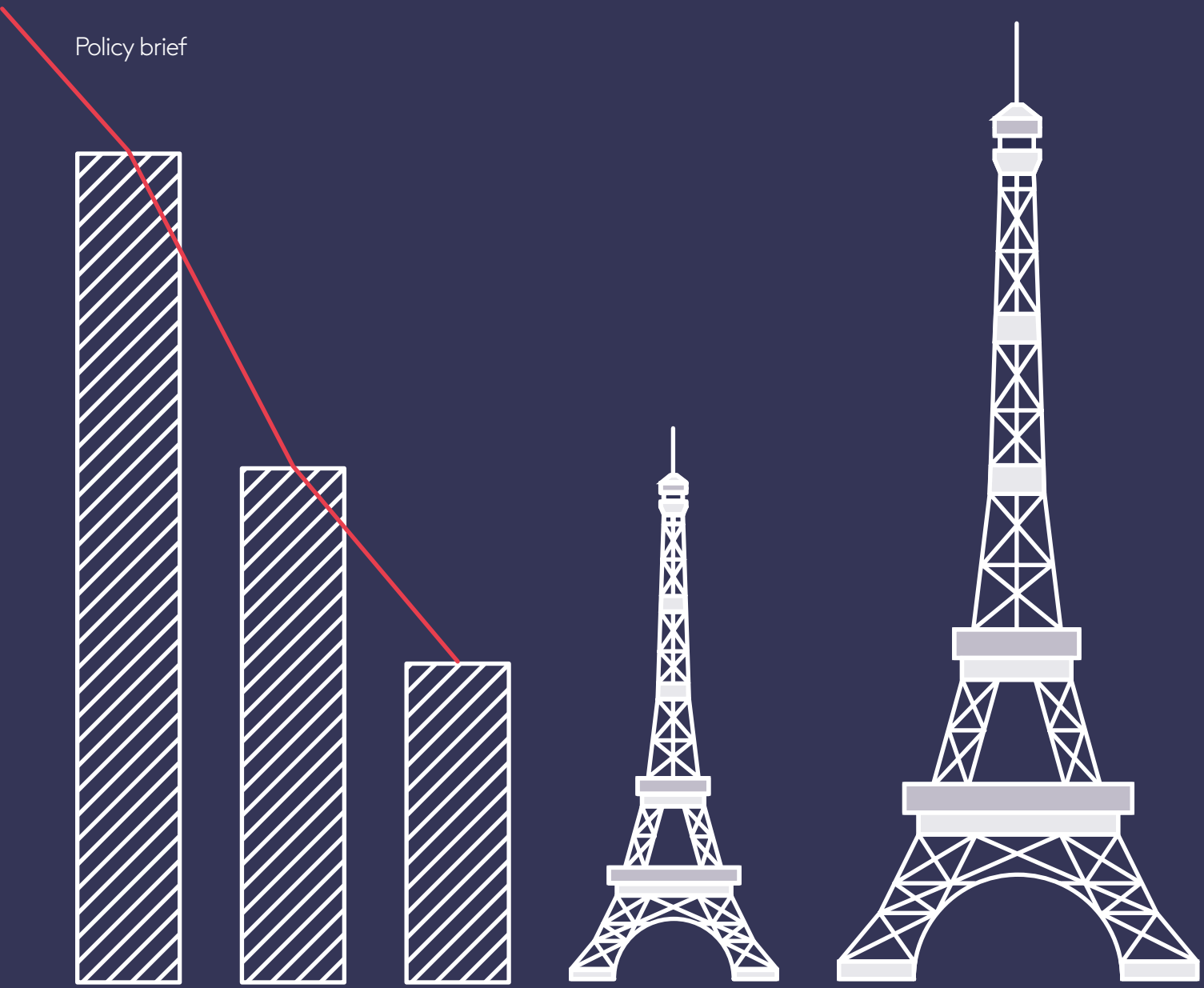
Assessing the consistency of national mitigation actions in the G20 with the Paris Agreement

Alina Averchenkova and Sini Matikainen

Policy brief



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Executive summary

The historic adoption of the Paris Agreement commits all countries to limit global temperature rise below 2 degrees Celsius above pre-industrial levels and to pursue efforts to limit the temperature increase even further to 1.5 degrees Celsius.

Fulfilling the Paris Agreement (and the decision adopting it) will require counties to rapidly implement their nationally determined contributions (NDCs), set (if they have not already) and meet ambitious emissions reduction targets for 2020 and ratchet up the ambition of future emissions reduction targets to close the gap between the temperature target and current global emissions pathway.

This policy brief explores the progress of G20 countries towards these requirements using the 'Paris consistency monitor'. This simple analytical tool assesses the consistency of countries' past and present mitigation action against three indicators.

- The consistency of domestic emissions reduction targets with those pledged in the NDC's
- Progress towards meeting 2020 emissions reduction targets pledged under the Copenhagen and Cancun Accords
- Past performance on ratcheting up their ambition on climate change mitigation based on evidence from country responses to the Kyoto Protocol and the subsequent Copenhagen and Cancun Accords.

The performance of G20 countries against these indicators is mixed. They fall into three broad categories.

1. G20 countries where past and present action on climate change is either completely or mostly consistent with the key requirements of the Paris Agreement

The European Union (EU) as a whole, as well as France, Germany, and the UK demonstrate past and present action on climate mitigation that is completely consistent with the key requirements of the Paris Agreement. All have national (or regional in case of the EU) targets that are consistent with or exceed their NDCs in terms of level, timeframe and scope. These jurisdictions are also on track with the implementation of their 2020 targets and have consistently ratcheted up ambition over time since ratifying the Kyoto Protocol.

While these jurisdictions can justifiably be seen as bellwethers of climate action there are areas where their policy implementation could be enhanced. For example, Germany's Climate Action Plan 2050, if approved, will be a strategic document adopted by the cabinet. Formalising it into law would maximise its legal strength and limit the risk of future policy reversal.

The UK's Committee on Climate Change found in its most recent progress report that current policies in the UK are not consistent with meeting the emissions reduction targets set under the fourth and fifth carbon budgets up to 2032. More generally, the UKs decision to leave the EU could affect the ability of EU and the UK to meet their emissions reductions pledges.

For the EU, its ability to implement the Paris Agreement will depend on the domestic actions of the Member States and their ability to put in place effective domestic legislation and policies consistent with the EU's NDC and effort sharing agreement.

Brazil, China and Italy perform strongly on the Paris consistency monitor, though they still need to update some aspects of their domestic legislation or executive action to bring their national targets into accordance with their NDCs. For example, China's latest five-year-plan covers the period until 2020, while Brazil's

National Policy on Climate Change covers the period until 2020 and uses a business-as-usual baseline rather than the 2005 baseline used in their NDC. Furthermore, both countries' ability to successfully implement the Paris Agreement would be enhanced by stronger decision-making processes that provide greater efficiency, inclusiveness and transparency. Italy needs to update the level of its emissions reduction targets and extend their timeframe to 2030. It could also consider strengthening its overall legislative framework by converting its non-binding strategic document on climate action into legislation.

2. Countries where past and present action on climate change is moderately consistent with the key requirements of the Paris Agreement

This group of countries consists of Japan, India, Indonesia, Mexico, Russia, South Africa and South Korea.

Over half of these countries (the exceptions being India, Russia and Japan) are behind on their 2020 targets. Others, including Japan, Russia and South Africa have in the past been unable to increase the ambition of their climate action. Japan in particular revised its 2020 emissions reduction target downward, though the recently adopted Cabinet Decision on the Plan for Global Warming Countermeasures affirms the emissions reduction target from its NDC and outlines methods for achieving it. South Africa and Russia have maintained targets at similar levels rather than increasing ambition over time, while India has not provided sufficient information on the baselines for its targets to make an assessment.

Several of these countries need to upgrade the timeframe of their domestic targets to make them consistent with their NDC (India, Russia, South Korea and Mexico). Others need to increase the level of their targets to make them consistent with their NDC (India, South Korea and Mexico for its conditional target). India needs both to adjust the level of its domestic target and consider upgrading its scope from sectoral to economy-wide to be consistent with its NDCs.

3. Countries where past and present action on climate change is largely inconsistent with the key requirements of the Paris Agreement

Argentina, Australia, Canada, Saudi Arabia, Turkey and the United States (US) are falling behind with their national climate mitigation action. These countries lack overall framework legislation or regulation on climate change, need to move from sectoral to economy-wide targets and extend the timeframe of their targets to 2030. Saudi Arabia, Turkey and Argentina have adopted targets for the first time through their NDCs, so they have some work to do in making their national policy and legislative framework consistent.

All countries in this group are either behind on meeting their 2020 targets (Australia, Canada and the US), or have not set any. Australia and Canada have a solid framework for developing legislation in principle, but due in part to political considerations have shown insufficient progress on implementation.

Finally, Australia, Canada and the US have so far shown inconsistent progress in ratcheting up their ambition over time. While past track record cannot be held as an indicator of future performance, these countries will clearly need to focus on improving their ambition levels in the future.

While this analysis focuses on the G20 countries, the Paris consistency monitor tool can be applied to any other jurisdictions. Going forward it could be expanded to include an assessment of the consistency of national ambition level with the long-term global goal of keeping temperature increase to 2 or 1.5 degrees and with the requirement to peak greenhouse gas emissions as soon as possible. It could also be augmented to take into account features of the national political processes and debate on climate change, as well as arrangements for monitoring, reporting and verifying emissions, which will be vital for implementing and increasing emissions reductions targets in the future.

1. Introduction

The ratification and adoption of the Paris Agreement commits the international community to accelerate and strengthen the global response to climate change. The objective is to keep global temperature rise this century well below 2 degrees Celsius and to pursue efforts to limit the temperature increase even further to 1.5 degrees Celsius above pre-industrial levels.

The focus is now on implementing the agreement. At the time of writing, 169 countries have committed to emissions targets and other mitigation and adaptation objectives through their nationally determined contributions (NDCs) up to 2025 and 2030. Their successful implementation is one the key requirements of the Paris Agreement and will be vital for enabling low-carbon and climate resilient development, as well as for positive and productive future international climate negotiations that set increasingly ambitious targets and meet the temperature goal.

The accompanying Decision 1/CP.21 of the Paris Agreement (UNFCCC, 2015b) noted a 'significant gap' between aggregate emissions reduction pledges for 2020 and an emissions pathway consistent with holding the increase in the global average temperatures at the desired target. It pressed for global ambition to be enhanced pre-2020 in order to lay a solid foundation for enhanced action post-2020. Hence, countries' ability to set and successfully deliver a 2020 emissions reduction target has important implications for the credibility and effectiveness of future implementation of the agreement.

Furthermore, under the provisions of the Paris Agreement, countries will be expected to submit an updated NDC every five years. Each submission must represent a progression beyond the country's then current NDC to reflect its highest possible ambition. This is particularly significant given that the current levels of pledges, when assessed cumulatively, are inconsistent with the temperature objective described above.

To facilitate the implementation of the NDCs and create a process for ratcheting up the ambition of emissions reduction pledges over time, the Paris Agreement established provisions for a periodic 'global stocktake'. This will be held every five years, beginning in 2023, and assess global collective progress towards achieving the long-term goals of the agreement. Prior to that, a facilitative dialogue will be conducted, beginning in 2018, to take stock of the collective efforts towards meeting the agreement's long-term goals.

The objective of this policy brief is to contribute to this process by assessing the consistency of past and present national mitigation actions by the G20 countries with the key requirements of the Paris Agreement. This is done using a simple analytical tool devised by the authors and named the 'Paris consistency monitor'. The monitor

provides a simple assessment framework that evaluates national mitigation actions using three indicators:

- Consistency of domestic emissions reduction targets with those pledged in the NDC's
- Progress towards meeting 2020 emissions reduction targets
- Past performance on ratcheting up ambition on climate change mitigation.

Focusing on the G20 group of leading nations, which covers roughly 80 per cent of global greenhouse gas emissions,[1] the intention is to provide a snapshot of the current implementation status of the Paris Agreement by comparing the mitigation objectives in the submitted NDCs with emission targets adopted in the domestic legislation or executive instruments.[2] In doing so, this analysis highlights key gaps in legislation and executive regulation vis-à-vis the key requirements of the Paris Agreement, and highlights where additional action is necessary.

[1] Using latest Climate Analysis Indicators Tool data from 2012 (WRI, 2014).

[2] Relying on Nachmany et al. (2015), which defines climate change legislation as 'legislation, or regulations, policies and decrees with a comparable status, that refer specifically to climate change or that relate to reducing energy demand, promoting low carbon energy supply, tackling deforestation, promoting sustainable land use, sustainable transportation, or adaptation to climate impacts.

2. Paris consistency monitor: methodology

The Paris consistency monitor devised here uses a set of indicators to assess the consistency of the G20 countries' past and present domestic mitigation efforts with the key requirements of the Paris Agreement. It assesses the performance of G20 countries across three indicators: the consistency of domestic emissions targets with the NDCs; countries' progress towards meeting 2020 emissions reduction targets and their past performance on ratcheting up the ambition of emissions reduction targets. The G20 countries are scored against these indicators to analyse how consistent their historic and current action is with the key requirements of the Paris Agreement and, by doing so, it is possible to identify policy and legislation gaps that can inform implementation of the NDCs (see Table 1).

The G20 countries were chosen for this analysis because they represent 80 per cent of global emissions and over 85 percent of global GDP. They are also crucial for the credible implementation of the Paris Agreement. At the time of publication, all the G20 countries have submitted NDCs to the Paris Agreement and 14 countries including Argentina, Brazil, Canada, China, the EU, France, Germany, India, Mexico, and the US have ratified it.

Table 1 summarises the indicators, assessment metrics and scoring framework used in the Paris consistency monitor. They are described in more detail in the sections below and in Appendix 1.

2.1. Consistency of domestic emissions targets with the NDCs

All G20 countries included an emissions target for 2030 in their NDC[3] making their integration into domestic legislation and policy an obvious indicator of whether domestic mitigation action is consistent with the key requirements of the Paris Agreement.[4] Emissions targets in NDCs were expressed in different ways. Some were absolute targets, quantified as reductions on a specified base year; others were relative targets that are compared to a business-as-usual scenario without emissions reductions; and others were expressed as emissions intensity targets. The type of domestic target is not assessed under this indicator; only whether the domestic targets legislated or included in regulation are consistent with those in the NDCs. Their consistency is assessed in terms of both scope (economy-wide or sectoral) and level of the targets, and timeframe (see sections 2.1.1 and 2.1.2 for more information on these assessment metrics).

Countries have then been categorised as either having domestic targets that are inconsistent with the NDCs put forward under the Paris Agreement; targets in need of upgrade; or targets consistent with the NDCs. For the purposes

[3] In the case of Saudi Arabia, their intention to 'achieve mitigation co-benefits ambitions of up to 130 million tons of CO_2eq avoided by 2030 annually' was taken as a target. (UNFCCC, 2015a)

[4] With the caveat that domestic legislation and executive action may not be sufficient in and of itself to ensure compliance, as noted in more detail in section 2.4 below.

Table 1. Indicators of the Paris consistency monitor

Indicator	Assessment metric	Scoring framework
Consistency of domestic emissions reduction targets with the NDCs	Consistent level and scope of domestic target; assessed using Global Climate Legislation Database (Nachmany et al., 2015) and Climate Action Tracker (2015)	Score: 1) Inconsistent scope 2) Consistent scope, but level needs to be updated 3) Scope and level are consistent
	Consistent timeframe of domestic target; assessed using Global Climate Legislation Database (Nachmany et al., 2015) and Climate Action Tracker (2015)	Score: 1) No timeframe defined in national legislation or executive instruments 2) Timeframe is defined but needs to be extended 3) Consistent
Progress towards meeting 2020 emissions reduction targets	Assessed using UNEP emissions gap report (2015) and analysis by the European Commission (Djikstra, L. and Athanasoglou, S., 2015)	Score: 0) Did not submit a 2020 GHG reduction pledge 1) Likely to require further action to meet 2020 targets, according to independent analysis 2) Independent analysis differs in whether the country is on track to meet its 2020 targets 3) On track according to meet 2020 targets according to independent analysis
Past performance on ratcheting up the ambition of emissions reduction targets	Whether targets have increased over time, from Kyoto's 2012 targets (where applicable) to Copenhagen's 2020 targets to Paris 2030 targets (CAT, 2015; UNFCCC, 2015a; UNFCCC, 2009)	Score: 1) Inconsistent or decreased ambition over time 2) Emissions pledges have remained at the same level over time or cannot be assessed 3) Increase in ambition over time

of visual representation, these categories have then been assigned a score from 1-3 respectively.[5] While this assessment method is far from exhaustive, it provides a qualitative snapshot of the current status of implementation of the Paris Agreement for the G20 countries. The assessment methods are described briefly below with the full methodology in Appendix 1.

The information on mitigation objectives adopted by countries was retrieved from Climate Action Tracker (2015).

2.1.1 Consistent level and scope of domestic target

The 'Consistent level and scope of domestic target' assessment metric assesses whether the level of emissions targets legislated or put into executive action domestically is consistent with that specified in the NDC. The G20 countries fall into one of three categories:

- The NDC is expressed as an economy-wide target (which in some cases is also augmented by sectoral targets) but no domestic economy-wide mitigation target is specified via legislative act or executive instrument *(inconsistent scope of the target)*;[6]
- The domestic legislative act or executive instrument specifies an economy-wide mitigation target, but this target is inconsistent with the level expressed in the NDC. This includes cases, for example, where the legislated level of the emissions reduction needs to be increased, or a BAU emission baseline needs to be changed to an absolute baseline *(consistent scope, but inconsistent level);*
- The level of the mitigation target specified in a legislative act or executive instrument is either consistent or above the level specified in the NDC *(consistent scope and level)*.

[5] In select cases, 0 has also been used when the indicator was not applicable: for 2020 progress when countries did not submit a pledge to the UNFCCC (namely, Turkey, Argentina, and Saudi Arabia).

[6] It is possible, in principle, that various sectoral policies would add up to the overall emission reduction equivalent to the level set under an economy-wide target set in the NDC. Yet the absence of a clear economy-wide framework domestically that gives an overall signal to the economy, consolidates various sectoral objectives and accounts for their performance and aggregation in a transparent manner makes ensuring delivery on the overall economy-wide target challenging. Hence, the case can be made that to be fully consistent with the Paris Agreement, domestic targets need to be consistent in scope with those set in the NDCs.

As noted above, this study examines only legislative acts and executive instruments, which includes strategic plans that have been adopted by the executive and legislative branch. The data comes from the Global Climate Legislation Database (Nachmany et al., 2015) and Climate Action Tracker (2015).[7]

It is important to note that this analysis concerns *consistency* between the domestic legislative acts or executive instruments with the level of target in the NDCs only. It does not assess the *adequacy* of the national policy in order to meet the NDC. For example, a country that has a national emissions target may still need to strengthen its underlying sectoral policies in order to meet it. On the other hand, a country that has sectoral policies only may still be able to meet its emissions reductions targets.

2.1.2 Consistent timeframe of domestic target

The 'Consistent timeframe of domestic target ' assessment metric assesses whether the timeframe for achieving the emissions reductions legislated or put into executive action nationally is consistent with that specified in NDCs. Countries are scored 1 to 3 respectively according to whether they fall into one of the following categories: no target timeframe specified in national action; timeframe for targets needs to be updated (for example national legislation has a 2025 target that will need to be changed to 2030 to match the timeframe specified within the NDC); or target timeframe consistent with the NDC.

2.2 Progress towards meeting 2020 emissions reduction targets

The 'Progress towards meeting 2020 emissions reduction targets' indicator assesses countries' progress towards meeting 2020 targets pledged under the Copenhagen and Cancun Accords. The countries were categorized as follows: 'Did not submit a 2020 greenhouse gas reduction pledge'; 'Likely to require further action to meet 2020 targets, according to independent analysis'; 'Independent analysis differs on whether the country is on track to meet its 2020 targets'; or 'On track according to meet 2020 targets according to independent analysis'. Countries are scored 0 to 3 respectively. The data for this indicator draws from the UNEP emissions gap report (2015) and Djikstra and Athanasoglou (2015) for the European Commission.[8]

2.3 Past performance on ratcheting up the ambition of emissions reduction targets

While the provision of the Paris Agreement to increase ambition in each subsequent NDC is forward looking, this analysis makes a historic assessment of countries' track record of increasing ambition in the UNFCCC process based on their response to the Kyoto Protocol and the subsequent Copenhagen and Cancun Accords (where applicable, respectively). Given that the requirement of ratcheting up ambition under the Paris Agreement is forward looking, this analysis looks at past performance of the G20 countries to determine whether the current trends in the behaviour of countries would generally be compatible with the direction set by the Paris Agreement and where change will be required, rather than considering past behaviour as a predictor of future performance.

Countries are categorized as follows: countries that have decreased their level of ambition or withdrawn from a treaty (the Kyoto Protocol) at any point in time; countries where the level of emissions reductions pledged has remained at the same level over time or cannot be fully assessed because of the way the emissions target in the NDC has been expressed (such as a lack of a clear baseline against which to measure progress); or countries where the level of the mitigation objective or emission target has consistently increased over time.[9] They were scored 1 to 3 respectively. Countries that had not made an emissions reductions pledge prior to the Paris Agreement were assigned to the second category (level

[7] For the full list of legislation and executive action taken into consideration, please see Appendix 2.

[8] For Germany, Italy, France, and the UK, which were not covered separately under the UNEP report.

has remained at the same level over time), as there is only one historical data point and so the overall trend could not be assessed.

2.4 Indicators not considered in this assessment

This analysis provides an assessment of the current status of implementation of the Paris Agreement. In doing so, it aims to highlight gaps in legislation and policy and inform future implementation of NDCs.

The indicators considered here are not exhaustive. A key area for future consideration is the consistency of national efforts with the 2 degree target and with the requirement to peak emission as soon as possible (Article 2 of the Paris Agreement (UNFCCC, 2015b)). This could encompass an assessment of whether national legislation or executive orders reference the long-term goal of keeping temperature increase well below 2 degrees; whether targets deliver emissions trajectories that are consistent with the temperature goal and whether timelines for peaking of emissions are ambitious enough. Furthermore, it will be important for future analysis to integrate an indicator that assesses whether countries are fulfilling the Paris Agreement provision to develop and communicate by 2020 mid-century, long-term low emission development strategies and domestic arrangements for measurement, reporting and verification (MRV). These indicators have not been included in the current analysis as much of the guidance on the MRV is still to be developed in the UNFCCC process and the data on the timeframe for peaking emissions was not available for all of the G20 countries. In addition, climate change adaptation and the mobilization of financial resources are key elements of the Paris Agreement. A framework needs to be developed for monitoring implementation and progress on these elements and should be considered in future analysis of this type.

This analysis focuses specifically on the consistency of the past and present domestic actions with the key requirements of the Paris Agreement. In the future the monitor could also be complemented by the indicators of overall credibility of the national action developed by Averchenkova and Bassi (2016), as well as an assessment of domestic political considerations (including cross-party consensus and executive leadership on climate change, upcoming elections and mechanisms for ensuring enforcement of legislation and executive action).[10]

[9] In assessing the past level of ambition the authors have mainly looked at the overall trend/direction of travel in the level of ambition, rather than making a judgement on the level of increase in the ambition.

[10] This could include mechanisms for accountability, monitoring and verification, or assessment of the relative 'reversibility' of the relevant legislation or executive action (e.g. through the analysis of the veto points in the political system). Similarly, cross-party agreement on climate change issues, the stance of key political figures, and upcoming elections can have a strong impact on policy stability and credibility. A classic example is the United States, where the polarization of opinion across the Democratic and Republican parties has made it difficult to pass climate change legislation, leading President Obama to follow regulation via executive action, which could stall or be reversed under Donald Trump.

3. Assessing the consistency of past and present climate mitigation action by the G20 with the Paris Agreement

Using the Paris consistency monitor to analyse the consistency of past and present mitigation actions by the G20 with the Paris Agreement reveals strong variations in performance among the member countries (see summary in table 2).

The countries fall into three broad categories:

- High consistency of domestic action: countries where past and present domestic action is either completely or mostly consistent with the key requirements of the Paris Agreement
- Moderate consistency of domestic action: countries where past and present action on climate change is moderately consistent with the key requirements of the Paris Agreement
- Low consistency of domestic action: countries where past and present action on climate change is largely inconsistent with the key requirements of the Paris Agreement

3.1 Countries where past and present domestic action is either completely or mostly consistent with the key requirements of the Paris Agreement

The European Union (EU) as a whole, as well as France, Germany, and the UK demonstrate past and present action on climate mitigation that is completely consistent with the key requirements of the Paris Agreement (Figure 1).

All of these countries have national (or regional in case of the EU) targets that are consistent with or exceed their NDCs in terms of level, timeframe and scope. These jurisdictions are also on track with the implementation of their 2020 targets and have consistently ratcheted up ambition over time since ratifying the Kyoto Protocol.[11]

While these jurisdictions can justifiably be seen as bellwethers of climate action, more work is required in certain areas. For example, Germany and the EU are in the process of finalising aspects of their climate legislation. Germany's Climate Action Plan 2050 is – at the time of publication – under discussion.

[11] While noting that these countries may have benefitted from being part of a negotiating bloc.

Table 2. Summary of country ratings

Legend:
Red: inconsistent
Yellow: needs upgrade or insufficient information to judge
Green: consistent

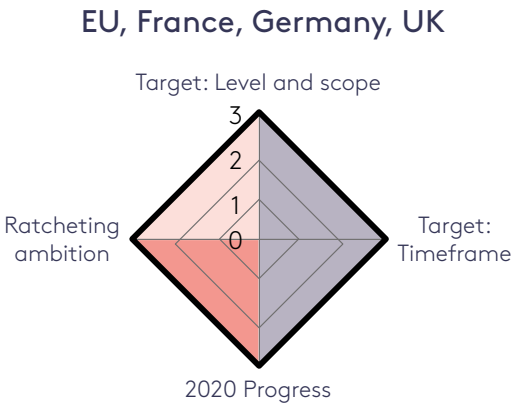
Country	Target: level and scope	Target: timeframe	2020 progress	Ratcheting
Argentina	1	2	0	2
Australia	1	2	1	1
Brazil	2	2	3	3
Canada	1	2	1	1
China	2	2	3	3
EU	3	3	3	3
France	3	3	3	3
Germany	3	3	3	3
Italy	2	2	3	3
India	1	2	3	3
Indonesia	2	2	2	3
Japan	3	3	3	1
Mexico	3	3	1	3
Russia	3	2	3	3
Saudi Arabia	1	2	0	2
South Africa	3	3	2	2
South Korea	2	2	1	3
Turkey	1	2	0	2
United Kingdom	3	3	3	3
USA	1	3	1	1

Furthermore, as a strategic document adopted by the cabinet, the Action Plan would benefit from formalization into law; maximizing its legal strength and limiting the risk of future policy reversal. The EU has set out its plans under the 2030 Framework for Climate and Energy Policies, but the effort sharing decision that determines emissions reduction targets for the individual Member States is still under discussion. The next big challenge for the EU will be ensuring that the Member States agree to and effectively implement their national emissions targets, as well as maintaining the overall integrity of the EU in the face of recent crises (Averchenkova et al., 2016).

Going beyond the indicators assessed in this study, there are additional possible barriers to implementation. For example, the UK's Committee on Climate Change found in its most recent progress report that current policies in the UK are not consistent with meeting its domestic targets for 2030 set under the fourth and fifth carbon budgets (Committee on Climate Change, 2016). More generally, the UK's decision to leave the European Union could affect the ability of EU and the UK to meet their emissions reductions pledges.

Figure 1. Paris consistency monitor: high consistency of domestic action with the key requirements of the Paris Agreement (part 1)

Scale: 0: not applicable; 1: inconsistent; 2: requires upgrade; 3: fully consistent



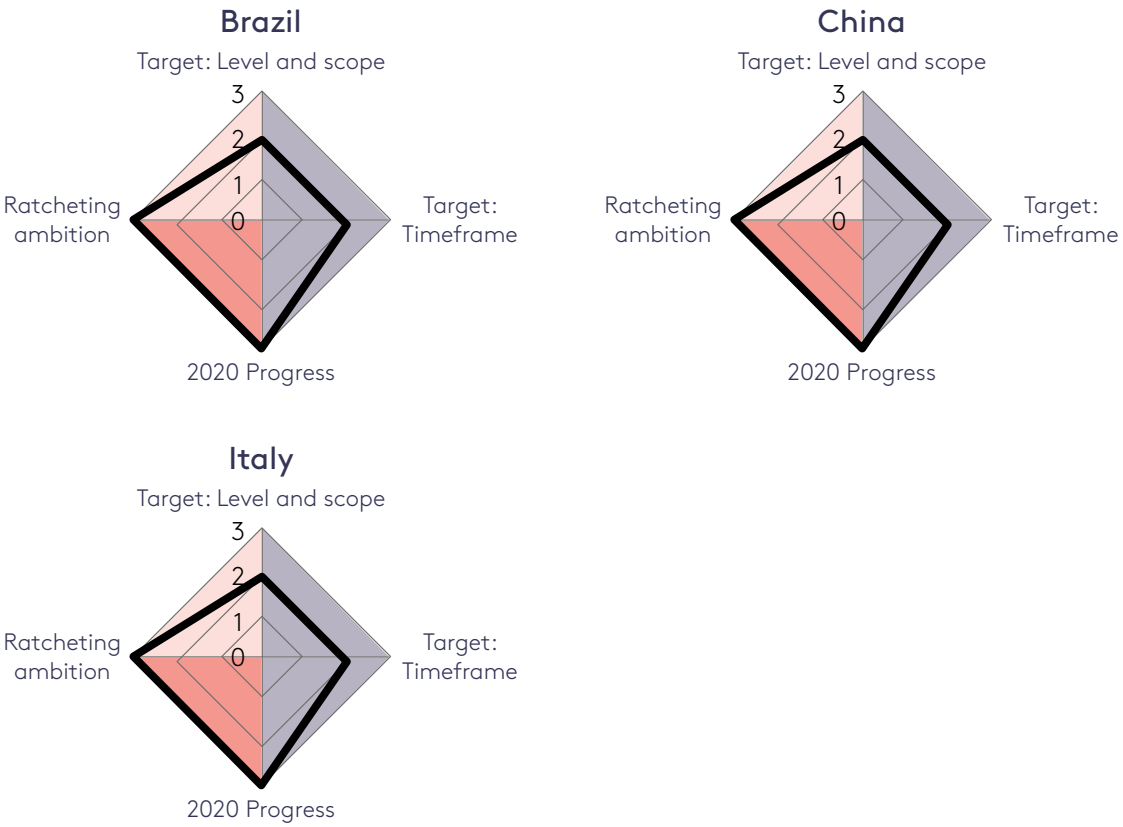
Three further countries – Brazil, China and Italy – perform strongly on the Paris consistency monitor. Their past and present action is broadly consistent with the key requirements of the Paris Agreement: all are on track with implementing their 2020 actions and have continuously ratcheted up ambition in recent years (see Figure 2). However, they still need to update some aspects of their domestic legislation or executive action to bring their national targets into accordance with their NDCs.

For example, all need to update the level and timeframe of their respective national emissions targets to be consistent with their NDCs. China's latest 5-year-plan covers the period until 2020. Brazil's National Policy on Climate Change covers the period until 2020 and uses a business-as-usual baseline rather than the 2005 baseline used in their NDC. Furthermore, both countries' ability to successfully implement the Paris Agreement would be enhanced by stronger decision-making processes that provide greater efficiency, inclusiveness and transparency; and from a stronger environmental and

low-carbon business lobby to hold government to account (Averchenkova and Bassi, 2016). Successful policy implementation in China also depends significantly on securing the cooperation of sub-national government and business enterprises. Devising effective enforcement mechanisms will also be crucial (Averchenkova et al., 2016). Italy needs to update the level and timeframe of its national emission targets in line with its NDCs and could also consider strengthening its overall legislative framework. At present its legislated sectoral targets are combined with an overall non-binding strategic document. A question for further discussion is whether the formalization of the emissions reduction target into legislation would lend additional credibility to its implementation.

Figure 2. Paris consistency monitor: high consistency of domestic action with the key requirements of the Paris Agreement (part 2)

Scale: 0: not applicable; 1: inconsistent; 2: requires upgrade; 3: fully consistent



3.2 Countries where past and present action on climate change is moderately consistent with the key requirements of the Paris Agreement

A larger group of countries – Japan, India, Indonesia, Mexico, Russia, South Africa and South Korea – exhibit mixed performance, with improvement required in more than one area (figure 3).

Most of these countries (with exception of India, Russia and Japan) are behind on their 2020 targets. Others, including Japan, Russia and South Africa have in the past been unable to increase the ambition of their climate action, while India has not provided sufficient information on the baselines for its targets to make a judgement. Japan in particular revised downward its initial 2020 pledge to a less ambitious target, though the recently adopted Cabinet Decision on the Plan for Global Warming Countermeasures affirms the emission reduction target from their NDC and outlines methods for achieving it. South Africa and Russia have maintained targets at similar levels rather than increasing ambition over time.

Several countries need to upgrade the timeframe of their domestic targets to make them consistent with their NDC (India, Russia, South Korea and Mexico). Other countries need to increase the level of their targets (South Korea and Mexico for its conditional target), while India needs both to adjust the level of its domestic target and consider upgrading its scope from sectoral to economy-wide.

Some countries can improve the legislative strength of their targets. Domestic emissions targets in Japan, Russia, Indonesia and South Africa are established through some form of executive order. A relevant question for consideration is whether an executive order is sufficient, or whether putting these targets into law would be desirable to strengthen implementation.

3.3 Countries where past and present action on climate change is largely inconsistent with the key requirements of the Paris Agreement

Finally Argentina, Australia, Canada, Saudi Arabia, Turkey and the United States (US) require improvement on all indicators of the Paris consistency monitor and are clearly falling behind with their national climate mitigation action (figure 4). These countries lack the legislative basis to deliver their NDCs i.e. they lack an overall framework legislation or regulation on climate change and need to move from sectoral to economy-wide targets, as well as adjusting the timeframes of targets. Saudi Arabia, Turkey and Argentina have adopted targets for the first time through their NDCs, so they have some work to do in making their national policy and legislative framework consistent. The US needs to update the scope of its target from sectoral to economy-wide. Furthermore, the US faces political uncertainty over the Clean Power Plan – the executive order that is critical for its ability to implement the Paris Agreement – which is currently under judicial review and could be impeded by its change of President (Averchenkova et al., 2016).

All countries in this group are either behind on meeting their 2020 targets (Australia, Canada and the US), or have not set any. Australia and Canada have a solid framework for developing legislation in principle (Averchenkova and Bassi, 2016), but due in part to political considerations have shown insufficient progress on implementation, as shown in their low scores against the indicators on 2020 progress and ratcheting up ambition.

Finally, Australia, Canada and the US have so far have shown inconsistent progress in ratcheting up their ambition over time. While past track record cannot be held as an indicator of the future performance, these countries will clearly need to give particular consideration to improving their ambition levels in the future.

Figure 3. Paris consistency monitor: moderate consistency of domestic action with the key requirements of the Paris Agreement

Scale: 0: not applicable; 1: inconsistent; 2: requires upgrade; 3: fully consistent
* Mexico's national legislation is consistent with its unconditional target, but would need to be adjusted to meet its conditional target.

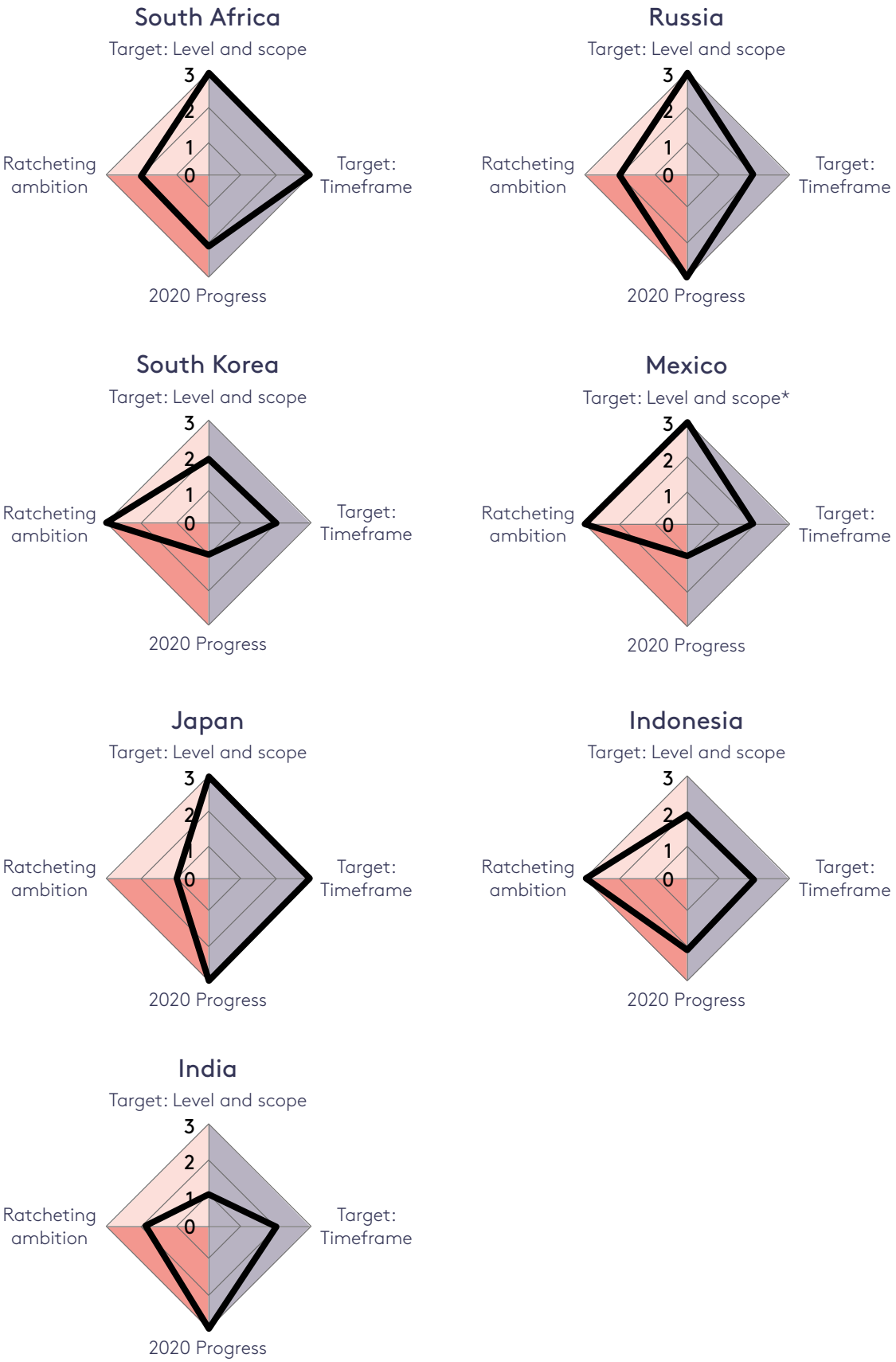
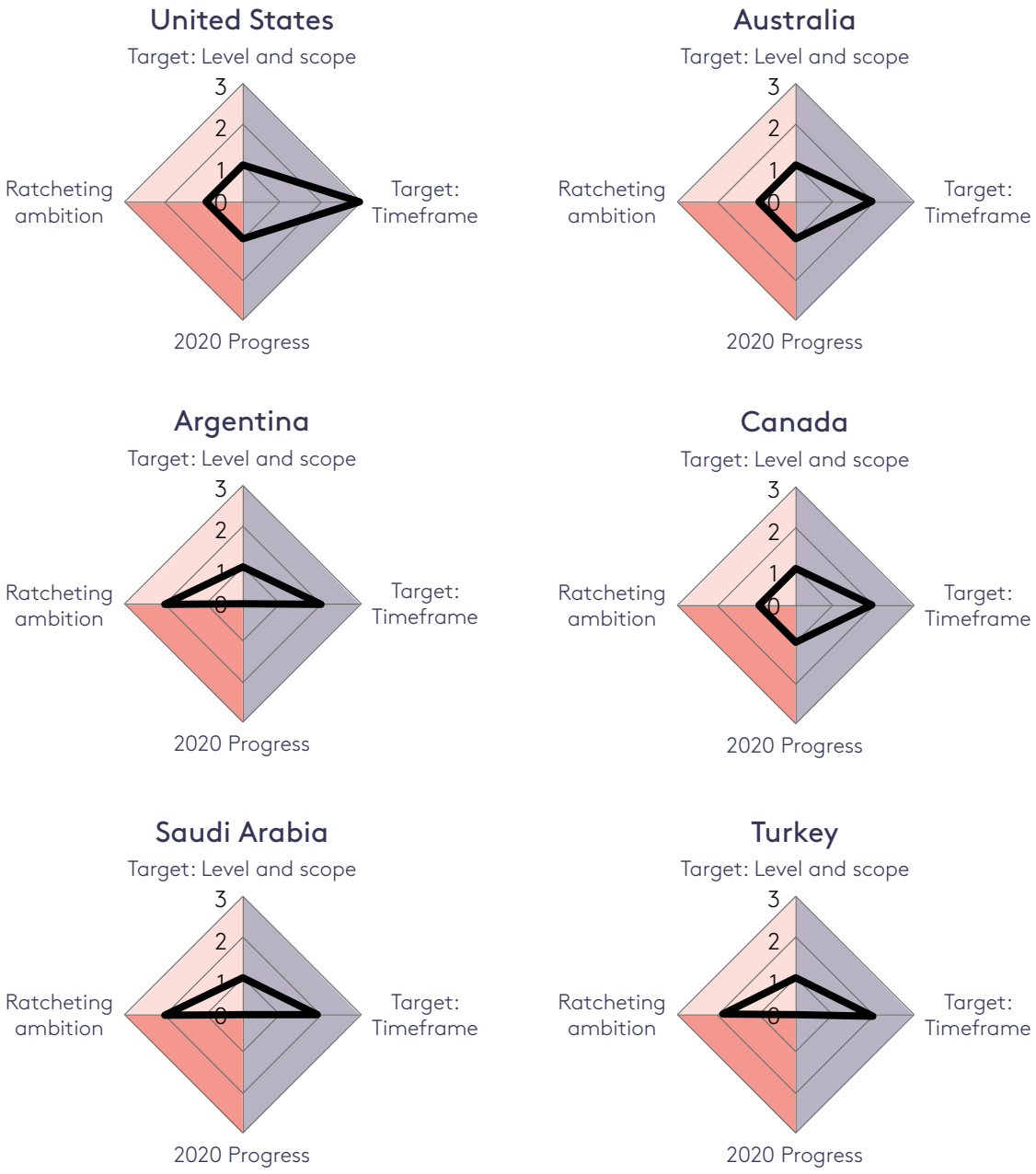


Figure 4. Paris consistency monitor: low consistency of domestic action with the key requirements of the Paris Agreement

Scale: 0: not applicable; 1: inconsistent; 2: requires upgrade; 3: fully consistent



4. Paris consistency barometer

Broad trends in the past and present action of the G20 on climate mitigation and its consistency with meeting the key requirements of the Paris Agreement can be explored using a barometer (Figure 5) that maps the G20's collective emissions reductions target below BAU for 2030[12] (as per their NDC's) against its aggregated performance on the indictors of the Paris consistency monitor.

A traffic light system is used to analyse the information. Red shows the proportion of required emissions reductions where action by G20 countries is inconsistent with the key requirements of the Paris Agreement; yellow shows the proportion of required emissions reductions where action by G20 countries is partly consistent (or there is a lack of information to fully judge) with the key requirements of the Paris Agreement, and green shows the proportion of required emissions reductions where action by G20 countries is consistent with the key requirements of the Paris Agreement. This analysis reveals the following trends:

- Bringing the level and scope of emissions reduction targets into line with NDCs is the area that requires most improvement across the G20. At the time of publication, only 11 per cent of the emissions reductions required were covered by targets with domestic legal and regulatory frameworks that are fully consistent with the NDC targets. The majority of G20 countries need to upgrade the level or scope of their domestic emissions reduction targets.

- Only one-third of emission reductions are covered by targets with a timeframe up to 2030. Two-thirds of emissions reductions are covered by targets where the timeframe needs updating, in most cases adjusting the domestic target from 2020 to 2025 and 2030.

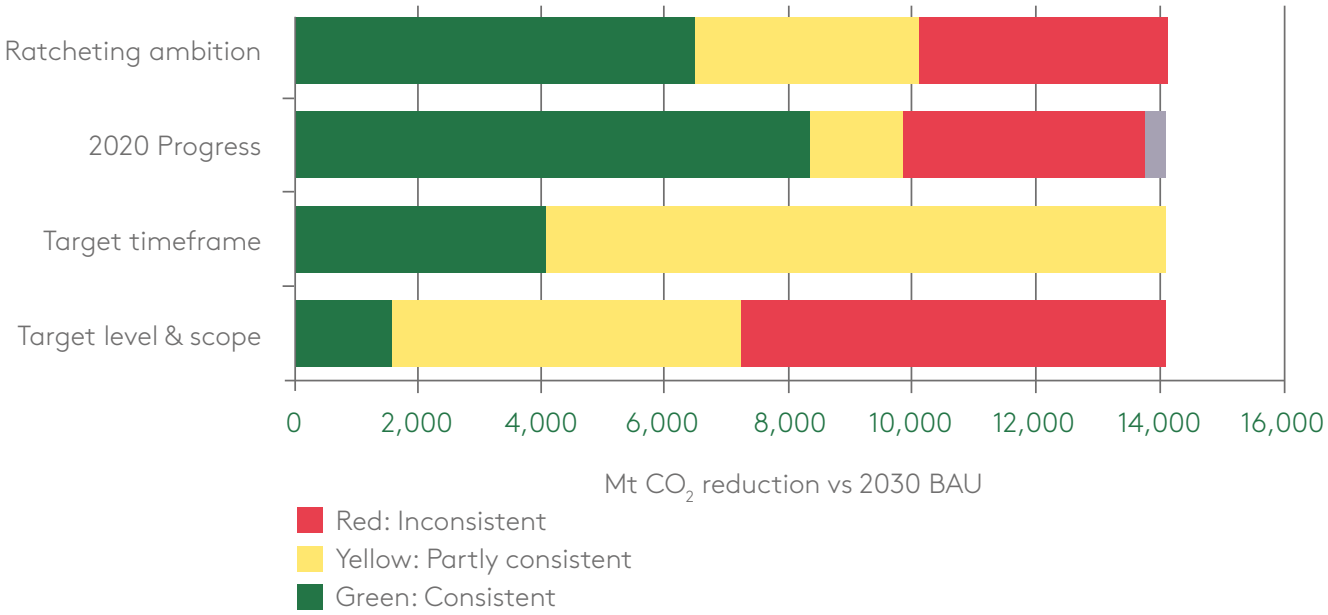
- Performance on meeting 2020 targets is mixed. 65 per cent of emissions reductions are attributable to G20 countries that are on track with the implementation of their 2020 targets. But about 25 per cent of emission reductions pledged by 2030 are expected to be delivered by G20 countries that are already behind on meeting their 2020 targets.

- Reassuringly, G20 countries have a good track record of ratcheting up the ambition of climate policy. Most countries have been increasing or at least maintaining the level of their ambition over time. Notably, on average, countries track record of increasing their ambition over time is stronger than the track record of delivery on that ambition, as reflected in the progress towards meeting 2020 targets. This would suggest that going forward countries will need to put greater emphasis on ensuring credible implementation.

[12] For the full details on how these estimates were calculated, please see Annex 2 of Averchenkova and Bassi (2016).

Figure 5. Paris consistency monitor for G20: Barometer

Source: Authors' calculations; based on estimated emissions reductions calculated in Averchenkova and Bassi, 2016 (Annex 2) and Boyd et al, 2015. In the case of India, for which calculations of 2030 BAU emissions and subsequent reductions have varied (see UNEP 2015 for a range of the calculations), the BAU level recently calculated in Frank (2016) was used.



5. Conclusions and policy implications

The Paris Agreement sets out a number of key requirements for national mitigation actions. All countries must successfully implement the targets outlined in their nationally determined contributions (NDCs); meet emissions reduction targets for 2020, and ratchet up the ambition of their mitigation actions over time.

This analysis explores the consistency of past and present climate mitigation actions by the G20 countries with these requirements. It finds that the climate action of only four G20 jurisdictions (EU, UK, Germany and France) can be considered to be fully consistent with the key requirements of the Paris Agreement. However, it should be noted that all these jurisdictions will have to increase their domestic efforts to meet the global objective of keeping global temperature rise this century well below 2 degrees Celsius and to pursue efforts to limit such increase to 1.5 degrees Celsius compared to pre-industrial levels.

As countries move towards implementation of the agreement they will need to assess their domestic policy and legislative frameworks to identify upgrades that may be necessary to the level, timeframe or scope of their targets. A year on from the adoption of the Paris Agreement only a handful of the G20 countries can be considered to be on track with implementing domestic legislation and regulatory frameworks consistent with their NDCs. The majority of countries still need to upgrade (or adopt for the first time as in the case of Saudi Arabia) their domestic emissions targets in line with the targets they committed to in their NDCs.[13] A number of countries[14] will need to update the timeframes of their domestic emission targets in line with those communicated in the NDCs, while some countries, such as the United States (US), will also need to update their NDCs to include an emissions target for 2030. Several countries, including India, the US, Argentina, Australia, Canada and Saudi Arabia have sectoral targets enacted in domestic legislation and executive action, and may need to examine whether their sectoral policies will be sufficient to meet their emissions targets, or whether they would benefit from having an economy-wide target that is consistent with their respective NDCs. Accordingly, specific policies underlying the emissions targets will need to be reviewed and adjusted.

Half of the G20 countries are on track to successfully meet their 2020 emissions targets. For two countries – South Africa and Indonesia – it is hard to assess due to a lack of official data and differing estimates in independent analysis, while five G20 countries – US, Mexico, Australia, South Korea, and Canada – are estimated to be behind on reaching their 2020 targets. Argentina, Saudi Arabia and Turkey have not made such pledges at all. This track record is particularly worrying given that, as noted in the provisions

[13] Including Brazil, China, India, Italy, South Korea, US, Indonesia, Argentina, Australia, Canada and Saudi Arabia.
[14] Namely Brazil, China, India, Italy, Russia, South Korea, Mexico, Indonesia, Argentina, Australia, Canada and Saudi Arabia.

of the Paris Agreement, current 2020 ambition is not sufficient to meet the temperature target and needs to be enhanced. Furthermore, the success of the 2020 efforts is important for the subsequent effective implementation of the 2030 targets. Hence there is an urgent need for policy-makers to step up the implementation efforts for the 2020 targets while moving ahead with the preparations for the implementation of the 2030 targets communicated in NDCs.

Past performance shows that many G20 countries have successfully ratcheted up the ambition of their mitigation action overtime (based on pledges made at Kyoto and subsequently at Copenhagen and/or Cancun). A historic look at the ambition of G20 countries' on climate change mitigation action shows that while overall they have been increasing their ambition levels over time, there are four industrialised countries – Australia, Canada, Japan, and the US – that have an unsatisfactory track record in this respect. Furthermore, a number of countries, including India, have not been providing sufficient information on the key underlying assumptions for their targets (e.g. baseline levels and BAU projections) making it difficult to assess the level of ambition over time. Given the requirement of the Paris Agreement to ratchet up ambition it is important for countries to not only increase their ambition, but also to provide sufficient information for the international community to be able to assess and recognise their efforts.

While this analysis focused on the G20 countries, the Paris consistency monitor tool can be applied to any other jurisdictions. Going forward it could be expanded to include an assessment of the consistency of national ambition level with the long-term global goal of keeping temperature increase to 2 or 1.5 degrees and with the requirement to peak greenhouse gas emissions as soon as possible. It could also be augmented to take into account features of the national political processes and debate on climate change, as well as well arrangements for monitoring, reporting and verifying emissions, which will be vital for implementing and increasing emissions reductions targets in the future.

Appendix 1: Detailed methodology

The methodology used for the indicators introduced in section 2 are explained in more detail below, specifically the scoring system used to assign the G20 countries to the categories of green (consistent), yellow (needs upgrade or insufficient information to judge), and red (inconsistent).

Consistency of domestic emissions target with NDCs

This indicator is assessed against two assessment metrics: consistency of the level and scope of domestic targets and consistency of their timeframe with those communicated in the NDCs. They focus on "legislative acts, which were passed by a parliament or equivalent legislative authority" and "executive instruments (e.g. presidential decrees, executive orders, government policies or plans), which were passed or decreed by the government, president or equivalent executive authority", (as defined by Nachmany et al., 2015).

1. Consistent level and scope of domestic target

The metric 'consistent level and scope of target' assesses whether the level of emissions targets legislated or put into executive action domestically is consistent with that specified in the NDC.

As shown in detail in Table 2 below, the G20 countries fall into one of three categories:

- the NDC is expressed as an economy-wide target (which in some cases is also augmented by sectoral targets) but no domestic economy-wide mitigation target is specified via legislative act or executive instrument *(inconsistent scope of the target* -**red**);

- the domestic legislative act or executive instrument specifies an economy-wide mitigation target, but this target needs to be upgraded or modified because it is inconsistent with the level expressed in the NDC. This includes cases, for example, where the legislated level of the emissions reduction needs to be increased, or a BAU emission baseline needs to be changed to an absolute baseline *(consistent scope, but inconsistent level* – **yellow**);

- the level of the mitigation target specified in legislative act or executive instrument is either consistent or above the level specified in the NDC *(consistent scope and level* -**green**).

It is important to note that this analysis concerns *consistency* between the domestic legislative acts or executive instruments with the level of target in the NDCs only. It does not assess the *adequacy* of the national policy in order to meet the NDC. For example, a country that has a national emissions target may still need to strengthen its underlying sectoral policies in order to meet it. On the other hand, a country that has sectoral policies only may still be able to meet its emissions reductions targets.

Table 1. Scoring system for 'Consistent level and scope of domestic target'

Comparison of national action and NDC	Countries	Target: level and scope Categorization
NDC specifies an economy-wide mitigation target, and domestic legislation or executive instrument also specifies an economy-wide mitigation target at the same or a higher ambition level.	EU, France, Germany, Japan, Mexico, Russia, South Africa, UK	3 – scope and level are consistent
NDC specifies an economy-wide mitigation target, and domestic legislation or executive instrument also specifies an economy-wide mitigation target but at a lower/less ambitious level than the one specified in the NDC.	Brazil, China, Italy, Indonesia, South Korea	2 – consistent scope, but level needs to be updated
NDC specifies an economy-wide mitigation target, while domestic legislation or executive instruments express sectoral targets only.	Argentina, Australia, Canada, India, Saudi Arabia, Turkey, US	1 – inconsistent scope

2. Consistent timeframe

As shown in Table 3 below, the 'consistent timeframe' metric assesses whether the timeframe for achieving the emissions reductions legislated or put into executive action domestically is consistent with what has been specified in the NDC, according to one of three categories:

- no timeframe specified in national legislation or executive instruments (**red**);
- needs to be updated (for example a 2025 domestic target needing to be upgraded to match the 2030 target specified in the NDC) (**yellow**);
- or consistent with the NDC (**green**).

Table 2. Scoring system for 'consistent timeframe of domestic target'

Comparison of national action and NDC	Countries	Target: timeframe Categorization
NDC and national action (legislative or executive) are specified on the same timeframe	EU, France, Germany, Japan, South Africa, UK, US	3 – consistent
National action (sectoral or economy-wide) specifies a different timeframe from the NDC	Argentina, Australia, Brazil, Canada, China, Italy, India, Indonesia, Mexico, Russia, Saudi Arabia, South Korea, Turkey	2 – timeframe is defined but needs to be extended in national action
National action does not define a timeframe for achieving sectoral or economy-wide targets	N/A for G20 countries	1 – no timeframe defined in national action

Progress towards meeting 2020 targets

Assessing the 'progress towards meeting 2020 targets' is primarily based on UNEP's Emissions Gap report from December 2015. Drawing from official data provided by the relevant country as well as independent analyses (primarily den Elzen, 2015; Climate Action Tracker, 2015) and in some cases country-specific data, the UNEP report qualitatively describes the meta-analysis of countries' progress towards their 2020 targets. For the purposes of the Paris consistency monitor, these broad categories described by UNEP were then converted into a scale according to the following categories:

- on track to meet 2020 targets according to independent analysis (**green**);
- independent analysis differs in whether the country is on track to meet its 2020 targets (**yellow**);
- likely to require further action to meet 2020 targets, according to independent analysis (**red**).

Table 3. Scoring system for 'Progress towards meeting 2020 targets'

UNEP assessment	Countries	Paris Monitor Categorization
Broadly on track according to all analyses	China, EU, India, UK, Germany, France, Italy	3 – On track according to meet 2020 targets according to independent analysis
On track according to most estimates and within 1-3% of pledge level according to all estimates	Brazil, Japan, and Russia	3 – On track according to meet 2020 targets according to independent analysis
Independent analyses differ on whether the country is on track to meet its 2020 pledge, and there is no official data.	South Africa and Indonesia	2 – Independent analysis differs in whether the country is on track to meet its 2020 targets
Likely to require further action according to both government and independent estimates	Canada and Mexico	1 – likely to require further action to meet 2020 targets, according to independent analysis
Likely to require further action according to independent analysis, but official data was unavailable	South Korea	1 – likely to require further action to meet 2020 targets, according to independent analysis
independent analyses agree that the further action will be required but as of the time of publication, official government status was that the country was on track to meet its commitments	US and Australia	1 – likely to require further action to meet 2020 targets, according to independent analysis
Did not submit a 2020 GHG reduction pledge	Argentina, Saudi Arabia, Turkey	0 – did not submit a 2020 GHG reduction pledge

The UNEP categorization assessed the EU as a whole, so the EU Commission's country-level report on progress towards 2020 targets (Djikstra, L. and Athanasoglou, S., 2015) was used to assess progress in Germany, France, Italy, and the UK, which found that all four were on track to meet their commitments under the EU.

Past performance on ratcheting up the ambition of emissions reduction targets

As set out in detail in Table 4, the authors examined the 2012 targets submitted under the Kyoto Protocol; the 2020 targets pledged in the UNFCCC meetings in Copenhagen, Cancun, and/or Warsaw; and the NDCs submitted under the Paris Agreement[15] and categorized the G20 countries as follows:

- countries that have decreased their level of ambition at any point in time or withdrawn from a treaty (Kyoto Protocol) (**red**);
- countries where the level of emissions reductions pledged has remained at the same level over time cannot be fully assessed (**yellow**);
- or countries where the level of the mitigation objective or emission target has consistently increased over time (**green**).

Countries that had not previously made an emissions reductions pledge were assigned to the second category (yellow; could not be fully assessed), as there is only one historical data point and so the overall trend could not be assessed.

An important note is that this indicator does not seek to show whether the emissions pledges are sufficiently ambitious in and of themselves with regards to meeting a 1.5-2 degree target, but rather whether they have increased the level of their targets over time.

[15] Based on pledges submitted to the UNFCCC and CAT (2015), where specified

Table 4. Explanation of scoring system for 'Past performance on ratcheting up the ambition of emissions reduction targets'

Performance	Countries and targets	Ratcheting Categorization
Emissions reductions targets have increased over time compared to a consistent reference year.	EU: 2012 target: 8% below 1990 levels 2020 target: 20% below 1990 levels 2030 target: 40% below 1990 levels	3 – increase in ambition over time
Emissions intensity target has increased over time compared to a consistent reference year, in addition to additional pledges being made.	China: 2020: 40-45% reduction in CO_2 emissions per unit of gross domestic product (GDP) from 2005 level 2030: 60-65% reduction of emissions intensity on 2005 levels by 2030; pledge to source 20% of its energy from low-carbon sources by 2030.	3
Country has increased the stringency of its target.	Brazil: moving from a target relative to BAU, to an absolute target. 2020 target: 36.1-38.9% below business-as-usual projected emissions level in 2020. 2030 target: A 37% reduction in emissions by 2025, compared to 2005 levels, with a further indicative target of a 43% reduction in emissions by 2030. Mexico: moving from a conditional to an unconditional target. 2020: conditional pledge of30% below business-as-usual projected emissions in 2020, subject to provision of adequate support. 2030: Unconditional 25% reduction in greenhouse gases and short lived climate pollutants from a business-as-usual scenario by 2030, which would rise to 40% subject to the outcome of a global climate deal with adequate provisions in "international carbon price, carbon border adjustments, technical cooperation, access to low-cost financial resources and technology transfer."	3
Targets have increased over time relative to a country-defined BAU scenario.	Indonesia: 2020: 26% below business-as-usual projected emissions in 2020 2030: A 29% reduction relative to BAU in 2030, and may increase its reduction goal to 41%, conditional on support from international cooperation. South Korea: 2020: 30% below business-as-usual projected emissions in 2020. 2030: A 37% reduction on business-as-usual emissions, where the NDC states the BAU scenario would be 850.6 Mt CO_2 equivalent in 2030.	3
Ambiguous whether ambition has increased over time.	Russia: While the general trend is greater reductions relative to 1990, the upper limit of their 2020 target is the lower limit of their 2030 target. In addition, the collapse of the Soviet Union meant that emissions declined precipitously post 1990, such that their emissions are still projected to increase under the current pledges. 2012: capped at 1990 levels 2020: 15-25% below 1990 levels 2030: 25-30% below 1990 levels	2 – emissions pledges have remained at the same level over time or cannot be assessed
Difficult to judge whether targets have increased over time because of a lack of data from the base year of comparison.	India: While there is an overall trend in improving emission intensity of the GDP over time relative to the same base year of 2005, the government has not stated the level of emissions intensity in 2005 for any of the pledges, which makes it difficult to assess definitively progress on increasing ambition over time. 2020 target: 20-25% reduction in emissions per unit of GDP (excluding agriculture sector) from 2005 level 2030 target: 33-35% reduction in emissions intensity compared to 2005 levels, plus a pledge to achieve 40% of cumulative electricity installed capacity from non-fossil fuel based resources by 2030 and increase tree cover.	2 – emissions pledges have remained at the same level over time or cannot be assessed

Table 4. Explanation of scoring system for 'Past performance on ratcheting up the ambition of emissions reduction targets' (continued)

Performance	Countries and targets	Ratcheting Categorization
Difficult to judge whether targets have increased over time because the baseline has changed and the target is defined as a range.	South Africa: Changed from an emission reduction target relative to BAU to a plan to peak between 2020 and 2025, with a range of targets for 2025 to 2030. This is perhaps best seen as a lateral move, comparing a precise target based on a changeable baseline (BAU) to a larger but precisely defined range and promise to peak. Depending on the BAU projection, the actual emissions levels from the 2020 target seem to fall within the range defined in the 2030 target (around 464 to 494, if BAU -- as it appears to be in the South African government's Long Term Mitigation Scenario -- has emissions between 800-850). 2020: 34% below business-as-usual projected emissions in 2020 2030: Aims to peak between 2020 and 2025, plateau for roughly a decade and then start to fall. Emissions during 2025-2030 will be in the range 398-614 million tonnes of CO_2 equivalent, including land and all sectors of the economy.	
Have not previously submitted a GHG emissions pledge, so there is no trend data to analyse.	Argentina, Turkey, Saudi Arabia	2 – emissions pledges have remained at the same level over time or cannot be assessed
Country has withdrawn from or did not ratify the Kyoto Protocol	Canada 2012 target: withdrew from Kyoto Protocol 2020: 17% below 2005 levels by 2020 [equivalent to 7% above 1990 levels] (CAT, 2015) 2030: A 30% reduction on 2005 greenhouse gas emissions, by 2030 [equivalent to -8% on 1990] (CAT, 2015) United States: 2012: did not ratify Kyoto Protocol 2020: In the range of 17% below 2005 levels by 2020 2030: 26-28% domestic reduction in greenhouse gases by 2025 compared to 2005, making its best effort to reach the 28% target	1 – inconsistent performance or decreased their level of ambition
Country has at some point decreased its targeted emissions reductions.	Australia: 2012: 8% above 1990 levels 2020: 5% below 2000 levels, which is equivalent to 26% above 1990 levels (CAT, 2015). 2030: A 26 to 28% reduction in emissions by 2030 relative 2005 levels: equivalent to -5% to 5% of 1990 levels (CAT, 2015) Japan 2012: 6% below 1990 levels 2020: 3.8% below 2005 levels, which is equivalent to 5.2% above 1990 levels (CAT, 2015). 2030: A 26% reduction in emissions on 2013 levels, which is equivalent to 18% below 1990 levels (CAT, 2015).	1 – inconsistent performance or decreased their level of ambition

Appendix 2: National legislation or executive instruments

Drawing from the Climate Legislation Database (Nachmany et al., 2015), the below shows which framework legislation or executive action was included in our analysis, representing – to the best of the authors' knowledge – the most recent and/or relevant national action at the time of publication. In the case where an economy-wide emissions target was not present, the most relevant sectoral targets and legislation were included.

Country	Framework Legislation considered in analysis
Argentina	No framework legislation, latest significant legislation is Law 27191 on Renewable Energy (2015)
Australia	Carbon Farming Initiative Amendment Bill 2014 (2014)
Brazil	The National Policy on Climate Change (2009)
Canada	Canadian Environmental Protection Act, Energy Efficiency Act, Heavy-duty Vehicle and Engine Greenhouse Gas Emission Regulations P.C. 2013-160 (2013). There are also some actions being undertaken on a subnational level (Ontario, Quebec, British Columbia).
China	The National Plan to Address Climate Change (2014-2020); 13th Five Year plan
EU	The 2030 Framework for Climate and Energy Policies
France	Grenelle I and II; National Programme for Tackling Climate Change; Law N° 2015-992 on Energy Transition for Green Growth.
Germany	Action Programme on Climate Protection 2020; Climate Action Plan 2050
Italy	Climate Change Action Plan; National Energy Strategy (Interministerial Decree of 8 March 2013)
India	National Action Plan on Climate Change (NAPCC) (2008)
Indonesia	Presidential Decree 61/2011, National Action Plan to reduce GHG emissions (RAN-GRK)
Japan	Law Concerning the Promotion of the Measures to Cope with Global Warming (Act on Promotion of Global Warming Countermeasures) (Law No. 107 of 1998); May 2016 Cabinet Decision on the Plan for Global Warming Countermeasures.
Mexico	2012 General Law on Climate Change; 10-20-40 National Climate Change Strategy.

Country	Framework Legislation considered in analysis
Russia	Greenhouse Gas Emission Reduction (Presidential Decree 752)
Saudi Arabia	National Energy Efficiency Programme 2008; Royal Decree establishing King Abdullah City for Atomic and Renewable Energy 2010
South Africa	National Climate Change Response Policy White Paper (NCCRP)
South Korea	Framework Act on Low Carbon Green Growth, regulated by Enforcement Decree of the Framework Act on Low Carbon Green Growth, (2010)
Turkey	Act No. 5346 on Utilization of Renewable Energy Sources for the Purposes of Generating Electrical Energy (Renewable Energy Law), (2005); Climate Change Action Plan 2011-2023
United Kingdom	2008 Climate Change Act; 5th Carbon Budget
USA	Clean Air Act; Climate Action Plan; Clean Power Plan

References

Averchenkova, A. and Bassi, S., 2016. Beyond the targets: assessing the political credibility of pledges for the Paris Agreement. [pdf] London: Centre for Climate Change Economics and Policy and Grantham Research Institute on Climate Change and the Environment. Available at: http://www.lse.ac.uk/GranthamInstitute/publication/beyond-the_targets/

Averchenkova, A., Bassi, S., Benes, K., Green, F., Lagarde, A, Neuweg, I. & Zachmann, G., 2016. Climate policy in the United States, China and the European Union: Main drivers and prospects for the future? Policy brief. London: ESRC Centre for Climate Change Economics and Policy and Grantham Research Institute on Climate Change and the Environment at the London School of Economics.

Boyd, R, Cranston Turner, J. and Ward, B., 2015. Tracking intended nationally determined contributions: what are the implications for greenhouse gas emissions in 2030? Policy paper. [pdf] London: Centre for Climate Change Economics and Policy, Grantham Research Institute on Climate Change and the Environment. Available at: http://www.lse.ac.uk/GranthamInstitute/publication/intended-nationally-determined-contributions-what-are-the-implications-for-greenhouse-gas-emissions-in-2030/

Climate Action Tracker, 2015. Rating countries. [html] Available at: http://climateactiontracker.org/countries.html

Committee on Climate Change, 2016. Meeting Carbon Budgets–2016 Progress Report to Parliament. [pdf] London: Committee on Climate Change. Available at: https://www.theccc.org.uk/publication/meeting-carbon-budgets-2016-progress-report-to-parliament/

Djikstra, L. and Athanasoglou, S., 2015. The Europe 2020 Index: The Progress of EU Countries, Regions, and Cities to the 2020 Targets. [pdf] Brussels: European Commission. Available at: http://ec.europa.eu/regional_policy/sources/docgener/focus/2015_01_europe2020_index.pdf

Frank, C., 2016. India: Potential for Even Greater Emissions Reductions. Brookings Institution. [pdf] Available at: https://www.brookings.edu/wp-content/uploads/2016/08/global_20160818_cop21_india.pdf

Ministry of the Environment, 2016. Cabinet Decision on the Plan for Global Warming Countermeasures. [html] Tokyo: Government of Japan. Available at: https://www.env.go.jp/en/headline/2238.html

Nachmany, M., Fankhauser, S., Davidová, J., Kingsmill, N., Landesman, T., Roppongi, H., Schleifer, P., Setzer, J., Sharman, A., Singleton, C.S., Sundaresan, J. and Townshend, T., 2015. The 2015 Global Climate Legislation Study – A Review of Climate Change Legislation in 99 Countries. [pdf and html] London: Grantham Research Institute on Climate Change and the Environment, Globe and Inter Parliamentary Union (IPU). Available at: http://www.lse.ac.uk/GranthamInstitute/wp-content/uploads/2015/05/Global_climate_legislation_ study_20151.pdf

United Nations Environment Programme (UNEP), 2015. The Emission Gap Report 2015 – Executive Summary. [pdf] Nairobi: UNEP. Available at: http://uneplive.unep.org/media/docs/theme/13/EGR_2015_ES_English_Embargoed.pdf

United Nations Framework Convention on Climate Change (UNFCCC), 2008. Kyoto Protocol: Targets for the first commitment period. [html] Available at: http://unfccc.int/kyoto_protocol/items/3145.php

United Nations Framework Convention on Climate Change (UNFCCC), 2009. Appendix I – Quantified economy-wide emissions targets for 2020. [html] Available at: http://unfccc.int/meetings/copenhagen_dec_2009/items/5264.php

United Nations Framework Convention on Climate Change (UNFCCC), 2015a. INDCs as communicated by Parties. [html] Available at: http://www4.unfccc.int/submissions/indc/Submission%20Pages/submissions.aspx

United Nations Framework Convention on Climate Change (UNFCCC), 2015b. Report of the Conference of the Parties on its twenty-first session, held in Paris from 30 November to 13 December 2015. FCCC/CP/2015/10/Add.1. [pdf] Bonn: UNFCCC. Available at: http://unfccc.int/resource/docs/2015/cop21/eng/10a01.pdf

WRI, 2014. Climate Analysis Indicators Tool: WRI's Climate Data Explorer. Washington DC: World Resources Institute.

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