Shaping Expectations to Foster the Low Carbon Transition: Can COP21 be a catalyst for action?

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This HET report explores the debate on how COP21 could shape expectations of a global shift towards decarbonisation and thus boost low carbon investments.

The ultimate goal of COP21 is to trigger a universal mobilisation of action, enabling a fundamental change in current GHG emissions trajectories that would hold the increase in global temperature below 2°C compared to pre-industrial levels[1]. While the emission path which can derived from the 2015 national contributions (Intended Nationally Determined Contributions - INDC) falls short of this globally agreed long-term goal[2], climate negotiators are considering other ways to ensure that the emission reduction gap will actually be bridged over time. In addition to establishing a periodic upward revision of commitments, COP21 could lead to defining what the 2°C limit implies in terms of global emissions cuts and encouraging countries to develop long-term decarbonisation strategies consistent with that goal.

It could be argued that the Paris agreement should not only be about securing countries' individual commitments for the next decade but it should also provide a strong signal that a global low carbon transition is the only realistic scenario. By doing so, COP21 would give reassurance to decision-makers on future returns and trigger large-scale investments in low-carbon solutions. However, this bet on the creation of positive feedback loops between expectations and behaviours can be questioned; focusing on the long-term could be interpreted as a way to draw the attention away from the insufficient level of ambition of mid-term contributions, and in fact add to the current confusion. The strength of the signals must be carefully weighed up, to see whether they can actually influence the decisions of economic agents.

After explaining why political signals matter, this HET looks at the precise implications of an "operationalisation" of the 2°C limit. In addition, it assesses ways in which the EU's pioneering role in decarbonisation could contribute to global confidence and finally presents potential limitations to the "self-fulfilling prophecy"[3] approach.

[1] Decision 1/CP.17, Establishment of an Ad Hoc Working Group on the Durban Platform for Enhanced Action

[2] For example, Climate Action Tracker analysis suggested that, with INDCs submitted as of 1 Oct. 2015, total global emissions were on track to be 52-54 $GtCO_2e$ in 2025 and 53-55 $GtCO_2e$ in 2030. Additional reductions of 11-13 $GtCO_2e$ by 2025 and 15-17 $GtCO_2e$ by 2030 would be needed for global emissions to be consistent with a 2°C pathway. (Climate Action Tracker, 2015)

[3] A self-fulfilling prophecy is *"one that becomes true because people expect it to be true and behave in a way that will make it happen"* (Oxford Advanced Learner's Dictionary, 2015). In the context of climate policy, the self-fulfilling prophecy would refer to the creation of a positive feedback loop between the expectation that a global low carbon future will inevitably be achieved and the decisions by economic players to actually favour low-carbon solutions. This expression was for instance used by Laurence Tubiana, France's Special Representative for COP21, during the conference "Our Common Future under Climate Change" held in Paris on 10 July 2015.

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Why long-term signals matter for the decarbonisation process

Uncertainty on the global commitment to stay within the 2°C limit is a key hurdle for investment in low-carbon technologies. The energy sector, representing two thirds of total anthropogenic emissions (IEA, 2015), relies heavily on capital-intensive infrastructures with a lifespan of 30 to 50 years. Before decisions are taken, the economics of the investment are assessed in the context of the future regulatory environments. 2025-2030 targets are meaningful indications but they are no guarantee against future backsliding of ambition, in particular under a regime of nationally determined contributions. Long-term commitments, particularly if they are internationally agreed, can provide a greater sense of stability (IEA, 2015).

The primary objective would thus be to avoid the risk of carbon lock-in, linked – in particular – to the rapid development of coal-fired power generation. Between 2005 and 2012, the yearly pace of net coal capacity additions was three times higher than during the two previous decades (Shearer et al, 2015). Although it receded in 2013, the global scale of new investments in unabated coal plants has been considered "the most urgent threat to climate policies"[4] (Gurria, 2015). Global demand for energy services is set to rise by 17 to 50% between 2012 and 2040 (IEA, 2014), primarily driven by emerging economies. Important choices will have to be made on how to meet this future demand and the risk is that short-term measures lead to a sub-optimal technology mix, delaying the necessary transition or requiring premature retirement or retrofitting of installations and increasing total decarbonisation costs (IEA, 2015).

Lack of predictability on the future course of action has become a matter of concern for investors; the "carbon risk" is no longer considered a non-financial risk factor, and is being progressively incorporated into standard financial risk calculations (Canfin and Grandjean, 2015). Adding to a volatile commodity price environment, investors' questioning on the future of climate action can create a 'Janus risk' for the energy sector as a whole; failure to invest early enough in either fossil fuel resources or low carbon alternatives will inevitably limit our possible future options (Mitchell et al, 2015). As illustrated by the recent call for carbon pricing launched by six EU oil and gas companies[5], clarity on future climate rules is considered crucial for all business models in the energy sector.

Providing a clear roadmap for future climate action is also viewed as a way to catalyze and foster current initiatives from the private sector. Data collected by the 'We Mean Business' coalition (2014) showed that 1,450 companies had reduced their emissions by approximately 420 MtCO2eq over 2012-2014. Likewise, PwC's global survey (PwC, 2015) suggested that an emerging group of CEOs were now proactive in integrating climate change in their business strategies. Climate action is becoming a business trend and the next challenge is to convince a wider range of decision-makers that anticipating a continuous reinforcement of climate policies and taking ambitious actions now is a source of

[4] Between now and 2050, if no further mitigation measures are undertaken, coal generation is projected to emit more than 500 $GtCO_2$. (OECD, 2015)

[5] In their letter to France's Foreign Minister and the Executive Secretary of the UNFCCC, the six companies (BG Group, BP, Eni, Royal Dutch Shell, Statoil and Total) say: "Pricing carbon obviously adds a cost to our production and our products – but carbon pricing policy frameworks will contribute to provide our businesses and their many stakeholders with a clear roadmap for future investment".

competitive advantage. In June 2015, following the G7 declaration on climate change, confidence in a global low-carbon transition was reported to have reached 48.5% among businesses, against 33.2% in May 2015 (Climate Group, 2015). This rise suggests that business leaders see some value in political pledges and would therefore give attention to the declarations made by the 196 Parties to the UNFCCC.

In addition, there is an increasingly large investor base wishing to gain exposure to green projects (Citigroup, 2015), as illustrated by the threefold increase in green bonds issuance in 2014 (Climate Bonds Initiative, 2015). Considering the large influence that the financial sector has acquired on business strategies, there is clearly a case for aligning its expectations on future returns and making it a key driver for climate action (Benhamou and Hassan, 2015).

This potential for stronger private leadership is even seen as a necessity, in order to go beyond the ambition of current national action plans and not jeopardize the 2°C limit. The expectation of a global decarbonisation could boost innovation efforts from the private sector, even during the pre-2020 period for which there are no INDCs, which could help reduce the cost of current technologies and increase the chances of the emergence of new technologies (Citigroup, 2015). Such prospect of a faster and cheaper transition would in turn facilitate the strengthening of national policy frameworks, creating a virtuous circle.

Finally, and beyond the climate benefit as such, calls for reinforcing the credibility of a low-carbon future are often linked to the economic opportunity that a new wave of private investment could create. While international forums dedicate growing attention to the need for more infrastructure investments as a way to boost growth and create jobs[6], there is, at the same time, a large amount of savings in need for long-term investment options (Canfin and Grandjean, 2015). Retrofitting the global economy to climate change would then be a way to offset the current deficit in demand (Stiglitz, 2015). Clarity on the ultimate climate ambition is thus also presented as a matter of sound macro-economics.

Operationalising the 2°C target - what implications?

Re-establishing the 2°C target as a critical objective in the Paris Agreement will only be meaningful if it can be effectively operationalised. Today, it is disconnected to what needs to happen in terms of mitigation action. Some academics have questioned the effectiveness of the 2°C goal, both in terms of it being scientifically inappropriate as it may already be unachievable, and politically impractical, due to it being difficult to effectively operationalise (Victor and Kennel 2014). The current absence of clear decarbonisation targets means that policymakers can speak the 'language of 2°C' but without taking the necessary action.

Working Group III (WG III) of the IPCC does reflect the type of actions that are required globally to limit global warming, primarily through Integrated Assessment Modelling (Pachauri et al., 2014). The IPCC AR5 WGIII report has usefully set out emission budgets (both to 2050 and 2100), against different probabilities. The RCP2.6 scenario, offering a 66% chance of staying within 2°C, is characterised by a 40-70% global emissions reduction by 2050 compared to 2010 and zero emissions by 2100. Although different terminologies are currently being debated,

[6] See in particular the G20-OECD work on long-term financing, http://www.oecd.org/finance/private-pensions/g20-oecd-long-term-financing.htm

131 countries (as of August 2015) have expressed their support for the inclusion of long-term decarbonisation goals in the Paris agreement (see appendix I). Such goals would allow for the 2°C target to be put in emission mitigation terms, necessary for understanding the global action required and the corresponding timeframe.

The challenge is then how to promote this action at the national level. Agreeing on global long-term goals can be seen as the first step to derive national long-term goals. However, applying equity criteria has previously been viewed as necessary. Exploring scenarios compatible with the 2°C target, the previous IPCC report (AR4 WG III) did refer to ranges of emissions reductions by 2030 and 2050 for annex I and non-annex I groupings[7]. Although this distribution was not agreed internationally, it served as a reference for the EU and Japan, when setting their 2050 mitigation targets. In addition, the two countries justified the level of ambition of their respective 2015 INDCs in respect of their consistency with these 2050 targets, which confirms that long-term targets matter for immediate policy actions. However, this annex I/non-annex I distinction is no longer seen as the only relevant one for distributing mitigation efforts. In its latest report, the IPCC chose not to update its previous conclusions for 2050 and preferred to display regional results (in terms of peak year of emissions and reductions by 2030 compared to 2000), emphasizing the non-political dimension of its work. If countries are ultimately left to decide individually what equity criteria should be applied, chances are high that the aggregate 'long-term' result will be insufficient, as with the current 'mid-term' INDCs.

Avoiding any explicit allocation of effort, an important initiative in the run up to COP21, the Deep Decarbonization Pathways Project (DDPP), seeks to explore how far country action, based on rigorous technical modelling analyses, can reduce emissions out to 2050 (SDSN & IDDRI 2014). A level of per capita emissions by 2050 is used as a benchmark for exploring national pathways, but not as a strict target. The purpose of this project is to highlight the need for a long term horizon given the transformational transition required, and to provide stakeholders with a credible pathway of how this can actually happen given the national context. It also takes account of the need to integrate country development priorities into any transition. This bottom-up, country-explicit approach to addressing how nations can cooperate on necessary global emission reductions provides a potential template at least for understanding the role countries can play. It also provides a basis for exploring the level of ambition that can be achieved, to strengthen current pledges. For developing countries, this will necessitate strong financial and technical support.

One could also imagine that the global mitigation targets, for example percentage reductions to be achieved in 2050 and 2100 relative to a given year, would be directly applied, without any actual disaggregation or differentiation per type of emitter. Should these targets be enshrined in the international agreement, they would at least provide clear references which could simply be used at any level (country, city, community, company, business sector), possibly with earlier due dates. Some even advocate for the creation of a "Zero Practitioners Network", bringing together developers and users of zero emissions and deep decarbonisation scenarios and encouraging a wider use of such

[7] As referred to in the United Nations' Convention on Climate Change, "annex I" countries include the industrialized countries that were members of the OECD in 1992, plus countries with economies in transition, including the Russian Federation, the Baltic States, and several Central and Eastern European States.

approaches (Centre for Alternative Technology and Track 0, 2015).

In one way or another, adopting global mitigation goals at COP21 would necessarily fuel the debate on each country or player's mitigation contribution. They would firstly signal the need to prepare for a deep and widespread transformation and thus give a boost to the development of long-term plans.

Building on the EU's pioneering role in climate action to promote global confidence

Given the EU's early engagement in decarbonisation, it could also use its experience and capabilities to reinforce confidence in the feasibility of a global low-carbon transition.

To go beyond what can be globally agreed, some in the academic community have suggested the role of "climate clubs" or "coalitions of the willing", groupings of actors (states, cities, corporations etc) that promote actions plurilaterally (Grubb et al. 2015, Victor 2015). By playing an active role in setting up such coalitions with partnering countries, the EU would contribute to reinforcing predictability on the long-term course of action.

Research into technologies is one of the main suggested areas of action for such coalitions. The IPCC Fifth Assessment Report (2014) emphasises the complementary role of technology policy to the role of "policies aimed directly at reducing current GHG emissions" (Pachauri et al., IPCC, 2014, 15.6.1). It is stressed that the development of "new technologies is crucial for the ability to realistically implement stringent carbon policies". Other analyses of decarbonisation pathways stress that technology policy is paramount and that this implies increased and better targeted support for research and development of low-emissions technologies (e.g., SDSN & IDDRI, 2014). However, public energy-related research and development (R&D) expenditures among IEA member-states today account for about 5% of total government R&D, compared to 11% observed in 1980 (Pachauri et al., IPCC, 2014, 7.12.4). Even in absolute terms expenditure has been declining since 2009. Given the broad consensus that increased energy research would improve the prospects for effective mitigation, innovation policy deserves a higher profile in climate negotiations. Enhancing publicly-funded research could give reassurance that the pace of technology progress will increase, in particular if national efforts are coordinated, with initiatives such as the Global Apollo Programme[8] but that explicitly addresses R&D, in low-emission technologies as well (Brook at al. 2015).

Here research funding in the EU and particularly in the European Research Area (ERA) can explicitly target those technologies that *globally* are most-energy intensive. Such research funding commitments provide a first step to decoupling economic growth from GHG emissions and thus helps developing economies towards more sustainable development (Ecomodernist Manifesto 2015). This provides the opportunity for the EU to "act" more globally in two ways: as a role model for low-emission energy policies and by focusing research in the direction of less-energy intensive applications and low-emission technologies.

Another area where the EU could contribute to greater predictability relates to carbon pricing. While future climate action is likely to take the form of a mosaic of policies and instruments, it becomes very difficult to estimate the explicit or implicit carbon price for the next

[8] http://globalapolloprogramme.org/

decades. In this fragmented and unstable context, Stiglitz (2015) advocated for a coalition of the willing of a global carbon price, with a group of like-minded countries committing to raise the price of carbon to agreed levels using various national tools. Along the same lines, Canfin and Grandjean (2015) argued that sending a collective signal on the long-term carbon price trajectory was essential for providing certainty to investors. Moving in this direction, the French energy transition law has recently introduced target carbon prices for 2020 (56€/ton) and 2030 (100€/ton). Even if the international coalition includes only a small set of prime-movers at the start, perceived risks could decrease over time and the members grow.

Finally, one can argue that confidence in the likelihood of the decarbonisation process would be increased if there was a better understanding of all the changes it requires. It will lead to fundamental shifts in how energy is generated, supplied to and used by different sectors of the economy. The challenge is to show that such changes do not necessarily have a negative impact on other public policy objectives. For example, low-carbon transitions could have implications for the cost of energy, with potential increases (for example, the current cost of electricity in Germany). The distribution of such impacts would need to be carefully managed to ensure vulnerable groups were not negatively impacted. Another example relates to the decrease of energy consumption rates. Most strikingly all or almost all renewable scenarios are based on very low consumption rates, sometimes as low as half of that given in the common BAU-scenario (Lovering et al. 2014). Implementing those or similar low carbon scenarios asks for clear commitment from developed countries as regards policies that make it feasible for their citizens to reduce their energy use, while maintaining levels of service and wellbeing in general. Using the EU experience as a case study, it should be further investigated in what way GHG emission reductions impact on human wellbeing right now, where wellbeing is understood in broad terms (see e.g. Stiglitz et al. 2010). Such investigation would echo the current work of the New Climate Economy on the co-benefits of climate action.

Limitations to the 'self-fulfilling prophecy' approach

While shaping expectations can potentially be an essential lever for action, the key challenge will be to articulate properly the different signals sent during and after COP21.

Long-term commitments, and in particular collective decarbonisation goals, can help think beyond incremental improvements and serve as a guideline. However, they will have a limited impact if the agreement is perceived as weak when it comes to concrete actions, in particular on mid-term national mitigation plans, transparency measures and financial support to developing countries. In other words, it is crucial that a framework is adopted that provides for a long term goal but also connects the near term policy requirement to get on track. As highlighted by the recent work of OECD, misalignments in public policies are too frequent and they are one of the main impediments to an efficient switch to the low-carbon economy (OECD, 2015). It is policies now that are needed to deliver the long term goals. It is still easy to ignore the long term, and not put the requisite policy package in place that is needed to start delivering the transition. In fact, conflicting long-term and short-term signals would only add to the current political uncertainty and favour inertia.

Operationalising the 2°C target should also not be regarded as a panacea, at least for the reason that many individual countries have

already defined long-term aspirational goals (see appendix II), without evidence of a clear-cut impact on business and investment strategies. The legal value assigned may vary from one country to the other but, in all cases, the same questioning arises on the credibility of goals set up by governments whose mandates expire long before the target year. Election cycles mean that decision makers only focus on 5 years at best. An institutional framework is therefore crucial; in the UK, the 2050 target has been established in legislation while an independent advisory body provides advice on interim budget setting and monitoring of progress.[9]

Despite the peer pressure that an international commitment may create, countries still have the possibility to withdraw, as experienced for the Kyoto protocol. Because there can be no institutional guarantee that collective long-term objectives will be fulfilled, it remains crucial to re-affirm the objectives; long-term signals can only have an impact if they are continuously strengthened over time.

With regards to the target carbon price in France, de Perthuis (2015) recently advocated for the adoption of a complementary set of measures that would facilitate the adoption of the yearly increase in budget laws. Their implementation was precisely presented as a safeguard against potential backsliding on the target carbon price. In the context of international climate negotiations, gradually implementing these "coalitions of the willing" and extending their scope, in addition to ensuring a ratcheting mechanism in relation to (I)NDCs, with more stringent obligations, could be an effective way to consolidate the potential long-term decarbonisation goals that would be adopted at COP21. Provided their consistency is ensured, the more signals are sent, the greater the chances are to "lock-in" a low carbon future.

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[9] Committee on Climate Change are the statutory advisors to the UK Government. www.theccc.org.uk

Appendix I: Total number of countries supporting a long-term goal

Source: Track 0, August Briefing on Countries Supporting the Long-term Decarbonisation Goal

Political bloc / country	Number of countries
AOSIS – Alliance of Small Island States	44
LDCs – Least Developed Countries	48 (6 also in AOSIS)
EU – European Union	28
AILAC – Independent Association of Latin American and the Caribbean	6
G7 – France, Germany, Italy, Japan, UK, USA, EU	7 (5 countries also in EU)
Other countries: Brazil, Georgia, Iceland, Mexico, Monaco, New Zealand, Norway, South Africa, Switzerland	9
TOTAL	131 states (+EU)
Total number of parties to the UNFCCC	195 states (+EU)

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Appendix II: National long-term mitigation goals

Source: Climate Action Tracker and UNFCCC INDC registry

Country	Type of goals
Bhutan	Maintaining carbon neutrality over the long-term
Canada	-60%/-70% below 2006 levels by 2050
Ethiopia	Achieving carbon neutrality (no target year
European Union	-80 to -95% below 1990 levels by 2050
Japan	-80% below 1990 levels by 2050
Kazakhstan	-25% below 1990 levels by 2050
Korea	-40 to -70% below 2010 levels by 2050
Republic of Marshall Islands	Achieving net zero GHG emissions by 2050, or earlier if possible
Mexico	-50% below 1990 levels by 2050
Monaco	-80% below 1990 levels by 2050
New-Zealand	-50% below 1990 levels by 2050
Norway	Achieving carbon neutrality by 2050 (or by 2030 in case of a global agreement)
Russian Federation	-50% below 1990 levels by 2050
Switzerland	-70 to -85% below 1990 levels by 2050
Ukraine	-50% below 1990 levels by 2050
USA	-83% below 2005 levels by 2050

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