has been persistently challenging in the history of efforts to coordinate an international response to climate change.

Literature demonstrates that the Paris Agreement and its universal and self-determined climate action plans, Parties' "Nationally Determined Contributions" (NDCs), provide a novel approach to coordinate such an international response. This includes studies on the provisions in the Paris Agreement that inform ambition and equity in the NDC model (Rajamani, 2016; Voigt & Ferreira, 2016); the criteria countries use in their NDCs to explain their fairness (Winkler et al., 2018); finance requests in NDCs (Pauw, Castro, et al., 2019a, 2019b); the relationship between Parties' self-interest and their NDCs' mitigation ambition (Mbeva & Pauw, 2016; Robiou du Pont & Meinshausen, 2018; Sælen et al., 2019; Tørstad & Sælen, 2018); and the level of consistency between self-determined NDCs and the subtle differentiation in the Paris Agreement (Pauw, Mbeva, et al., 2019). The ambition and equitability of NDCs' mitigation targets receives particular attention (Anderson et al., 2020; van den Berg et al., 2020; CAT, 2020; Civil Society Equity Review, 2015, 2018; Höhne et al., 2018; Holz et al., 2018; Pan et al., 2017; Robiou du Pont et al., 2017; Robiou du Pont & Meinshausen, 2018; for a critical view, Kartha et al., 2018; Dooley et al., 2021). Most of this literature is based on the content of the NDC submissions, rather than examination of NDC preparation processes. Where literature focusses on these processes (De Pinto et al., 2018; Laudari et al., 2021; Röser et al., 2020), it does not investigate the role of equity therein. Finally, most studies examine large numbers of NDCs either on an aggregate level or by assessing them against benchmarks, but few studies focus in-depth on individual NDCs, although there are exceptions (e.g. on Brazil (Gurgel et al., 2019), India (Mohan & Wehnert, 2019), and Indonesia (Tacconi, 2018)). To our knowledge, there are no studies that focus on how equity considerations specifically may influence the formulation of the NDCs. This leaves a gap in the understanding of how Parties arrive at the

NDCs they pledge to the international community. Addressing this gap question is important because NDCs are *self-determined* in the sense that countries set their own ambition and priorities, and it is timely because many countries are in the process of updating their NDCs.

To contribute to filling this gap, we focussed our study on a series of research questions: Did equity considerations inform the preparation of the NDCs and if so, how? More broadly, what is the influence of equity, if any, on policy, strategy, planning, and implementation of measures related to the NDCs? Where equity considerations play a role, do they enable ambition? The study utilized a method that combined document analysis and semi-structured expert interviews and considered four case studies (Canada, the European Union (EU), Kenya, and South Africa). Comparative analysis of the case studies was performed to identify similarities and differences in terms of the scope and targets of each NDC, how each Party substantiates the fairness and ambition of its NDC, and the role of equity considerations in the process followed within each Party to formulate the NDC. While undertaking our research, it became clear that for addressing our research questions, a differentiated consideration of "equity" as international equity, domestic equity, and, to a lesser degree, procedural equity was required.

The remainder of this article is structured as follows. The next section explains how we understand international equity, domestic equity, differentiation, and NDCs, and how they are important in the context of international climate policy, and for the domestic policy processes that result in the formulation of an NDC. Section 3 explains our methods. Section 4 provides results of our analysis of equity considerations in the NDCs for our case studies and explains how NDC mitigation targets were determined, and how different actors were involved in NDC preparation. Section 5 derives implications from a comparison among the four case studies. The final section concludes and briefly discusses what can be expected in terms of the NDC updates of the four case studies and beyond.

2 Equity in national determination processes

2.1 International equity

Here, international equity is understood to mean equity between countries with regards to their contributions to addressing climate change, with regards to mitigation, adaptation, and through means of implementation and support (IPCC, 2014). Given countries' large diversity with regards to their contribution to cumulative and current global GHG emissions, their wealth, their development and adaptation needs, and their vulnerability to climate change, countries with higher (historical) emissions and capabilities are expected to do more to address climate change than poorer countries with lower capabilities, lower historical emissions, and larger sustainable development needs. This is captured in the notion of "common but differentiated responsibilities and respective capabilities" which is one of the core equity principles of the UNFCCC (Article 3.1) and its Paris Agreement (Article 2.2). Countries' differentiated exposure to risks of climate impacts and to the relative costs and benefits of mitigation action also play a role.

International equity appears central to animate an international regime that aims to foster large-scale international cooperation, such as the UNFCCC and the Paris Agreement: according to the IPCC, "inducing cooperation relies, to an important degree, on convincing others that one is doing one's share," (IPCC, 2014: 295) while "the evidence suggests that

outcomes seen as equitable can lead to more effective cooperation" (IPCC, 2014: 5). While the largest global emitters are wary of taking on mitigation ambition that they consider to be unfair compared to those of countries with economies and emissions of similar size (Deleuil, 2012; Pauw et al., 2014), adaptation and international support are particularly important for those countries that are most vulnerable and that have historically contributed least to global GHG emissions (Klinsky, Waskow, et al., 2017).

2.2 Domestic equity

Here, domestic[1] equity is understood to refer to equity issues *within* countries and regions, which arise with regards to the costs, benefits, and opportunities associated with climate action, as well as the risks of impacts arising from inaction, accruing to different groups across time, space, and socio-economic strata. First, in terms of impacts, research demonstrates that socially marginalised groups (based on, for example, poverty, race, religion, education, gender, age, or disability) are more vulnerable to, and have less capacity to recover from, disasters within both developing and developed countries (Cutter et al., 2006; Oxfam, 2015). Second, domestic equity is important for adaptation. A recent study (Pelling & Garschagen, 2019) concludes that poor communities face a double burden of inequality from uneven development and climate change, making them less able than others to withstand hazards, and they lose a larger proportion of their wealth from climate change impacts. However, on a macro-economic scale, the losses of poor people are often relatively small or tend not to be accounted for. The authors therefore argue that equitable adaptation "must meet the needs of the poorest directly" and recommend that, to put the poor at the centre of decision-making with funding, three axioms should be applied: support local innovation, measure success in the most vulnerable, and focus on social vulnerability, rather than broader resilience (Pelling & Garschagen, 2019).

Third, domestic equity also plays a role in mitigation. Mitigation imposes costs and offers benefits and how these are distributed within a country or region may influence its approach. For example, it was "no accident" that the 2018 UN climate change conference, COP24, was held in Poland's coal-producing heartland (Robert, 2018). The COP24 president explained that bringing the climate summit to Katowice was a strategic decision to showcase a city and region in need of transition away from its lifeblood, and asked "How does one tell a region of 5 million people (…) to just move on, your world is that of the past?" (Osaka, 2018). Similarly, in recent years national labour unions in South Africa have sought to frustrate the roll-out of independent renewable electricity supply by holding public protests against the closing of ageing state-owned coal-fired power stations, over concerns for their members' jobs and livelihoods (NUM, 2018; NUMSA, 2018). Representing a powerful political bloc whose cooperation is paramount for successful national mitigation policy, labour unions demonstrated that addressing their equity concerns is fundamental to South African mitigation efforts.

Fourth, procedural equity regarding the involvement of domestic stakeholder in the NDC formulation process can also be considered an important aspect of domestic equity and its relationship to ambition, the link between procedural equity and the overall effectiveness of the climate response has been highlighted elsewhere (e.g. Fleurbaey et al., 2014 for an overview). In this study, procedural equity was not an original focus of the research but arose as a theme from the interviews. Therefore, our treatment of it must

[1] We use "domestic" and "national" synonymously and also to refer to the EU level.

remain somewhat limited, as we did not systematically interrogate it in all cases and with all respondents.

Finally, it is important to highlight that actors may make either meritorious or spurious equity claims. For example, "actors trying to shirk their obligations certainly have invoked equity concerns to slow the political momentum of policy change" (Klinsky, Roberts, et al., 2017: 171). This is relevant for both domestic and international equity. In the former case, for example, fossil-fuel-dependent sectors, regions, or social groups within a country may utilize equity claims regarding the distributional impacts of mitigation action to lower ambition. However, in this study we do not indent to analyse or pass judgment on the legitimacy of any equity claims that may have an impact on the domestic processes of NDC preparation.

Based on such considerations, our study seeks to investigate what role domestic equity considerations may have played when parties formulated their NDC ambitions and priorities. However, it is not clear whether domestic equity considerations have tempered or enabled ambition (see Sect. 5). The more ambitious mitigation actions within NDCs are, the more likely they will result in distributional consequences within countries and across regions. A better understanding of procedural equity in terms of domestic actor constellations and influence in NDC formulation processes might also provide insights into whether and how countries can be expected to increase the ambition of their NDCs over time.

2.3 Differentiation

NDCs represent an innovation with regards to the long-contested differentiation of countries' responsibilities to address climate change within the UN climate negotiations. The Paris Agreement breaks with the dichotomy between the responsibilities of industrialised (Annex I) countries on one hand and all other (non-Annex I) countries on the other. Instead, it was negotiated to be an agreement that is "applicable to all" (decision 1/CP.17, paragraph 2, UNFCCC, 2011). Rather than differentiating based on Annexes, more nuanced forms of differentiation within the Agreement text did not refer to lists of countries (Pauw, Mbeva, et al., 2019; Winkler & Rajamani, 2014) and countries largely self-differentiate based on nationally (self-)determined contributions (NDCs; decision 1/CP.19, paragraph 2(b), UNFCCC, 2013).

2.4 The five-year NDC update cycle

Importantly, countries are required communicate successive NDCs every five years (Article 4.9, Paris Agreement, UNFCCC, 2015a) and are guided in their preparation by the parameters of "progression" beyond the current NDC, "highest possible ambition," and "common but differentiated responsibilities and respective capabilities, in the light of different national circumstances" (Article 4.3; Rajamani, 2016; Voigt & Ferreira, 2016). Additionally, with regards to mitigation, the Agreement reiterates that developed countries "should continue taking the lead by undertaking economy-wide absolute emission reduction targets," and that, reflecting countries' evolving circumstances, developing countries are "encouraged" to move towards such targets over time (Article 4.4). This arrangement is intended to allow future NDCs to increase ambition towards achieving the Paris Agreement's long-term temperature goal while also reflecting international equity in a context of countries' further development. This structure is intended to ensure both ambition and equity through countries' national self-determination of their contributions. As a result of

this self-determination, combined with the limited NDC formulation guidance provided by the UNFCCC, current NDCs demonstrate a high diversity in scope (Pauw et al., 2018) and approaches taken in justifying their fairness (Winkler et al., 2018).

In 2020, Parties were requested to "communicate or update" their NDCs, depending on the time frames included in their first NDCs (UNFCCC, 2015b). Around 130 countries had indicated their intention to do so (COP25 Presidency, 2019; Pauw & Klein, 2020), but only 75 parties had submitted such NDCs prior to the December 31, 2020 cut-off date for the UNFCCC secretariat's NDC report (UNFCCC, 2021). While the report suggested little ambition increase of these NDCs (2.8% higher mitigation ambitions in 2030 relative to first NDCs), it remained uncertain whether other countries, individually and collectively, would substantially increase their ambition (the NDCs included in the report only covered about 30% of global GHGs). However, given our insights in the processes that informed the preparation of first NDCs, the extent of such increases in ambition will, as we argue, depend on both international and domestic equity. While our fieldwork was limited to first NDCs, a future study similar to the present one but focussing on the processes that led to updated or new NDCs, could provide valuable additional insights.

3 Methods

This article draws upon analyses of NDCs and other relevant official documents, interviews with key individuals, and grey literature to compare the four cases of the EU, Kenya, South Africa, and Canada. Specifically, we examined the equity considerations in national determination processes of Parties' NDCs, the role of domestic actors and stakeholders with agency for influencing climate change policy, how these interests were balanced in the formulation of the NDCs, and the extent to which NDCs led to shifts in domestic climate policy. The case studies were not selected with the intention of providing a representative sample of UNFCCC Parties, because it was not our intention to generate formally generalisable results. Rather, they were chosen as they exemplify different NDC formulation processes, undertaken in countries with different circumstances and contexts, both developed and developing, but with the shared goal of generating political documents with similar functions and with the same purpose with regards to the architecture of the Paris Agreement (i.e., NDCs). In addition, study countries were chosen since at least one co-author had existing in-depth contextual knowledge, relationships, and networks in each country. This, in turn, enabled easier access to documents and interviewees. Taken together, the four countries comprise what has been described as a 'most different' case selection (Seawright & Gerring, 2008), which allowed us to approach our research questions from a broad variety of situations.

We first evaluated the NDCs of the case studies through content analysis, in terms of the scope and targets of the NDCs, as well as the Party's approach to explaining how their NDC represents a fair contribution. We also examined relevant auxiliary policy documents, legislation, and other content sources to identify how NDC targets were formulated. To complement and triangulate the results of the document analysis, we conducted semi-structured interviews with key individuals. The primary purpose of the interviews was to generate insights into the views and considerations of policy-makers and other stakeholders on the equity dimensions of the NDCs from a domestic perspective. The interviews were guided by the broad themes of how the actors (interviewees) perceived domestic

equity, and their analysis of the role of equity in the respective NDCs and climate policy documents.

A total of 30 semi-structured[2] interviews were conducted over the course of 2018 in Canada (7), the EU (8), Kenya (7), and South Africa (8). We interviewed high-ranking policy makers and civil servants including those who took part in the development and/or updating of NDCs, as well as members of the civil society, the private sector, and academia. Part of the process of identifying respondents included snowballing, whereby interviewees directed us to other actors intimately acquainted with the respective NDC preparation processes. Where possible, face-to-face interviewing was conducted, otherwise remote modes of interview such as via telephone and web-conferencing were used.

Once each case study Party had been analysed, we conducted a qualitative comparative analysis across the four cases, drawing on similarities and differences, for example with regards to the scope of the NDCs, the extent to which NDCs were drawn from or influenced domestic climate policy development, and the influence of domestic stakeholders and interests on this discourse. We then mapped out the domestic decision-making processes of the Parties and commonalities and divergent features between the NDCs, allowing for flexibility to account for unique and self-determined aspects of each case. We triangulated our findings through a research workshop and a side-event at two different UNFCCC sessions, during which we presented findings and engaged participants with our initial results.

4 Results

4.1 NDC document analysis

All of the Parties in our study submitted an INDC document before the 2015 Paris Climate Change Conference. Those INDCs became NDCs when Parties ratified the Paris Agreement (October to December 2016). Following a change in government in October 2015 and subsequent development of the *Pan-Canadian Framework on Clean Growth and Climate Change* (PCF), Canada submitted a revised NDC in 2017 reflecting the PCF's role in NDC implementation but not revising the main mitigation NDC target. For the other three cases, originally submitted INDCs remained the current NDC as of the end of the study period.[3] Content analysis of the NDCs identified similarities and differences between the NDCs in terms of their scope and targets, and in their approach to substantiating how their NDCs are fair and ambitious.

The scope and NDCs targets are interesting from an international equity perspective for at least three reasons. First, the type of mitigation targets differ (see Table 1). The EU and Canada include economy-wide absolute emission reduction targets. South Africa has a "peak-plateau-decline" target and Kenya expresses its target relative to a business-as-usual trajectory. While the former two are in line with Article 4.4 of the Paris Agreement, the latter two might also reflect Article 4's encouragement to developing countries to "move over

[2] The interview guide for the interviews is available in Annexure A of the research report for this project (Cunliffe et al. 2019).

[3] The EU, Kenya, and Canada have, however, submitted new or updated NDCs in December 2020 and July 2021, respectively. However, these new submissions, and the domestic determination processes that preceded them, are outside the scope of the present study, which was conducted in 2018 and 2019.

Table 1 Results of the documents analysis of the NDC documents of Canada, the EU, Kenya, and South Africa

Party	*Scope of NDC*	*Mitigation component*			*Equity in mitigation component*										*Adaptation component*		
		Target type	*Scope*	*Level*	*Explicit equity section*	*Indicators used*[e,f]									*Vulnerability as equity argument*[e]	*Statement of Vulnerability/ Quantification of impacts*[e]	*Detailed Adaptation Actions*
						small share of global emissions	low per capita emissions	declining per capita emissions	decoupled GDP and emissions	achieved peaking of emissions	peaking envisioned	progress of own effort	in line with least-cost pathways	in line with own targets			
Canada	Mitigation	Absolute reduction from base year	Economy wide	30% below 2005 levels by 2030, use of markets reserved[a]	Absent	X		X	X			X	X	X	Adaptation section absent		
EU	Mitigation	Absolute reduction from base year	Economy wide	At least 40% below 1990 levels by 2030, no use of international markets[b]	Present			X	X	X		X		X	Adaptation section absent		
Kenya	Mitigation, Adaptation, Support	Reduction below BAU levels	Economy wide, with focus on CO_2, CH_4, N_2O	30% below BAU (143 $MtCO_2$-eq) by 2030[c]	Present	X	X								X	yes, statement of vulnerability and quantification of impacts and adaptation support needs	Sectoral breakdown of priority adaptation actions
South Africa	Mitigation, Adaptation, Support	"Peak, Plateau, Decline" (range of absolute emissions levels)	Economy wide, with focus on CO_2, CH_4, N_2O	GHG emissions by 2025 and 2030 between 398 and 614 $MtCO_2$-eq[d]	Present						X			X	X	yes, statement of vulnerability and quantification of adaptation support needs	Detailed listing of adaptation goals and actions, including level of investment

(a-d)—NDC submission documents from (a) Canada (2015), (b) European Union (2015b), (c) Kenya (2015), (d) South Africa (2015); (e) information from own analysis and supplementary data for Winkler et al., (2018), (f) indicators may be found in an explicit equity section or elsewhere in the NDC document

time towards economy-wide emission reduction or limitation targets in the light of different national circumstances" (UNFCCC, 2015a).

Second, only Kenya and South Africa include information on adaptation and support, with both countries emphasising the adaptation components of their NDCs as part of their equitable overall contributions to achieving the Paris Agreement objectives (see Table 1) and providing quantified investment need for their mitigation and adaptation actions.

Third, Kenya explicitly makes its NDC actions partly conditional on the receipt of such international support. South Africa, while not mention conditionality in its NDC, did include a dedicated "support NDC" component, which provided information on finance and investment needed for NDC implementation. This suggests that South Africa does expect to receive international support for implementing its NDC, one interviewee from the government notes that the NDC is "in no way conditional" but that it would be "very difficult to operationalize" the full scope of its mitigation and adaptation activities without international support.

These differences in scope of the NDCs of the developing (Kenya, South Africa) and developed countries (EU, Canada) is representative of all NDCs and replicates disagreements about scope in the negotiations.[4] With regards to support, the inconsistent approach of developed and developing countries has been highlighted as a substantial flaw in the NDC approach of self-determination of climate ambition: Developed countries' inability to articulate the scale and timing of their support on similar time scales as developing countries are expected to articulate their mitigation (and ambition) action through their NDCs may lead the latter to putting forward less ambitious action than they would be willing to embrace in the context of certainty of support (Pauw, Mbeva, et al., 2019). In terms of the approach to substantiating the fairness and ambition of their NDCs, the EU, Kenya, and South Africa included an explicit section to that effect. Canada's NDC has no dedicated section but mentions several of the indicators that have been identified elsewhere as widely used to substantiate NDCs' fairness (Winkler et al., 2018). These utterances show how the Parties consider equity from the perspective of fairness on the global scale; each Party takes a different approach to substantiating the fairness of their mitigation contribution and references a different combination of indicators (see Table 1). None of the four NDCs explicitly contemplate the implications for the global effort if other Parties were also to apply their self-determined criteria.

The EU's NDC invokes both science as well as its own previously articulated objectives by stating that its mitigation target is "in line with the EU objective, in the context of necessary reductions according to the IPCC by developed countries as a group" (European Union, 2015). It further substantiates the fairness and ambition of its mitigation contribution by citing previous progress in ways that reflects multiple types of mitigation targets, making the NDC comparable to NDCs without absolute emission reduction targets. It states that emissions (1) have been decoupled from GDP growth, (2) have reduced in per capita terms since 1990 (with further reductions projected through 2030), and (3) had already peaked across the EU in 1979.

[4] For example, Winkler et al. (2018) find that while the vast majority of all NDCs they analyzed (145 of 163 NDCs, or 89%) have an adaptation component, none of these NDCs are from developed country parties. Likewise, Pauw, Castro, et al., (2019a, 2019b) find that the vast majority of non-Annex I countries' NDCs (148 of 155 NDCs, 95%) at least mention the need for support (with many of them making NDC implementation fully or partially conditional on receipt of support), while support is not mentioned in any of the Annex I NDCs.

Kenya's NDC explains the fairness and ambition of its mitigation contribution by citing (1) low historical responsibility for cumulative greenhouse gas emissions, (2) low per-capita emissions relative to the global average, and (3) the prioritisation of national objectives of "poverty alleviation and sustainable economic development" (Kenya, 2015). Kenya's status as a developing country and its low historical responsibility form the basis of its international equity arguments, in contrast to the EU's highlighting of its progress within the (implicit and unstated) context of greater historical responsibility.

South Africa took a unique approach to substantiate the fairness and ambition of its mitigation NDC (Winkler et al., 2018), by referring to explicit effort-sharing analysis of "South African experts" which, by "applying Convention principles of responsibility, capability and access to equitable sustainable development," found that the less stringent bound of the targeted emission range was more ambitious than their calculations of a fair share of a 2 °C-consistent global carbon budget (South Africa, 2015).

There is no explicit equity section in Canada's NDC. However, Winkler et al., (2018) studied the NDCs of 161 Parties and found eleven different indicators that were used to make implicit claims regarding the ambition and equity of NDCs. Canada's NDC uses six of these indicators, specifically, that (1) with 1.6% it only represents a small share of global emissions, (2) its per capita emissions have been in decline, and (3) GDP growth has decoupled from emissions growth. Canada's NDC also states that its NDC target is (4) consistent with least-cost pathways, (5) a progression relative to the country's previous target, and (6) in line with its own domestic targets. Table 1 summarises the document analysis of the NDCs of our four cases, including against the equity indicators found by Winkler et al. (2018).

4.2 Processes for the determining NDC mitigation targets

While analyses of NDC documents provide important insights into equity considerations made by Parties with respect to their NDCs, a fuller account of how equity considerations guided national determination processes only emerges by also analysing auxiliary documents and investigating NDC formulation processes themselves through interviews with individuals involved in these processes. Based on these additional sources, the following two sub-sections discuss how the mitigation targets of our case studies were determined, and what role equity played in these determinations.

Overall, 80% of all NDCs refer to existing domestic and/or plans and strategies for mitigation communicated elsewhere to the UNFCCC (e.g. as NAMAs) when presenting the mitigation target (Pauw et al., 2016). Such frequent references suggests that NDC targets typically draw to varying degrees on policies that have been previously established through domestic processes as opposed to being conceived from a blank slate. We examine how this is reflected in our four case studies below.

Our interviews revealed that the EU's 2030 target of at least 40% emissions reductions below 1990 levels was drawn directly from the bloc's *2030 Climate and Energy Policy Framework* and is derived from the long-standing target to reduce emissions by 80–95% by 2050 (see also, European Commission, 2011; European Council, 2008). That 2050 target, in turn, represents the reduction range for the group of Annex I countries as reported in the IPCC's *Fourth Assessment Report's* (AR4) synthesis of the then-current effort-sharing literature (IPCC, 2007; see also Lahn, 2018, for a critique of the AR4's approach). Unique for the EU case is that explicit effort sharing is negotiated among member states to meet the EU reduction targets for emissions not covered by the EU Emission Trading Scheme.

Effort sharing was first utilised to meet the EU's target under the Kyoto Protocol's first commitment period with the aim to share the mitigation burden among the member states. Effort sharing among member states is based on their relative wealth, measured by gross domestic product (GDP) per capita. Domestic equity considerations are further refined in the 2030 climate and energy policy framework. Here, effort sharing is also confined by upper and lower bounds of reduction, and the targets are adjusted to balance fairness and cost-effectiveness for member states with an above average GDP per capita; and transferring parts of annual emission allocation to other member states is also allowed (European Commission, 2018). Further adjustments of the effort-sharing regulation is being developed (European Commission, 2021).

South Africa's mitigation NDC was also derived from existing policy, specifically the *Peak, Plateau and Decline* (PPD) emission trajectory for 2010–2050, formalised in a government White Paper published in 2011 (South Africa, 2011). Cabinet first agreed to the concept of an "emissions decline trajectory" in 2008, stating its commitment to "negotiate an equitable burden-sharing paradigm that balances the needs of developing nations against those of developed nations" (South Africa, 2008). Interviews confirmed that the PPD trajectory itself was informed by South Africa's own *Long-Term Mitigation Scenario* analysis, which determined a "required by science" emission pathway to 2050, defined as the mitigation effort required by South Africa with the included factorisation of a "burden-sharing discount … [whereby South Africa] bears less than its proportional share of the global burden of reduction because it is a developing country" (Scenario Building Team, 2007). The PPD trajectory emerged from this foundational analysis, became national policy in 2011 and formed the central pillar of South Africa's mitigation NDC in 2015, with the support of the business community (Trollip & Boulle, 2017), and despite calls from civil society for greater ambition (e.g. Greenpeace Africa, 2015; groundWork, 2015; WWF-SA, 2015).

In contrast, Canada's INDC mitigation target was not derived from existing objectives or policies. Interviewees stated that federal bureaucrats prepared advice for the federal cabinet's INDC determination, focussing on (1) the effort implied by the targets of "major peers and competitors," such as the United States, EU, and China, and (2) a bottom-up determination of the collective effort implied in undertakings by Canadian provinces. The former arguably reflects international equity, albeit non-transparently, through consideration of comparability of effort. In respect of the latter, federal bureaucrats considered the mitigation policies and targets adopted by provincial governments and focussed on measures that would be additional to these provincial undertakings and that would allow the (NDC) target for the whole of Canada to be more stringent than the mere sum of provincial ambition. According to interviewees, this bottom-up approach was intended to ensure inter-provincial equity since provinces and territories would not consider a Canadian target that is largely based on the aggregate of provincially determined contributions to impose an unfair burden on them. Thus, the Canadian NDC target was somewhat informed by both international equity (via considerations of comparability of effort) and domestic equity (via crude consideration of inter-provincial equity based on a domestic bottom-up process). Importantly, after the 2015 election, the new Trudeau government found that in the absence of substantial additional federal climate policy initiatives, the NDC target would be unachievable. As a result, a policy process was established that engaged provinces and territories, as well as indigenous groups, and relevant stakeholders. It culminated in the PCF whose policy goal is to close the implementation gap to NDC target achievement.

Kenya submitted two different emissions reductions targets to the UNFCCC in 2015. In its *Second National Communication*, Kenya identified a total mitigation potential of 60%

reduction below baseline in 2030, which "represents what can be achieved if Kenya takes up all expected technology advances, introduces appropriate and enabling policies and regulations, and moves forward on all mitigation actions. It is aspirational and based on a best-case scenario" (Kenya, 2018: 13). However, though based on this previously determined mitigation potential, the NDC submission's mitigation target for 2030 is a less ambitious 30% reduction below business as usual (BAU). This target is characterised as "a doable and conservative mitigation contribution that is half the potential identified" (Kenya, 2018: 13). The difference between these two figures was justified using equity arguments that pointed to the country's low historical responsibility, its needs with regards to equitable access to sustainable development, and the need for external support for means of implementation. Our interviewees explained that the need to establish an NDC for submission to the UNFCCC begun a public discourse about Kenya's climate policies.

Collectively, these four case studies highlight the importance of previously existing domestic policies and/or planning in the NDC determination processes, with NDC targets being largely shaped by previously established policies, rather than the other way around. A possible exception is Canada, where the realization that the NDC target set by the previous government—albeit purportedly based on established provincial measures—would be unachievable absent substantial additional federal policy-making, spurred on the development of those additional measures.

4.3 Inter-national and intra-national equity in national determination processes

Domestic equity considerations were found to have influenced NDC decision making in each of our case study countries.

In Canada, the concern that provinces might consider a federal target an unfair burden for them (perceived or real), led to an approach which foregrounded existing provincial measures in federal target setting. In the EU, the explicit effort-sharing negotiations among member states were concluded in 2018 based on the quantitative criteria described in the previous section. In Kenya, a key new equity concern emerged during NDC preparations, raising the trade-off between the potential impact on mitigation of recent oil and gas discoveries versus potential development benefits from extracting the reserves. So far, Kenya has explicitly exempted potential increase of extractive sector emissions from the NDC, reportedly to maintain a relatively higher mitigation target in light of its self-conception as a climate leader.

In South Africa, labour unions highlight the need for a just transition focus of mitigation activities, while concerns for coal industry workers lead to unions' legal and industrial action against specific mitigation measures (see, for example, COSATU, 2011; COSATU et al., 2015; NUMSA, 2018). That South Africa did not strengthen its original (2011) PPD trajectory for the NDC was at least partly due to concerns raised by business, industry, Eskom, the state-owned utility, and unions, regarding the impact of "additional" mitigation on economic growth and development.

The documentary and interview evidence from our case studies highlights the possibility that domestic equity considerations acted as a constraint on ambition in Canada, Kenya and South Africa, as decision makers sought to limit the (real or perceived) risk of backlash from domestic entities who anticipated (or purported to anticipate) having disproportionate or undue costs or burdens placed upon them as part of mitigation action. As for the EU, one interviewee noted that the two-stage approach (setting an EU-wide mitigation target before agreeing on how to share efforts internally) persuaded member states to agree

to a higher EU target. The EU might therefore be an example of how domestic equity considerations helped to increase overall ambitions.

4.4 Domestic stakeholder engagement in NDC preparation

Domestic equity can also refer to procedural equity regarding the involvement of domestic stakeholder in the NDC formulation process. The most comprehensive arrangements for stakeholder engagement were found in Kenya and South Africa. In Kenya, the inter-ministerial task force that has been steering the climate planning and policy development since the first *National Climate Change Action Plan* (Kenya, 2013) conducted cross-sectoral consultations on the NDC, including broad engagement with civil society, the private sector, youth etc. South Africa also undertook wide stakeholder engagement in developing its NDC. Additionally, stakeholders advanced their positions through parliamentary committee representations and private interactions with decision makers. Within this engagement, the key tension manifested between civil society's demands for ambition, and business' calls for flexibility and balance between mitigation and safeguarding economic growth. Labour unions took an ambivalent stance on ambition, in principle supporting it but opposing mitigation measures seen to potentially harm their members under an overall just transition frame. Unions criticized the quality of consultations, perceiving them to be "merely ticking the boxes" (COSATU et al., 2015).

Interviewees confirmed that no stakeholder consultation took place in the EU during the NDC preparation. However, the agreement of the *2030 Climate and Energy Policy Framework*'s mitigation targets were the subject of extensive stakeholder consultations and were harshly criticized by environmental NGOs, the renewable industry, and others, because the targets were seen as reflecting the lowest possible ambition in the context of the agreed long-term trajectory to 2050 (Ydersbond, 2016). In contrast, Canada's INDC preparation involved no stakeholder consultations whatsoever. Interviewees pointed out that the positions of the provinces were indirectly reflected in Canada's INDC through the overall approach taken by the government, while the government was well aware of and had largely internalised the concerns of business, especially the oil and gas extracting industry, even absent dedicated consultations. However, for the preparation of the PCF, the foundational policy for Canada's revised NDC, extensive consultations with provinces, indigenous groups, municipalities, business and industry, environmental groups, labour unions, and wider civil society were undertaken. These consultations mainly highlighted the ambition tempering role of oil and gas extracting industry interests and of the provinces that are economically dependent on them.

5 Discussion: equity as tempering and enhancing NDC ambition

This study finds countervailing implications of equity in relation to NDCs: We find indications that international equity may enhance ambition, in that these four Parties show willingness to do more if others do, too. Yet domestic equity considerations (e.g., distributional issues), appear to temper ambition, at least in our case studies. This section examines how both of these effects influenced target-setting, followed by some suggestions on options for improvement.

As far as equity considerations are concerned, the European and South African target-setting exercises took *inter*-national equity into account. The former by aligning its target loosely with the IPCC AR4's collective Annex I reduction range, itself based on explicit effort sharing studies, and the latter by explicitly including effort-sharing considerations in its modelling of the PPD range and the determination of the NDC target itself. Canada's approach to international equity utilised rough comparisons of its effort with a small group of economic competitors and peers, desiring the ability to claim comparable level of ambition relative to these competitors but not relative to a specific global mitigation objective. Kenya utilised arguments relating to international equity to justify a target representing less than its previously identified full mitigation potential. This demonstrates that international equity considerations are universally used among the four case studies in their NDC formulation processes and that these international equity considerations may facilitate ambition higher than would otherwise be the case.

As mentioned, the processes associated with NDC development are at least as important as the final document for understanding the role of equity. The comparative analysis implies that policy-makers' desires to balance the viewpoints of key actors tended to inhibit enhancing ambition in NDCs. For the EU, as noted above, effort-sharing among member states is likely to have led to higher overall mitigation targets. However, from a procedural perspective, setting an EU-wide mitigation target requires all EU heads of state or government to come together to discuss climate change, which two interviewees considered an impediment for a nimble policy-setting regime. Kenya's NDC process was informed directly by equity, based on the broad agreement in multilateral climate policy (Stavins et al., 2014) that that poorer countries should not be expected to embrace as stringent an effort as richer ones. In Canada, the development of the PCF was more influential on ambition than the NDC process itself, since it represented a detailed implementation plan rather than an abstract target. However, while reflecting key balances among provinces, it locked in previously established ambition instead of raising it. South Africa's first NDC framed its mitigation target on a PPD trajectory, established in national policy (South Africa, 2011). While the target type shifted from a reduction below BAU used in South Africa's Copenhagen pledge to a fixed-level target, the stringency of underlying mitigation ambition was not increased. This reflects contestation, with civil society calling for ambition in line with a low PPD or below, while business interests expressed concerns about hard constraints. Government balancing different viewpoints has not led to increased ambition.

By contrast, our study found evidence that international equity considerations enabled ambition, in that the Parties examined here considered the level of ambition of other Parties in their NDC processes, arguably leading to higher ambition than otherwise. In the EU example, evidence for this dynamic lies in a process wherein member states do not commit to individual targets from the onset and thus are willing to accept a higher collective EU target, without yet committing to a national target level for themselves. For example, the EU Green Deal, proposed by the Commission in 2019, makes the case for increased 2030 targets: reductions of 50 to 55% below 1990 levels as compared to the 40% reduction in the original EU NDC (European Commission, 2019). This level of ambition would have been harder to achieve if explicit disaggregation would have been part of the deliberations, judging from the complex negotiations among heads of states and governments on a new reduction target for 2030. The new 55% reduction target (as compared to 1990) could only be agreed on after Poland and other coal-dependent central European countries obtained assurances that their economies will not suffer disproportionate costs from the transition to a net-zero economy (Simon, 2020).

For South Africa, Kenya, and Canada, it appears that concrete domestic policy steps undertaken since the development of the initial INDCs, which make their attainment more plausible, combined with international dynamics wherein countries aspire to be seen by others as contributing equitably, lead to a willingness to enhance ambition in 2020. For example, President Ramaphosa has indicated that South Africa would be enhancing the mitigation NDC in 2020, and that "additional mitigation ambition by 2030 will require a bold programme" (Ramaphosa, 2019). The distributional implications of mitigation action are negotiated in associated processes and through a national debate on just transition (National Planning Commission, 2019). In South Africa, new legislation appears important, with carbon tax law adopted and framework legislation still in process. Kenya has also adopted legislation since its first NDC, the *Climate Change Act*, in 2016. Together with mainstreaming climate change in the *Medium-Term Plan*, this may enhance ambition. In Canada, backstops are provided in the PCF to prevent backsliding and express intentions of federal interventions to ensure minimum compliance across provinces. Focusing on ensuring polices are implemented to achieve or "exceed current 2030 targets" (Trudeau, 2019) served as an early indication that Canada prepares to enhance the level of ambition in its NDC, which did in fact come to pass in the July 2021 submission of its updated NDC. The observation that others are willing to do more encourages countries to also make greater efforts. This dynamic can be helpful in the global stocktake, the Paris Agreement's quinquennial ambition assessment which is to be conducted "in the light of equity" (Breakey, 2018; Holz et al., 2019; Pathak & Pathak 2019; Winkler 2020), especially if the global stocktake enables countries to get a clearer understanding of the relative ambition required of them and their peers to fulfil the Paris Agreement's objectives (e.g., in the case of mitigation, via benchmarks from studies such as Civil Society Equity Review, 2015, 2018; Holz et al., 2018; Pan et al., 2017; Robiou du Pont et al., 2017).[5]

Across the four cases, contestation among domestic actors about distributional implications shaped the NDCs, though with differing key actors: Federal, provincial, and territorial governments, as well as sectoral considerations in Canada; Inter-ministerial discussions in Kenya; government, business, labour, and civil society in South Africa; and effort-sharing between EU member states. In domestic processes, potential co-benefits of mitigation action can motivate higher ambition. But equity claims are also made with regards to unequal distribution of barriers to mitigation and potential negative implications, especially distributive impacts, of stringent climate policy, and in such case they can temper ambitions. It is worth reiterating that such equity claims can be meritorious or spurious and self-serving, for example when actors have an interest of slowing the climate policy response, but that an assessment about the legitimacy of these claims was outside the scope of the present study, which instead focusses on their effect in the domestic preparation processes. Developing a co-benefits approach can address both development priorities and enable more mitigation by combining narratives of equity and co-benefits (Caetano et al., 2020; Dubash, 2013). Importantly, the risk of negative consequences of mitigation measures is higher in countries with high levels of poverty and inequality (Markkanen and Anger-Kraavi, 2019). Moreover, an overemphasis of net co-benefits risks exacerbating inequities, for example as positive co-benefits may accrue to different groups of people, at

[5] As mentioned before, the EU, Kenya and Canada have all submitted updated NDCs after the end of our study period, each with strengthened mitigation targets relative to the NDCs considered in this study. However, systematic analysis of these updated NDCs is beyond the scope of this article.

different point in time, or in different places, than those who bear the costs of the mitigation measure (Holz et al., 2019).

Another implication for the relationship between equity and ambition in NDCs relates to the scope of the NDCs. Equity considerations arise not only regarding mitigation, but also concerning adaptation and support. However, only the developing country case studies included adaptation and support in the scope of their NDCs, while developed countries address adaptation and support elsewhere. In this regard, the NDCs replicate disagreements in the negotiations on the scope of NDCs. This has been highlighted elsewhere as a potential major flaw in the institution of NDCs as self-determined vehicles to facilitate climate action, because a lack of clear indication by developed country Parties of the scale and timing of support for implementation of developing countries' NDCs has been described as an impediment to the latter's willingness to increase ambition dependent on such support (Pauw, Mbeva, et al., 2019). Because level of ambition and the support received, or provided, to achieve this ambition is one of the central questions of international climate equity, this conflict between developed and developing countries' approaches to inclusion of support, and adaptation, in their NDCs can also be understood as a question of equity.

Finally, ensuring procedural equity is generally understood to lead to outcomes that are seen as more equitable (Adeyeye et al., 2019; Fleurbaey et al., 2014). As such, NDCs that are determined through domestic process that include a strong element of procedural equity for domestic stakeholders may lead to more ambitious overall outcomes. The present study does not allow for strong conclusions about the relationship between procedural equity and fostering higher ambition, though the party in our sample with the weakest stakeholder engagement in the NDC process (Canada) also has a comparatively weak mitigation target.

6 Conclusions

This study examined and compared the role of equity in the formulation of four NDCs. *International equity* considerations are found to enable ambition, whereby parties based the determination of their NDCs' ambition level at least in part on considerations of the effort taken by other Parties. However, the distributional issues associated with *domestic equity*, as raised during domestic processes related to NDCs preparation, tended to temper ambition.

Among the four case studies, we found that, at least initially, domestic policy and planning tended to shape the mitigation targets of the Parties' NDCs, rather than NDCs shaping domestic policy. All case studies showed that consultations with relevant domestic stakeholders were undertaken, either directly as part of the NDC preparation process (Kenya and South Africa), and/or in developing the policy frameworks that directly informed the NDC (for the EU and Canada's revised NDC).

Importantly, in all four cases, the need to formulate NDCs have at least partly driven Parties to either raise or better define their overall ambition beyond what had previously been established domestically, or/and to develop further climate change policies and measures for implementation, including through the establishment of new institutions, discourses, and policy programs. Domestic equity was found to influence the development process of all four NDCs. The mitigation NDC targets across all cases represented a balance of national developmental priorities that sometimes appeared in competition with Parties' national and international climate objectives. The extent to which the targets balanced and were influenced by the viewpoints of key domestic actors was found to vary in each

case study, but in none of the cases did this balance result in greater ambition; in fact, it might have led to tempering of ambition. Further systematic assessment of the role of domestic equity in NDC formulation may provide more information on *how* these balances are performed, and thus provide greater understanding of Parties' NDC process and more transparency to the self-determination of Party ambition.

Furthermore, equity relates to mitigation, adaptation, and support. All three of these dimensions are essential elements of the global climate effort, and international equity (as well as domestic equity) relates to all of them as well as their interactions with each other. However, as discussed, only the developing country case studies included support and adaptation in the scope of their NDCs, while developed countries address adaptation and support elsewhere and, at least in the case of support, on timescales inconsistent with the NDC cycle. This points to structural challenges with regards to the international equity of the institutional framework of the NDCs as a whole, because it creates an accountability challenge for the NDC framework where developed countries cannot be held accountable for support they chose not to include in their NDCs, while developing countries cannot be held accountable for the conditional portions that they chose to include in their NDCs if those conditions were left unfulfilled. This, in turn, points to the need to overcome the discrepancy between different view of NDC scope to unlock the full institutional potential of NDCs.

In general, equity will continue to be crucial in order to move global climate change response negotiations forward and for climate change research (Chan, 2016; Civil Society Equity Review, 2018; Klinsky, Roberts, et al., 2017). Additionally, there could be a role for facilitative guidance and the sharing of experiences on understanding of fairness considerations for NDCs. With the rules for the global stocktake (UNFCCC, 2018), including consideration of equity as a source of input to the quinquennial global stocktake (Winkler, 2020), it is likely that analysis of equity, particularly at a domestic level, will continue to be relevant for Parties.

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