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## Climate Change Policy Differentials: A Review of the Paris Agreement

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### Abstract

*The paper examines the climate policies of the biggest world emitters of greenhouse gases against the objectives of the Paris Agreement. It explores the reasons for inefficiencies in outcome delivery of international agreements on climate mitigation. It finds that the policy differentials incorporated into the Paris Agreement are potentially damaging while ethically justified. This might discredit global policy instruments as ultimately ineffective in mitigating climate change. Policy instruments would have to be drastically enhanced in order to be more effective in climate change mitigation.*

**Keywords:** Climate Change, Paris Agreement, Mitigation, Policy Differential, Nationally Determined Contributions

### Introduction

Climate change is increasingly affecting economies and societies all over the world. While there is consensus that effective and coordinated global actions are needed in order to curb its negative development there are still many discussions and misgivings about the best ways to achieve them. The Paris Agreement is a second attempt at global level to codify policy commitments towards curbing global warming and adapting to its effects. As it is recently adopted, the Paris Agreement is qualitatively assessed for projected efficiency based on its main principles and modalities as well as by comparing the announced contributions of the main greenhouse gases (GHG) emitters.

### Kyoto Protocol and the first climate policy differential

The first try for comprehensive climate mitigation was the Kyoto Protocol (KP), adopted in December 1997 under the United Nations Framework Convention on Climate Change (UNFCCC). The KP entered into force in February 2005. The Parties included in the Annex I to the KP – 37 industrialized countries and the European Community – committed to binding GHG emissions reduction targets (Annex B). The aggregate reduction commitment of GHG emissions was at least

5 per cent below 1990 levels<sup>1</sup> in the reference period 2008 to 2012. States not included in Annex B – the so-called developing countries – had much looser and non-binding environmental commitments, which were subsumed to “*their specific national and regional development priorities, objectives and circumstances*” (Article 10).

The main policy drivers of the KP were the quantified national emission limitation or reduction commitments included in Annex B of the Protocol. The document also listed a series of non-binding policy measures to promote sustainable development: enhancement of energy efficiency, protection of sinks and reservoirs of greenhouse gases, promotion of sustainable forms of agriculture, research and development of new and renewable forms of energy, of carbon dioxide sequestration technologies, limitations or reductions of GHG in the transport sector etc.

The commitments under Annex B could be also met through verifiable net changes in GHG emissions and removals by sinks resulting from direct human-induced land-use change and forestry activities, limited to afforestation, reforestation and deforestation.

A key measure under the Kyoto Protocol was the introduction of three market-based mechanisms: Clean development mechanism (CDM), Joint implementation (JI) and Emissions trading (ET). They were meant to create a “carbon market” and had several comprehensive goals:

- to provide for sufficient flexibility so as industrialized countries meet their emissions commitments in a cost-effective manner;
- to co-interest the private sector in joining efforts to curb global warming; and, not least,
- to stimulate investment, technology transfer and environmental policies in the developing countries – a sizable group that did not have quantified obligations under the KP.

The lack of quantified obligations for developing countries stemmed from the principle of ‘*common but differentiated responsibility*’, which was established by the Rio Declaration of the United Nations Conference on Environment and Development, in 1992 (the so-called Earth Summit). The Rio Declaration (Principle 7) proclaimed that “*in view of the different contributions to global environmental degradation, States have common but differentiated responsibilities. The developed countries acknowledge the responsibility that they bear in the international pursuit of sustainable development in view of the pressures their societies place on the global environment and of the technologies and financial resources they command.*”

This ethics-based principle introduced a first major differential in how global policies are designed to limit global warming and combat its negative consequences. The principle acknowledges that climate is a global common good thereby affecting and being affected by every nation in the world irrespective of borders. At the same time, it differentiates between countries based on their contribution to raised GHG levels and environmental degradation, grounded on the notion of “polluter pays”.

Rosencranz (2002) attributes the origin of this principle in the Roman law dictum *sic utere tuo ut alienum non laedas*, meaning use your property so that the property of others is not damaged. A precursor of the Rio Declaration – *The Declaration of the United Nations Conference on the Human Environment (Stockholm Declaration 1972)* - also included a principle of differentiated responsibilities by affirming that “*States have, in accordance with the Charter of the United*

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<sup>1</sup> A number of countries notified 1989 or earlier as reference years

*Nations and the principles of international law, the sovereign right to exploit their own resources pursuant to their own environmental policies, and the responsibility to ensure that activities within their jurisdiction or control do not cause damage to the environment of other States or of areas beyond the limits of national jurisdiction” (Principle 21).*

The ‘differentiated responsibility’ principle was the essence of the Kyoto Protocol. It established the notion that the industrialized nations were the culprit for the sharp increase of atmospheric GHG since the Industrial Revolution and therefore must bear the brunt of the efforts to reduce emissions and stop global warming. This differential treatment practically prioritizes past GHG emissions and/or economic capacity as the main criteria for action, and ultimately as principal efficiency indicators towards achieving the specific environmental objectives related to limiting global warming and climate change.

Out of the 37 signatories initially included in the Annex B, the United States has not ratified the Kyoto Protocol. Canada notified its decision to withdraw from the KP, effective from 15 December 2012, just a couple of weeks before the end of the first commitment period 2008-2012. For the remaining 35 industrialized countries (plus the European Community), the individual limitation or reduction commitments ranged from negatives such as -8% compared to 1990 level for a large number of countries and -6% (Hungary, Italy, Japan) to 0% for New Zealand, Russian Federation and Ukraine or positives such as +1% (Norway), +8% (Australia) and +10% (Iceland). The aggregated commitment of the European Community (or the European Union, as it will be later designated) was -8%.

Data shows that while the KP achieved its nominal targets it failed on the real and more systemic climate objectives i.e. curbing global GHG emissions and creating a relevant ‘carbon market’ to discourage emissions through market mechanisms. All the 36 parties that fully participated in the KP under Annex B were complying at the end of the commitment period and only nine parties emitted higher levels of GHG than committed and had to recourse to market mechanisms to ensure compliance (Shishlov, Morel and Bellassen, 2016).

The European Union and its member states (EU-28), which together constituted the bulk of emissions accounted under Annex B commitments, overachieved their target under KP’s first commitment period (2008-2012). For the whole period, the EU’s total emissions, without Cyprus and Malta which had no targets, were equivalent to a reduction of around 19% below the base year without counting the additional reductions coming from carbon sinks and international credits (EC, 2018). However, because it did not involve many other major emitters (US, China, developing countries etc.), the Kyoto agreement only covered about 18 % of total global emissions and therefore did not produce a significant reduction effect. The United States non-ratification and Canada’s withdrawal also meant that the KP’s market-based mechanisms based on trading emission allowances did not have enough volume to initiate a relevant global carbon market.

The United States position on the Kyoto agreement can be attributed in part to the refusal of the ‘differentiated responsibilities’ principle. The Hagel-Byrd resolution adopted unanimously by the US Senate in July 1997, a few months before the adoption of the KP, specified that “*the United States should not be a signatory to any protocol to, or other agreement regarding, the United Nations Framework Convention on Climate Change of 1992, at negotiations in Kyoto in December 1997 or thereafter which would: (1) mandate new commitments to limit or reduce greenhouse gas emissions for the Annex 1 Parties, unless the protocol or other agreement also mandates new*

*specific scheduled commitments to limit or reduce greenhouse gas emissions for Developing Country Parties within the same compliance period ; or (2) result in serious harm to the U.S. economy” (105th Congress, 1997).*

The explicit reference to matching commitments from developing countries, which under KP included big emitters such as China, Brazil, India, Indonesia etc. illustrates very well the efficiency vs. ethics conundrum of designing global climate policies: either exempt a large portion of world’s GHG emissions and risk the efficiency of the whole process, or include everybody and ignore the moral obligations deriving from one’s past actions. This conundrum becomes even more difficult to address from a policy-making point of view considering that by 2010 the share of cumulative historical emissions in developing countries had become almost equal to those of the developed countries (48 % vs. 52 %, compared to 20 % vs. 80 % if most recent emissions 2000-2010 were excluded, according to Den Elzen, Olivier, Höhne and Janssens-Maenhout (2013).

Despite limited achievements under the KP, in December 2012, the Parties adopted the “Doha Amendment”, which includes: new emission reduction commitments for Annex B countries for a second period from 1 January 2013 to 31<sup>st</sup> December 2020, a revised list of GHG; and, amendments to several articles of the KP related to several issues of the first commitment period that need to be updated for the second commitment period.

Under the Doha Amendment, Japan, New Zealand and the Russian Federation indicated that they will not assume new quantitative emission limitations or reduction commitments (QELRC), leaving only the European Union and its 28-member states, plus Australia, Belarus, Kazakhstan, Liechtenstein, Monaco, Norway, Switzerland and Ukraine with QELRCs for the second commitment period.

The Doha Amendment has not yet entered into force. Until August 1<sup>st</sup>, 2018, 114 countries have ratified the Amendment out of a total of 144, which are required for the entry into force of the amendment.

### **The Paris Agreement and the Second Policy Differential**

Following the Kyoto Protocol, the Parties to the UNFCCC adopted the Paris Agreement (PA) on 12 December 2015. 179 Parties have ratified until now the PA<sup>2</sup> (United Nations, 2018), which entered into force on 4 November 2016.

Acknowledging that “*climate change is a common concern of humankind*”, the Agreement sets as principal objectives (Article 2) to:

- a. hold the increase of the global average temperature to well below 2°C above pre-industrial levels and pursue efforts to limit the temperature increase to 1.5°C above pre-industrial levels (*mitigation*);
- b. increase the ability to adapt to the adverse impacts of climate change and foster climate resilience and low greenhouse gas emissions development (*adaptation*); and
- c. make finance flows consistent with a pathway towards low GHG emissions and climate-resilient development.

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<sup>2</sup> Status as at July 16, 2018, according to United Nations Treaty Collection – Depository - Status of Treaties, consulted at [https://treaties.un.org/Pages/ViewDetails.aspx?src=TREATY&mtdsg\\_no=XXVII-7-d&chapter=27&clang=\\_en](https://treaties.un.org/Pages/ViewDetails.aspx?src=TREATY&mtdsg_no=XXVII-7-d&chapter=27&clang=_en)

The Paris Agreement introduces the same “*common but differentiated responsibilities*” principle as the Kyoto Protocol. However, it also introduces a new differential by eliminating binding quantitative commitments and replacing them with “*nationally determined contributions*” (NDCs), which describe each Party’s foreseen climate actions post-2020.

These contributions are entirely voluntary in the Agreement’s framework and therefore not quantifiable on an equivalent basis. NDCs are to be renewed every five years, with the vague understanding that “*efforts of all Parties will represent a progression over time*”. In replacing the quantitative commitments, the PA uses qualitative descriptions both for the timelines for reaching stated objectives (“*the Parties aim to reach global peaking of greenhouse gas emissions as soon as possible*”, “*anthropogenic emissions by sources and removals by sinks of greenhouse gases in the second half of this century*”) and the amplitude of needed actions and measures (developed countries “*should continue taking the lead by undertaking economy-wide absolute emission reduction targets*”, while developing countries “*should continue enhancing their mitigation efforts, and are encouraged to move over time towards economy-wide emission reduction or limitation targets in the light of different national circumstances*”).

The new differential, while blurring the distinction between developed and developing countries, opens a new problem on the effectiveness side: it leaves the climate action entirely up to the domestic decision-making of each emitter, thereby risking to diminish the impact of such a global agreement.

The following chapter examines the communicated contributions of the largest emitters of GHG against the policy goals set by the Paris Agreement.

### **GHG Emissions by Emitters and their Mitigation Contributions**

Due to its global nature, climate change can only be managed through interventions of global relevance. After the indecisive outcome of Kyoto Protocol, the Paris Agreement was meant to spur genuine global action involving all states and non-state actors. However, according to Friedrich, Ge and Pickens (2017) currently over 70% of GHG emissions are produced by only 10 state-level actors - China, the United States, the European Union, India, the Russian Federation, Japan, Brazil, Indonesia, Canada and Mexico (Table 1; Figure1). Moreover, the top three emitters - China, the US and the EU - account for about half of the total emissions, more than 14 times than the last 100 emitters taken together.

Given these discrepancies, it is clear that in order to be effective global emissions reductions intervention should have included comparable and significant mitigation efforts from all top emitters. This was the essence of Hagel-Byrd resolution and other subsequent mandates for international negotiations, while not necessarily with the same motivation or scope. For example, before the 2009 UNFCCC Conference of the Parties in Copenhagen (COP15) was supposed to adopt a comprehensive follow-up to the KP, the Council of the European Union reaffirmed “*its commitment to move to a 30% reduction compared to 1990 levels as its contribution to a global and comprehensive agreement for the period beyond 2012, provided that other developed countries commit themselves to comparable emission reductions and that developing countries contribute adequately according to their responsibilities and respective capabilities*” (CUE, 2009).

	GHG emissions totals <sup>3</sup>	% of total
	MtCO <sub>2</sub> e <sup>4</sup>	
<b>World</b>	<b>45,740.70</b>	<b>100%</b>
China	11,911.71	26.04%
United States	6,371.10	13.93%
EU 28	4,053.66	8.86%
India	3,079.81	6.73%
Russian Federation	2,137.83	4.67%
Japan	1,314.59	2.87%
Brazil	1,051.00	2.30%
Indonesia	789.48	1.73%
Canada	745.11	1.63%
Mexico	721.65	1.58%
Others	13,564.76	29.66%

Table 1: World's top GHG emitters; data source: WRI (2018)

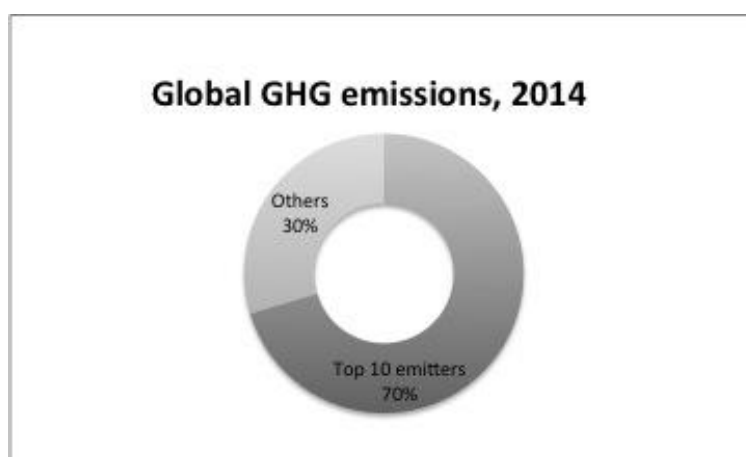


Figure 1: Distribution of global GHG emissions, 2014

The Paris Agreement did not achieve comparable or equivalent commitments from major emitters because the process is voluntary and relies mostly on domestic implementation. There are important differences between the reference base years as well as between the targets for emission cuts or the reference implementation periods. Additionally, there are no mechanisms for pledges enforcement. The following table (Table 2) compiles the top 10 emitters' main NDCs by 2030 submitted as their first pledges under the PA.

<sup>3</sup> Data is for GHG Emissions Excluding Land-Use Change and Forestry – 2014; it includes emissions and derivative indicators for 186 countries;

<sup>4</sup> Million tons of carbon dioxide equivalent

	Main NDC	Base year	Observations
China	Intends to achieve the peaking of carbon dioxide emissions around 2030 and making best efforts to peak early; To lower carbon dioxide emissions per unit of GDP by 60% to 65% from the 2005 level; To increase the share of non-fossil fuels in primary energy consumption to around 20%; To increase the forest stock volume by around 4.5 billion cubic meters on the 2005 level.	2005	Reduction target per unit of GDP, not absolute;  Emissions to continue to increase until around 2030
United States	Intends to achieve an economy-wide target of reducing its greenhouse gas emissions by 26-28% below its 2005 level in 2025 and to make best efforts to reduce its emissions by 28%.	2005	No specific commitment for 2030
EU 28	Committed to a binding target of an at least 40% domestic reduction in greenhouse gas emissions by 2030 compared to 1990, to be fulfilled jointly.	1990	Binding commitment enforced by internal legislation
India	Intends to reduce the emissions intensity of its GDP by 33 to 35% by 2030 from 2005 level; To achieve about 40 percent cumulative electric power installed capacity from non-fossil fuel-based energy resources by 2030 with the help of transfer of technology and low-cost international finance including from Green Climate Fund (GCF); To create an additional carbon sink of 2.5 to 3 billion tons of CO <sub>2</sub>	2005	Reduction target per unit of GDP (*emissions intensity of GDP);  Absolute emissions may continue to grow according to GDP growth rate  Non-fossil fuel energy development dependent on international funding



	equivalent through additional forest and tree cover by 2030.		
Russian Federation <sup>5</sup>	The long-term goal of limiting anthropogenic emissions of greenhouse gases in the Russian Federation can be a figure of 70-75% of 1990 emissions by 2030, subject to the greatest possible consideration of the absorptive capacity of forests. There will be GHG emissions reduction per GDP unit. The Russian Federation currently has in force legally-binding instruments aimed at providing for limitation of the GHG emissions to at most 75% of 1990 levels by the year 2020.	1990	Indicative target, very limited scope (preservation of 2020 binding targets);  Further reductions will be made per GDP unit
Japan	Intends a reduction of 26.0% by fiscal year (FY) 2030 compared to FY 2013 (25.4% reduction compared to FY 2005) (approximately 1.042 billion t-CO <sub>2</sub> eq. as 2030 emissions), ensuring consistency with its energy mix, set as a feasible reduction target by bottom-up calculation with concrete policies, measures and individual technologies taking into adequate consideration, inter alia, technological and cost constraints, and set based on the amount of domestic emission reductions and removals assumed to be obtained.	2005	Indicative target, despite assurances of feasibility

<sup>5</sup> Russian Federation is the only big emitter that hasn't ratified so far the Paris Agreement according to United Nations Treaty Collection – Depository - Status of Treaties; its INDC (Intended Nationally Determined Contribution) was submitted on April 1<sup>st</sup>, 2015, ahead of the negotiation and signing of the PA; retrieved from <http://www4.unfccc.int/submissions/indc/Submission%20Pages/submissions.aspx>

Indonesia	<p>Indonesia has committed to reduce unconditionally 29% of its greenhouse gasses emissions against the business as usual (BAU) scenario by the year of 2030. The BAU scenario is projecting approximately 2,869 GtCO<sub>2</sub>e in 2030.</p> <p>BAU scenarios of emission projection started in 2010, based on historical trajectory (2000-2010)<sup>6</sup>.</p> <p>Could increase its contribution up to 41% reduction of emissions by 2030, subject to availability of international support for finance, technology transfer and development and capacity building.</p>	2010	<p>Emission reduction calculated not on actual emissions at base year but on virtual emissions at target; absolute emissions might continue to grow</p> <p>Conditional increase based on availability of international funding</p>
Brazil	<p>Intends to commit to reduce greenhouse gas emissions by 37% below 2005 levels in 2025.</p> <p>Subsequent indicative contribution: reduce greenhouse gas emissions by 43% below 2005 levels in 2030;</p> <p>Timeframe: single-year target for 2025; indicative values for 2030 for reference purposes only;</p> <p>To restore and reforest 12 million hectares of forests by 2030, for multiple purposes;</p> <p>Achieve 45% of renewables in the energy mix by 2030, including:</p> <ul style="list-style-type: none"> <li>- by expanding the use of renewable energy sources other than hydropower in the total energy mix to between 28% and 33% by 2030;</li> </ul>	2005	No emissions reduction commitment beyond 2025;

<sup>6</sup> Compiled from Indonesia's INDC, submitted September 24<sup>th</sup>, 2015; retrieved from <http://www4.unfccc.int/submissions/indc/Submission%20Pages/submissions.aspx>

	<ul style="list-style-type: none"> <li>- by expanding the use of non-fossil fuel energy sources domestically, increasing the share of renewables (other than hydropower) in the power supply to at least 23% by 2030, including by raising the share of wind, biomass and solar;</li> <li>- achieving 10% efficiency gains in the electricity sector by 2030.</li> </ul>		
Canada	<p>Intends to achieve an economy-wide target to reduce its greenhouse gas emissions by 30% below 2005 levels by 2030. In addition to addressing gases covered under the UNFCCC, Canada is acting to reduce black carbon – a short-lived climate pollutant of particular significance in the Arctic due to its contribution to Arctic warming.</p>	2005	Not binding but enforceable through consolidated domestic legislation
Mexico	<p>Committed to reduce unconditionally 25% of its Greenhouse Gases and Short-Lived Climate Pollutants emissions (below BAU) for the year 2030. This commitment implies a reduction of 22% of GHG and a reduction of 51% of Black Carbon. This commitment implies a net emissions peak starting from 2026, decoupling GHG emissions from economic growth: emissions intensity per unit of GDP will reduce by around 40% from 2013 to 2030. The 25% reduction commitment expressed above could increase up to a 40% in a conditional manner, subject to a global agreement addressing important</p>	2013	<p>Emissions reduction relative to a Business As Usual baseline;</p> <p>Absolute emissions will continue to grow.</p> <p>Conditional increase based on availability of international funding</p>

	<p>topics including international carbon price, carbon border adjustments, technical cooperation, access to low-cost financial resources and technology transfer, all at a scale commensurate to the challenge of global climate change. Within the same conditions, GHG reductions could increase up to 36%, and Black Carbon reductions to 70% in 2030</p> <p>Business As Usual scenario of emission projections based on economic growth in the absence of climate change policies, starting from 2013 (first year of applicability of Mexico’s General Climate Change Law)</p>		
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Figure 2 – main NDCs of top GHG emitters; data source: UNFCCC, NDC Registry (interim); retrieved from <http://www4.unfccc.int/ndcregistry/Pages/Home.aspx>

### Brief Analysis and Discussion

The two policy differentials embedded into the PA – differentiated responsibilities between developed and developing countries and the voluntary and unenforceable nature of commitments – create premises for inefficiency against the main climate objective of the agreement, i.e. putting the world on a downward emission trajectory consistent with limiting global warming to two degrees Celsius above pre-Industrial levels. The review of pledges from the top 10 emitters, which together account for almost 75 % of global emissions, reveals three major vulnerabilities:

- i. *Base year.* The only top emitters having 1990 as baseline are the European Union and the Russian Federation. All the rest chose as base year 2005 and beyond. According to WRI (2018), between 1990 and 2005, World’s emission grew from 29,964.04 to 38,272.92 MtCO<sub>2</sub>e, a 27.72% increase. By choosing the latter year, commitments are weaker in absolute terms and the impact on overall emission reductions is minimal. In such cases emission trajectories are almost *business as usual* given advances in low-carbon technologies and the effect of the global economic and financial crisis at the end of the ‘00s.
- ii. *Indicative and non-enforceable targets.* Many of the developed emitters seized the opportunity of voluntary pledges to switch from Kyoto’s binding targets – enforced through international market-based clearing mechanisms – to PA’s indicative targets. Although enforced domestically through national legislation and measures, indicative targets are sensitive to short-term political cycles and programming. Also, a global and

reliable emission allowances market ('carbon market') is difficult to form, due to lack of liquidity and/or low prices of carbon.

- iii. *Relative reductions*. Some of the world's biggest emitters (China, India, Brazil, Indonesia) will continue to grow economically. By adopting relative type of reduction measures – related to units of GDP, emissions intensity of GDP or virtual emissions under BAU scenarios – absolute emissions could continue to grow for most of the reference period until 2030.

Even without a more thorough and comprehensive review of all the pledges under the Paris Agreement it is evident that the global accord is not fit for its purpose. The policy differentials included in the agreement have the inherent potential to hamper the achievement of its primary objective.

At the time, the withdrawal of the United States delivered a crucial blow to the efficiency of the Kyoto Protocol. Currently, the potential US retreat from the Paris Agreement, as announced by the US Administration in June 2017, will not have the same impact as the KP non-ratification due to a combination between the already relatively weak US commitments under the PA and lower relative size of US emissions.

The European Union is the only emissions-relevant Party with 2030 binding commitments consistent with the stated ambition of the agreement. However, contributing only 9% of global emissions the EU cannot alter the whole outcome even if it drastically increases its commitments. It appears that all major emitters with very few exceptions (EU, Japan, Canada) have prioritized economic growth and energy security over climate goals.

The gap between PA's national pledges and the required emissions cuts is recognized already at the level of the UNFCCC. A UN Environment's report on Emissions Gap found that national contributions only bring a third of the reduction in emissions required by 2030 to meet climate objectives (UNEP, 2017). The report's main findings were that: a) there is an urgent need for accelerated short-term action and enhanced longer-term national ambition, if the goals of the Paris Agreement are to remain achievable; b) the 2020 revision of the NDCs are the last opportunity to close the 2030 emissions gap; c) global CO<sub>2</sub> emissions from energy and industry have remained stable since 2014, but overall greenhouse gas emissions continue to rise slowly; and d) a large gap exists between 2030 emission levels and those consistent with least costly pathways to the 2°C and 1.5°C goals respectively.

According to the PA, new or updated NDCs will be submitted in a second round in 2020. In the absence of drastic upgrades of the national pledges, which are improbable given the past negotiations dynamics, policy instruments might be compromised as ineffective or at most partially effective climate change mitigation tools. If the urgency of the climate situation is to be properly addressed, global policies should be either completely overhauled to ensure meaningful and fully equivalent efforts, while weighted to account for ethical and development considerations, or complemented by science-based climate interventions such as geo-engineering (GHG removal or solar radiation management).

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