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Climate change in COP 22: irreversibility of action and rulebook development despite the elephant in the room

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Theme

The design of the Paris Agreement set the stage for a technical meeting in COP 22 but the stakes were raised in the aftermath of the US election. The rapid entry into force of the Paris Agreement has accelerated the development of the Paris rulebook that is expected to be finalised in 2018. Implementation, increased ambition and a just transition are the pending tasks in the minds of negotiators amid statements of the irreversibility of climate action.

Summary

Since the adoption of the Paris Agreement the world of climate politics and policies has experienced a year of accelerated change. Scientific data on ever-increasing temperatures, evidence of our limited mitigation, adaptation and finance actions, a rapidly changing energy landscape, the UK vote to leave the EU, the adoption of the Kigali Amendment to the Montreal Protocol, the establishment of a Global Market- based Measure (GMBM) under the International Civil Aviation Organisation (ICAO), the entry into force of the Paris Agreement and the US elections have all kept the climate community busy prior to the climate meeting in Marrakech.

After the political climax in Paris, and given the design of the Paris Agreement, COP 22 was expected to be a technical meeting. Progress was indeed made as regards the initial understanding of countries' positions, processes and plans. And, for the first time after a big negotiating breakthrough such as that opened up by the Paris Agreement, there was no major backtracking or re-opening of the agreed text.

The unexpectedly fast entry into force of the Paris Agreement has led to an accelerated roadmap for the development of the Paris rulebook that will govern international climate action in the post Kyoto-Protocol era. Hence, the transitional period from ratification to implementation and rule development will be necessarily short. Some may argue that excessively so, as agreeing on the entire set of rules for a permanent climate governance system is likely to be a complex endeavour that could benefit from a longer development timeframe.

Other interesting developments announced at the Marrakech climate meeting, aside from the political declaration (the Marrakech Action Proclamation for our Climate and Sustainable Development) include: the Partnership for Global Climate Action that seeks to engage Parties and non-Parties in pre-2020 action (in the absence of a Doha Amendment entry into force); the 2050 Pathways Platform to foster the development of deep decarbonisation initiatives across sectors; and the Climate Vulnerable Forum

Vision, where 48 climate vulnerable developing countries from Africa, Asia, the Caribbean, Latin America and the Pacific have pledged to go 100% renewable. Finally, there is a joint declaration to develop a Roadmap for Sustainable Electricity Trade between Morocco, Portugal, Spain, France and Germany.

Analysis

Context

This section will discuss the contextual factors that preceded COP 22 in Marrakech. These include: the scientific data available as regards climate change; the insufficient advances in mitigation commitments compared to our 2ºC benchmark as well as our insufficient adaptation finance efforts; a brief reflection on the changing narrative of the economics of climate change since the publication of the Stern Review 10 years ago; advances in the competitiveness and deployment of renewable energy; unforeseen political events; citizen views on climate change; and climate and related agreements since the adoption of the Paris Agreement.

(1) Science

Scientific information regarding climate change in 2016 has not been positive. In July NASA reported that the first six months of the year had been the hottest on record since 1880. Additionally, Arctic sea ice had reached its lowest extent for five out of the six first months in 2016 since records began in 1979 (NASA, 2016). By mid-November the Washington Post reported that Arctic scientists were warning that mean temperatures in that area were a staggering 20ºC warmer than usual (Mooney & Samenow, 2016). These and other (more contested and alarming) findings (see Hansen *et al.*, 2016) come after the Intergovernmental Panel on Climate Change, IPCC's Fifth Assessment report that warned that climate change is unequivocal, with a clear anthropogenic component and already affecting humans and ecosystems alike (IPCC, 2014).

(2) Commitments and gaps: mitigation and adaptation finance

In terms of progress made towards our temperature goal, the United Nations Environmental Program (UNEP) emissions gap reports have been telling us since 2010 that there is a wide and non-diminishing gap[1] between our commitments and a pathway consistent with a 2ºC target (see UNEP, 2010; UNEP, 2011; UNEP, 21013; UNEP, 2014; UNEP, 2015; and UNEP, 2016b). In fact, the 2016 Emission Gap Report (UNEP, 2016b) warns that climate action both pre-2020 and pre-2030 has to be significantly ramped up to meet our goals. This is so because full implementation of the INDCs will overshoot our 'well below' 2ºC by over one degree centigrade (UNEP, 2016b).

As regards action to bridge the emissions gap, the latest UNEP report recommends further improvements in energy efficiency in the building, transport and industrial sectors. In the building sector, building energy codes and energy certificates are recommended.

[1] The emissions gap for 2030 is currently 12GTCO$_2$e to 14 GtCO$_2$e for 2°C scenarios and 3 GtCO2e larger for 1.5ºC scenarios according to UNEP (2016b).

At an industry level the adoption of energy management systems and standards should be pursued. On the transport front the report focuses on improving vehicle efficiency, promoting electric mobility[2] and improving logistics.

Additionally, UNEP (2016b) underlines that despite the added complexity of including non-state actors in the calculations (due to the uncertainty about the additionality of their actions, accounting concerns and questions regarding potential overlaps with actions by other institutions), their role is essential to achieve a low carbon transition. What is more, actions by non-state actors can additionally help mobilise policy makers towards the implementation of increasingly ambitious climate policies.

Key to the lasting engagement of developing countries in the fight against climate change is the availability of climate finance. In fact, many of the NDCs are conditional (or contain conditionality clauses) on the availability of finance in their commitments. To help evaluate the adaptation aspect of finance, the second iteration of the Adaptation Finance Gap Report (UNEP, 2016c) analyses adaptation costs, the finance available to cover these costs and the gap between the two. Despite the need for further information and despite the various methods used to account for adaptation costs, the report offers a range of adaptation cost estimates based on existing studies. These adaptation costs range from US$140 billion to US$300 billion by 2030 and from US$280 billion to US$500 billion in 2050. Total adaptation finance amounted to US$25 billion in 2014. UNEP (2016c) estimates that avoiding the adaptation gap in 2030 would require multiplying available finance from developed to developing countries by six to 13 in 2030 and by 12 to 22 in 2050.

(3) Economics: from costs to opportunities

As for the economics of climate change, 2016 marks the 10th anniversary of the release of the Stern Review. As Lord Stern recently stated (see Stern, 2016, and Stern, 2006), the key messages, that have arguably stood the test of time, were:

- Climate change is a global threat, affecting the poor and most vulnerable disproportionately.
- Climate change is the largest externality (market failure) we have ever experienced but there is still time for tackling the problem before the worst consequences hit.
- The cost of inaction significantly exceeds the cost of action[3] although large uncertainties existed as regards these costs at the time the Stern Review was released.

[2] For instance, Canada, China, France, Japan, Norway, Sweden, the UK and the US announced their pledges to increase electric vehicles in government fleets through the Government Fleet Declaration during COP 22.

[3] Provided assumptions on ethics and discount rates were aligned with the choices made in the Stern Review.

- Prompt action is strongly recommended.
- Policies can yield promising results, especially if concerted global climate action is forthcoming.
- Proactive adaptation should be considered as a priority given the inevitability of the consequences of the change in climate already built into the system.

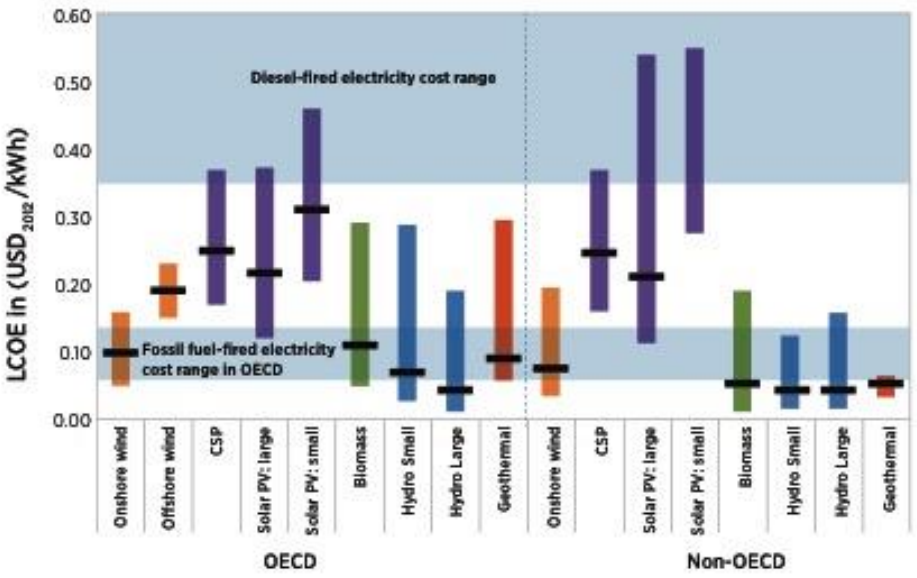
After the academic debates on the results of the Stern Review (Tol & Yohe, 2006; Carter *et al.*, 2006; Byatt *et al.*, 2006; Nordhaus, 2007; and Dietz, Hope, Stern & Zenghelis, 2007) and the subsequent analyses on model limitations (Stern, 2013), uncertainties and fat-tail probability distributions of climate damages –plus the limits these may imply for the use of cost benefit analysis (Weitzman 2009, 2010; and Pyndick, 2011)– the economic narrative on the reasons for climate action (see Dell. *et al.*, 2011; Burke *et al.*, 2015; and Wagner & Weitzman, 2015) strengthened in the public eye. This narrative also morphed from emphasising the cost of action *versus* inaction into emphasising the opportunities of climate action, while acknowledging some additional upfront investment costs will exist and institutional barriers will have to be addressed. This has been particularly so since the publication of the New Climate Economy Report (GCEC, 2014, 2015 and 2016).

(4) Energy: renewable electricity and e-transport?

As the energy sector is key in the transition to a low carbon economy,[4] developments in the costs of renewables are important to watch. According to the International Renewable Energy Agency (IRENA) the Levelised Cost of Electricity (LCOE) produced from renewable sources both in OECD and in non-OECD countries is lower (on average) than producing electricity from diesel. The same holds true for electricity produced from onshore wind, biomass, hydropower and geothermal energy *vis-à-vis* electricity produced using other fossil fuels (IRENA, 2014). In fact, in some locations hydropower and geothermal are the cheapest sources for electricity production (see Figure 1). Bloomberg New Energy Finance (2016) expects that electricity produced from wind and solar will become cost competitive across a large number of countries and in terms of deployment, since 2013 there is more power installed from renewable energy sources than from fossil fuel sources.

[4] Two thirds of greenhouse gas emissions come from the energy sector and 87% of global primary energy comes from the use of fossil fuels (IEA, 2015).

Figure 1. LCOE (weighted average and range)



Source: IRENA (2014), p. 62.

Other sectors such as transport[5] are key in decarbonising the economy. In fact, the International Energy Agency IEA (2016) recently stated that in order to meet their 2ºC scenario (2DS), there was a need to reach 10% of global penetration of electric vehicles (EVs) in 2030 and over 40% (1 billion light duty vehicles, LDVs) in 2050 up from 0,1% today in a market with a prominently Chinese, Norwegian and Dutch demand (IEA, 2016). Infrastructure, cost[6] and institutional barriers are yet to be tackled in earnest for such a significant uptake. Policies guided towards pushing the uptake of electric cars and vans *en masse* (such as reducing taxes or providing subsidies to electric vehicles, ensuring every new building has plugs for e-cars or making use of command and control regulations to avoid the most polluting cars entering city centres to mitigate air pollution problems) can nudge consumers towards low CO_2 vehicles when an alternative to public transport is needed.

(5) Politics: surprise, surprise

As regards politics, 2016 has been a year of surprises for climate change. The vote to leave the EU by the UK was unexpected and it is arguably too early to discern the consequences for EU climate policies. Despite the small contribution of the UK to world emissions (1,3%), its potential divorce from the EU could imply that the Europeans will lose of one of their most skilful climate negotiators in the international arena. It could also mean a weakening of the EU's internal climate ambition due to the relative strengthening of less ambitious member states such as Poland.

[5] See for example the case of Spain in Deloitte (2016).

[6] Note that some analysts believe EVs might become cost competitive *vis-à-vis* vehicles powered by internal combustion engines (ICE) in a decade (IEA, 2016).

The European Emission Trading System (one of Europe's flagship climate initiatives that has been strongly supported by the UK) could be affected by Brexit should the UK decide to operate a separate Emissions Trading System (ETS) or if the UK and the EU end up de-linking and re-linking their emission trading systems. European energy efficiency and renewable ambition could, however, be raised in the absence of the UK that has been less ambitious than other member states. British-inspired calls for cutting EU red tape could be softened if article 50 is finally invoked, appeasing concerns regarding a possible weakening of European environmental standards.

On the other side of the Atlantic, America's election of Donald Trump as its 45th President again caught the world off guard. Given the strident campaign rhetoric regarding climate change, dubbed a hoax made in China to reduce America's competitiveness by the President-elect, the first reaction of the international climate-change policy community after the elections could be described as one of shock and concern. It also inevitably raised the stakes of COP 22 and prompted a political declaration by world leaders regarding their steadfast determination to pursue decisive climate action.

In the aftermath of the US elections, the issue was not only about getting the first truly global climate agreement to work, the fight was, once again, to keep global climate multilateralism alive. The first test for the Paris Agreement has come early on in its life. However, both the design of the agreement (based on countries' self-interest and inclusive of non-state actors) and the resolve of major emitters including China and India, as well as emerging climate leaders –such as the High Ambition Coalition or the Climate Vulnerable Forum– seem to have helped us pass this test.

As for the consequences of a Trump Presidency in the US on climate change the jury is still out. If he abides by his campaign promises, President Trump will pull out of the international climate regime. This drastic step would take one year if he were to decide to withdraw from the United Nations Framework Convention on Climate Change (UNFCCC), leaving the US as the only major power in the world outside the global climate-change framework of action. If Trump decided instead to withdraw from the Paris Agreement, article 28 states that this would take three years after entry into force of the agreement and one year after the notification of withdrawal has been deposited. If this were the route taken, the US withdrawal would come as Trump's term in office ends.

Other actions announced by Trump could, however, be as damaging as a withdrawal from the Paris Agreement, or even more damaging. Trump could, for instance, cut domestic funding for climate research. America is a powerhouse in terms of climate analyses and this would damage international understanding of the phenomenon. Trump could fail to honour America's financial commitments towards the international community (ie, US$ 3 billion, Green Climate Fund, 2016) thereby increasing tensions between developed and developing countries regarding climate finance. Trump's replacement of Judge Scalia could undermine the Clean Power Plan, one of the key pieces of climate legislation of the Obama Administration, which seeks to reduce GHG emissions from power plants by 32% in 2030 compared with 2005 levels. These, plus the recent appointment of Myron Ebell, climate-change denier and contrarian to the Clean Power Plan, to run the Environmental Protection Agency transition team are indeed a cause for concern.

Not all is lost though. The economic case for climate action is growing (GCEC, 2016; and The Economist, 2016) and if Trump wants to make America great again the clean tech and renewable energy sectors can provide the country with growth, jobs and a competitive edge in the next wave of innovation (Wilenius & Kurki, 2012). Additionally, the Federal government, though important, is not the only piece of the climate puzzle in the US. Action at the state and city levels is likely to continue apace (Hultman, 2016).

(6) Citizens

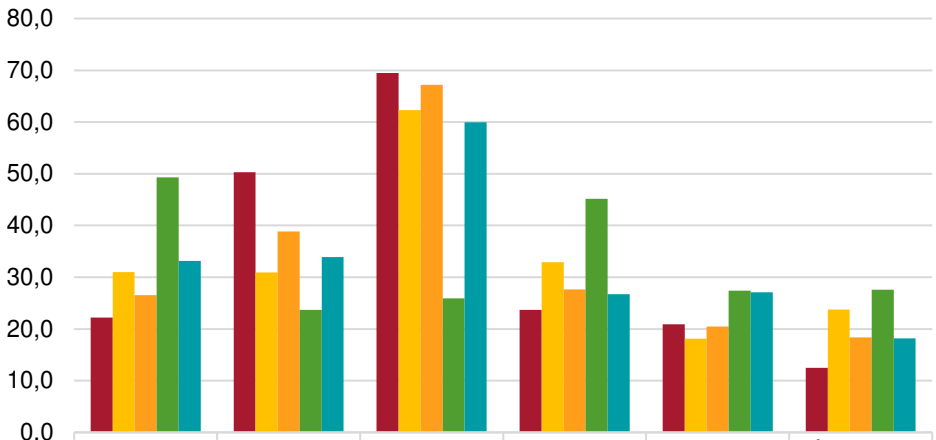
As regards global citizen views on climate change, the survey conducted in 2015 called World Wide Views[7] on Climate and Energy shows that 78% of respondents were very concerned about climate change. In line with the above discussion regarding the economics of climate change, two thirds of respondents see climate policies as an opportunity to improve the quality of life and 63% said they would support all the necessary policies for limiting temperature increases by 2ºC. Respondents were also overwhelmingly in favour of the use of economic instruments such as taxes to implement climate policies, although citizens in the US, China and Russia were less in favour of CO_2 taxation (Danish Board of Technology Foundation, Missions Publiques and the French National Commission for Public Debate, 2015).

Of potential interest to Trump, according to a survey conducted by Yale University in March 2016, 70% of Americans believe climate change is happening, with 58% being at least somewhat worried about climate change and 61% of respondents supporting climate action by the US independently of what other countries do (Leiserowitz *et al.*, 2016).

In terms of foreign policy, climate change is an area governments should address as one of their top priorities, according to citizens, at lease in some countries. In two recent surveys conducted by the Elcano Royal Institute in 2016, respondents across 10 different countries were asked to choose the first, second and third foreign-policy priorities for their governments. Once they responded the question, an index was calculated to compound their preferences. According to this index, respondents in Germany, France and the US stated that the fight against climate change was their second foreign policy priority- the first being fighting international terrorism. The UK and Portugal placed climate change fourth and sixth in the index, respectively (see Figure 2).

[7] Note that the sample was 10,000 people across 76 countries who were given information about climate change prior to the survey; they had time to reflect on the information provided and they debated among themselves before answering questions about climate change.

Figure 2. Foreign policy priorities in Germany, the UK, France, Portugal and the US (1), weighted index (2)



	Promote national businesses interests	Fight climate change	Fight international terrorism	Invest in development aid	Improve the country's image	Increase the country's influence on the world
Germany	22,2	50,3	69,5	23,7	20,9	12,5
United Kingdom	31,0	30,9	62,3	32,9	18,1	23,8
France	26,5	38,8	67,2	27,7	20,5	18,4
Portugal	49,3	23,7	25,9	45,1	27,4	27,6
United States	33,1	33,9	60,0	26,7	27,1	18,2

(1) Countries whose respondents were asked about six possible foreign policy goals.

(2) index = (most important * 1) + (second most important * 0,66) + (third most important * 0,33).

The value of the index for each of the priorities ranges from 0 to 100.

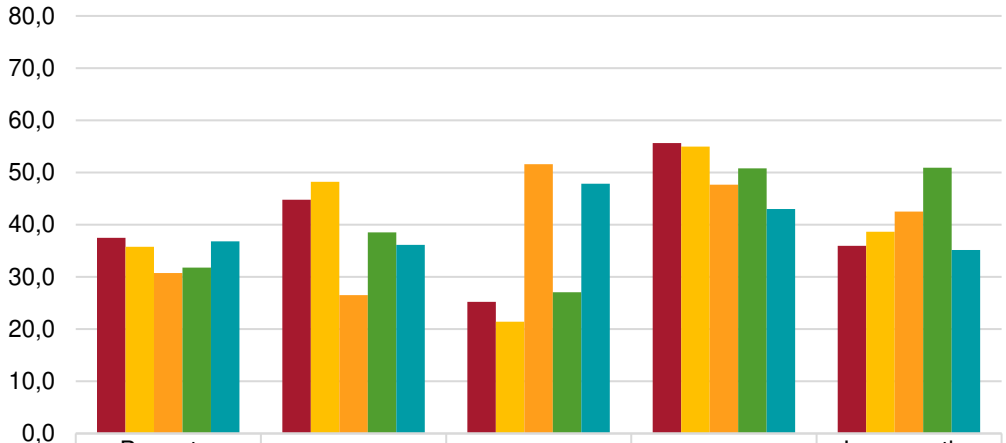
Source: Real Instituto Elcano (2016a), *Barómetro de la Imagen de España*, nr 6.[8]

For other countries in which the option of investing in development aid was not included (Colombia, Peru, Morocco, China and India) the results indicate that it is only in Latin American countries, Colombia and Peru, that the fight against climate change is considered the second most important foreign-policy priority –the first being improving the country's image–. In China, climate change is ranked third, after increasing the country's influence in the world and improving its image. Both of these top priorities could arguably be achieved, *inter alia*, by stepping up China's game in the global fight against climate change in the (expected) absence of national-level US leadership during the Trump era. As regards India, the results indicate that fighting against climate change would come fourth in the index for foreign-policy priorities, just above increasing the country's influence on the world. For Morocco, and despite its COP 22 presidency starting just a few months after the survey was conducted, the fight against climate

[8] Note that the survey was conducted via Internet by Qíndice. The fieldwork took place between 26 May and 9 June 2016. The sample amounted to 4,105 respondents (between 400 and 473 respondents depending on the country). Quota sampling was used for age, gender and location. The error margins vary from +/-5% for countries with 400 interviews to +/- 4.6% for the country (Peru) where 473 surveys were completed, for a 95% confidence level and the most unfavourable case (p = q = 0.5). The age of respondents ranged from 18 to 70. For further details on the survey see Elcano Royal institute (2016a), p. 3-5).

change was the last of the foreign policy priorities according to survey results (see Figure 3).

Figure 3. Foreign policy priorities in Colombia, Peru, Morocco, China and India (1), weighted index (2)



	Promote national businesses interests	Fight climate change	Fight international terrorism	Improve the country's image	Increase the country's influence on the world
Colombia	37,5	44,8	25,2	55,6	35,9
Peru	35,8	48,2	21,4	54,9	38,7
Morocco	30,8	26,5	51,6	47,6	42,5
China	31,8	38,6	27,0	50,8	50,9
India	36,8	36,1	47,9	43,0	35,1

(1) Countries whose respondents were asked about five possible foreign policy goals.

(2) index = (most important * 1) + (second most important * 0,66) + (third most important * 0,33).

The value of the index for each of the priorities ranges from 0 to 100.

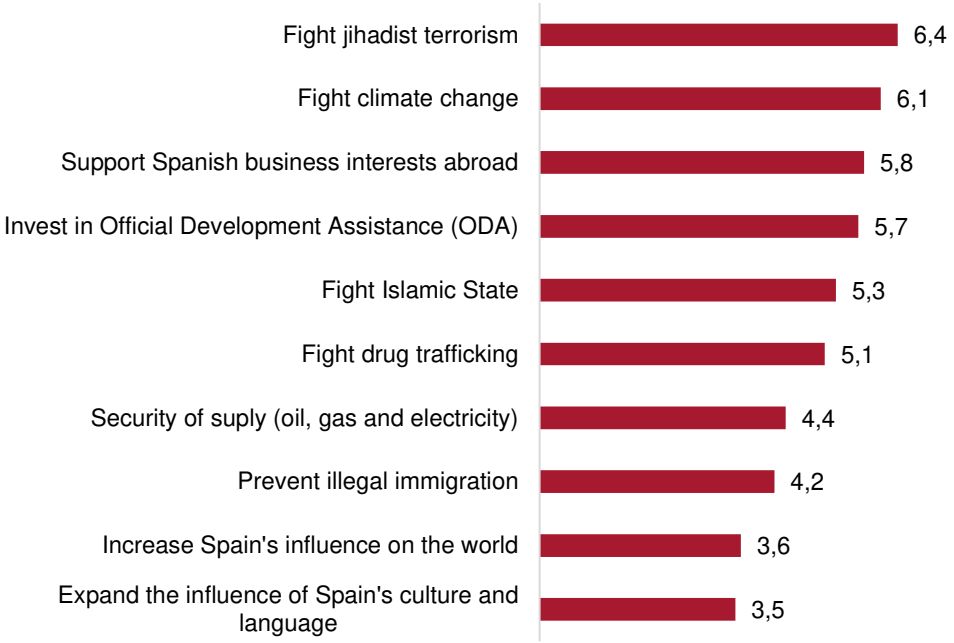
Source: Real Instituto Elcano (2016a), *Barómetro de la Imagen de España*, nr 6.[9]

Reflecting on what Spanish people consider their top foreign-policy priorities it is interesting to read the Elcano Royal Institute's forthcoming 38th survey (*Barómetro del Real Instituto Elcano*, BRIE). In this survey the index shows that respondents in Spain see the fight against climate change as the second most important foreign-policy priority after fighting jihadist terrorism[10] (see Figure 4). In fact, Spanish citizens have ranked climate change as the second top foreign-policy priority in every survey since 2011 and consider climate change one of the greatest threats to Spain (*Real Instituto Elcano*, forthcoming, 2016b, 2015 and 2013). The newly appointed government in Spain could reflect on the above data and continue engaging in international and national climate action, aligning its priorities with those of its citizens.

[9] *Ibid*.

[10] The BRIE asked the question in a different format compared with the BIE and hence the results are not directly comparable. In the BRIE, respondents to the questionnaire were presented with a conjoint analysis-type question where they choose between pairs of alternatives. The analyses of results provided the ranking available in Figure 4.

Figure 4. Top foreign-policy priorities for Spanish respondents



Source: Real Instituto Elcano (forthcoming).

(7) The Paris Agreement and other climate-related agreements since 2015

The Paris Agreement was adopted on 12 December 2015. Its main goal, in line with the UNFCCC, is avoiding a dangerous interference with the climate system. In order to meet this goal the agreement seeks to limit global mean-temperature increases to 'well below' 2ºC (aspiring to 1.5ºC) compared with pre-industrial levels. It also strives for a balance between emissions and absorption (removals by sinks such as forests) in the second half of the century, in line with the scientific warnings that stabilisation of temperature requires gradually reducing emissions to zero (Thomas *et al.*, 2016).

The Paris Agreement resorts to a hybrid system to achieve its goals. The bottom-up process –embedded in global climate governance since the Copenhagen Accords– requires Parties to periodically present national commitments[11] for curbing greenhouse gases (GHGs) that are to be increasingly ambitious. The top-down approach entails both a periodic review of the progress made (via the all-important transparency mechanism) and guidance to achieve the above stated goals (Stavins, 2015). Market and non-market mechanisms have also been enshrined in the Paris Agreement as additional instruments to nudge the low carbon transition. Moving away from the Kyoto-style penalty system for non-compliance, Paris hopes to engage countries in increasing cooperation that is in the Parties' self-interest, expressed through their national commitments.

[11] Commitments made by countries are called Intended Nationally Determined Contributions (INDCs) or Nationally Determined Contributions (NDCs) once the instrument of ratification, accession or approval has been deposited with the UNFCCC secretariat.

In order to enable developing countries to meet their commitments, the accompanying decision to the Paris Agreement stresses the need for scaling up finance (to the tune of US$ 100 billion annually by 2020, echoing the Copenhagen Accord, and above that amount after 2025). Technology, capacity building and increasing adaptation capacity are further pillars of the accord.[12]

This new landmark global framework for climate action was to enter into force 30 days after 55 Parties, amounting to 55% of world GHG emissions, deposited their instrument of ratification, acceptance or approval. China and the US ratified ahead of the G-20 meeting in September 2016, putting pressure on the EU to do so. When the EU, among others, ratified the Paris Agreement on 5 October, the double requirement for entry into force was achieved. Hence, on 4 November 2016 the Paris Agreement entered into force. This is quite an achievement that had been in the making since (at least) the diplomatic debacle of COP 15.[13]. Few expected the Paris Agreement to enter into force less than a year after its adoption. In fact, this is one of the fastest entries into force within the international agreements realm and by far the fastest of any climate-change treaty.[14] It therefore seems that the 'spirit of Paris' has survived a turbulent 2016.

Other international meetings have taken place –and agreements have been adopted– in 2016 that add to the great diplomatic success of the Paris Agreement and that, indeed, signal an unprecedented momentum in climate action, despite the election of Donald Trump in the US. These agreements include the Kigali Amendment of the Montreal Protocol and the Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA).

The Montreal Protocol that entered into force in 1989 regulates the use and phasing out of substances that deplete the ozone layer. Many of these substances, such as hydroflourocarbons (HFCs), are also powerful greenhouse gases. The Kigali Amendment of the Montreal Protocol adopted in 2016 has mandated a phase-down of HFCs for developed countries starting in 2019 (UNEP, 2016a). Developing countries will have a longer time frame for reducing consumption of HFCs (2024 or 2028 depending on the country). By 2040 the goal is to limit consumption to 15% to 20% of countries' baselines. The Kigali amendment has been widely praised as a very positive development for climate action, with announcements that claim that it could even prevent 0,5ºC of global warming. Climate experts caution against excessive optimism as some of the effects of phasing out HFCs might have already been accounted for within the NDCs.

The aviation sector, currently responsible for 2% of global CO_2 emissions and one of the fastest in emissions growth, celebrated its 39th Assembly of International Civil Aviation

[12] For further information on the Paris Agreement and the accompanying decision see European Parliament (2016). For further analysis of the drivers of the Paris Agreement and the elements of this global climate agreement, see Clemençon (2016) and Lázaro-Touza (2016).

[13] It could be argued that COP 15 in Copenhagen allowed the basic pillars of the Paris Agreement to be forged (Lázaro-Touza, 2010), despite comments to the contrary (see the discussion in Bodansky, 2010).

[14] Note that the UNFCCC was adopted in May 1992 and took almost two years to enter into force (in March 1994). The Kyoto Protocol was adopted in December 1997 and entered into force after Russia's ratification on 16 February 2005, over seven years later (UNFCCC, undated, a, b).

Organisation (ICAO). Governments, industries and other stakeholders agreed on a global market mechanism called Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA). The mechanism's goal is to achieve carbon neutrality from 2020 onwards, based on carbon emissions in 2019-20, it is to be hoped without incentivising companies to unduly increase their emissions during that period. Despite having been criticised by countries such as India (for being unfair) as well as by NGOs (that blame the aviation industry for using offsets rather than abating), the decision by ICAO has been commended by some climate negotiators who believe that progress has been significant as this type of initiative was unthinkable just a few years ago.

Headline results from COP 22

Given the design of the Paris Agreement, with its five-year review cycles, facilitative dialogue in 2018, etc., COP 22 was never expected to be a meeting of grand political announcements and big agreements. In fact, as Pete Betts recently argued,[15] according to the mantra of climate negotiators that 'nothing is agreed until everything is agreed', the complete rulebook for the Paris Agreement was not to be expected until at least 2018 (COP 24). Given this mantra and the results from COP 22, it seems that the package-deal approval approach will push ahead. This is so despite some less-developed countries wanting to adopt individual decisions concerning the Paris rulebook as soon as they are ready, that is, without waiting for the entire Paris rulebook package to be agreed (ENB, 2016).

As regards the headline results in Marrakech, it can be argued that initial understanding of Party positioning, procedural advances in the Paris rulebook, plans and calls for submissions were the key outcomes of COP 22 (C2es, 2016). It is also worth noting that, according to Alina Averchenkova,[16] contrary to previous COPs that succeeded the adoption of landmark climate agreements, there was no backtracking during COP 22, perhaps ironically due to the need to counteract the Trump effect. With the above considerations in mind some salient issues discussed in Marrakech are summarised in Figure 5.

[15] Panel debate 'A year on from Paris: turning commitments into action'. Grantham Research Institute on Climate Change and the Environment. 24/XI/2016. Pete Betts is the Director, International Climate Change at the Department for Business, Energy and Industrial Strategy in the UK.

[16] Panel debate 'A year on from Paris: turning commitments into action'. Grantham Research Institute on Climate Change and the Environment. 24/XI/2016. Alina Averchenkova is the Co-Head of Climate Policy at the Grantham Research Institute on Climate Change and the Environment at the London School of Economics.

Figure 5. Summary of some headline results from Marrakech

Topic	Results and recommendations	Comments
Key meetings[17]	COP 22 (UNFCCC). CMP 12 (Kyoto Protocol). CMA 1 (Paris Agreement).	The first meeting of the governing body of the Paris Agreement (CMA 1) took place and was adjourned until all countries could participate in the rulemaking process after ratification.
Mitigation	The diversity in the characteristics and specificity of NDCs resulted in calls for clarification to enhance transparency.	Countries dissented on the flexibility that should be allowed as regards commitments, timing, monitoring and reviews.
	The US, Mexico, Germany and Canada were the first countries to communicate their long-term decarbonisation strategies.	US target: reduce GHGs by 80% or more below 2005 levels by 2050. Mexico's target: reduce GHGs by 50% by 2050 below 2000 levels. Germany's target: reduce GHGs by 80% to 95% below 1990 levels by 2050. Canada's target: reduce GHGs by 80% in 2050 below 2005 levels.
Adaptation	The Adaptation Fund created under the Kyoto Protocol will continue serving the Paris Agreement in all likelihood. US$81 million were pledged for the Adaptation Fund, beating its fundraising target for 2016. The report of the Adaptation Committee and a reviewed work plan for 2016-18 was presented. Next review of the Adaptation Committee will occur in COP 27.	Developing countries pushed for the Adaptation Fund to continue serving the Paris Agreement. As regards adaptation communications, effort recognition and analyses were the areas where COP 22 focused on. A shortfall in funds for the Adaptation Committee was noted.
Loss and damage	The first review of the Warsaw International Mechanism for Loss and Damage took place.	The review took place despite the short time available for it. Further guidance on strengthening the WIM is recommended. Periodic reviews are recommended, starting in 2019. The review will analyse the work and the long-term vision of WIM.
Capacity building	The terms of reference for the Paris Committee on Capacity-building (PCCB) were adopted. Work begins in 2017.	The goal is to address capacity building needs in developing countries, facilitating climate action.

[17] During COP 22 in Marrakech the following meetings took place: the 22nd session of the Conference of the Parties (COP 22), the 12th session of the Conference of the Parties serving as the meeting of the Parties to the Kyoto Protocol (CMP 12), and the 1st session of the Conference of the Parties serving as the meeting of the Parties to the Paris Agreement (CMA 1).

Finance	The Australian/UK analysis of the Roadmap towards the US$100 billion was presented and recognised. Developed countries agreed to continue to increase finance and a work program was agreed. The 2016 biennial assessment report emphasised the need to improve data collection, increase granularity of data, and improve tracking and reporting of climate finance. The initial strategic plan for the Green Climate Fund (GCF) was adopted. There is increasing support for *climate- related financial risk disclosures* to foster low carbon investments. The updated guidelines for the 6th review of the Financial Mechanism were adopted.	Finance is still one of the most contentious issues with developing countries unsatisfied with the level of funding disbursed by developed countries. Developing countries should enhance their institutional capacity to enable adequate reporting. There are gaps in the systematic collection of private climate finance data. Finance flows from developed countries to developing countries amounted to US$25.4 billion in 2013 and US$26.6 billion in 2014. Total average climate finance flows in 2013-14 amounted to US$741 billion. Currently 70% of climate finance is allocated to mitigation. Further balance in the allocation of climate finance should be sought. There are significant costs of fund and project management (1%-12% of approved funding). The sixth review of the Financial Mechanism will be finalised in COP 23 (2017).
Technology	The joint annual report of the Technology Executive Committee and the Climate Technology Centre and Network for 2016 was presented.	Linkages between the Technology Mechanism and the Financial Mechanism are encouraged to enhance mitigation and adaptation. The importance of finance in early stages of technology development is underlined.
Transparency	The work programme is clearly guided by a common set of questions that all countries have to respond.	Diverging views were voiced regarding flexibility in transparency requirements between developed and developing countries. Further discussions are expected on this issue.
Market and non-market instruments	Market and non-market mechanisms were discussed. More significant advances were recorded as regards market-based mechanisms *vis-à-vis* non-market based instruments. Further submissions by Parties are expected. The potential use of economic instruments, such as fossil fuel subsidy reforms were tabled.	Avoiding double counting was discussed in the context of ensuring environmental integrity and avoiding past mistakes (eg, avoiding hot air). Discussions were held regarding whether to precisely define the concept of sustainable development. Avoiding fuzzy conceptualisations would arguably require clarifying whether a weak sustainability paradigm (substitutability of man-made capital for natural capital) or strong sustainability (requiring the preservation of certain forms of natural capital) should be pursued.

Stocktake and compliance	Consultations will continue on the organisation of the facilitative dialogue in COP 23. Procedural discussions took place as regards the first global stocktake.	Questions on how the compliance mechanism would work were raised.

Sources: UNFCCC (2016), C2es (2016), LSE (2016), ENB (2016), Lázaro-Touza & Atkinson (2013).

Beyond the advances in procedural elements mentioned above, the key political declaration arising from COP 22 was the Marrakech Action Proclamation for our Climate and Sustainable Development. Of little practical substance, the proclamation is important because it reiterates the high-level political commitment to increasingly ambitious climate action that is mindful of asymmetric national circumstances. It also recognises the transition towards a low-carbon economy as an opportunity and encourages multi-stakeholder engagement in climate action. This recognition of climate action as an economic opportunity signals a paradigm change in the political narrative of climate change that arguably started 10 years ago with the publication of the Stern Review.

The results as regards the multi-level and multi-stakeholder engagement with the UNFCCC framework materialised in the Marrakech Partnership for Global Climate Action heralded by the Climate Champions Hakima el Haite and Laurence Tubiana. The goal of the initiative is to foster action and interaction between Parties and non-Parties (firms, subnational and local governments as well as NGOs and civil society organisations) prior to 2020. It calls for climate policy coherence (integration) in order to ensure effective cooperation.

Complementing the UNFCCC negotiations, the Marrakech Partnership for Global Climate Action seeks to help track non-Party actions, increase ambition, identify priorities and help exchange information and experiences. The initial topics the partnership will focus on include: land-use, oceans and coastal zones, water, human settlements, transport, energy and industry. Transverse issues will include gender, education, health and 'decent work'. In fact, the inclusion of the concept of a 'just transition' is seen by some negotiators, such as Emmanuel Guérin,[18] as absolutely crucial to counteract phenomena of disenfranchisement of the population with the low carbon transition that will inevitably alter production and consumption systems. This is a topic requiring further academic and political attention if we are to ensure social appropriation of the low-carbon transition. The partnership will meet throughout the year as well as during the COP and will produce the Yearbook of Global Climate Action, containing information on policy options for decision-makers to consider.

Also under the aegis of the Climate Champions, the '2050 Pathways Platform' was announced during COP 22. The platform's goal is to foster the development of deep decarbonisation pathways so that the goal of carbon neutrality –balancing emissions and

[18] Panel debate 'A year on from Paris: turning commitments into action'. Grantham Research Institute on Climate Change and the Environment, 24/XI/2016. Emmanuel Guérin is Special Advisor to the French Climate Ambassador, Laurence Tubiana; and Consultant, Children's Investment Fund Foundation.

absorption capacity by sinks– is reached. This is to be achieved through the integration ('mainstreaming' in UN policy parlance) of climate-policy considerations across sectors.[19]

Another welcome development arising from Marrakech was the Climate Vulnerable Forum Vision, according to which 48 developing countries will strive to reach 100% renewable-energy production. This group of countries can be seen as significantly pushing the current political ambition regarding climate change. The leadership void left by the US could be filled by these newly emerged leaders plus China and the High Ambition Coalition (including the EU) in a move *à la* 2001 when the US failed to ratify the Kyoto Protocol and the EU took the lead in global climate action.

Finally, during COP 22 the governments of Morocco, Germany, Portugal and Spain signed a joint declaration on the establishment of a Roadmap for Sustainable Electricity Trade between Morocco and the European Internal Energy Market. The declaration acknowledges that in order for the EU to meet its commitment to reach 27% of renewable energy consumption by 2030 and for Morocco to meet its commitment of producing 52% of its electricity from renewable energy sources by 2030, enhanced electricity market integration between the Middle East and North Africa (MENA) and Europe could be mutually beneficial. The effective implementation of this roadmap would also help in the integration of renewable electricity. The purpose of the roadmap is to identify and suggest ways to eliminate barriers to trade in sustainable electricity (EC, 2016). Signatories of the joint declaration have pledged to work on a Sustainable Electricity Trade Roadmap (SET Roadmap) and to work towards an agreement that could be ready for COP 23.

Conclusions

After a turbulent 2016, COP 22 –dubbed the 'Action and Implementation COP– delivered a roadmap for operationalising the Paris rulebook in 2018. It also provided guidance on how to proceed for the successful development of the facilitative dialogue. Some progress was made in the analysis of positions regarding implementation and compliance, mitigation, adaptation, transparency and the global stocktake. And, as explained above, there were a host of initiatives from Party and non-Party actors that reiterated the momentum of climate action.

Some of the challenges that remain include the entry into force of the Doha Amendment that establishes the second commitment period of the Kyoto Protocol that would increase ambition pre-2020. Developing domestic legislative frameworks to match NDCs and increasing ambition are still pending tasks. All of these, with a just transition in mind to help gain acceptance of low carbon strategies by citizens. In terms of expected hurdles,

[19] According to the UNFCCC '22 countries have started or are about to start a process of preparing a 2050 pathway. Already 15 cities, through C40 and ICLEI, 17 states, regions and cities, through the Under2 coalition, and 196 businesses, through the We Mean Business Coalition and the Science Based Target initiative, are also committed'. Spain has not yet prepared a 2050 decarbonisation pathway but the region of Catalonia and several companies in Spain are already in this platform. These companies are: ACCIONA S.A., Correos (Grupo Sepi), FERROVIAL, Gamesa Corporación Tecnológica, S.A., Gas Natural SDG SA. Gestamp, Grupo Logista, Iberdrola SA, Inditex, Maessa and NH Hotel Group.

flexibility issues between developed and developing countries and allocation of responsibilities are expected to lead to disagreements in future meetings.

As regards the leadership void left by the US there are indications that the world, perhaps through the actions of newly emerged climate leaders (among others), will work *à la* 2001 when the EU performed a directional leadership role in the entry into force of the Kyoto Protocol after the US failed to ratify the agreement.

Should the world push ahead with its climate commitments, the case for decisive climate action is likely to be made based on the economics on transitioning to a low carbon future, the co-benefits of a decarbonised development model (Stern *et al.*, 2016), better messaging and (sadly) increasing climate change experience, especially with extreme weather events (Dunlap *et al.*, 2016).

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