

BREAKING THE CLIMATE DEADLOCK

DOING THE DEAL: KEY ELEMENTS FOR A COPENHAGEN CLIMATE AGREEMENT

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CONTENTS

03	EXECUTIVE SUMMARY
04	INTRODUCTION
05	THE EMISSIONS REDUCTION OBJECTIVE: AN ACHIEVABLE SAFE CLIMATE PATH
15	SHARING THE COST OF REDUCING EMISSIONS
18	A COMMON FRAMEWORK
20	ANNEX
26	REFERENCES
27	CREDITS

CUTTING A DEAL IN COPENHAGEN

Negotiating a new global deal on climate change has proved to be one of the most complex international processes in recent history. There are uncertainties over what countries are willing and able to do, the ability of cost-efficient technologies to deliver the needed emissions cut and the timing and cost of the effort required. And yet the political will to secure a strong agreement in Copenhagen is clearly in place.

At the heart of the deal is the question of how collectively we put global greenhouse gas emissions on a path that minimises the risk of dangerous and irreversible climate change. We know the technologies and policies needed to achieve this and we know the reductions that are required by 2020, the first milestone along the way. Delay is not an option, as this would require much sharper cuts in emissions in the future that would be more difficult to achieve, both politically and economically.

All major countries have now made ambitious pledges to reduce their emissions over the next decade. Although these are not yet quite good enough to secure a safe climate path, they constitute a major step in the right direction. Agreement in Copenhagen should at least ensure that the most ambitious of these pledges are translated into action, while negotiations should continue to find ways to bridge the gap between these pledges and what is ultimately needed. We cannot allow the desire for a perfect deal to delay the vital opportunity we now have to move forward.

Once a start has been made in making the necessary cuts, it is likely that they will be neither as hard nor as expensive as feared. Scaling up the low-carbon technologies we already have will bring costs down, drive further innovation and improve public acceptance of the changes needed. Therefore, to enable targets to be strengthened in the coming years, governments should put in place mechanisms that will allow ambition levels to be raised. These include:

- Setting themselves longer term targets, such as for 2025 or 2030, that will create political certainty and point out the long-term path;
- Establishing a review mechanism that will be able to recommend deeper cuts, based on the latest scientific, technological and economic knowledge, with a first review in 2015;
- Agreeing to develop Low Carbon Growth Plans that help as yet unidentified emission reduction opportunities to be uncovered;
- Providing financial support for a fast start that enables immediate emissions reduction and builds the capacity for them to be scaled up.

Financing will also have to be made available, in particular to support mitigation efforts in developing countries. Here it is important that public money is used to maximise private sector investment. Deep and broad international carbon markets will play a crucial role in directing this investment towards the best opportunities. While short-term funding cannot be a substitute for more substantial flows later on, a real commitment to a fast start, backed by new public money, will be the catalyst needed to put the agreement into action.

A deal is there to be had: now is the time to grasp it.

INTRODUCTION

The negotiations to secure a new global agreement that builds on and extends the achievements of the UN Framework Climate Convention on Climate Change are now entering the home straight. These negotiations cover a wide range of issues that affect almost every sector of the economy and the political system. Despite their immense complexity, at the heart of these negotiations lies one core question: how do we put global greenhouse gas emissions on a trajectory that minimizes the risk of dangerous and irreversible climate change?

To resolve this essential but broad question there are a number of more specific questions that will need to be answered by governments in Copenhagen:

- By how much must we reduce emissions below current levels in the short, medium and long term?
- What does this mean in terms of effort to cut emissions from what they would otherwise be in 2020?
- How should the responsibility for emissions reduction be allocated between countries?
- Are the commitments made to date sufficient? If not, how can we obtain the additional necessary emissions reduction?
- How much additional funding is needed to finance this emission reduction and how can it be provided?
- How should responsibility for this funding be shared between countries?
- What mechanisms are needed to build confidence in the agreement to facilitate and guarantee its longevity?

Other areas being dealt with in the negotiations – adaptation, technology development and transfer, governance, measurement, reporting and verifying, and capacity building – are of course essential pieces of the climate policy jigsaw and we address some of the key institutional and governance issues later in this paper. However, if countries are unable to reach a satisfactory consensus on the crucial questions listed above, then most of these other issues become redundant. Adaptation will then be the only option and one that may already be closed down.

THE EMISSIONS REDUCTION OBJECTIVE: AN ACHIEVABLE SAFE CLIMATE PATH

Heads of government around the world have already largely accepted that a safe climate path for emissions is one that keeps the average global temperature increase to no greater than 2°C above pre-industrial levels, the level above which the scientific community believes the risk of irreversible and possibly runaway climate change becomes unacceptably high. This is equal to around 1.2°C above current levels.⁰¹

To have a reasonable chance of achieving this, the concentration of greenhouse gases in the atmosphere must be stabilized at no higher than 450 parts per million (ppm), about 60% higher than that in pre-industrial times but only 15% higher than today's.⁰² This, in turn, requires cutting global emissions to around 60% below the current levels by mid-century. To achieve this, while avoiding the need for excessively abrupt and expensive reductions further on in the future, emissions need to peak within the next ten years and then fall by an average of around 3% a year thereafter. Delaying these cuts in emissions, would mean that emissions would peak at a later date, that the starting point for the necessary cuts would be higher, and that much sharper reductions would consequently be required, estimated by some to be as much as 8% a year.⁰³ This is not likely to be technologically feasible, nor is it likely to be acceptable economically or politically. Without action, we are likely to be closer to 750 or 800 ppm, which would result in a 4 or even 6 degree increase in average global temperatures.⁰⁴

It is the cumulative effect of the total emissions released into the atmosphere over the next forty years that would lead to higher global temperatures, so we can express this global emissions objective in terms of the maximum permitted annual emissions at the end of each decade through to 2050. These figures are shown in Table 1 and Figure 1 below. What is evident is that there needs to be a major downward shift in the carbon intensity of economic activity if we are to sustain economic growth at the same time as keeping global emissions on a path compatible with 2°C.

Table 1. Maximum annual emissions and required percentage changes 1990-2050

YEAR	BAU PATH GtCO ₂ e	2° PATH GtCO ₂ e	% CHANGE FROM 1990	% CHANGE FROM 2010	% CHANGE FROM BAU
1990	40	40	0	—	0
2000	48	48	20	—	0
2010	52	52	30	0	0
2020	58	44	10	-15	-24
2030	68	35	-13	-33	-49
2040	75	27	-33	-48	-64
2050	83	20	-50	-62	-76

Sources: IPCC (2007) Climate Change 2007: The Synthesis Report; Project Catalyst (2009) Taking stock – the emission levels implied by the current proposals for Copenhagen. Briefing paper, 7 December 2009; Stern, N (2009) Meeting the Climate Challenge: Using Public Funds to Leverage Private Investment in Developing Countries. Unpublished paper, London.

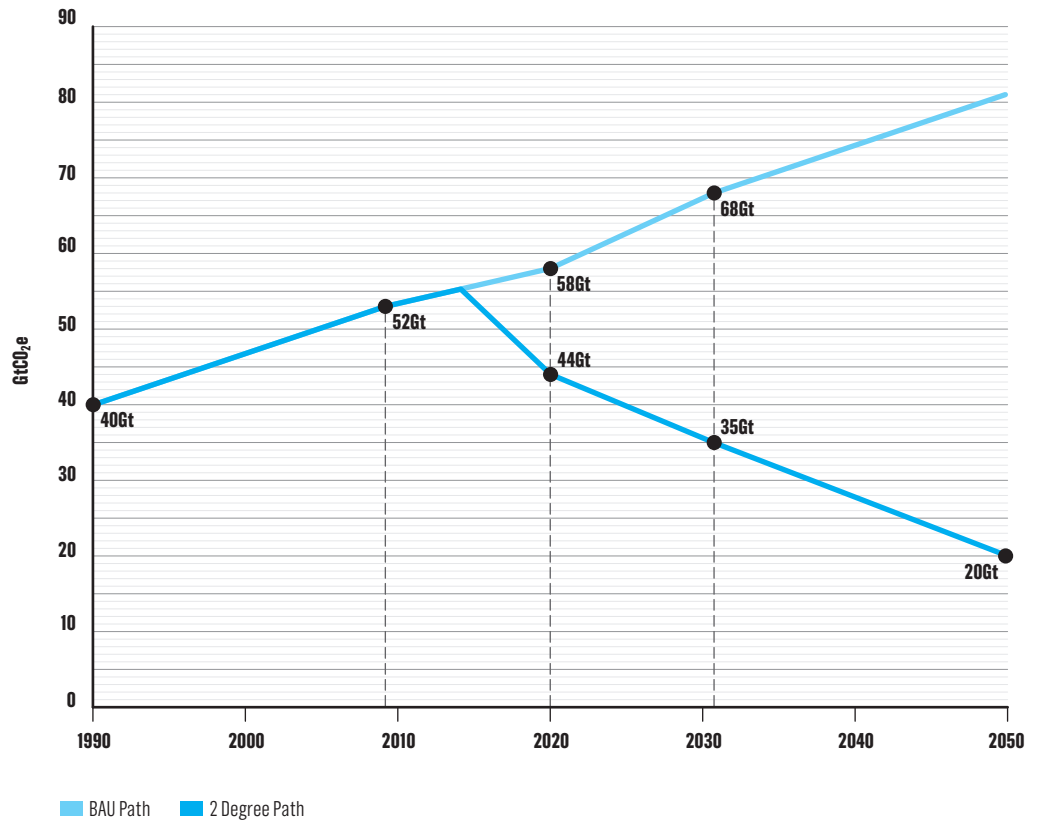
⁰¹ Extrapolated from IPCC (2007) Climate Change 2007: The Synthesis Report. Contribution of Working Groups I, II and III to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change [Pachauri, R.K. and Reisinger, A. (Eds.)] Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA.

⁰² Extrapolated from IPCC (2007) Climate Change 2007: The Synthesis Report.

⁰³ Nature. International Weekly Journal of Science 458, 1159-1162 (30 April 2009). Letter from Malte Meinshausen and other to the Journal's Editor (<http://www.nature.com/nature/journal/v458/n7242/full/nature08017.html>).

⁰⁴ Stern Review (2006). The Economics on Climate Change. The Stern Review. Cambridge University Press.

Figure 1. Global Emissions pathways



Sources: Adapted from data by IPCC (2007) Climate Change 2007: The Synthesis Report; Project Catalyst (2009) Taking stock; Stern, N (2009) Meeting the Climate Challenge.

The immediate objective for 2020 is clear. Instead of allowing unconstrained emissions to rise to close to 58Gt (billion tonnes), some 15% above current levels, we need to find and deliver 14Gt of emissions reduction.⁰⁵ This is the challenge for Copenhagen.

We also know how we can obtain the emissions cut we need over the next decade. McKinsey and Company have calculated that 19Gt of emissions reduction are available around the world at a cost of less than €60/tCO₂e (tonne of carbon dioxide equivalent), with the vast majority costing less than €30/tCO₂e. And nearly a third of this potential can be realized through energy efficiency improvements that pay for themselves through energy cost savings. In fact 70% of the available reductions – roughly equal to the 2020 emissions reduction challenge – can come from investing in just three areas: improved energy efficiency, low carbon energy (principally switching sources from coal to renewables, nuclear and gas) and forestry (mostly from reduced tropical deforestation).⁰⁶ The policies required to achieve these reductions are well-known and have all been successfully implemented, albeit to date at a smaller scale than necessary, in various countries around the world. The challenge may be large but it is certainly manageable.

⁰⁵ International Energy Agency (2009) World Energy Outlook 2009. OEDC/IEA, Paris.

⁰⁶ McKinsey & Company (2009) Pathways to a Low-carbon Economy: Version 2 of the Global Greenhouse Gas Abatement Cost Curve. The Climate Group and The Office of Tony Blair (2009) Breaking the Climate Deadlock: Technology for a Low Carbon Future.

SHARING THE RESPONSIBILITY FOR MEETING THE 2020 CHALLENGE

Nevertheless, meeting the 2020 challenge will certainly require some fairly major changes to how we manage our economies, will require additional investment and will create winners and losers as old technologies and sectors are phased out and new ones appear. It will also impact different countries in different ways. Therefore an approach to sharing the responsibility for the 14Gt reduction between countries needs to be found that is both fair and efficient.

There are a number of well-accepted facts and principles that can help guide this task:

- Unless all major countries and regions participate, it will be impossible to secure the emissions reduction that is needed;
- Where the emissions reduction actually take place is immaterial. Therefore the geographical location of policies and technology changes need not correspond to where the cost burden is felt;
- Linked to the above, an agreement that is cost-effective, i.e. which secures the needed emissions reduction at the lowest possible cost, will be more economically and politically sustainable than one that is seen to impose unnecessarily high costs;
- Fairness demands that industrialized countries – with their predominant share of historic emissions, higher current per capita emissions levels and greater wealth and technological capacity – should act first and cover at least some of the costs incurred by developing countries making emissions reduction;
- The fairness principle also suggests that countries in similar situations should make similar levels of commitment.
- A collaborative approach will bring greater cost-effectiveness, speed up the deployment of new technologies and build trust between countries that each is doing its fair share;
- Investors and business require reasonable long-term certainty in order to make investments to deploy low-carbon-technology alternatives that may not be the short-term, least-cost option.

From the above, we can identify the basic criteria for determining how the responsibility for emissions reduction should be allocated.

Firstly, industrialized countries should undertake all the mitigation options that are available at a reasonable cost. The McKinsey analysis cited above suggests that around 5Gt's worth of emissions reduction can be achieved at a marginal cost of less than €60/tCO₂e, with the average cost likely to be around a quarter of this amount.

Secondly, it seems reasonable to expect all countries to commit to self-financing those measures that can achieve emissions reduction at zero net cost and/or which generate co-benefits that more than outweigh the initial investment. Many efficiency improvements and some agricultural practices fall into this category, although for some less-developed countries technology and capacity support may be needed for them to be viable. For developing countries the potential abatement that falls into this category and which should therefore form part of their own contribution comes to a total of around 3Gt of emissions reduction.

Thirdly, the lowest-cost options for finding the remaining 6Gt of reductions that are needed to meet the target level of 44Gt in 2020 are to be found in developing countries.⁰⁷ However, since realizing these options would not be economically viable in the absence of a carbon policy, the additional cost necessary to make them as attractive as the carbon-intensive, business-as-usual (BAU) alternatives should be covered by the industrialized countries.

Within these 'net positive cost' opportunities, there are two groups. The first group comprises those actions for which putting a price on emissions would act as sufficient incentive for them to be implemented. These principally include investments in technologies that are well-known and commercially tried and tested and for which the necessary skills and institutional conditions are in place. Examples of this include switching from coal to gas for power generation or to some renewable sources of energy and the upgrading of cement production. These abatement options can be financed cost-effectively through the international carbon market, via an expanded Clean Development Mechanism or via a new approach for crediting reductions at the sectoral level. The volume of emissions reduction that can be achieved will depend crucially on the international price of carbon; this, in turn, will be determined by the level of ambition embodied in industrialized country targets. The more ambitious these are, the greater will be the flow of financing to developing countries, and the larger the volume of emissions reduction that can be achieved.

⁰⁷ McKinsey & Company (2009) Pathways to a Low-carbon Economy.

The second group comprises of 'net positive cost' opportunities actions where a carbon price stimulus will be insufficient to change investment decisions, either because cost is not the main barrier to implementation or because a transparent and liquid market cannot readily be created. Much of the abatement potential from reducing tropical deforestation falls into this category and can be best supported through direct funding.

Thus we can see that to achieve the 14GtCO₂e in emissions reduction needed in 2020, a reasonable division of responsibility would be for:

- Industrialized countries to cut 5Gt through domestic action;
- Developing countries to contribute 3Gt through measures that come at net zero or negative cost; and
- The remaining 6Gt to take place in developing countries but be dependent on funding by industrialized countries through a combination of private sector investments via carbon markets and direct public funding.

THE FIRST STEP: CONSOLIDATING EXISTING PLEDGES AND COMMITMENTS

Reflecting the political commitment of leaders to secure a successful agreement in Copenhagen, almost all major countries have proposed significant pledges or commitments to reducing or limiting the growth of their emissions. A selection of these is shown in Table 2 below.

Table 2. Current national emission reduction pledges

COUNTRY	PLEDGE 2020 BASIC ACTION	PLEDGE 2020 AMBITIOUS ACTION	BAU 2020 EMISSIONS GtCO ₂ e	TARGET LEVEL 2020 GtCO ₂ e	PLEDGE POST-2020	NOTES
Australia	5% below 2000 levels	25% below 2000 levels	0.6	0.4-0.5	60% below 2000 levels by 2050	Higher cuts conditional on comparable action from other countries
Brazil	Emissions reduction by reduced deforestation; increased biodiesel blend; renewables	36%-39% cut from BAU	2.7	1.7-2.6	—	Commitment for 2020 conditional on external financing
China	40-45% cut in carbon intensity from 2005 levels; Emissions reduction by energy intensity reduction; increased share of low carbon energy sources; increase in forest coverage		13.9	12.2	—	Absolute target level depends on economic growth
EU	20% below 1990 levels	30% below 1990 levels	5.6	4.0-4.5	80-95% below 1990 by 2050	30% target conditional on comparable action from other countries
India	Emissions reduction by energy efficiency; more efficient coal power; solar; reduce T&D losses	20-25% cut in carbon intensity from 2005 levels; Emissions reduction from nuclear and hydro	3.3	2.7-3.0	—	Absolute target level depends on economic growth
Indonesia	26% below BAU	41% below BAU	2.8	1.7-2.1	No post-2020 target but possible commitment to billion tonne CO ₂ reduction by 2050 and shifting forests from net emitter to net carbon sink by 2030	41% target conditional on external financing
Japan	15% below 2005 levels	25% below 1990 levels	1.5	1.0-1.2	60-80% below 2005 by 2050	25% target may be conditional comparable action from other countries
Mexico	Energy efficiency; fuel switching; renewables; LULUCF	An absolute emissions reduction target of 700 Mt CO ₂ e	0.9	0.7-0.8	50% below 2002 by 2050	President committed to cut 50 million tonnes of annual emissions by 2012; reductions after 2012 conditional on external financing
Russia	10-15% below 1990 levels	22-25% below 1990 levels	2.9	2.1-2.6	30% below 1990 after 2020; 50% below 1990 by 2050	Commitment of ambitious pledge conditional on comparable action from other countries
South Africa	34% below BAU resulting in emissions peak in 2025, stabilize for 10 years and decline	Emissions peak in 2020, stabilize for 10 years and decline	0.6	0.5-0.6	—	Conditional on finance and technology transfer. No post 2020 target but study of long-term mitigation pathways and options up to 2050
South Korea	30% below BAU		0.8	0.6	No post-2020 target but aggressive target for renewables	2020 target equivalent to 4% cut below 2005 levels
US	Emissions reduction by fuel emissions standards; appliance standards; economic stimulus bill	17% below 2005 levels	7.8	6.1-7.6	42% below 2005 by 2030; 83% below 2005 by 2050	Current Senate targets, equivalent to a 4% reduction below 1990 levels

Sources: Project Catalyst (2009) Taking stock – the emission levels implied by the current proposals for Copenhagen. Briefing paper, 7 December 2009 and; Climate Analytics, Ecofys and Postdam Institute for Climate Impacts Research (2009) Climate Action Tracker www.climateactiontracker.org accessed 11.12.09 and; Sustainability Institute (2009) Climate Interactive <http://climateinteractive.org/> accessed 11.12.09 and; National Policy Announcements.

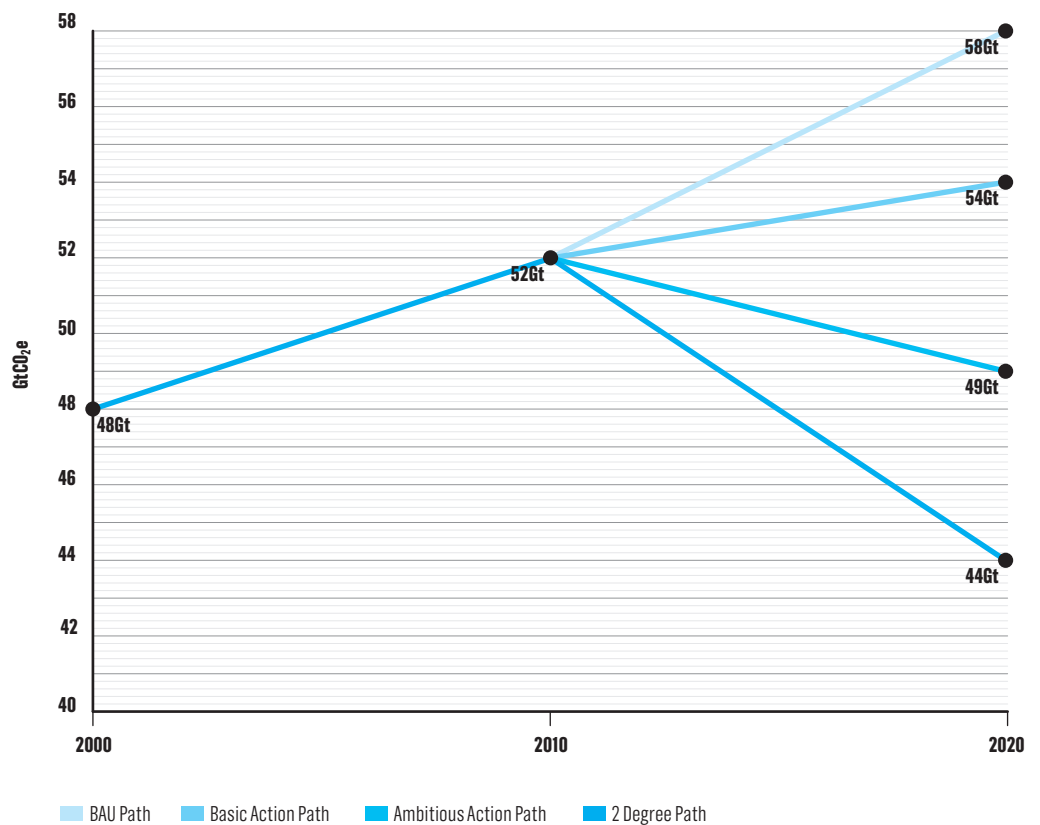
The range of numbers that are given for target emission levels in 2020 reflects the fact that countries have used different approaches in expressing their pledges and established conditions for meeting their more ambitious aspirations. For example, most industrialized countries have set economy-wide, absolute emissions reduction targets, but with their deeper cuts being contingent on other countries doing the same and on a global agreement being reached in Copenhagen. Most developing countries, on the other hand, have set targets relative to BAU levels, or in terms of energy or carbon intensity, meaning that the final result in absolute terms will depend on their level of economic growth over the coming decade. Moreover, in many cases, part or all of developing countries' commitments are conditional upon sufficient financial support being made available.

If one aggregates the lower and upper bounds of the pledges across countries,⁰⁸ we can identify two scenarios:

- Basic action scenario: comprising only unconditional national commitments, targets and policies already enshrined in law;
- Ambitious action scenario: comprising of pledges that allow countries to meet their highest current levels of ambition. Subject to stipulated conditions being met.

The predicted impact of both these scenarios on global emission levels in 2020 and how these compare with the 2 degree path outlined earlier are shown in Figure 2 and Table 3.

Figure 2. Impact of country pledges on global emissions pathways



Sources: Adapted from data by IPCC (2007) Climate Change 2007: The Synthesis Report; Project Catalyst (2009) Taking stock; Stern, N (2009) Meeting the Climate Challenge.

Table 3. Global emissions reduction resulting from national pledges

	DEVIATION IN 2020 FROM 2010 LEVELS	DEVIATION IN 2020 FROM BAU LEVELS
BAU PATH	+12%	—
BASIC ACTION	+4%	-7%
AMBITIOUS ACTION	-6%	-16%
2 DEGREE PATH	-15%	-24%

Sources: Adapted from data by IPCC (2007) Climate Change 2007: The Synthesis Report; Project Catalyst (2009) Taking stock; Stern, N (2009) Meeting the Climate Challenge.

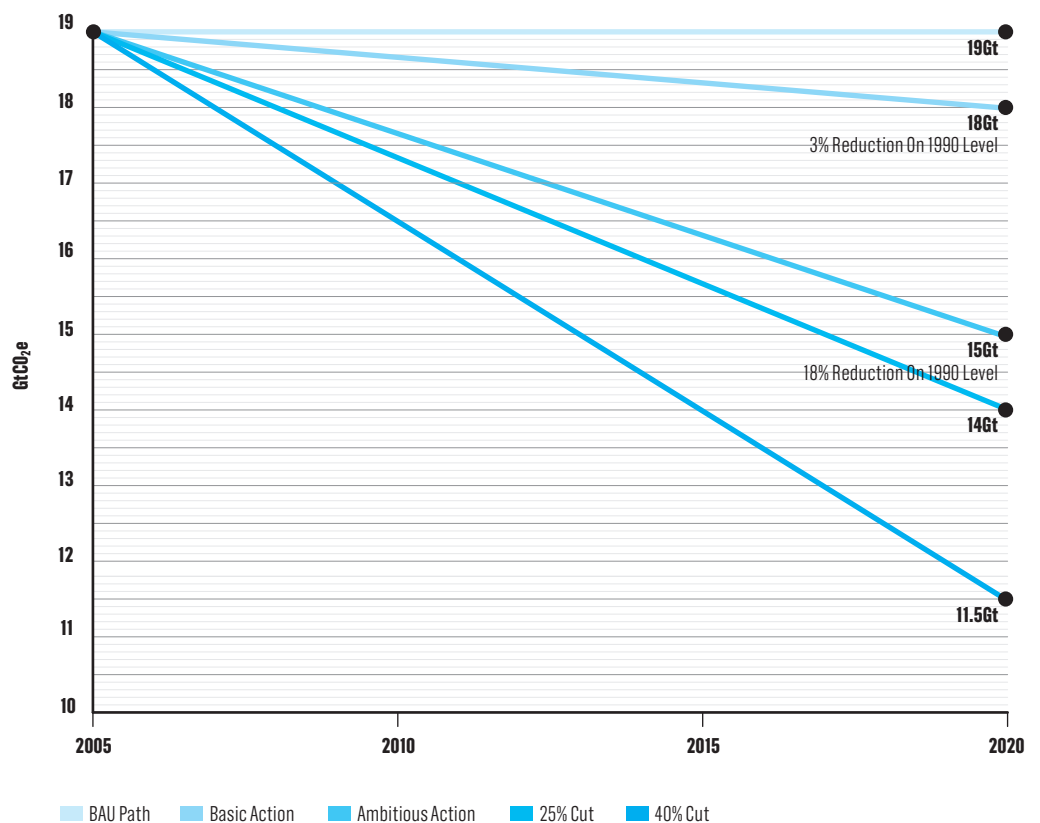
⁰⁸ The fact that some industrialized countries assume the use of emissions reduction from developing countries as offsets, while some developing countries propose to use carbon markets to finance their contributions, means that it is not possible simply to add up all commitments. This is reflected in the difference between the figures in Table 2 on the one hand, and those in Table 3 and Figures 2, 3 and 4 on the other.

The first conclusion that can be drawn is that in both scenarios, especially that of 'Ambitious Action', emissions are significantly lower in 2020 than they would otherwise have been and represent a significant collective effort. The first task for leaders in Copenhagen is therefore to lock in the commitments that make up the 'Ambitious Action' scenario.

Nevertheless, even this scenario is not sufficient to put the world on a 2 degree pathway. If no further reductions are achieved, it is likely that the atmospheric concentration of greenhouse gases will exceed 550ppm and that the global temperature increase will be in the order of 3.5°C. To get on the 2 degree path another 5Gt of emissions reduction will need to be found.⁰⁹

The aggregate impact of current pledges and the additional effort that is needed can also be broken down between industrialized and developing countries. This is shown in Figures 3 and 4. The 2 degree target pathway is broken down between the two regions on the basis proposed by the Intergovernmental Panel on Climate Change (IPCC): absolute reductions by industrialized countries of between 25% and 40% and reductions by developing countries (seen in the Figure below) of between 15% and 30%.¹⁰

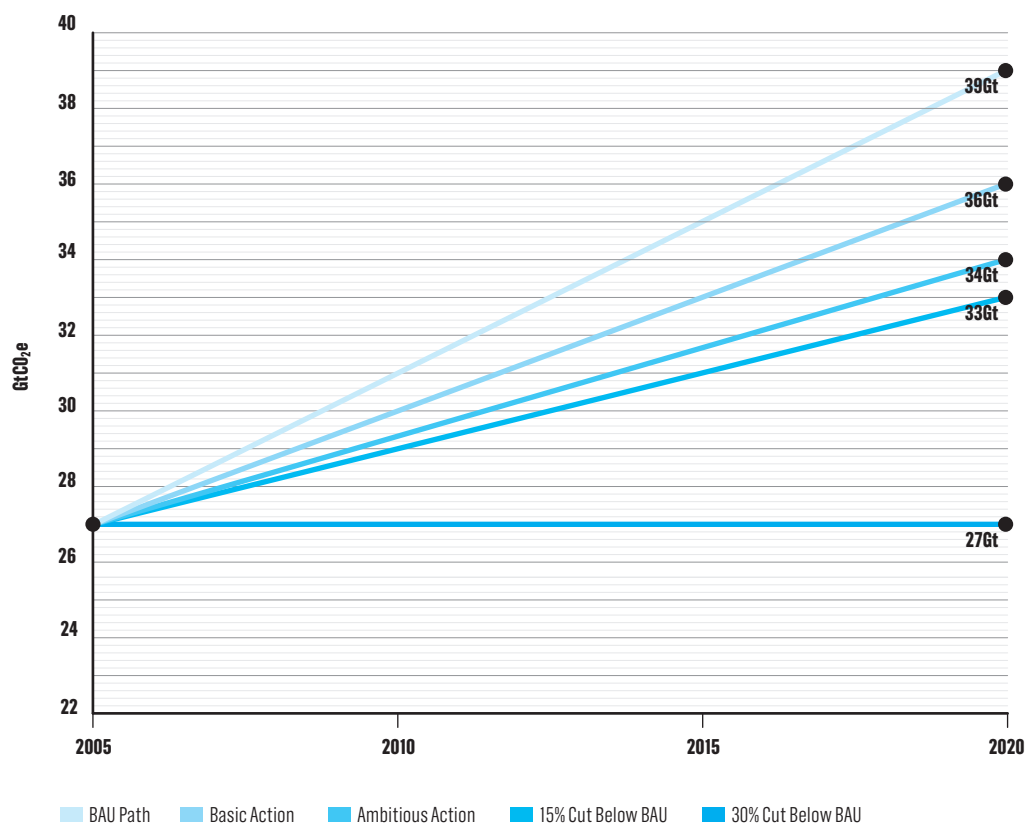
Figure 3. Industrialized Country Pledges



Sources: Adapted from data by IPCC (2007) Climate Change 2007: The Synthesis Report; Project Catalyst (2009) Taking stock; Stern, N (2009) Meeting the Climate Challenge.

⁰⁹ Stern, N (2009) Building an Equitable Agreement on Climate Change. LSE
¹⁰ IPCC (2007), Summary for Policymakers. In: Climate Change 2007: Mitigation. Contribution of Working Group III to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change (B. Metz, O.R. Davidson, P.R. Bosch, R. Dave, L.A. Meyer (eds)), Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA.

Figure 4. Developing Country Pledges



Sources: Adapted from data by IPCC (2007) Climate Change 2007: The Synthesis Report; Project Catalyst (2009) Taking stock; Stern, N (2009) Meeting the Climate Challenge.

As in Figure 2, in both scenarios it can be seen that countries would achieve an important reduction in emissions below their BAU levels in 2020, by 4Gt and 5Gt respectively, under the 'Ambitious Action' scenario getting quite close to the lower end of their target range. Nevertheless, even if both groups of countries were to reach the lower end of their target range this would not be sufficient to take emissions to a level consistent with the 2 degree pathway and would fill only 2Gt of the 5Gt gap.¹¹

¹¹ Stern, N (2009) Building an Equitable Agreement on Climate Change. LSE

BRIDGING THE GAP

Securing the extra 5Gt of emissions reduction will be no easy task, even though assessments of the 2020 mitigation potential show that further emissions reduction is available at a reasonable cost. Following the principle of achieving emissions reduction in the most cost-effective way suggests that one area where further abatement may be possible is through increased efforts to reduce deforestation in developing countries, similar to the ambitious contributions proposed by Brazil and Indonesia. However, this would be contingent on industrialized countries providing the necessary additional public funding. There may also be more low-cost abatement opportunities in developing countries in the energy and industrial sectors, which could be financed through international carbon markets. However, for this to be effective, industrialized countries would need to adopt more ambitious targets themselves, as this would generate a greater demand for international offsets.

While governments should strive to secure the necessary extra emissions reduction, it may not be possible to deal with them all in Copenhagen. This should not be seen as failure; although it is important that the gap is bridged as quickly as possible. We have already noted that the pledges under the 'Ambitious Action' scenario are a major first step in the right direction. It is probable that the true cost will be much lower than originally predicted, as has been the case with other environmental policies in the past, such as clean air legislation in the United States and the Montreal Protocol. The very fact that all the world's major economies have taken on meaningful targets and enacted policies to achieve them, makes it likely that business will begin to shy away from high carbon investments, even where this is not actually mandated, in order to avoid the risk of being left with stranded assets.

What is important is that mechanisms and tools be put in place to enable increased levels of ambition to be included as soon as possible after Copenhagen. There are three immediate ways of doing this, which complement each other:

1. Establishing a review process to determine the additional abatement that is required and available.

The science of climate change and our understanding of the technological options for reducing emissions and for building resilience to climate impacts are continually evolving. Since it is this knowledge that frames the policy decisions that are made domestically and internationally, it is essential that this is used to inform the process of reviewing and setting new targets.

Therefore, governments in Copenhagen should establish a regular review mechanism that assesses the latest evidence on the abatement that is needed, the options that have emerged for achieving this abatement and any new knowledge of the costs involved. This assessment, performed under the direction of the UNFCCC, would lead to recommendations that would form the basis for a new round of negotiations on the collective and individual country targets required. This process would not amount to re-opening the Copenhagen agreement. Quite the opposite, it would constitute a way of enabling ambition levels to be raised without the need for full-blown negotiations.

The IPCC is due to publish its Fifth Assessment Report in 2014. The following year, 2015, which coincides with the half-way mark between now and 2020, would therefore seem an appropriate moment for the first of those reviews. Subsequent reviews could then proceed on a five-yearly basis.

2. Setting medium and longer term targets that establish the overall level of ambition, and thereby sending a clear signal to business and investors about policy directions.

While 2020 targets provide the spur to immediate action to cut emissions, goals for 2030 and beyond, which are enshrined in both international agreements and national legislation, can play an important role in influencing decisions about investment in areas such as power plants, public infrastructure and other projects whose operations are measured in decades rather than years. Similarly they can provide an important incentive for entrepreneurs and early stage investors in clean technologies, by indicating that markets will exist for their products and services. Where one country's 2020 targets are not considered by the majority of others to be sufficient, setting a much tighter cap for the post-2020 period could be an effective way of demonstrating that an adequate level of ambition exists.

As Table 2 above shows, many countries, from both the industrialized and developing world, have already done this, setting targets for both 2030 and 2050. This could be formalized in Copenhagen by agreeing on the collective long-term goal and providing a mechanism for countries to lodge their associated commitments. Key elements coming out of Copenhagen in this connection could include:

- Reaffirming the collective commitment to keep the average global temperature increase to 2°C above pre-industrial levels. As we have seen, this sets the parameter for the overall safe emissions path over the next forty years;
- A global goal that emissions should fall to below half their 1990 levels, or less than 20GtCO₂e, by mid-century. This could be accompanied by agreement that total emissions in 2030 should not exceed 35GtCO₂e¹²;
- A commitment by industrialized countries to cut their emissions by at least 80% below 1990 levels, or down to two tonnes per capita in 2050.¹³ This would create a clear signal for business in these countries, while also demonstrating to developing countries that they will have the 'space' to grow while cutting their carbon intensity.

3. Creating Low Carbon Growth Plans (LCGPs) that allow further abatement opportunities to be identified.

While providing the means to ensure that emissions are kept to a safe trajectory, the targets discussed above will only be achieved if they are backed by solid national and regional policies and the necessary financing. To help facilitate this, all industrialized and major emerging economies should set out Low Carbon Growth Plans (LCGPs).

For industrialized countries the LCGPs should show how they plan to meet their targets, thereby providing credibility to their commitments and offering an indication of the expected level of carbon market financing that will be made available. Developing country LCGPs should also lay out how they propose to make their pledged contributions and, in addition, show what they will do on their own, what can be achieved through carbon market financing and where direct funding and other support is needed.

If designed well, LCGPs can provide a key tool for ensuring that a coherent set of actions that is consistent with national development priorities is developed, including the allocation of public finance, attracting external private sector investment into the low-carbon transformation of the economy, building confidence domestically and internationally, and the sharing of experiences. LCGPs provide the most direct means for identifying as yet undiscovered abatement opportunities, as well as enabling the raising of levels of ambition.

LCGPs will vary from country to country, depending on national circumstances and priorities. In those countries where the capacity to generate economy-wide plans does not yet exist, a set of proposed Nationally Appropriate Mitigation Actions (NAMAs) could be proposed, covering those sectors where policies can be put in place and that are in need of support. Where possible, these should aim to use the same metrics to facilitate monitoring, comparison of progress and assessment of investment opportunities.

¹² Stern, N (2009) Building an Equitable Agreement on Climate Change. LSE

¹³ Stern, N (2009) The economic crisis and the two great challenges of the 21st century.

SHARING THE COST OF REDUCING EMISSIONS

An agreement that successfully puts the world on, or close to, the 2 degree path and that drives a rapid transition to a climate resilient, low-carbon global economy will require a major mobilisation and redirection of both public and private capital. In particular, as stated above, new financing will be needed:

- To finance the additional investment costs associated with mitigation strategies in developing countries¹⁴ and make capital loans available for abatement options that generate positive returns but for which capital availability is a limiting factor;
- To support Reducing Emissions from Deforestation and Forest Degradation and other natural sinks in developing countries (i.e. REDD+, which we discuss later on).

In addition to that, new financing will be needed:

- To increase publicly supported Research, Development and Diffusion (R,D&D) of new technologies for both mitigation and adaptation;
- To build institutional and technical capacity in developing countries, including: for the design of Low Carbon Growth Plans; monitoring, reporting and verification; needs assessment; and programme development;
- To cover the costs of adaptation, particularly in poorer, more vulnerable countries.

In order to drive long-term planning and investment decisions effectively, the funding in each of these areas will need to be genuinely new, additional and predictable.

VOLUME AND SOURCE OF FUNDS

Estimates of the total quantum of financing required depend on critical assumptions about future energy prices, rates of economic growth, the cost of different abatement options, the response of the climate to increased warming and associated impacts and the speed and effectiveness of the global policy response. Nevertheless, most studies put the annual amount needed to cover the incremental costs of adaptation and mitigation in developing countries at between US\$100 billion and US\$200 billion by 2020, with approximately two-thirds for mitigation and the remainder for adaptation, technology and capacity building.¹⁵

Whichever numbers are used, this represents a significant increase on the current annual flows of US\$9 billion for mitigation in developing countries, of which three quarters flow through the CDM, while approximately US\$600 million is allocated to the Climate Investment Funds and around US\$200 million is committed to adaptation through the Global Environment Facility.¹⁶ A deal in Copenhagen should therefore have at its heart a commitment to generate financing of at least US\$100 billion a year by 2020. It is important that countries are committed to the right scale of finance from the outset – while small amounts of money can effect important changes, without a transformational approach, we will only be incurring higher costs for the future. Of this total, some US\$10 billion needs to be deployed immediately as part of a fast-start provision in the agreement (see below).¹⁷

¹⁴ The additional costs refer to the extra financing required to make the rate of return on low-carbon and climate-resilient investments at least equal to the least cost or most profitable option for providing the same service.

¹⁵ Council of the European Union (2009) Presidency Conclusions: Brussels European Council 29/30 October 2009. Document 15265/1/09 REV 1 CONCL 3 and; Project Catalyst (2009) Scaling up Climate Finance. Finance briefing paper, September 2009; and Stern, N (2009) Meeting the Climate Challenge: Using Public Funds to Leverage Private Investment in Developing Countries. Unpublished paper, London.

¹⁶ Araya, M, Findlay, M. and Langley, C. (2009) Towards a Global Deal on Climate Finance at Copenhagen. E3G, London, UK.

¹⁷ The Commonwealth Climate Change Declaration (2009) available online at <http://www.thecommonwealth.org/files/216780/FileName/PortofSpainClimateChangeConsensus.pdf>

By no means all of this money needs to be raised from public finances, although public money will be the predominant source of funding for adaptation, technology development, capacity building and REDD+. If deployed effectively, public funds can be used to leverage significant investment from the private sector. It is worth bearing in mind that the more ambitious the emissions cap that is adopted by industrialized countries, the greater the (private sector) investments that will flow through the carbon markets and the less that will be required from public purses. Several sources of public funding have been suggested in the academic literature and through the UN negotiations.¹⁸

- US\$10-15 billion could be raised through the auctioning of emission allowances to the aviation and shipping sectors as part of a market-based sectoral agreement;
- A similar amount could be generated by auctioning a portion of the emissions permits that make up the industrialized country cap and/or the allowances allocated to companies under national and regional emissions trading schemes;
- A levy on international emissions trading, similar to the 2% levy that currently applies to Clean Development Mechanism projects, with the total dependent on the size of the global carbon market;
- Use of Special Drawing Rights (SDRs) and other international financial instruments;
- Direct government support, through additional Overseas Development Assistance (ODA) and other forms of public finance (of up to US\$30 billion, including voluntary contributions from both industrialized and developing countries) and concessional debt (of US\$6-10 billion), with contribution levels set using a metric like that contained in the Mexican Green Fund proposal; and
- Use of public balance sheets to leverage private investment, for example by providing risk guarantees.

It is likely that a combination of all of the above will be needed and governments in Copenhagen should agree to both the overall level to be reached by 2020 and to targets for funding from bunker fuel allowances, and assigned amount auctions. As well as agreement on this overall target, individual countries should commit firm amounts of public funding in the immediate, short-term and should have these commitments recorded, monitored and verified as part of their broader obligations. Initially, this direct public funding will need to be the primary source to ensure a predictable flow of funds until the other mechanisms can take over; as other sources expand so the need for additional public support will be reduced.

Alongside the public funding, it is essential that private sector, low-carbon financing is mobilised. Indeed, as emissions reduction targets become more ambitious, the price of carbon (and fossil-based energy) rises, supporting policies (such as efficiency and renewable energy standards) are increasingly put in place and the capacity to develop investible emissions reduction projects and programmes improves, so it is reasonable to assume that more mitigation financing will come from the private sector.

The main source of private sector financing for emissions reduction in the developing world is likely to be the carbon market. An expanded CDM would allow investment both individual projects and programmatic approaches and have greater capacity for processing projects quickly and involving more countries. This could be complemented by new crediting systems that enable the transformation of whole sectors to be financed based on pre-established low-carbon plans. With sufficiently tight caps in industrialized countries, these carbon market mechanisms can drive large quantities of investment – possibly as much as \$50-100 billion per year by 2020 – into cost-effective greenhouse gas abatement. This is about half the additional annual investment that the International Energy Agency (IEA) says will be needed in developing countries by 2030 for low-carbon restructuring of their energy production and consumption.¹⁹

Crucially, however, carbon markets are not and cannot be the only mechanisms used to mobilise low-carbon private finance and need to be complemented and supported by other approaches. For example, energy efficiency improvement programmes are likely to be financed more successfully through the creation of low cost debt facilities that help to cover the sometimes high, initial investment costs that are then recouped through energy bills and other methods for capturing reduced energy costs. REDD programmes are also unlikely to be best served by carbon markets in the short-term, while blended public and private finance in consolidated funds that are linked to both policies and concrete outcomes could prove very effective.

Given the importance of REDD, it is essential that early action is taken in this area. Forestry and agriculture account for more than 30% of greenhouse gas emissions and, as we have seen, provide as much as 50% of the cost-effective emissions abatement opportunities in 2020. Tropical deforestation is the largest source of land-based emissions and thus provides the most urgent and immediate opportunity for action. Reducing emissions from deforestation and forest degradation, along with enhancement, conservation, and sustainable management of forests (collectively referred to as 'REDD+') has emerged as one of the strongest areas of consensus for multilateral agreement and action in Copenhagen. An immediate investment of €15-25 billion could reduce global deforestation rates by 25% in 2015 with a corresponding reduction in emissions of 76tCO₂e.²⁰

¹⁸ Report of the Ad Hoc Working Group on Long-term Cooperative Action (2009) under the Convention on its seventh session, held in Bangkok from 28th September to 9th October 2009, and Barcelona from 2nd to 6th November 2009. Document IF4C/CSaCp/IAemWbGerL/2009/92/009/11. Stern, N (2009) Meeting the Climate Challenge: Using Public Funds to Leverage Private Investment in Developing Countries. Unpublished paper, London. UNEP and Partners (2009) Catalysing

¹⁹ low-carbon growth in developing economies. International Energy Agency (2009) World Energy Outlook 2009. OECD/IEA, Paris.

²⁰ Informal Working Group on Interim Financing for REDD+ (IWG-IFR) (2009) Discussion Document.

In the short-term at least, however, the carbon market will not be sufficient to finance the necessary scale of reductions. Specific fund structures will be needed to:

- Support the creation of the necessary technical and institutional infrastructure;
- Support (smaller) governments in developing alternative development plans;
- Fund projects and programmes that reduce deforestation; and;
- Finance deforestation policies at the national/regional level.²¹

CATALYSING A FAST START

In addition to the components above, countries should agree a fast-start mechanism, comprising initial funding and technical support to build capacity in developing countries, that will enable action to start immediately without waiting for 2013 (the likely starting point for formal commitments) or for the completion of all the legal work that remains to be finalised after Copenhagen. This fast start funding would be used for the following:

- Help rainforest nations build capacity for REDD and deliver initial reductions in deforestation;
- Build the infrastructure necessary to expand the international carbon market;
- Support the development of Low Carbon Growth Plans and NAMAs;
- Create and strengthen institutional capacity in developing countries for: project delivery; monitoring, reporting and verification of emissions reductions; technology development and diffusion; and adaptation planning;
- Implementation of short-term preventative adaptation measures;
- Accelerate the development and diffusion of next generation technology solutions.²²

As noted above, these fast start activities will require at least US\$10 billion in funding to be made available as soon as possible. This money should be put on the table in Copenhagen and placed into an international fund (or, if not, set aside and earmarked as being from national budgets and registered as such with the UNFCCC) by industrialized countries from public budgets, over and above their existing ODA commitments, and be independent of final agreement on the legal treaty that will be constructed on the Copenhagen agreement. Beyond enabling the critical actions outlined above, the provision of these funds would represent a significant gesture of commitment towards, and help to build confidence in, the delivery of the Copenhagen agreement.

GOVERNING THE FINANCES

A well-designed and managed governance system that provides transparency, guarantees that funds are directed where they are most needed and is flexible enough to respond to a wide range of needs in countries at differing stages of development is the third key ingredient for a successful climate framework. Although there are disagreements about the transparency, representativeness and effectiveness of existing institutions, these should nevertheless be used wherever possible to avoid long delays in putting the architecture in place, while still dealing directly with the issues that have been raised.

Foremost amongst these issues is ensuring greater ownership of the funds by developing countries, in particular through a more balanced representation on their boards and management structures. Moreover, the funds – especially those relying heavily on public money – should be accountable to the UNFCCC, again to ensure representative decision-making, broad geographical use of funding and to ensure that disbursement does not respond excessively to the priorities of “donors”. Equally important is ensuring that the respective institutions have the capacity to deal with large-scale financing – at levels far larger than existing flows of climate finance – using programmatic and strategic approaches rather than purely project-based ones, and without high levels of procedural complexity and slow decision-making.

²¹ The Eljasch Review (2008) *Climate Change: Financing Global Forests*. Earthscan, London.

²² The Climate Group and The Office of Tony Blair (2009) *Breaking the Climate Deadlock: Technology for a Low Carbon Future*. London.

A COMMON FRAMEWORK

The creation of a registry system for aggregating, measuring, reviewing and strengthening national commitments, together with agreeing institutions for inspecting and auditing emission inventories and performance reports on commitments, represent the foundations of the new agreement and will be necessary to facilitate the meeting of commitments made on emissions reductions and on finance discussed above.

These foundations will facilitate comparisons between countries' commitments and their performance in meeting them, enable assistance to be provided in a timely manner to those having difficulty meeting their obligations, help channel necessary financial and technological support, and strengthen the expansion of international emissions trading. In the case of emissions trading, consistency on how emissions and emission reduction credits are assessed and measured is essential to promoting trust in the units being traded, ensuring full convertibility between units from different sectors and regions and thereby allowing the market to seek out and channel financing to the least cost abatement options efficiently.

There are five critical areas needing agreement:

1. Comprehensive and transparent reporting and the review of national GHG emissions in a timely manner.

A significant amount of work was done in developing the Marrakech Accords to establish a rigorous scientifically-based system for estimating, reporting and reviewing GHG emissions from developed country Parties under an international system.²³ These efforts were embodied in a series of decisions taken by governments and subsequently implemented by all developed countries. The vast majority of the provisions agreed are applicable to whatever kind of agreement is reached in Copenhagen and should serve as the core elements for reporting and reviewing GHG emissions under this new international agreement.

2. A transparent mechanism for registering countries' commitments and actions.

The ability of countries to have confidence in the commitments and contributions of their peers is essential for building trust in the international climate policy regime. This is one of the reasons for asking all countries to prepare Low Carbon Growth Plans that detail how they will meet their commitments and that can be used as a metric for monitoring progress over time. However, it is not only LCGPs that need to be open to scrutiny, an international registry system that allows LCGPs, emissions reduction and commitments to provide climate finance to be lodged, reported, monitored and assessed and verified would enable independent assessment of the comparability of different commitments and of progress towards meeting them. This registry should be operated by the UNFCCC and supported by a cross-country panel of experts to provide independent analysis and review. Information contained in the registry would be publicly available, thereby also facilitating exchange of best practice on policies, measures and other successful approaches to addressing both mitigation and adaptation.

3. Common standards for reporting and reviewing GHG emissions resulting from land use, land-use change and forestry.

Methods for estimating emissions and emission reductions from land use, land-use change and forestry aim to allow Parties to compare the level of effort among countries, to promote linking of emission trading systems and to ensure that land use, land-use change and forestry credits that are purchased from another Party comply with national laws. Common standards would ensure that national baselines are set consistently with each other; that the same definitions are used to assess forest cover, deforestation and activities designed to maintain or increase forest cover; and that the same methodologies are used to account for natural disturbances such as fires or pestilence. Countries have already adopted rules for estimating land-use change emission inventories based on IPCC Guidelines and IPCC Good Practice Guidance and for reporting them using a common reporting format. Under the Kyoto Protocol, countries have also adopted criteria and guidelines for defining, estimating and accounting for afforestation, reforestation and deforestation, along with the accounting rules for forest management, cropland management, grazing land management, and revegetation. Given the work that developing these rules has involved and the high degree of consensus around them, it makes obvious sense for countries to use them as the basis for the new agreement.

²³ The Marrakech Accords (2001) <http://unfccc.int/resource/docs/cop7/13a02.pdf> Document FCCC/CP/2001/13/Add.2

4. Common standards for national GHG registries and the transfer of units between entities in different countries.

National GHG registries are the basic infrastructure necessary for properly functioning carbon markets. By holding emissions units held by entities operating in their jurisdictions and by ensuring the emissions trades between these entities are accurately recorded and, via an International Transactions Log (ITL), consistent with pre-established rules, they underpin the integrity of emissions trading. The ITL also provides an independent check that unit holdings are being recorded accurately in registries.

It should be self-evident that internationally agreed standards for registries are essential to prevent double counting as well as possibly fraudulent transactions between entities, for facilitating access to the international offset market, for tracking the purchase of offsets by entities and countries, and for determining compliance with national laws. This should therefore be a central part of the framework agreed in Copenhagen.

5. Common standards for global carbon markets.

In order to operate effectively and efficiently, carbon markets need to have high levels of transparency, stability and, where more than one market is linked together, common operating rules and principles. In establishing the current global carbon market, a wide range of internationally agreed methodologies and guidelines have already been developed that govern the trading and issuance in the global carbon market of carbon permits and credits and include rules for emissions reporting, basic conditions for participating in carbon markets (such as having well-managed inventories that meet global standards) and rules to allow and govern the consistency of offsets, so that one tonne of emissions reduction is the same and verified to the same standard in all countries. Maintaining these standards, and building on them where necessary through the international process rather than relying on an ad hoc process of national standards, will ensure transparent comparability of efforts and smooth the development of an efficient, global carbon market.

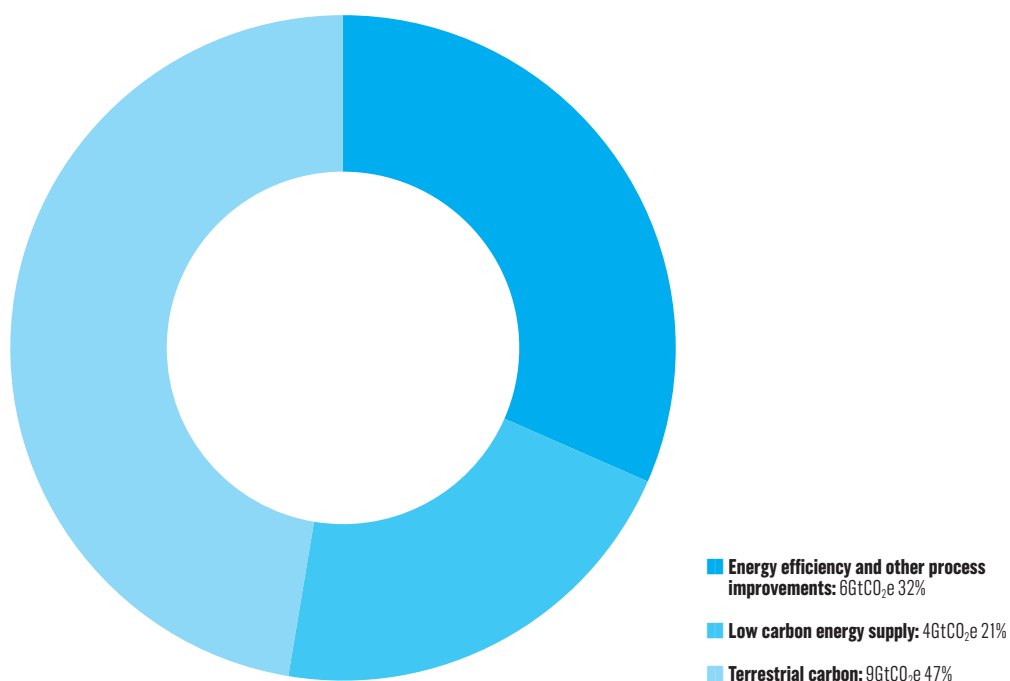
GLOBAL EMISSIONS REDUCTIONS – OPTIONS TO 2020

To put ourselves on a pathway that will give us a reasonable chance of limiting global warming to 2°C above pre-industrial levels, we need to reduce global annual emissions by 14GtCO₂e below Business-As-Usual (BAU) levels in 2020. Analysis by the IPCC, the IEA and McKinsey and Company suggests that some 19Gt of abatement options are available at a reasonable cost a less than €60/tCO₂e. Many of the options, particularly in the area of energy efficiency, destruction of industrial gases and reducing deforestation can be realised at a significantly lower cost or even no net cost at all.

The opportunities can be divided into three categories (see Figure A):

1. Energy efficiency, energy saving and other process improvements
2. Low carbon energy supply
3. Terrestrial carbon

Figure A. Global Emissions Reduction: Options to 2020

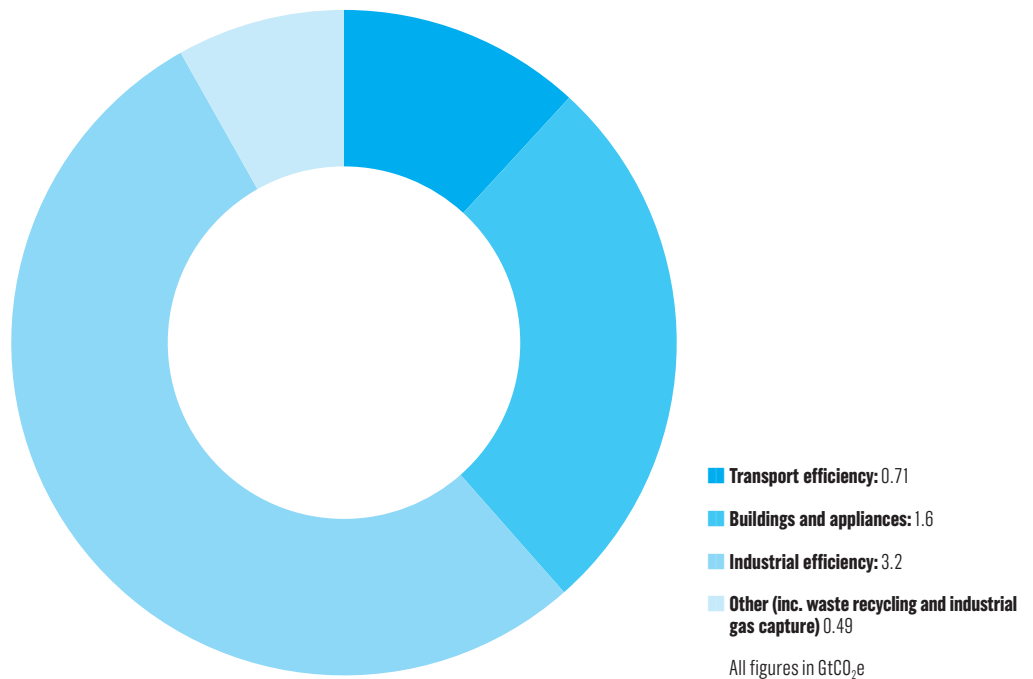


ENERGY EFFICIENCY, ENERGY SAVING AND OTHER PROCESS IMPROVEMENTS

One third of the available low cost abatement opportunities available over the next ten years can be achieved through improvements in energy efficiency, changes in industrial processes and capture of fugitive gases. The main options include (see figure B):

- the use of efficient electrical appliances, lighting, and air conditioning systems;
- substitution of inefficient industrial motors;
- building insulation;
- efficient cars and trucks and hybrid vehicles;
- reduced leaks from gas pipelines;
- capture and destruction of industrial gases; and
- improved steel and cement manufacture.

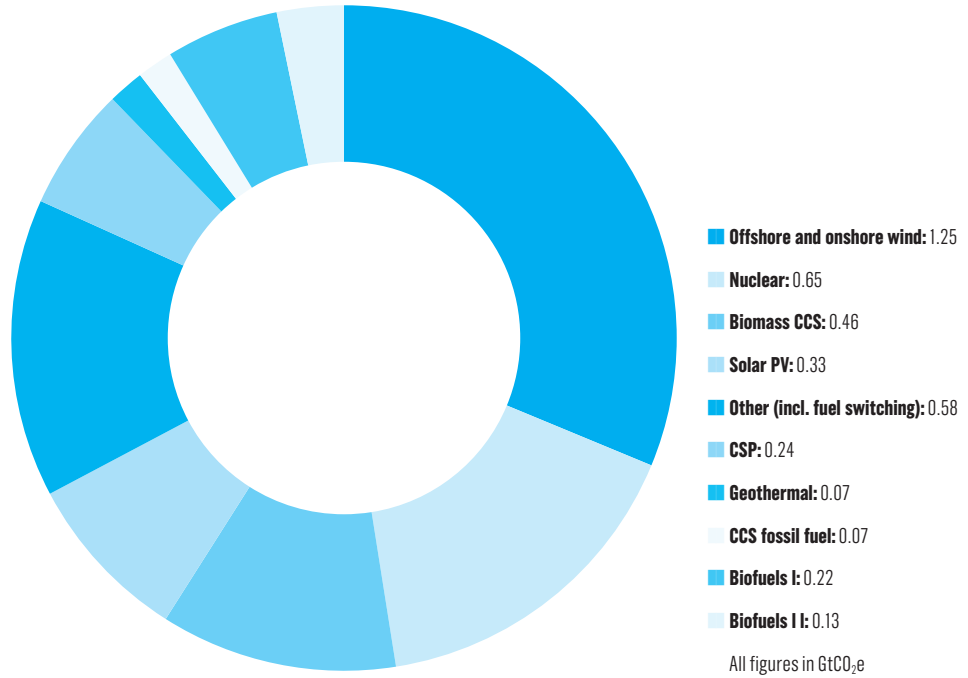
Figure B. Global Emissions Reduction to 2020: Opportunities from energy efficiency and process improvements = 6GtCO₂e



LOW CARBON ENERGY SUPPLY

One fifth of the abatement potential by 2020 can be achieved by shifting from high to low carbon energy resources. Of these wind power and already planned nuclear make up nearly half of the total opportunity while solar (both photovoltaic and concentrating solar thermal) and biomass can also make an important contribution (see Figure C).

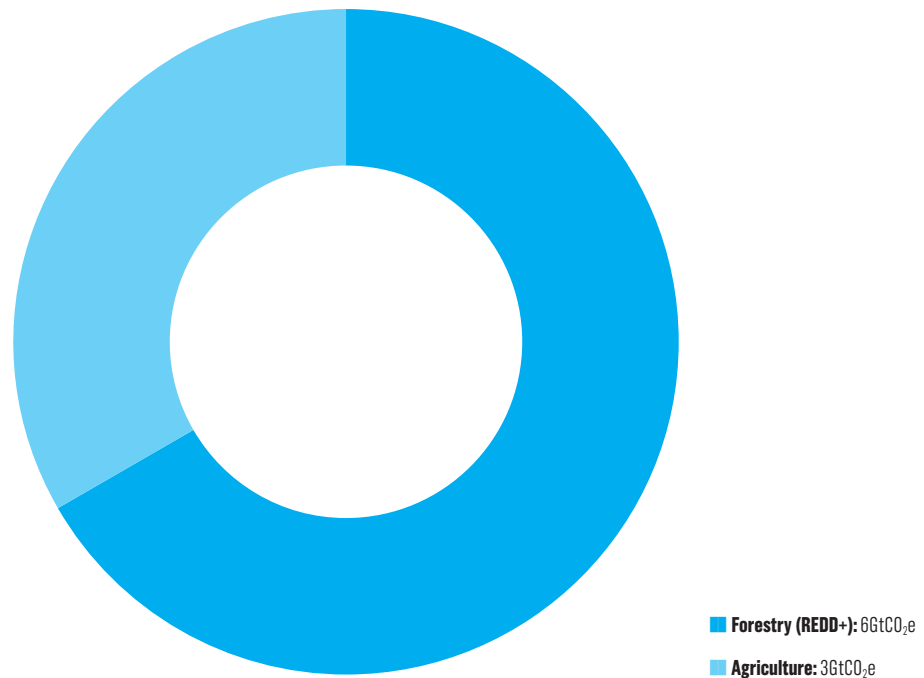
Figure C. Global Emissions Reduction to 2020: Opportunities from low carbon energy supply = 4GtCO₂e



TERRESTRIAL CARBON

Nearly half the global emission reductions available by 2020 can be delivered through reduced emissions from deforestation, forest degradation and land use change – see Figures A and D. By far the biggest single portion of this can be achieved by reducing tropical deforestation with other options including reforestation of pastures, grasslands and degraded forests, low till agriculture, efficient cropland management, soil restoration and biochar.

Figure D. Global Emissions Reduction to 2020: Opportunities from terrestrial carbon = 96tCO₂e



REDUCING EMISSIONS FROM DEFORESTATION AND DEGRADATION (REDD)

The Kyoto Protocol excludes payment for action to reduce carbon emissions from forest destruction and degradation, but 'REDD' is one of the more probable areas for agreement at COP 15.

Without an effective global deal for REDD, cutting global emissions to stabilise at 450ppm will be much more difficult and expensive, if not impossible, to achieve. 'REDD+' which includes measures to reduce peat emissions offers significant additional abatement potential.

REDD abatement potential

The greatest potential for forest carbon abatement lies in reducing forest destruction and degradation in developing countries. Very large volumes of carbon are stored in forests and forest soils in the northern hemisphere, particularly in the vast boreal forests. However, of the annual global total forest loss of c. 13 million hectares and the associated emissions of 5–7GtCO₂e, over 90% is estimated to occur in tropical countries including, with Indonesia and Brazil, the largest forest carbon emitters.

McKinsey's global abatement cost curve indicates that forestry related actions in developing countries have the potential to deliver up to 6GtCO₂e of abatement by 2020. An additional 1GtCO₂e potential exists from reduced peat emissions.

The importance of REDD's abatement potential lies not only in its volume, but also in the possibility for relatively rapid progress over the coming decade. A planning and start up phase is necessary for REDD, but relative to the scale-up time that some up key low-carbon technology solutions will need, REDD could deliver significant abatement quickly.

The Informal Working Group on Interim Finance for REDD+ estimates that by 2015 deforestation rates and emissions could be cut by 25%, and that – with similar rates of reduction in peat emissions – a cumulative saving of 7GtCO₂e could be achieved by 2015. This assumes that preparatory action gets underway early in 2010, and that funding of €15-25 billion is made available over the 2010-15 period.

Requirements of an effective international REDD agreement

A number of unilateral and bilateral commitments have already been made to reduce forest emissions. Notably, both Brazil and Guyana have developed national strategies to limit their emissions, based primarily on measures to conserve their forests.

Norway has reached significant funding agreements with both countries. In Brazil's case payments will be dependent on achieving a sustained downward trend in deforestation against historically high rates of destruction. In the case of Guyana, which has had minimal deforestation, payments will be conditional on developing and following a low-carbon development pathway which leaves Guyana's forests intact.

Individual initiatives such as these are important in their own right, but for REDD to reach its full abatement potential, a common international REDD framework is required. That framework will need to unlock the required funding on the one hand, and the required commitment and ability to protect forests on the other. The agreement that creates this framework will have to achieve certain critical outcomes:

- Funding available to forested developing countries that is sufficient, sustainable and predictable enough to incentivise serious, sustained commitment to REDD+ action by developing countries. Funds are needed to:
 - build capacity and develop adequate strategies;
 - begin to implement those strategies; and
 - pay developing countries for verified forest emissions reductions.The funding requirement is estimated variously at between €15 and 40 billion per annum, with in the order of 90% used for payments for verified forest emissions reductions.
- A funding arrangement that is sufficiently flexible to incentivise countries with historically high deforestation rates to cut their emissions, and to incentivise developing countries with significant forest cover not to start deforesting.
- REDD results-based payments should be made on the basis of reliable transparent monitoring, reporting and verification (MRV) of emissions against agreed baselines, such that confidence in the system is maintained.
- Proper provisions and safeguards for the rights and interests of indigenous people and other local communities.
- Avoid perverse carbon outcomes, and particularly avoid peat emissions.

Key negotiating challenges

The main challenges facing negotiators include:

- Funding commitments;
- REDD commitments by developing countries (national commitments, and commitments conditional on external funding);
- The extent to which developed economies should be allowed to offset their emissions through 'REDD';
- How finance, and particularly payments for emissions should be raised – whether through market mechanisms or an international fund, or both;
- Whether existing international institutions / organisations should be responsible for the management and international distribution of funds, or if a new institution is required;
- Monitoring Report and Verification requirements;
- How biodiversity conservation should be addressed within the framework;
- How the rights and interests of indigenous people and local communities should be addressed within the framework;
- How to avoid perverse carbon outcomes, and particularly avoid peat emissions,

The list is long, but progress has been made in many of these areas, under the 'Bali Road Map' process, through initiatives taken by individual countries and through bilateral agreements to developed real-world REDD projects.

Divisions between developing countries appear to have reduced somewhat in the months leading up to COP 15.

Brazil's call for an international fund is still distinct from the Coalition of Rainforest Nation's preference for funding through carbon markets, but there appears to be a growing consensus that some combination of government and market mechanisms will be necessary.

There also appears to be broad agreement around the actions that should qualify for REDD funding. The three-stage phased funding approach deployed by Norway, which both provides an element of support for readiness action and for payment for verified emissions reductions, helps to accommodate the differing states of 'readiness' among developing states. Support for a 'REDD+' approach that protects and enhances forests and protects peatland has also strengthened.

While there appears to be stronger agreement among developing countries at the conceptual level as to how REDD should be framed, it remains to be seen how well this increased unity at a conceptual level will hold during detailed negotiations.

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