

INVESTMENT-GRADE CLIMATE CHANGE POLICY:

FINANCING THE TRANSITION TO THE LOW-CARBON ECONOMY



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Executive summary

This report has been commissioned by the three major investor climate change networks (the European-based Institutional Investors Group on Climate Change (IIGCC), the North American-based Investor Network on Climate Risk (INCR), and the Investor Group on Climate Change Australia/New Zealand (IGCC)) and the United Nations Environment Programme Finance Initiative (UNEP FI). These groups, and their members, are concerned about climate change because of the potential for climate change to have major negative impacts on the economic systems they operate in and, in turn, on the assets in which they invest. They also recognise that investors have a critical role to play in responding to climate change, through their ability to provide capital to finance the transition to a low-carbon economy, through the decisions they make about the sectors and activities they invest in, through their ability to encourage the companies in which they invest to reduce their emissions, and through the support they can lend to public policy efforts directed at reducing greenhouse gas emissions and at enabling society to respond effectively to the physical and other impacts of climate change.

The report has two objectives: (1) to contribute to policymakers' understanding of the factors that institutional investors consider when investing in areas such as renewable energy and energy efficiency, and (2) to set out what institutional investors see as 'investment-grade' climate change and clean energy policy that would support significant low carbon, clean energy investment.

When investors consider investments in areas such as clean and renewable energy, energy efficiency and decarbonisation, they consider a range of issues, including:

- The sort of policy or other support that is in place. This is a central question given that many of these investments are not viable without some level of government support.
- Whether the investment is financially attractive, both relative to other energy sector-related investments and to investment opportunities outside the energy sector?
- The expected duration (or longevity) of the policy framework.
- The maturity of the technologies involved.
- Whether governments are likely to change policies or incentives in a way that affect existing investments.

These issues, in turn, point to a series of conclusions about what constitutes investment-grade climate change and clean energy policy at the domestic and internal levels.

At the domestic level, in order to attract private sector investment, governments need to:

1 Ensure that relevant policy exists. An integrated climate change and clean energy policy framework should include:

- Clear short-, medium- and long-term greenhouse gas emission reduction objectives and targets, and comprehensive, enforceable legal mechanisms and timelines for delivering on these objectives and targets.
- Comprehensive energy and climate change policies that accelerate the deployment of energy efficiency, cleaner energy, renewable energy, green buildings, clean vehicles and fuels, and low-carbon transportation infrastructure.
- Comprehensive policies directed at reducing greenhouse gas emissions from sources other than energy, for example waste, industrial emissions, fugitives, land-use change, deforestation and agriculture.
- Policies supporting investment in renewable energy generation, including measures that support the access of electricity generated from renewable energy sources to electricity transmission and distribution infrastructure.

- Financial incentives that shift the risk reward balance in favour of low-carbon assets. This includes strong and sustained price signals on carbon, well designed carbon markets and appropriate incentives to enable private investment in clean energy. An integral part of this should be the removal of fossil fuel subsidies.

2 Ensure that the policies are well designed. Investment grade climate change and clean energy policy should:

- Provide appropriate incentives to invest. Specifically, policy needs to recognise that investing in areas such as renewable energy and energy efficiency is not risk free, and therefore needs to be designed to allow investors to make appropriate returns relative to the risks that they are taking and the costs, risk and returns of alternative investments.
- Recognise that scale is critical to addressing risk and enabling low-carbon investment opportunities to be more cost-effective relative to high-carbon investment opportunities. Scale allows unit costs to be reduced and allows expertise in the development and deployment of new technologies to be gained.
- Be transparent. That is, it should be clear how the policy is designed and implemented (or intended to operate in the case of new legislation).
- Be of appropriate duration. Investors – in particular, those making large investments in areas such as infrastructure and power generation – need long-term policy certainty. If policy instruments have a time horizon shorter than the timeframe over which the investment is expected to repay the capital invested and generate an appropriate investment return or if there is the likelihood that future governments will significantly change the policy framework, investors will tend to invest elsewhere.
- Avoid retroactivity. Where governments wish to adapt or change policy they should commit to clear, prospective timeframes and set clear criteria for these changes.
- Seek to harness the power of markets to find the least cost ways to deliver on climate change objectives.
- Align with wider policy goals including economic, energy, resources and transport policy objectives.

3 Ensure the effectiveness of the institutions charged with implementing these policies. In particular, relevant regulatory or oversight bodies should have appropriate resources, and have the ability and authority to ensure that climate change and related energy policies are effectively implemented.

While domestic legislation is the critical determinant of the level of capital flows into areas such as renewable energy and energy efficiency, a rules-based international climate change regime is critically important to send appropriate signals to global capital markets. Such a regime would signal serious international resolve to tackle climate change and would provide a higher level of certainty that government commitments will be delivered. Specifically, investors encourage governments to:

- Continue to work towards a binding international treaty that includes all major emitters and sets short-, mid-, and long-term greenhouse gas emission reduction targets.
- Support the development of robust international carbon markets that provide strong and sustained price signals on carbon, hence sending economic signals that will facilitate the flow of private capital.
- Support the development of the Green Climate Fund and other comparable funding mechanisms as part of broader efforts to scale up climate-relevant financial flows, from both public and, in particular, private sources, to developing countries.

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Setting the scene: the need for capital investment

Climate change policy has advanced rapidly over the past five years, with many countries having adopted greenhouse gas emission and renewable energy targets, implemented policy measures such as energy efficiency, technology and vehicle performance standards, and provided financial signals such as carbon prices and incentives to encourage private investment in clean energy. The private sector has responded to these incentives and measures, and substantial amounts of private capital are now being invested in cleaner and renewable energy, energy efficiency and decarbonisation.

Despite the progress, the reality is that the rate at which private sector capital is being deployed into activities such as renewable energy generation and reducing industrial and fugitive emissions is simply not fast enough to avoid unmanageable risks of climate change. In its 2010 World Energy Outlook, the International Energy Agency (IEA) forecast that US\$13.5 trillion (or some US\$500 billion per year) in clean energy investment and spending, in addition to the commitments that have already been made by governments, will be needed between 2010 and 2035¹. In contrast, the United Nations Environment Programme's (UNEP's) analysis of global trends in renewable energy (see Box 1.1) estimated that global investment in renewable power and fuels was US\$211 billion in 2010.

The gap between the level of capital investment required and the actual level of investment is creating a clean energy investment gap which is causing countries to miss opportunities to realise benefits such as improved energy security, the creation of new employment opportunities and the stimulation of innovation. This gap reflects factors such as the relative immaturity of climate change policy frameworks in many countries, the limitations in the design and implementation of many climate change policies, competing political and economic priorities which result in climate change being seen as a lower priority issue, and the reality that, in many countries, investment incentives continue to be weighted in favour of fossil fuels over energy efficiency and renewable energy. It also, at least in part, reflects the lack of attention paid to the needs and interests of institutional investors when designing and implementing climate change policy.

About this report

This report – which accompanies the 2011 Investor Statement on Climate Change (see Appendix 1) – has been commissioned by the three major investor climate change networks (the European-based Institutional Investors Group on Climate Change (IIGCC), the North American-based Investor Network on Climate Risk (INCR), and the Australia/New Zealand-based Investor Group on Climate Change (IGCC)), and the United Nations Environment Programme Finance Initiative (UNEPFI). These groups, and their members, are concerned about climate change because of the potential for climate change to have major negative impacts on the economic systems they operate in and, in turn, on the assets in which they invest. They also recognise that investors have a critical role to play in responding to climate change, through their ability to provide capital to finance the transition to a low-carbon economy, through the decisions they make about the sectors and activities they invest in, through their ability to encourage the companies in which they invest to reduce their emissions, and through the support they can lend to public policy efforts directed at reducing greenhouse gas emissions and at enabling society to respond effectively to the physical and other impacts of climate change.

¹ The International Energy Agency estimates that the commitments made to date equate to some US\$4.5 trillion over business as usual, over the period 2010 to 2035 (International Energy Agency [IEA] (2010), *World Energy Outlook 2010* (OECD/IEA, Paris)).

² United Nations Environment Programme [UNEP] and Bloomberg New Energy Finance (2011), *Global Trends in Renewable Energy 2011* (UNEP, Nairobi).

Box 1.1 Setting the scene: capital flows in 2010

The UNEP *Global Trends in Renewable Energy 2011*¹² report provides a comprehensive overview of global investments in renewable energy and related areas such as clean energy and technology research and development. The major conclusions of the report are that:

- Global investment in renewable power and fuels reached US\$211 billion in 2010, representing a 32% increase over 2009. To put this into context, this investment was of a similar magnitude to global investment in fossil fuel power plants.
- In 2010, most of the growth in investment occurred in developing economies and, according to one measure (financial new investment, a measurement that covers transactions by third-party investors) developing countries overtook the richer countries for the first time. On this measure, China accounted for more than two-thirds of the total investment in developing countries and more than a third of the global total.
- Wind continued to dominate in terms of financial new investment but, if small-scale projects (particularly rooftop photovoltaics in Europe) are included, the gap between wind and photovoltaics was relatively small.
- There are clear benefits to scale (i.e. the level of deployment of particular technologies), with the price of photovoltaic (PV) modules having fallen by 60% per MW since the summer of 2008, and wind turbine prices having fallen by 18% per MW over the period 2009-2010.

While the overall picture of investment flows in 2010 was positive, the report also highlighted Spain's decision to make retroactive cuts in feed-in tariff levels for already-operating PV projects, and Germany and Italy's announcements of reductions in feed-in tariffs for new projects. These changes raised concern that governments facing economic hardship might go back on previously agreed arrangements for existing projects, damaging returns for equity investors and banks.

The report has two objectives. The first (see, in particular, Chapter 2) is to help policymakers better understand the factors that investors consider when investing in areas such as renewable energy and energy efficiency. The second (see Chapters 3, 4 and 5, focusing on domestic policy, international policy and carbon markets respectively) is to set out what investors see as 'investment-grade' climate change policy that would support significant low carbon, clean energy investment. While the report focuses primarily on institutional investors (asset owners, asset managers, insurance companies, financial intermediaries) investing in companies or projects through equity, debt or private equity, the analysis and conclusions are equally relevant to other investors (e.g. project developers).

2 Investors and investment

2.1 What do investors consider when making investment decisions?

Before considering the specific issues relating to investing in low-carbon growth areas such as cleaner and renewable energy, energy efficiency and decarbonisation, it is important to recognise that institutional investors (investment managers, asset owners such as pension funds, insurance companies, financial intermediaries) have a number of characteristics and constraints that affect how they approach investment decision-making. Most importantly, they have duties to, depending on the organisation, their beneficiaries (fiduciary duties) and/or their clients. In broad terms these include duties to be prudent in their investment activities, to seek to maximize risk-adjusted returns over relevant timeframes and/or to deliver returns in line with client-defined investment objectives, and not to put their own personal interests over that of their beneficiaries or their clients. As a consequence, other than in those situations where a client or beneficiary has made an explicit request in this regard, most institutional investors will only invest in areas such as low-carbon technology or clean energy if there is a compelling financial case for making such investments. Moreover, institutional investors – in particular, asset owners – tend to be risk averse, and are frequently reluctant to invest in investment products or asset types that are relatively new to the market, seeing such investments as risky, uncertain and unproven³.

These characteristics have profound implications for the manner in which institutional investors make investment decisions. In particular, because the objective of institutional investors is to achieve financially acceptable risk-adjusted returns⁴, they generally exclude wider societal benefits from their investment assessments, other than to the extent that these may impact positively or negatively on their investments. So, while there are compelling macroeconomic⁵ and social arguments (e.g. new employment opportunities, the stimulation of innovation, the creation of more secure and resilient energy systems) for investing in areas such as renewable energy, the wider societal benefits of these investments are generally excluded from investment decision-making processes.

These factors also influence what investors will invest in. There are two specific points to note in this regard. The first is that low-carbon investments are not only competing with fossil fuel and other energy-related investments but also with investments in other sectors. That is, when trying to encourage investment, policymakers need to consider not only how low-carbon investments can be made more attractive relative to other energy investments but also how to ensure that the clean energy sector itself is seen as an attractive sector for investment. The second

³ There is a wider point to note here: some of the most important investment decisions relate to what is referred to as 'asset allocation', which is where investors make decisions about whether they will explicitly allocate a specific amount of their capital to a particular 'asset class' (e.g. equities, fixed income, infrastructure, property), to a particular sector (e.g. utilities, pharmaceuticals) or to a particular geographic region (e.g. emerging markets). While there is significant investor interest in the investment opportunities in areas such as cleaner and renewable energy, energy efficiency and decarbonisation, relatively few investors have made explicit asset allocation decisions to invest in these areas; rather these investments generally need to compete (on a purely financial basis) with other energy sector investments or investments in similar asset classes (e.g. an equity investor would ask whether a renewable energy company would provide higher returns than an investment in, for example, a pharmaceutical company). Another important point to note here is that investors such as insurance companies are required to hold more capital on their balance sheets against 'riskier investments' rather than safer investments such as government bonds, and will tend to prefer investments with low capital charge intensity (i.e. where less capital is required to be held against these investments) than those with a high capital charge intensity. Low-carbon assets are often treated in a similar manner to private equity and so are often burdened with relatively high capital intensity requirements.

⁴ Or, expressed another way: some investments are riskier than others, and the higher the risk the higher the expected (or required) return.

⁵ See, for example, the arguments presented in the Stern Review on the economics of climate change (N. Stern (2006) *Stern Review: The Economics of Climate Change* (Cambridge University Press, Cambridge)).

is that, in particular for large investment institutions (e.g. the larger pension funds and asset managers), a critical issue is the size of the investment opportunity. Specifically, investments need to be sufficiently large to address the fact that many investors have minimum thresholds on the amount they can invest in a particular issue (whether equity or debt) and simultaneously will generally not want to hold more than a certain percentage of a company's equity or of a particular debt issue. While there are no hard and fast rules, many large institutions will require, for example, bond issues to be of the order of at least a few hundred million dollars to enable them to make a reasonably sized investment in the context of their total portfolio and to cover the research and other transaction costs associated with evaluating such an investment⁶.

2.2 Risk and uncertainty in low-carbon investments

The level of risk faced by a particular project or for a company as a whole is reflected in its cost of capital, or in the discount rate assigned by investors to the project or the company. In very general terms, discount rates generally comprise two elements: the risk-free rate and the compensation for risk⁷.

When investors look at energy sector-related investments, for example, a series of risks need to be considered (see Box 2.1). Some are outside the control of the investor (e.g. wholesale electricity prices, government policy, market conditions), whereas others relate to the particular technology in question (e.g. load factor, technology maturity, cost structure). Together, these influence both sides of the investment equation: costs (capital and operating) and sales (prices, volumes, timing of sales).

Box 2.1 opens up a number of general points that are relevant to the present discussion. The first is that investors consider multiple factors in their investment decisions. Second, many of the risks are interrelated. For example, the weakening of countries' budgetary positions as a result of the global financial crisis since 2008 has left them less willing or able to commit significant resources to renewable energy subsidy schemes and, because of competitiveness concerns, has also seen some reduction in enthusiasm for market-based incentive schemes such as emissions trading. Third, climate change policy is just one of the factors that influences energy sector investments; the signals created by the electricity market, regulation, and other incentives are also important⁸. Fourth, geography matters, as the extrinsic factors can really only be properly evaluated on a country-by-country or project-by-project basis. That is, domestic factors (energy and climate change policy, economic prospects, electricity demand, natural resources, etc) are the key determinants of whether or not a particular country will succeed in attracting capital and of where that capital will be deployed.

⁶ See, for example, the analysis of residential energy efficiency backed bonds in Climate Bonds Initiative (2011), *Local Energy Efficiency Project. Project Information Booklet: Phase 1* (Climate Bonds Initiative, London).

⁷ Oxera (2011), *Discount Rates for Low-carbon and Renewable Generation Technologies. Prepared for the Committee on Climate Change* (Oxera, Oxford), p. 20.

⁸ For example, one of the central conclusions from UNEP's report *Global Trends in Renewable Energy 2011* is that developing countries generally cannot afford the same level of subsidy support for clean energy technologies as Europe or North America, but that these countries have succeeded in attracting investment because of their pressing need for new power capacity and, in many places, superior natural resources in the shape of high capacity factors for wind power and strong solar insolation (UNEP and Bloomberg New Energy Finance (2011) (Note 2)).

Box 2.1 Intrinsic and extrinsic investment risk factors in energy investments⁹

Extrinsic risks

- **Policy risk (including wider concerns about energy policy as well as more specific concerns about changes in price regimes, subsidies and other incentives, environmental obligations, permitting and other processes).**
- **Wholesale electricity price level and volatility (which are especially important when investing in projects with large upfront capital costs or long construction lead times).**
- **Carbon price level and volatility.**
- **Climate and weather conditions (extreme heat, drought, floods, severe storm damage).**
- **Energy and/or electricity demand.**
- **Public attitudes and perceptions (e.g. is there public support for government action on climate change, community opposition to projects).**
- **Macroeconomic factors (e.g. government debt levels, interest rates).**
- **Political risk (e.g. nationalisation of assets, political or social instability).**
- **Security (e.g. terrorism, violence, public safety).**

Intrinsic risks

- **Capital (both total capital and capital per unit of power output) and operating costs, including fuel costs and costs associated with greenhouse gas emissions³.**
- **Project lead times (including planning and permitting processes, construction and testing, securing grid access).**
- **Maturity of technology (reliability, availability).**
- **Ability to secure or guarantee cashflows (e.g. offtake agreements).**

When considering low-carbon investments in cleaner and renewable energy, two factors – policy risk and technology maturity – have a dominant influence on investors’ overall risk perceptions¹¹. While the risk factors for other low-carbon investments (e.g. measures to reduce greenhouse gas emissions from industrial sources, energy efficiency) are slightly different, policy and technology risks are also among the most important risks that investors in these areas need to manage.

⁹ Adapted from Oxera (2011) (Note 6) and R. Sullivan and W. Blyth (2006), *Climate Change Policy Uncertainty and the Electricity Industry: Implications and Unintended Consequences*. Chatham House Briefing Paper EEDP BP 06/02 (Chatham House, London).

¹⁰ The financial characteristics of renewable energy investments differ significantly from those of conventional, mature power generation technologies such as gas, coal or nuclear. For example, coal-fired power stations are very capital intensive, but the fuel costs (and, therefore, operating costs) are relatively low and these power stations have high availability (i.e. the percentage of time that they are able to generate). In contrast, renewable technologies such as wind and solar power have zero fuel cost, and hence low operating costs but, on a per unit of installed capacity basis, relatively high capital costs. Moreover, their availability, which depends on the environmental characteristics of the locations where these technologies are installed, can be limited. Gas-fired power generation has relatively low capital costs and offers relatively flexible operations and high availability, but is exposed to uncertainty in gas prices which form the largest part of the project’s cash flow.

¹¹ Oxera (2011) (Note 6), p. 13. For an analysis of the implications of technology and policy risk at a portfolio level, see Mercer (2011), *Climate Change Scenarios: Implications for Strategic Asset Allocation* (Mercer, London).

Policy risk

Even though policy risk is an inevitable consideration whenever making any large capital investment, it is noteworthy that policy risk is commonly identified as *the* major risk in low-carbon investments in the energy sector. The reason is that, notwithstanding the progress that has been made in reducing the costs of many low-carbon technologies, most of these technologies are not currently cost-competitive with conventional fossil fuels without some form of explicit policy support (whether through regulation or through assigning a price to carbon) or subsidy¹². This dependence on public policy support, in turn, means that investors pay even more attention to public policy in relation to low-carbon investments than when investing in the energy sector more generally. This problem is compounded in many countries by the huge level of incentives and subsidies being provided by governments to fossil fuels¹³.

When investors discuss policy risk, they generally consider risk across two dimensions. The first is the inherent (or 'objectively measureable') dimension relating to the fact that it is difficult for governments to provide the absolute certainty that investors would like. The reason is that governments also need to retain flexibility to respond appropriately to new information (e.g. changing understanding of climate change science and impacts), the changing economics of energy and energy technologies, changing policy priorities (e.g. the growing importance of energy system security and resilience within climate change debates) and changing economic conditions. The problem is that government's desire for flexibility (which may manifest itself either by not implementing policy at all or by reserving the right to change policy) is often seen by investors as a source of uncertainty that they will need to consider in their investment decisions.

The second dimension is one of perception. Within any discussion on policy risk, it is important to recognise that investors are sceptical about governments' commitment to action on climate change. This is a critical issue given that cleaner and renewable energy are so dependent on public policy. The reality is that establishing a reputation for credibility and commitment – whether on climate change in the round or in a specific policy area – takes a long time. Conversely, damaging this reputation can occur quickly. This is not just a matter for individual governments, but is a collective problem for all governments as changes in policy in one country or region can have a negative impact on investors' perceptions across the board. For example, the recent move by Spain to make retroactive cuts in feed-in tariff levels for already-operating PV projects damaged investor confidence in these types of investments across the board. That is, investors have an asymmetric view of the risks on public policy; they tend to take a long time to recognise and reward governments that do a good job in this area but tend to be quick to criticise and to slow or stop their investment when they perceive governments as taking action that damage their interests, even in situations where the incentives or policy measures are clearly too generous or unsustainable.

¹² This statement is qualified by noting that onshore wind is – depending on fossil fuel prices – frequently cost-competitive with conventional fossil fuels, and that solar PV may, within a few years, be cost-competitive (see, for example, the analysis in Deutsche Bank Climate Change Advisors (2011), *The German Feed-in Tariff for PV: Managing Volume Success with Price Response* (Deutsche Bank Group, New York); CLSA Asia-Pacific Markets (2011), *Blue Book: Global –Renewable Power* (CLSA, London); P. Lorenz, D. Pinner and T. Seitz (2008), 'The Economics of Solar Power', *The McKinsey Quarterly*, June 2008). Whether or not these technologies can become (and remain) cost-competitive will depend on the future evolution of global fuel and energy prices and on how the unit costs of these technologies evolve over time.

¹³ The IEA has estimated that the incentives provided to fossil fuels totalled US\$312 billion in 2009, compared to US\$57 billion for renewable energy and biofuels (IEA, OECD and World Bank (2010), *The Scope of Fossil Fuel Subsidies in 2009 and a Roadmap for Phasing Out Fossil Fuel Subsidies. Report for the G-20 Summit, Seoul, 11-12 November 2010* (IEA, Paris)).

Technology risk

The maturity or deployment of a given technology appears to be the dominant intrinsic factor that defines the overall risk perception for that technology. For example, there are significant uncertainties around the technical viability and performance of certain low-carbon electric generation technologies (see Box 2.2). Ultimately, these questions can – as we have seen with onshore wind and solar PV – only be addressed through the relatively wide deployment of the technology, enabling its operation to be tested under a range of operating conditions and in a range of operating environments, thereby providing robust information on issues such as reliability (and maintenance costs), availability and equipment lifetimes.

Wide deployment also drives unit costs down. In part this is simply a function of scale (where capital and fixed costs can be spread over a larger number of projects) but also of technical improvements (e.g. optimised designs, improved reliability, the development of expertise in the installation and operation of the technology) and, at the project level, lower discount rates (as the technology is progressively seen as ‘less risky’¹⁴). Institutional investors generally like to invest in well established, proven, ‘boring’ technologies that can be counted on to perform as projected.

Box 2.2 Technological risk perceptions for conventional and low-carbon technologies

Low	Medium	High
Combined cycle gas turbine (CCGT)	Biomass	Tidal stream
Hydro (run of river)	New build nuclear	Tidal barrage
Solar PV	Offshore wind	Carbon capture and storage (CCS) coal
Dedicated biogas	Wave (fixed)	CCS gas
Onshore wind		Wave (floating)

How do risk and uncertainty affect investment decision-making?

Investors usually respond to policy uncertainty and technology risk in one of three ways. First, they may seek higher returns (i.e. to be compensated for the risks that they are taking). A recent survey of discount rates for low-carbon investments in the UK suggested that the discount rate for many low-carbon technologies was around 3-4% higher than for a conventional CCGT plant (see Box 2.3). While the specific discount rates should be treated as indicative, Box 2.3 highlights that there is a risk premium even for conventional (‘low risk’) power generation and that the risk premium can be substantial, in particular as one moves towards technologies that are perceived as higher risk.

¹⁴ It is important to note that confidence in technology has a number of dimensions. When investors talk about confidence, what they really want is clarity around operating and other aspects of performance and related costs, so that the uncertainties and assumptions in their models can be calibrated to reflect actual operating experience.

Box 2.3 Indicative discount ranges across technology types

Technology	Real, pre-tax discount rate (%)	
	Low	High
Conventional power generation (e.g. CCGT)	6	9
Hydro run of river	6	9
Solar PV	6	9
Onshore wind	7	10
Biomass	9	13
New build nuclear	9	13
Offshore wind	10	14
Wave (fixed)	10	14
Tidal stream	12	17
Tidal barrage	12	17
CCS, coal or gas	12	17
Wave (floating)	13	18

Second, investors may decide to ‘wait and see’. Because of the scale of investment involved, investors may choose to wait until the uncertainty has been resolved (or reduced) rather than investing immediately. Hence, in order to stimulate immediate (or earlier) investment, a project would need to achieve not only a positive net present value that compensates for technology risk (as indicated in Box 2.3), but also an additional return on investment sufficient to exceed the value of waiting caused by the uncertainty¹⁵. This could mean that the prices (e.g. electricity or carbon prices) or other financial support required to stimulate investment in low-carbon technology may be higher than expected based on normal discounted cash-flow analysis¹⁶.

Third, investors may simply decide to invest elsewhere¹⁷.

2.3 Implications for policymakers

The analysis presented in Sections 2.1 and 2.2 leads to five important conclusions:

- **Policy and technology risk are extremely important to investors** in low-carbon growth areas such as cleaner and renewable energy, energy efficiency and decarbonisation.
- **Investing in low-carbon-related technology and activities presents opportunities – and risks – for investors.** Therefore, the incentives provided by government need to compensate for the risks that institutional investors are being asked to take, and need to be structured so that low-carbon investments are seen as attractive relative to conventional fossil fuel

¹⁵ Sullivan and Blyth (2006) (Note 7).

¹⁶ This statement should not be interpreted as a call for supernormal (or excessive) returns. Rather, the point is that, in order to stimulate or catalyse investment, governments need to recognise both the real risks that investors face as well as investors’ perception of policy risk.

¹⁷ For example, a survey of institutional investors’ willingness to invest in energy efficiency-backed bonds found that investors were looking for products that had risk-return characteristics that were similar to other bonds, and that the returns would need to compensate for the potential extra costs of analysis and due diligence on what would be perceived as novel products (Climate Bonds Initiative (2011) (Note 5)).

investments and relative to the returns that may be achieved from outside the energy sector. Moreover, governments may need to accept that they have to provide additional incentives to overcome investor concerns about policy uncertainty and policy longevity.

- **Climate change policy should be of appropriate duration.** Investors – in particular, those making large investments in areas such as infrastructure and power generation – need long-term certainty and predictability on policy. If policy instruments have a time horizon shorter than the timeframe over which the investment is expected to repay the capital invested and generate an appropriate investment return, investors will tend to wait and see rather than deploying capital¹⁸.
- **The scale of technology deployment matters,** and the deployment of renewable and clean energy, energy efficiency and decarbonisation at scale should be a central objective of policy. Scale allows unit costs to be reduced and allows investors to properly and robustly characterise the risks and returns associated with the deployment of new technologies. Scale and policy uncertainty are related; concerns about policy uncertainty make investors less willing to invest which, in turn, means that the benefits associated with technology deployment at scale may not eventuate.
- **Governments should avoid retroactivity.** Retroactivity has important consequences for investor confidence in existing and future climate policies of national governments. Governments that provide the most stable policy frameworks will engender the most confidence. When governments wish to adapt or change policy they should commit to clear timeframes and clear criteria for these changes, to allow for market transitions, and should make the changes purely prospective.

Finally, it is important to recognise that the economics of low-carbon investment are not static and if policymakers succeed in attracting investment at the scale required, a series of new policy challenges will emerge. First, technology costs will change and price signals and incentives need to be sufficiently flexible to be able to respond to these changes. That is, policy needs to be adaptive rather than static. However, reflecting the fifth bullet point above, policy also needs to be predictable and governments need to provide clear timelines and criteria for policy changes. Second, the technical challenges associated with the deployment of renewable energy at scale (e.g. intermittency, the type of back-up required) are quite different to those associated with small scale deployment. This requires that policymakers are aware of these challenges and ensure that electricity generation, transmission and distribution systems are sufficiently robust and resilient to cope with these changes. Third, because of the need to incentivise investment (and to overcome both the real and perceived risks associated with low-carbon investments), governments need to offer appropriate support. One potential implication is that, at least at some points in the investment cycle, companies will make supernormal levels of profit potentially creating political pressure to change the level of tariff or support being offered. Some analysts recognise this and, perhaps paradoxically, have lower levels of confidence when extremely generous incentives are being offered.

None of these policy challenges are easy to address but if they are recognised at the beginning of the policy implementation process, it is possible to see how (through adaptive policy and well-structured incentives), it may be possible to address them effectively.

¹⁸ For example, the IIGCC, in a recent policy paper on EU climate change policy, called on the EU to rapidly decide on its greenhouse gas emissions target for 2020 and to indicate its expected targets for 2030 or 2035 (IIGCC (2010), *Shifting Private Capital to Low Carbon Investment: An IIGCC Position Paper on EU Climate and Energy Policy* (IIGCC, London)).

3 Domestic policy

3.1 Why is domestic policy important to investors?

Domestic policy is the key determinant of whether and under what conditions investors will deploy their capital in areas such as clean and renewable energy, energy efficiency and decarbonisation. However, as discussed in Section 2, the fact that policy exists is not enough, in and of itself, to incentivise investment. Policy uncertainty is a major issue for investors and a major obstacle to delivering the investments necessary to keep the increase in global average temperatures below two degrees Celsius – the goal that governments set in 2010 in Cancun. The countries that have attracted the most investment in low-carbon technologies, renewable energy and energy efficiency have been those that have provided long-term certainty around the structure and incentives associated with these investments. Conversely, many countries have struggled to attract significant investment because they do not have appropriate policies in place, because the policies are poorly implemented or because the policies do not provide sufficient incentives for investment.

This section presents six examples, covering developed and less developed countries, of climate change and clean energy policy frameworks. The examples have been chosen because they provide important insights into the design and/or implementation of investment-grade climate change policy; their inclusion in this section does not imply that their national greenhouse gas emission reduction targets are of greater or lesser ambition.

3.2 Australia: integrated framework for a carbon intensive economy

The Clean Energy Future policy framework – which includes a carbon price scheme, clear targets, comprehensive and generous programmes of industry assistance and industry support – will provide Australia with an investment-grade climate change and clean energy policy framework. However, political opposition may see implementation delayed or some of the proposals altered or weakened.

Background

Australia's exports are heavily dependent on the mining and minerals industry, and on agriculture¹⁹. Australia is the world's largest exporter of black coal, and is among the world's leading exporters of bauxite, alumina, lead, uranium, gold, iron ore, aluminium, nickel and zinc. Australia is also one of the world's largest exporters of wool, beef, cotton, wheat, canola, barley, and wine.

Electricity generation in Australia is dominated by coal. In 2009-2010, 74.7% of Australia's electricity was sourced from black and brown coal, with the balance provided by natural gas (15%), renewable energy (8.2%), petroleum products (1.1%) and other sources (1%)²⁰.

¹⁹ For a more detailed breakdown, see Department of Foreign Affairs and Trade [DFAT] (2011), *Composition of Trade Australia 2010* (DFAT, Canberra).

²⁰ A. Schultz and R. Petchey (2011), *Energy Update 2011* (Australian Bureau of Agricultural and Resource Economics and Sciences, Canberra), p. 10.

The multi-party climate change committee

Australia's dependence on the mining and minerals industries and on low-cost energy has been the critical influence on the Australian approach to climate change policy. While there has been broad public support for action on climate change, this has needed to be balanced against concerns about not damaging Australia's major exports and not damaging import-exposed sectors (such as chemicals and steel). Climate change policy has been the subject of heated political debate over recent years. In September 2010, the Australian government formed a Multi-party Climate Change Committee to develop a framework for Australia's response to climate change and explore options for setting a carbon price. The Committee was chaired by Australia's Prime Minister, Julia Gillard.

In response to the Multi-party Climate Change Committee recommendations, the Australian Government introduced a suite of legislative bills to the Parliament in September 2011. The *Clean Energy Future* legislation is expected to commence in July 2012. The major elements of the proposed legislation are²¹:

- **The establishment of a carbon price scheme:** The carbon pricing mechanism will commence on 1 July 2012, with a fixed price for the first three years. The price will start at A\$23 per tonne and will rise at 2.5% per annum in real terms. On 1 July 2015, the carbon price will transition to a floating price under an emissions trading scheme. A price ceiling and floor will apply for the first three years of the flexible price period, with the price ceiling set at A\$20 above the expected international price and rising by 5% in real terms each year, and the price floor set at A\$15, rising annually by 4% in real terms.
- **International linking:** At least half of a liable party's compliance obligation must be met through the use of domestic permits or credits (and these may include free permits from government), but most companies will be able to import credits to meet additional liabilities in the floating price phase.
- **Clear targets:** The Government has committed to reduce emissions by 5% from 2000 levels by 2020 regardless of what other countries do, and by up to 15 or 25% depending on the scale of global action. These targets will require cutting expected emissions by at least 23% relative to business as usual in 2020. In addition, the Government committed to a 2050 target to reduce emissions by 80% compared with 2000 levels. Parliament will set intermediate targets towards the 2020 and 2050 targets.
- **Industry assistance:** The proposed legislation includes provision for the allocation of free carbon permits to various sectors, with a particular focus on the most emissions-intensive, trade-exposed activities (such as aluminium smelting, steel manufacturing and most pulp and paper manufacturing activities). Companies in these sectors will initially be eligible for free permits representing 94.5% of industry average carbon costs. In addition, financial support will be provided to the steel, coal and manufacturing industries.
- **Closure of existing power stations:** The Government has proposed the establishment of an Energy Security Fund which will pay for the full or partial closure of some of the most emissions intensive power generators, and transitional assistance for the most emissions-intensive coal-fired power stations.
- **Renewable energy financing:** The proposals include A\$10 billion for a Clean Energy Finance Corporation which will invest in businesses seeking funds to get innovative clean energy proposals and technologies off the ground and in businesses seeking to develop in areas such as manufacturing wind turbine blades and solar photovoltaic panels; A\$3.2 billion for an Australian Renewable Energy Agency to manage existing Federal Government grants for research and development into renewable energy technologies and initiatives to bring them to market; and A\$200 million for a Clean Technology Innovation Program to provide grants to support business investment in renewable energy, low emissions technology and energy efficiency.

²¹ Commonwealth of Australia (2011), *Securing A Clean Energy Future* (Commonwealth of Australia, Canberra).

An investor perspective

The proposals from the Multi-party Committee on Climate Change, reflected in the *Clean Energy Future* legislation, should provide investors with real confidence when investing in areas such as renewable energy in Australia. Of particular note are:

- The establishment of clear short-, medium- and long-term greenhouse gas emission reduction targets.
- The clear alignment of climate change policy with other areas of public policy, in particular wider energy, industrial and economic policy objectives. Australia's dependence on heavy industry, agriculture and coal-fired power generation has been the major obstacle to Australia taking action on climate change. While there may be concerns about the idea that these industries should be insulated from climate change policy, the fact that the needs and interests of these sectors have been explicitly addressed maximises the likelihood that the Committee's proposals as a whole will be implemented.
- Clear incentives for technology development and scale up and, interestingly in the context of Australia's wider economic policies, a clear focus on the development of international class suppliers.
- Transparency about the timing for the implementation of policy and of how policy will evolve over time. This latter point is particularly important as it demonstrates that governments can implement policies that can evolve over time while simultaneously allowing investors to be reasonably confident in their predictions about the implications of policy for their investments.
- Explicitly linking Australia's policies to international carbon markets which should allow Australia to quickly integrate with an international trading scheme if/when such a scheme is implemented.

While the design of the Australian policy framework can be considered investment-grade across virtually all aspects, not all risks have been eliminated. The two that are of particular importance are: (a) political risk, in particular that the opposition Liberal Party may unwind elements of the proposals if elected, (b) industry backlash, in particular as carbon prices increase over time²². In relation to this latter point, the European experience is relevant as the fear of an industry backlash was central to the decisions to have generous allocations in Phases I and II of the EU Emissions Trading Scheme. While this decision proved contentious with some environmental non-governmental organisations (NGOs), it had the benefit of allowing industry to gain confidence with the monitoring, reporting and trading elements of the scheme, it provided them with the time (and incentives) to take action to reduce their emissions, and it provided them with incentives to welcome rather than oppose emissions trading.

²² For an overview of the political context and the likely responses to the proposals, see The Climate Group (2011), 'The Clean Energy Plan – Analysis. Policy Briefing, 18 July 2011 (The Climate Group, Melbourne).

3.3 China: attracting ever more investment

China's 12th Five Year Plan emphasises renewable energy and energy efficiency as integral elements of China's wider strategic and economic objectives. The case for investing in these areas is underpinned by rising energy demand in China as a whole, but questions remain around grid access for renewable energy and the manner in which market-based policy instruments such as emissions trading are to be implemented and enforced.

One of the most striking features of global clean energy investment flows is how much of that money is flowing to China²³. Over the past five years, China has installed the world's largest wind power capacity, become the biggest manufacturer of solar panels and developed a dynamic market for electric vehicles²⁴.

While investor interest in China relates, in part, to the wider macroeconomic case for investing in China (specifically the size and growth potential of the Chinese market), China has also deliberately sought to increase the amount of electricity generated from renewable sources and to develop its capabilities in what it has identified as its seven emerging strategic industries of energy saving and environmental protection, next generation information technology, biotechnology, high end manufacturing, new energy (nuclear, solar, wind), new materials and clean energy vehicles.

In its recently announced 12th Five Year Plan (covering the period 2011 to 2015)²⁵, China has signalled its determination to continue on this journey, with significant targets for renewable energy, energy efficiency and clean technology; for example, it has set carbon intensity and energy intensity reduction targets of 17% and 16% respectively to be achieved by 2015²⁶. The rationale underpinning these targets include China's need to maintain growth and investment, to address real resource limits, to be economically and competitive and technologically advanced, and to 'keep its house in order' to be a trusted voice on climate and energy²⁷. These high level targets are supplemented by a range of policy and other measures including improving and expanding grid transmission lines for renewable energy, significant capital investment in infrastructure and generation capacity, and pilot programmes for market-based policy instruments²⁸.

An investor perspective

The case for investing in renewable energy and other low-carbon areas in China is based on the following factors:

- China's demand for energy is likely to continue to grow and any investments in the energy sector (whether fossil fuel-based or renewable energy) are likely to be welcomed and, importantly, provide attractive returns.

²³ See, for example, the data presented in UNEP and Bloomberg New Energy Finance (2011) (Note 2).

²⁴ The Climate Group (2011), *Delivering Low Carbon Growth: A Guide to China's 12th Five Year Plan* (The Climate Group, London).

²⁵ The five year plan is the Chinese 'masterplan' for legislation and other actions to guide the development of China as a country and as an economy. As such, it does not focus solely on climate change and energy-related issues.

²⁶ KPMG Advisory (China) (2011), 'China's 12th Five-Year Plan: Energy. April 2011' (KPMG Advisory (China), Beijing); J. Lewis (2011), 'Energy and Climate Goals of China's 12th Five-Year Plan' (Pew Center on Global Climate Change, Arlington, VA).

²⁷ The Climate Group (2011) (Note 25).

²⁸ One example is China's recent decision to introduce a national feed-in tariff for solar energy (G. Parkinson (2011), 'China's Great Solar Boost', *Climate Spectator*, 9 August 2011).

- China's Five Year Plans are hugely important and the emphasis on renewable energy and energy efficiency in the new 12th Five Year Plan is a clear signal that investments in these areas will be encouraged.
- The objectives set out in the Five Year Plan align with China's wider strategic and economic objectives such as those relating to technological leadership and energy security.
- The 12th Five Year Plan builds on the trajectory set by the 11th Five Year Plan. Climate change and energy efficiency are now seen as integral parts of the policy process.
- The 12th Five Year Plan provides a five year forward look into the evolution of policy. While this may seem relatively short in the context of large capital investment time horizons, taken in conjunction with the trajectory that China is following, this should give investors reasonable confidence in the longevity of public policy in this area.

Even though the Chinese 12th Year Plan, in many ways, meets the criteria for investment-grade climate change and clean energy policy, there are risks. These include: (a) the fact that there is limited certainty beyond 2015, (b) uncertainty around the policy instruments (and associated costs to business) that will be deployed to deliver on China's climate change objectives, (c) the problems of local policy implementation and enforcement, which will be of particular importance if an emission trading scheme is implemented, because of limited oversight and lack of robust energy and environmental data, (d) lack of capacity and experience with energy efficiency, energy data management and the financing of energy efficiency, and (e) the lack of progress on electricity market reform – in particular the lack of incentives for electricity distribution companies to purchase renewable power and the difficulty many renewable energy projects face in obtaining access to the electricity grid, and full energy pricing. These risks are compounded by the potential tension between China's drive for economic growth and its climate change targets; without strong and effective intervention, it seems likely that investment in traditional fossil fuels will continue to grow faster than renewable energy.

3.4 Germany: outcomes-focused renewable energy policy

The success of the German feed-in tariff scheme has been underpinned by the provision of long-term incentives for investment. While the scheme has been criticised because of its cost, the scheme has been designed so that the level of subsidy reduces as technology costs decline, illustrating how policy can adapt to changing circumstances, thereby reducing the risk of the policy becoming a long-term drain on customer or governments.

Germany has supported PV growth at the national and regional levels since the early 1990s, starting with its 1991 Energy Feed-in Law and its subsequent 2000 Renewable Energy Law (which was updated in 2009), as well as a suite of other measures and incentives, including guaranteed grid access, local ownership of projects and planning and other legislative supports. Germany introduced feed-in tariffs for renewable energy in 2000, with the tariff scheme explicitly designed to drive solar PV (and other renewable energies) down its learning curve. The key features of the legislation are that it provides 20 years of payments with guaranteed payment streams, a tariff digression over time to match all reductions in technology costs and an end target of renewable energies achieving grid parity with fossil fuels.

From 2000 to 2009, Germany had a schedule of automatic price digressions for PV. More recently, Germany introduced a volume-responsive price digression scheme under which feed-in tariff rates decline based on the amount of capacity installed during prior periods²⁹.

²⁹ Deutsche Bank Climate Change Advisors (2011) (Note 11).

However, the scheme could not adequately correct for the sharp declines in PV costs in 2009³⁰ and, as a result, German policy makers instituted several unscheduled downward adjustments to the PV rate in 2010 and 2011.

Since introducing the national feed-in tariff for PV in 2000, Germany has emerged as a dominant solar energy player, capturing 57% of the world investment in small-scale solar projects in 2010³¹. Germany has installed more than a Gigawatt (GW) of capacity each year since 2007 and an estimated 7.4 GW in 2010, significantly more than its target installation rate of about 3.5 GW per year³². It has been estimated that the German PV market will grow by 3-4 GW per year through to 2020³³.

In its 2010 National Renewable Energy Action Plan³⁴, Germany predicted it would achieve 36.8% renewable electricity by 2020, exceeding its legislated target of 30% set in 2008. It has made these commitments and delivered these outcomes in the context of its wider strategy to achieve 80% renewable electricity by 2050.

Investor perspective

The German feed-in tariff scheme is widely recognised as one of the most successful programmes to encourage investment in renewable energy. There are a number of reasons for its success.

The first is that the feed-in tariff scheme is not a stand-alone policy but an integral part of Germany's overall climate change and clean energy policy framework. Germany has a policy commitment to a 40% reduction in its greenhouse gas emissions by 2020, against a 1990 baseline, a binding renewable heat target to supply 14% of Germany's thermal energy from renewable energy by 2020, and a binding target to supply at least 30% of its electricity from renewable sources by 2020. Confidence in the long-term support for Germany's renewable energy industry was reinforced in June 2011 when the Chancellor, Angela Merkel, announced a six point plan that would further accelerate the adoption of clean and renewable energy³⁵.

Second, the scale of the incentives provided are sufficiently high to encourage large scale deployment, as evidenced by the very significant solar and wind capacity installations that have resulted. In fact, the generosity of the feed-in tariff has been the source of criticism of Germany's approach. A number of studies have argued that the cost (in absolute terms and in terms of Euros per tonne of carbon abated) is significantly higher than the cost associated with other policy measures such as emissions trading³⁶. While this is one way of assessing costs, it is also important to recognise that the objectives of the policy are not solely to obtain the most efficient (or cost-effective) reductions in greenhouse gas emissions but also to drive unit costs down and to ensure the deployment of renewable energy at scale. Against these criteria, the policy seems to have been effective. There have also been wider economic benefits, as Germany has created significant employment as a result of the policy. It has been estimated that by the end of 2009, Germany, had approximately 10,000 renewable energy-related companies, mainly installers and suppliers, employing some 63,000 people³⁷. It is

³⁰ PV module prices plummeted from about \$4 per Watt in the middle of 2008 to just under \$2 per Watt by 2010 (UNEP and Bloomberg New Energy Finance (2011) (Note 2), p. 45).

³¹ UNEP and Bloomberg New Energy Finance (2011) (Note 2).

³² UNEP and Bloomberg New Energy Finance (2011) (Note 2), p. 45.

³³ Deutsche Bank Climate Change Advisors (2011) (Note 11), p. 9.

³⁴ http://ec.europa.eu/energy/renewables/transparency_platform/doc/national_renewable_energy_action_plan_germany_en.pdf

³⁵ Deutsche Bank Climate Change Advisors (2011), *Global Climate Change Policy Tracker Winners and Losers* (Deutsche Bank Group, New York), p. 4.

³⁶ Productivity Commission (2011), *Carbon Emission Policies in Key Economies*, Research Report, (Commonwealth of Australia, Canberra); M. Frondel, N. Ritter, C. Schmidt and C. Vance (2009), 'Economic Impacts from the Promotion of Renewable Energy Technologies: The German Experience. Ruhr Economic Papers No. 156' (RWI, Essen).

³⁷ UNEP (2011) (Note 2), p. 45. See, further, the data presented in Deutsche Bank Climate Change Advisors (2011) (Note 11), pp. 6-7.

also important to recognise that the German feed-in tariff has been designed in such a way as to avoid it becoming a permanent subsidy programme. In fact, the scheme shows how policy can adapt (and be adaptable) as technology and costs evolve, reducing the risk of the policy becoming a long-term drain on customer or governments.

Third, the implementation of policy in Germany has been clear and transparent, in particular in relation to the changes in the level of feed-in tariff. It is interesting to note that investor confidence in the German feed-in tariff has remained high despite the unscheduled changes to the programme in 2010 and 2011. The reasons include Germany's 20 year track record of energy market support and the German government's decision not to institute capacity caps or seek to limit PV growth.

3.5 India: from policy to policy finance

India has commenced the process of developing and implementing a comprehensive and integrated climate change and clean energy policy framework, and this has already led to increased investor interest in low-carbon investment opportunities in India. However, investors remain cautious because policy is still in the process of being developed and because many of the policy goals are contingent on the availability of international finance.

In June 2008, the Government of India released the National Action Plan on Climate Change³⁸, the country's first strategy on climate change. Eight Missions (including Missions for solar energy, energy efficiency, and strategic knowledge for climate change) were established to develop more detailed policy proposals and frameworks.

Since then, India has set a series of low-carbon policy targets. These include reducing emissions of carbon dioxide per unit of GDP by 20-25% from 2005 by 2020, increasing the proportion of electricity from renewable energy sources to 15% by 2020, installing up to 20 GW of solar by 2022, requiring that biofuels comprise at least 20% of diesel and gasoline by 2017, having 60 GW of installed nuclear power capacity by 2030, and reducing the specific energy consumption of designated consumers in industry by approximately 5% over the period 2009-10 to 2014-15³⁹.

In relation to energy efficiency, the measures adopted have included the new Perform, Achieve and Trade system, setting tighter building standards for lighting and heating, ventilation and air-condition systems, demand-side management initiatives in agriculture, the mass distribution of compact fluorescent lamps, an energy efficiency rating programme for office buildings, and mandatory standards for air conditioners, lighting, refrigerators and distribution transformers. India has also promoted the establishment of Energy Service Companies (ESCOs) to facilitate the roll out of these technologies and has established a Bureau of Energy Efficiency to implement its energy efficiency policies.

In relation to solar, the National Solar Mission aims to increase the capacity of grid-connected solar power generation to 1 GW by 2013, and by an additional 3 GW by 2017 through mandatory use of the Renewable Purchase Obligation by utilities, backed by a preferential tariff. Reaching 10 GW or more installed power by 2017 is conditional on the availability of international finance and technology transfer. The Mission is targeting 20 GW of solar capacity by 2022, 100 GW by 2030 and 200 GW by 2050.

³⁸ <http://pmindia.nic.in/Pg01-52.pdf>

³⁹ HSBC Global Research (2011), *Sizing India's Climate Economy*. 28 January 2011 (HSBC Securities and Capital Markets (India), Mumbai).

The Indian government has supplemented its regulatory and policy measures with targeted financial provisions to boost renewable energy sources. It has established a Clean Energy Fund, financed by a tax of US\$1 per tonne of coal – expected to raise US\$1.1bn in financial year 2011/2012 – which will be used for funding research and innovative projects in clean energy technologies. The National Mission on Enhanced Energy Efficiency has proposed setting up two funds, a partial risks guarantee fund to act as guarantor of energy efficiency investments and that can enter into agreements with commercial banks that originate transactions, and a venture capital fund to invest in innovative efficiency technologies. In addition, India has launched Renewable Energy Certificate and Renewable Purchase Obligation schemes.

Investor perspective

The absence of a comprehensive climate change policy has, in the past, been seen as a major barrier to investing at scale in India. There are signs that India's policies are already starting to have an effect on investors' views. Renewable energy investment in India grew by 25% in 2010 alone, to a total of US\$3.8 billion, with India ranked eighth in the world for renewable energy investment. India is, after China, seen as the market with the greatest potential for renewable energy and other low-carbon investments. The fact that India's climate change policies are so comprehensive (in terms of their breadth of coverage) and have an explicit focus on the financial aspects of policy are likely to significantly boost investors' willingness to invest at scale in India⁴⁰.

However, at least in the short-term, investors are likely to focus on those areas where there are clear and immediate paybacks, even if at the expense of investments that provide better long-term returns. There are various reasons. The first is that India's policies and policy frameworks are still being developed, with many of the details around how these are to be implemented still missing or unclear. Investors are, therefore, likely to be cautious about investing until the policy process is further developed. The second is that many of the targets (e.g. the solar targets for 2017 and 2022) are contingent on the availability of finance from international sources. The third is that India remains heavily focused on economic growth and its energy policies see a critical role for fossil fuels and nuclear in providing the energy to power this growth. That is, access to energy and energy security are likely to be dominant considerations for policymakers. This has implications for the level of support that will be provided for renewable energies and also for practical issues such as access to the electricity grid, with the likelihood that grid operators will favour and prioritise the interests of fossil fuel and nuclear generators over those of renewable energy generators.

⁴⁰ See, further, the analysis by HSBC which notes; "The 2008 National Action Plan on Climate Change (NAPCC) has been followed by a series of policy measures, which have made India one of the world's most attractive clean energy markets. As a result, we expect 2011 to be another record year for renewable installations and energy efficiency savings." (HSBC Global Research (2011) (Note 40), p. 1).

3.6 United Kingdom: the devil is in the detail

The UK's Climate Change Act sets medium (2020) and long-term (2050) targets for the UK's greenhouse gas emissions, and provides the institutional framework for monitoring performance against these targets. Many countries have sought to replicate policy proposals such as the Green Deal, the Green Investment Bank and the Climate Change Committee. However, the level of investment has been quite low, reflecting the relatively slow rate of policy implementation and the changes that have been made to specific policy instruments.

The UK adopted the Climate Change Act in November 2008, which sets a target for the UK to reduce greenhouse gas emissions to 80% below 1990 levels by 2050, and an interim target of a 34% reduction by 2020. The Act also established the concept of five year carbon budgets. The Committee on Climate Change was appointed to advise the UK Government on setting targets and budgets and on the measures that could be adopted to achieve these targets and budgets.

Since the new Conservative/Liberal Democrat government came to power in 2010, there have been a series of significant policy announcements and consultations on climate change and energy-related issues. The most significant of these have been:

- The explicit support from the government for the 2050 targets and the idea of five year carbon budgets. In May 2011, the Energy and Climate Change Secretary proposed a carbon budget (the 4th Carbon Budget) for 2023 to 2027, targeting a 50% reduction in UK greenhouse gas emissions from the 1990 baseline⁴¹. It is relevant to note that nuclear new build is a central element of the UK's low carbon policy, in contrast to Germany and Switzerland which are planning on phasing out nuclear power.
- The introduction of the CRC Energy Efficiency Scheme⁴², a mandatory scheme aimed at improving energy efficiency and cutting emissions in large public and private sector organisations. The scheme features a range of reputational, behavioural and financial drivers, which aim to encourage organisations to develop energy management strategies that promote a better understanding of energy usage.
- The publication of the Carbon Plan, a Government-wide plan of action on climate change, setting out department-by-department actions and deadlines for the next five years⁴³.
- The publication of the Electricity Market Reform White Paper⁴⁴ setting out key measures to attract investment in new power generation, to reduce the impact on consumer energy bills, and to create a secure mix of electricity sources. The key elements of the reform package include a Carbon Price Floor, the introduction of new long-term contracts (Feed-in Tariff with Contracts for Difference) to provide stable financial incentives to invest in all forms of low-carbon electricity generation, and an Emissions Performance Standard set at 450g CO₂/kWh to reinforce the requirement that no new coal-fired power stations are built without CCS, but also to ensure necessary short-term investment in gas can take place. The Government intends for legislation to reach the statute book by Spring 2013, so that the first low-carbon projects can be supported under its provisions around 2014.

⁴¹ Department of Energy and Climate Change [DECC] (2011), 'UK Proposes Fourth Carbon Budget. Press Release 17 May 2011'. Available at: http://www.decc.gov.uk/en/content/cms/news/pn11_41/pn11_41.aspx

⁴² http://www.decc.gov.uk/en/content/cms/emissions/crc_efficiency/crc_efficiency.aspx

⁴³ HM Government (2011), Carbon Plan (DECC, London). See, further: http://www.decc.gov.uk/en/content/cms/tackling/carbon_plan/carbon_plan.aspx

⁴⁴ DECC (2011), *Planning our Electric Future: A White Paper for Secure, Affordable and Low-carbon Electricity* (DECC, London).

- The publication of the Renewable Energy Roadmap⁴⁵ which outlines a plan of action to accelerate renewable energy deployment – to meet the target of 15% of all energy by 2020 – while driving down costs. Within this, the UK has a very ambitious programme of offshore wind development⁴⁶.
- The Green Deal⁴⁷ which is intended to significantly improve the energy efficiency of British properties through enabling private firms to offer consumers energy efficiency improvements to their homes, community spaces and businesses at no upfront cost, and to recoup payments through a charge in instalments on their energy bills.
- The Green Investment Bank⁴⁸ whose mission will be to accelerate private sector investment in the UK's transition to a green economy.

One of the most interesting features is the potential for these policy measures to accelerate the uptake of energy efficiency in residential properties. Through providing support to households with the capital required for such investments, the Green Deal offers the prospect to overcome one of the major barriers to domestic energy efficiency. The Green Investment Bank can, in turn, help structure this demand for capital into a form (e.g. energy efficiency-backed bonds) that investors can then invest in. The missing piece of the jigsaw is addressing the other barriers to energy efficiency (e.g. inertia, lack of knowledge, lack of pressure to take action) to enable demand for energy efficiency to be at sufficient scale to drive costs down (i.e. further improve rates of return). There are a number of emerging examples of UK local authorities seeking to establish energy efficiency programmes, with the aim of then attracting private sector finance to deploy energy efficiency and renewable energy technologies more widely⁴⁹.

Investor perspective

In many ways, the UK's approach to climate change policy is recognised as world-leading and extremely innovative, not least because of its framing of climate change as a long-term policy issue, and its focus on stimulating and encouraging private sector investment in the low-carbon economy. Many countries have sought to replicate the ideas and thinking underpinning proposals such as the Green Deal, the Green Investment Bank and the Climate Change Committee.

Yet, the reality has also been that the UK has not always converted this innovation into real and sustained investment into the low-carbon economy. For example, in 2009, just over 3% of the UK's energy was obtained from renewable sources. There are a number of reasons, notably:

- The sheer number of policy announcements in the area of climate change and clean energy. To provide just one example, there have been four Energy White Papers in the past decade alone (in 2003, 2007, 2010 and 2011). While there were credible reasons for each, the impression created has been one of policy that can change rapidly and unpredictably.
- The tendency for policy to change, both before and after it is implemented. For example, the UK's CRC Energy Efficiency Scheme (previously known as the Carbon Reduction Commitment) originally included a revenue recycling component, but this feature was subsequently removed, with all revenues raised being used to reduce the budget deficit. The government's argument was that the revenue scheme was overly complex for the level of greenhouse gas emissions abatement that would result. The decision to change the scheme not only removed one of the incentives for companies to reduce their greenhouse gas emissions but also, given that there had been extensive consultation on the scheme,

⁴⁵ DECC (2011), *The Renewable Energy Roadmap* (DECC, London).

⁴⁶ See, for example, the data presented in British Wind Energy Association [BWEA] (2010), 'UK Offshore Wind: Staying on Track. Forecasting offshore wind build for the next five years' (BWEA, London).

⁴⁷ http://www.decc.gov.uk/en/content/cms/tackling/green_deal/green_deal.aspx

⁴⁸ <http://www.bis.gov.uk/greeninvestmentbank>

⁴⁹ See, further, Climate Bonds Initiative (2011) (Note 5).

had the effect of reducing confidence in the government's willingness to follow through on its commitments.

- The level of public incentives previously provided have raised questions about whether the government is willing to financially support large scale build out of renewable energy. However, more recently, the government has shown commitment to considerably increase support in the future⁵⁰.
- The difficulties in obtaining planning permission for large renewable energy projects and associated infrastructure (e.g. high voltage transmission lines).

3.7 United States: some progress, but much more needed

The United States should be one of the world's most attractive locations for low-carbon investment, given its economic scale, its great natural resources, its international class universities, its political stability and its general attractiveness as an investment destination. However, while the United States has some significant policies and regulations in place, it does not have a coherent and comprehensive national climate change and clean energy framework as a consequence of regional and political divisions. The consequence is that, despite notable exceptions such as California and Texas which have attracted significant levels of investment, the United States faces a serious threat to its competitiveness as the international race for technological leadership heats up.

At the time of writing (September 2011), the United States has several significant regulations and policies in place, but still lacks a comprehensive national climate and clean energy plan. The national climate change-related policies in place include the following:

- The US Environmental Protection Agency (EPA) and the Department of Transportation (DoT) finalised a joint rule in 2010 to establish a national program consisting of new greenhouse gas emission and fuel economy standards for model year 2012 through 2016 light-duty vehicles that will reduce greenhouse emissions over the life of the vehicles by 960 million tonnes and save 1.8 billion barrels of oil; these measures are expected to reduce emissions from the US light-duty fleet by approximately 21% from business-as-usual by 2030.⁵¹ EPA and DoT are currently working on standards for 2017-2025 model year vehicles, which are likely to lead to reductions in greenhouse gas emissions of the order of about two billion tonnes over the lifetime of the vehicles⁵².
- EPA and DoT followed the light-duty vehicle rule with a first-ever programme to reduce greenhouse gas emissions and improve fuel efficiency for medium- and heavy-duty trucks and buses. The agencies estimate that the programme will reduce carbon dioxide emissions by about 270 million tonnes and save about 530 million barrels of oil over the life of model year 2014 to 2018 vehicles⁵³. EPA has established rules for Clean Air Act permitting requirements for greenhouse gas emissions from new and existing industrial facilities and has proposed a schedule for establishing emission standards for fossil fuel-fired power plants and petroleum refineries⁵⁴.

⁵⁰ Recent announcements about the Green Bank and the Electricity Market Review indicate that this issue is now being recognised by the UK government and these measures, if implemented, could provide a better structured and integrated policy framework that provides more appropriate incentives for investors. See, further, the analysis in Deutsche Bank Climate Change Advisers (2011) (Note 35).

⁵¹ EPA (2010), 'EPA and NHTSA Finalize Historic National Program to Reduce Greenhouse Gases and Improve Fuel Economy for Cars and Trucks'. <http://www.epa.gov/oms/climate/regulations/420f10014.htm>

⁵² EPA (2011), 'EPA and NHTSA, in Coordination with California, Announce Plans to Propose Greenhouse Gas and Fuel Economy Standards for Passenger Cars and Light Trucks'. <http://epa.gov/otaq/climate/420f11027.pdf>

⁵³ EPA (2011), 'EPA and NHTSA Adopt First-Ever Program to Reduce Greenhouse Gas Emissions and Improve Fuel Efficiency of Medium-and Heavy-Duty Vehicles'. <http://www.epa.gov/oms/climate/documents/420f11031.pdf>

⁵⁴ <http://www.epa.gov/climatechange/initiatives/index.html>

- EPA has also issued rules that require new and modified sources of greenhouse gases to take modest steps to reduce emissions. In addition, all large sources must report on their greenhouse gas emissions.

EPA's plans to regulate greenhouse gas emissions from stationary sources have been under constant attack in Congress and in the courts. While the rules have survived so far, their future is unclear. At the time of writing, EPA rules are the only avenue for national climate change policy, as the prospects for Congress passing a comprehensive climate policy framework are bleak.

The United States has also implemented policies to promote clean energy. Most notably, the US stimulus package contained significant funding for building efficiency, renewable energy, transit, and high speed rail. The stimulus was a short-term measure, however, and the national tax credits in support of clean energy have similarly been short-term measures that are either renewed or allowed to expire every few years. The prospects for continued high-level support in the United States for clean energy are unclear given that the politically divided Congress and the vast budget deficit have created a stalemate that looks unlikely to change in the near future. While financial new investment in renewable energy jumped from just under \$16 billion to just over \$25 billion in 2010⁵⁵ and may show a further increase in 2011 as a result of the 2009 stimulus bill, the absence of a coherent and comprehensive national approach to climate change and clean energy, coupled with the possible reduction in spending in 2012 (from both the expiry of stimulus programmes and the likely reductions in spending from budget compromises), is likely to lead to a sharp fall in renewable energy-related investment⁵⁶.

A slightly more encouraging picture emerges when state-level activities are considered, and it is here that a great deal of proactive policy development has been seen in recent years. For example, in 2010, California, which has long been a leader on these issues in the United States, adopted a Renewable Energy Standard requiring electricity providers to increase procurement from eligible renewable energy resources until they reach 33% of deliveries by 2020. In December 2010, California approved rules for a carbon market. Texas has committed to install 5,880MW of renewable energy (primarily wind) by 2015 and 10,000MW by 2025, and Massachusetts has committed to cutting its greenhouse gas emissions to 25% below 1990 levels by 2020.

Some states have also started to work together. For example, the Regional Greenhouse Gas Initiative, which includes ten northeast and mid-Atlantic states, raised \$789.2 million in carbon dioxide allowance proceeds in 2010 from its regional cap-and-trade program. Of this revenue, 52% has been invested in energy efficiency programmes and 11% in renewable energy. To drive energy savings, more than half of the US states have adopted an Energy Efficiency Resource Standard – a requirement for electric utilities to deliver increasing amounts of energy efficiency from their customers. These positive state actions help to counterbalance the less positive picture from the national government. However, recent political changes and budgetary pressures in many states are now threatening to roll back – or at least halt the progress of – currently existing renewable energy and clean technology investment incentives and climate policies.

The national and state-level initiatives have been important and have succeeded in attracting some investment. However, the United States still lacks a coherent national framework that comprehensively addresses climate change and clean energy. This 'patchwork of inconsistent state policies'⁵⁷ has some profound economic implications.

⁵⁵ UNEP and Bloomberg New Energy Finance (2011) (Note 2), p. 21.

⁵⁶ For example, in a recent report analysing global investment flows into clean energy, it was noted that "...the United States continued to slide down the top 10 list, falling from second to third. Given uncertainties surrounding key policies and incentives, the United States' competitive position in the clean energy sector is at risk." (Pew Charitable Trusts (2011), *Who's Winning the Clean Energy Race? 2010 Edition* (Pew Charitable Trusts, Philadelphia), p. 3).

⁵⁷ Deutsche Bank Climate Change Advisors (2011) (Note 36), p. 4.

First, it is likely to mean that the US climate change policy response is sub-optimal from an economic perspective. The fact that many states have yet to take substantive action and that national efforts have focused on areas where existing statutory authority allows for regulatory progress means that some of the cheapest emissions abatement options may not be accessed. Second, the US may not reap the benefits of its scale. The literature on renewable energy technologies shows that there are clear and significant benefits to scale; these include technological improvements, improved reliability (as technology moves from the laboratory to full-scale deployment) and huge reductions in unit costs (due to technological and production improvements, better use of capital, greater production efficiencies, etc.). Third, the competitiveness of the US economy is likely to be undermined. Driven not only by concerns about climate change but also concerns around energy security, it is likely that there will be significant opportunities for countries (and, in turn, companies) that proactively engage with the issue, using it as an opportunity to develop new skills and new technologies, to gain experience in the deployment of these technologies and, ultimately, to access new markets. For all these reasons, the US is likely to lag the market-leading countries in attracting new clean energy investment, and to fall further behind China and other nations with clear, comprehensive and attractive policies that are competing for investment dollars in this space.

Investor perspective

The starting point for any analysis of investment opportunities in the United States is that the United States should be a preferred location for investment, given its economic scale, its great natural resource assets, its international class universities, its political stability and its general attractiveness as an investment destination. Yet, the actual capital being invested in renewable energy and clean technology is far lower than would be expected. This can primarily be attributed to the lack of a coordinated, progressive approach at the national level which has meant that the incentives to encourage investment are simply not in place, except inconsistently at the state level. It is clear that this is not an insurmountable problem; the fact that certain states (notably California) have successfully attracted investment and positioned themselves as technology and policy leaders confirms this. Yet, as the international race for technological leadership heats up, with many of the countries featured in this report (China, India, the UK, Australia, Germany) seeking to accelerate the deployment of renewable energy and build industries of global scale and quality, the threat to the United States' competitiveness is clear. Without a coherent and coordinated approach, starting at the national level and then through the states, the United States risks becoming an investment backwater in the race to capture the economic benefits of the low-carbon economy.

3.8 Conclusions: investment-grade domestic policy

When considered in conjunction with the arguments presented in Chapter 2, the case-studies presented in Sections 3.2 to 3.7 above point to a series of conclusions about what constitutes investment-grade climate change policy at the domestic level. In order to attract private sector investment, governments need to:

1 **Ensure that relevant policy exists. An integrated climate change and clean energy policy framework should include:**

- Clear short-, medium- and long-term greenhouse gas emission reduction objectives and targets, and comprehensive, enforceable legal mechanisms and timelines for delivering on these objectives and targets.
- Comprehensive energy and climate change policies that accelerate the deployment of energy efficiency, cleaner energy, renewable energy, green buildings, clean vehicles and fuels, and low-carbon transportation infrastructure.
- Comprehensive policies directed at reducing greenhouse gas emissions from sources other than energy, for example waste, industrial emissions, fugitives, land-use change, deforestation and agriculture.
- Policies supporting investment in renewable energy generation, including measures that support the access of electricity generated from renewable energy sources to electricity transmission and distribution infrastructure.
- Financial incentives that shift the risk reward balance in favour of low-carbon assets. This includes strong and sustained price signals on carbon, well designed carbon markets and appropriate incentives to enable private investment in clean energy. An integral part of this should be the removal of fossil fuel subsidies.

2 **Ensure that the policies are well designed. Investment grade climate change and clean energy policy should⁵⁸:**

- Provide appropriate incentives to invest. Specifically, policy needs to recognise that investing in areas such as renewable energy and energy efficiency is not risk free, and therefore needs to be designed to allow investors to make appropriate returns relative to the risks that they are taking and the costs, risk and returns of alternative investments.
- Recognise that scale is critical to addressing risk and enabling low-carbon investment opportunities to be more cost-effective relative to high-carbon investment opportunities. Scale allows unit costs to be reduced and allows expertise in the development and deployment of new technologies to be gained.
- Be transparent. That is, it should be clear how the policy is designed and implemented (or intended to operate in the case of new legislation).
- Be of appropriate duration. Investors – in particular, those making large investments in areas such as infrastructure and power generation – need long-term policy certainty. If policy instruments have a time horizon shorter than the timeframe over which the investment is expected to repay the capital invested and generate an appropriate investment

⁵⁸ This set of conclusions builds on the analysis above but also previous work by investors and investor-related groups which have called for policy measures to provide transparency, longevity and certainty ('TLC') and for policy to be 'long, loud and legal'. The term TLC was developed by Deutsche Bank Climate Change Advisors – see, for example, Deutsche Bank Climate Change Advisors (2009), *Paying for Renewable Energy: TLC at the Right Price* (Deutsche Bank Group, New York) and the other Deutsche Bank Climate Change Advisors publications cited in this report. On 'long, loud and legal', see K. Hamilton (2009), 'Unlocking Finance for Clean Energy: The Need for 'Investment Grade' Policy' (Chatham House, London) and R. Della Croce, C. Kaminker and F. Stewart (2011), *The Role of Pension Funds in Financing Green Growth Initiatives. OECD Working Papers on Finance, Insurance and Private Pensions No. 10* (OECD, Paris).

return or if there is the likelihood that future governments will significantly change the policy framework, investors will tend to invest elsewhere.

- Avoid retroactivity. Where governments wish to adapt or change policy they should commit to clear, prospective timeframes and set clear criteria for these changes.
- Seek to harness the power of markets to find the least cost ways to deliver on climate change objectives.
- Align with wider policy goals including economic, energy, resources and transport policy objectives.

3 Ensure the effectiveness of the institutions charged with implementing these policies. In particular, relevant regulatory or oversight bodies should have appropriate resources, and have the ability and authority to ensure that climate change and related energy policies are effectively implemented.

4 International policy

4.1 Why is international policy important to investors?

While domestic legislation is the main determinant of the level of capital flows into areas such as renewable energy and energy efficiency, an international climate change agreement is of critical importance to investors. From the discussion in Section 2 regarding the needs and interests of investors, a well-designed and effectively implemented climate change treaty is important for four reasons:

1. It would provide a framework for governments to work together, thereby helping address the reluctance of individual governments to act in a way that may undermine their national competitiveness. This, in turn, would provide investors with confidence that governments are committed to action through providing a forum and an institutional basis for discussions around reducing international greenhouse gas emissions. More immediately, given that many of the commitments that have been made by governments depend on other governments making similar commitments, an international treaty would provide investors with confidence that these domestic commitments will be delivered and create a 'level international playing field' for similarly situated countries.
2. It would help provide and sustain the financial incentives (e.g. the Green Climate Fund, an effective funding mechanism for REDD+⁵⁹, the continuation of the Clean Development Mechanism (CDM)) to support developing countries to take action to reduce their greenhouse gas emissions and to adapt to the impacts of climate change. These incentives also have a critical role to play in facilitating and supporting private sector investment, in particular given that many low-carbon technologies need some form of regulatory or other support to compete effectively with fossil fuel-based investments in the short and medium term.
3. It would play a critical role in creating the rules and markets necessary to incentivise private sector investment. For example, the significant investments that have been made in CDM projects would not have been made without clear rules about how the carbon credits from these projects could be utilised in the European Union's Emission Trading Scheme (which was, itself, developed in response to the Kyoto Protocol).
4. It would help create the scale necessary to test and, over time, reduce the costs of key low-carbon technologies, particularly for high capital cost technologies such as CCS.

In summary, an international agreement would ensure that national and international efforts, collectively, are directed towards limiting global temperature increases to two degrees or less. This, in turn, would increase the confidence of investors in the domestic policy frameworks that are in place to deliver this outcome, and in the willingness of the international community to work together to support all countries to deliver on their commitments.

4.2 International climate change negotiations: some comments on the current state of play

The 16th session of the Conference of the Parties (COP 16) to the United Nations Framework Convention on Climate Change (UNFCCC) was held in Cancun, Mexico, from 29 November to 10 December 2010. The COP outcomes set out in the Cancun Agreements were, following

⁵⁹ For proposals on the design of a REDD+ funding mechanism, see UNEP FI (2011), *REDDy Set Grow. Part 2 – Recommendations for International Climate Change Negotiators. Designing an Effective International regime for Financing Forest-based Mitigation* (UNEP FI, Geneva).

the relative lack of progress at the previous COP, seen as a significant step forward by the international community to address the long-term challenge of climate change and to speed up the global response. Among the commitments made were: the formal adoption of national statements on intended domestic emissions-reducing action, including those from developing countries such as China, made at COP 15 in Copenhagen in 2009; commitments on helping developing countries deal with climate change, including commitments on finance, technology and capacity-building support; and some progress on reduced deforestation (REDD+).

In the context of the comments in Section 4.1 above, there are three aspects of the Cancun Agreements that are of particular relevance to investors, namely progress towards binding targets, climate finance and trading mechanisms.

Domestic and international targets

It is unclear whether governments will agree to a second commitment period (i.e. targets beyond 2012) under the Kyoto Protocol. What we have seen has been a move away from the top-down approach that underpinned the Kyoto Protocol (where countries committed to mandatory greenhouse gas emission targets) towards a bottom-up approach (where countries develop their own national plans to reduce emissions). This approach offers the advantage of allowing countries to make progress on reducing their domestic greenhouse gas emissions while international negotiations continue.

While the domestic commitments that have been made are welcome and, in a number of cases, represent a significant departure from 'business as usual', there are two important points to highlight. The first is that many of the commitments that have been made are contingent on other countries making similar commitments and, as a consequence, questions remain around the dependability of these commitments in particular if a binding international agreement is not negotiated and agreed. Second, there is a significant gap between the commitments that have been made and the commitments that need to be made (and implemented) if we are to hold the increase in global average temperature below two degrees Celsius. An analysis by UNEP of the pledges made suggests that these pledges will deliver approximately half of the emissions reductions required by 2020⁶⁰. From an investment perspective, these factors create uncertainty about the dependability of the commitments that have been made (i.e. will these commitments be implemented if we do not have an international agreement) and about the future trajectory of climate change policy (specifically, the risk that climate change policy may get much tougher over time and that companies and their investors may have limited time to respond to these changes).

International climate finance

From an investment perspective, perhaps the most significant announcement related to the proposed establishment of the Green Climate Fund (GCF)⁶¹. The Fund will seek to raise funding for adaptation and mitigation in developing countries, will leverage private sector investment, and will be charged with supporting projects, programmes, policies and other measures in developing countries. At the time of writing (September 2011), the details of the governance, objectives and operation of the GCF remain under discussion.

While it is, clearly, premature to comment on how the GCF is likely to function, it could play a critical role in scaling up climate relevant financial flows to developing countries. In order to deliver capital flows at the scale required to meet the climate challenge, an explicit focus on how public funds can be used to leverage private sector funds into areas such as clean and renewable energy, energy efficiency and decarbonisation is important. The investor networks

⁶⁰ UNEP (2010), *The Emissions Gap Report: Are the Copenhagen Accord Pledges Sufficient to Limit Global Warming to 2°C or 1.5°C? A Preliminary Assessment* (UNEP, Nairobi).

⁶¹ See, for example, the views in UNEP FI (2011), 'The Green Climate Fund (GCF): The Private Financial Sector's Perspective' (UNEP FI, Geneva).

supporting this report have previously made a series of practical and detailed suggestions on the types of instruments – for example country risk insurance, policy risk insurance, various guarantees, and public-private co-financing arrangements⁶² – that could be considered and potentially deployed through a ‘private sector window’ of the GCF;. UNEP’s experience with a number of different models of public financing mechanisms shows that leverage ratios between 3 and 15 can be achieved; that is, for every US\$1 of public money deployed, between US\$3 and US\$15 of private investment can be generated⁶³.

In order to deliver this level of private sector investment, it is essential that the GCF also:

- Moves early to establish its credibility with the investment and finance community and develops a strong dialogue with the private as well as with the public sector⁶⁴. This could be supported through creating a formal requirement for the Fund to engage with the private sector and financial community, for example, by allowing private finance representation on the Fund’s board.
- Plays an active role in supporting climate change and clean energy policy development and implementation in developing countries⁶⁵. As has been emphasised throughout this report, well-designed and effectively implemented public policy is critical to attracting private investment. Given the GCF’s role in encouraging public and private sector investment, it is likely to be able to play an important role in encouraging countries to adopt investment-grade climate change and clean energy policy frameworks.
- Defines, at least at a broad level, the key performance measures it intends using to guide its work and measure its contribution⁶⁶.
- Secures a meaningful level of committed government funding to give it credibility and to enable it to attract and leverage private sector capital.

Trading mechanisms

Investors have consistently supported carbon markets as an integral part of the international climate change architecture. Carbon markets have catalysed investment and have also facilitated the search for the least cost abatement options (see further the discussion in Chapter 5). While COP 16 saw progress on a number of elements of the CDM, the critical element for an effective carbon market, i.e. an international cap on emissions, has not been agreed upon. While some countries look likely to retain or establish their own emissions trading schemes, it is not clear that there is or will be sufficient global demand to absorb the supply of carbon credits that are or that could be produced⁶⁷.

⁶² See, further, Vivid Economics (2009), *Catalysing Low-carbon Growth in Developing Countries: Public Finance Mechanisms to Scale Up Private Sector Investment in Climate Solutions. Report to UNEP & Partners* (Vivid Economics, London).

⁶³ UNEP (2008), *Public Finance Mechanisms to Mobilise Investment in Climate Change Mitigation* (UNEP, Nairobi).

⁶⁴ These were central messages in the IIGCC’s response to the GCF Transitional Committee’s survey of the private section (IIGCC (2011), ‘Transitional Committee for the Design of the Green Climate Fund – Survey of the Private Sector. Response from the Institutional Investors Group on Climate Change’ (IIGCC, London)). See, also, UNEPFI (2011) (Note 62).

⁶⁵ For further detail, see UNEPFI (2011) (Note 62).

⁶⁶ These performance measures could include measures relating to scale (e.g. the amount of capital invested by the Fund, the amount of capital leveraged from the private sector) and to impact (e.g. the main areas where the Fund will seek to invest, the amount of carbon abated as a result of the Fund’s investments).

⁶⁷ See, for example, the World Bank’s 2011 report on the state of the carbon markets which stated “Beyond 2012, the main constraint to the carbon market is perhaps a lack of demand beyond current initiatives, with no further encouragement to build up a substantial and credible supply. For both developed and developing countries, this could be a missed opportunity to benefit from market instruments to mobilize resources and engage private sector in climate action.” (World Bank (2011), *State and Trends of the Carbon Market 2011* (World Bank, Washington DC), p. 70).

4.3 South Africa: financing policy implementation⁶⁸

The South African Renewables Initiative (SARi), has analysed whether and how South Africa's renewable energy generation could be substantially increased. SARi's analysis illustrates the critical role that could be played by international finance in unlocking the renewable energy potential of countries such as South Africa. Notably, it identifies that certain renewable energy technologies are at or near grid parity, suggesting that any international financial support would be transitional rather than permanent.

The South African Renewables Initiative (SARi), a South African Government initiative, was started in early 2010 to determine whether and how South Africa's renewable energy ambitions could be substantially increased as part of its broader industrial and economic strategy. Its task is to define an industrial strategy for securing the economic gains from an ambitious program of renewable energy development, including financing and associated institutional arrangements.

SARi has argued that the appropriate financing of incremental costs of renewable energy is the key to unlocking renewables' green growth potential, noting that the estimated incremental costs of an ambitious renewable energy programme (of around 1-3 GW per year, building up towards the at least 15% of South African electricity generation by 2020-2025) would have a net present value of about US\$21 billion at current renewable energy feed-in tariff rates, or US\$9 billion if they were reduced to a more cost competitive level. SARi has stated that these costs (whether expressed in terms of the total capital required or the level of the feed-in tariff necessary to stimulate capital investment at this scale) are unaffordable, and as a result will limit South Africa's ability to scale up renewable generation and allow the country to capture the full economic potential of rapid renewable energy market growth.

SARi has identified the potential for international sources of finance (such as the GCF) to catalyse privately led investment in an ambitious renewable energy programme through domestic institutional de-risking and the provision of a blend of concessionary debt and risk guarantee instruments from international sources. SARi's analysis suggests that through public and private sector finance, the South African renewable energy industry could grow to a scale where the unit costs could be sufficiently reduced to enable them to be financed from domestic sources (through a relatively low feed-in tariff or other forms of support). That is, international finance would play a transitional rather than a permanent support role.

Investment perspective

The work of SARi illustrates the critical role that could be played by international finance in unlocking the renewable energy potential of countries such as South Africa. It also provides two important insights into international climate finance and the design and implementation of domestic policy.

The first is that the constraints on government finances may undermine the credibility of specific policy measures. One of the most important characteristics of the South African case-study is that this is explicitly recognised and, rather than assuming that capital will simply follow a well-designed policy measure (in this case a feed-in tariff), SARi is very clear that the feed-in tariff will not drive investment at the scale that is required.

The second is that the SARi focus is on technologies that are at or near grid parity, again confirming that financial support is seen as transitional rather than permanent. Reflecting the

⁶⁸ The description of SARi and its work to date is based on the materials on the SARi website, at <http://blog.sari.org.za>. See, in particular, South African Renewables Initiative (2010), 'Unlocking South Africa's Green Growth Potential: The South African Renewables Initiative. Update Briefing, December 2010' (Department of Trade and Industry).

experience of Germany the level of financial support could be structured so that it reduces over time as the technologies become cost-competitive. The fact that international financing is explicitly seen as a transitional rather than a permanent support is likely to make it much more attractive to international donors than a completely open-ended commitment.

4.4 **Conclusions: investment-grade international policy**

For investors, international climate change policy is a central part of the overall policy framework, and the existence of a robust international climate change treaty is seen by investors as an important influence on and guarantor of domestic policy. In this context, investors see that, at COP-17 in Durban, governments should:

- Continue to work towards a binding international treaty that includes all major emitters and sets short-, mid-, and long-term greenhouse gas emission reduction targets.
- Support the development of robust international carbon markets that provide strong and sustained price signals on carbon, hence sending economic signals that will facilitate the flow of private capital.
- Support the development of the Green Climate Fund and other comparable funding mechanisms as part of broader efforts to scale up climate-relevant financial flows, from both public and, in particular, private sources, to developing countries.

5 Domestic and international carbon markets

5.1 Why are carbon markets important to investors?

Investors have consistently supported domestic and international carbon markets as key elements of the policy response to climate change⁶⁹, and have been active participants as project developers and as carbon traders in the various emissions trading schemes that have been established (in particular, the EU Emissions Trading Scheme) and the Clean Development Mechanism (CDM))⁷⁰.

From an investment perspective, carbon markets (whether at the domestic or international level) are important for three reasons. First, through assigning a price to carbon, carbon markets send a clear signal to companies and investors that reducing greenhouse gas emissions should be a key priority. Second, carbon markets enable companies and investors to search out and identify the cheapest options for the delivery of a defined level of greenhouse gas emissions reductions. Third, through the CDM process, global carbon markets are seen as a key vehicle for financing carbon reductions in developing countries.

At the time of writing (September 2011), the future prospects for international carbon markets remain unclear. In the absence of a successor treaty to the Kyoto Protocol, questions remain about the future of the flexibility mechanisms (emissions trading, the CDM, Joint Implementation) that were provided under the Protocol. However, the European Union has continued to strongly support its emissions trading scheme (see Section 5.2) as an integral part of its policy response to climate change, and Australia and China have both indicated that they are actively considering the implementation of emissions trading schemes.

5.2 The EU Emissions Trading Scheme: an investment perspective

The European Union Emissions Trading Scheme meets many of the criteria for investment-grade policy: strong and sustained political support, clear targets, transparent allocation processes (in particular in Phases II and III), reasonable duration, and breadth of coverage. While the scheme has had a major effect on electricity dispatch decisions, its influence on capital allocation has, as yet, been modest because the carbon price has remained too low to support investment and because of concerns that wider economic conditions and other policy measures directed at reducing electricity demand may continue to exert downward pressure on the carbon price.

Description

The European Union (EU) Emissions Trading Scheme (EU ETS) is the most significant of the greenhouse gas emissions trading schemes that has been implemented to date, and has dominated world carbon markets since its inception in 2005. In 2010, according to the World Bank's review of global carbon markets, European Union Allowances (EUAs) accounted for 84% of global carbon market value in 2010 or, if secondary CDM transactions are taken into account, the share of the carbon market primarily driven by the EU ETS was 97%⁷¹.

⁶⁹ See, for example, Institutional Investors Group on Climate Change [IIGCC] (2009), 'Towards an Effective Global Carbon Market. Statement by the IIGCC' (IIGCC, London).

⁷⁰ See, for example, the data in World Bank (2011) (Note 67).

⁷¹ World Bank (2011) (Note 67), p. 9.

The EU ETS is one of the key policies introduced by the European Union (EU) to help meet its greenhouse gas emissions target under the Kyoto Protocol and, subsequently, as an integral part of the actions to meet its target of reducing European greenhouse gas emissions by 20% from 1990 levels by 2020. The EU ETS applies to almost half of the EU's emissions of carbon dioxide, and 40% of its total greenhouse gas emissions⁷², covering electricity generation and the main energy-intensive industries (refineries and offshore, iron and steel, cement and lime, paper, food and drink, glass, ceramics, engineering and the manufacture of vehicles). The aviation sector is expected to be included in the EU ETS from 2012.

From 2013, the system for the allocation of allowances will change, with the EU setting a single EU-wide cap (rather than Member States setting their own caps) and allocating allowances on the basis of fully harmonised rules. The cap will see emission allowances reduce each year, with the objective of delivering an overall reduction of 21% below 2005 verified emissions by 2020. Due to international competitiveness and leakage concerns, industrial sectors will be allocated allowances for free on the basis of product benchmarks (set on the basis of the average of the top 10% most greenhouse gas-efficient installations in the EU). Sectors deemed at significant risk of relocating production outside of the EU because of the carbon price will receive 100% of their benchmarked allocation for free.

Impact and influence

The EU ETS has had a major influence on dispatch decisions (i.e. whether gas or coal should be burned) in the electricity sector. However, it has, at least to date, had less influence on the deployment of capital; more specifically, the EU ETS has not provided companies or investors with the robust price signals necessary for them to make long-term capital commitments to low-carbon technologies. There are two major reasons. The first has been that the carbon price has simply not been high enough. The second has been that the carbon price has been extremely volatile, ranging from virtually zero up to approximately 30 Euro/tonne over the life of the EU ETS.

Despite the EU ETS being widely regarded as one of the most important climate change policies to have been adopted to date and, in the particular context of this report, as a key catalyst for investor interest in and action on climate change⁷³, it has not been without its challenges and controversies. These have included: the over-allocation of permits in Phase I (2005-2007); the risk of over-allocation in Phase II (2008-2012) as a result of the decline in economic activity due to the global financial crisis; the windfall profits that accrued to power generators in Phase I; 'carousel fraud', where value-added tax (VAT) refunds were claimed from international carbon trades; the theft of credits as a result of hacking into national registries; the strong opposition of international (ex-European) airlines to their inclusion in the EU ETS. While each of these events has created problems for the EU and its Member States, the EU's strong support for the EU ETS has made it clear to market participants that emissions trading will remain an integral part of the European climate change policy framework.

The bigger challenge to the EU ETS (specifically, the carbon price and the incentives provided to companies through the carbon price), perhaps paradoxically, comes from the EU's efforts to encourage energy efficiency. The EU's proposed Energy Efficiency Directive, which will introduce regulations to require energy utilities to achieve annual savings equivalent to 1.5% of their sales and require the public sector to carry out annual energy saving renovations in their buildings, could deliver a significant reduction in greenhouse gas emissions. However,

⁷² Europa (2008), 'Press Release: Questions and Answers on the Commission's proposal to revise the EU Emissions Trading System, 23 January 2008'. <http://europa.eu/rapid/pressReleasesAction.do?reference=MEMO/08/35&format=HTML&aged=0&language=EN&guiLanguage=en>

⁷³ For a discussion of the influence that the EU ETS has had on European institutional investors' views on climate change, see S. Pfeifer and R. Sullivan (2008), 'Public Policy, Institutional Investors and Climate Change: A UK Case-Study', *Climatic Change*, No. 89, pp. 245-262; R. Sullivan and S. Pfeifer (2009), 'Moving the Capital Markets: The EU Emissions Trading Scheme', *Journal of Corporate Citizenship*, Issue 33 (Spring 2009), pp. 87-96.

it could also have the effect of leaving the EU ETS long (i.e. the price of European Union Allowances (EUAs) could fall to close to zero⁷⁴, thereby eliminating the carbon price incentive for emissions reductions). At the time of writing (September 2011), it is unclear how the EU will address this issue⁷⁵.

Analysing the EU ETS from an investment perspective

The EU ETS, despite the design and implementation challenges that it has faced, continues to be seen as a highly credible policy framework by investors. There are a number of characteristics that are worth highlighting:

- The strong institutional support and leadership that has been provided by the EU. The EU ETS has, from its very inception, been central to the EU's climate change strategy and has been strongly supported by the EU and Member States, even in the light of challenges it has faced.
- The process for setting allocations has, in particular in Phases II and III, been reasonably transparent
- The allocation periods under EU ETS, in particular Phase III (2013 to 2020) are seen as being of reasonable duration and as providing a reasonable degree of confidence to investors looking to invest.
- The EU ETS has been designed to provide the benefits of scale. It has created a deep and liquid carbon market and has covered most of the major industrial sources of greenhouse gas emissions.
- The EU has avoided substantially changing the rules within allocation periods.

5.3 Investment-grade carbon markets

The analysis and discussion above point to a series of conclusions about what constitutes investment-grade carbon markets.

1. While the prospect of a single integrated international carbon market seems remote at the present time, policy makers should, as a general principle, design their domestic carbon markets to be as aligned as possible with international policy frameworks in areas such as the monitoring and measuring of emissions, the accounting for emissions, and the recognition of carbon credits (e.g. from the CDM). This will minimise the likelihood of major changes at a later date in the event that an international carbon market is established.
2. The strengths and limitations of carbon markets need to be recognised as an integral part of their design and implementation. In the context of one of the central themes of this report, i.e. the need for the wide deployment and testing of capital intensive technologies such as CCS, policy makers will probably need supplementary policy measures to encourage capital flows into these technologies.
3. The interaction with other policy instruments needs to be recognised and built into the design of the caps and allocations. Schemes should – consistent with the principles of transparency, duration and avoiding retroactivity – allow for changes to be made (e.g. to the caps or to allocations) to ensure that new policy instruments or changes in circumstances do not undermine the effectiveness of the carbon market in question.
4. As with all policy instruments, carbon markets should be of appropriate duration and provide certainty to participants on the goals that they need to meet.

⁷⁴ See, for example, the analysis in HSBC Bank (2011), 'Climate Investment Update. EU: New Energy Efficiency Obligations for Utilities. 24 June 2011' (HSBC Bank, London).

⁷⁵ For a discussion of possible solutions as well as further analysis of the interactions between emissions trading schemes and other climate change policy measures, see W. Blyth (2010), 'Climate Policy after Copenhagen: Managing Carbon Price Risk in an Uncertain World. Chatham House Briefing Paper, January 2010' (Chatham House, London).

Concluding comments

Investment-grade climate change and clean energy policy will provide substantial economic benefits. Those countries that succeed in attracting private capital into low-carbon growth areas such as cleaner and renewable energy, energy efficiency and decarbonisation will enjoy multiple benefits, including new jobs, new businesses, new research and technology innovation, more resilient and secure energy systems and, ultimately, more sustainable economies.

Private investment can and must play a critical role in addressing the risks and opportunities posed by climate change. However, private sector investment will only flow at the scale and pace necessary if it is supported by clear, credible and long-term domestic and international policy frameworks – ‘investment-grade climate change and energy policies’ – that shift the balance in favour of low-carbon investment opportunities.

Appendix 1 2011 Global Investor Statement on climate change

This Statement is supported by 285 investors that represent assets of more than US\$20 trillion

Climate change presents major long-term risks to the global economy and to the assets in which we invest. At the same time, well designed and effectively implemented long-term climate change and clean energy policy (“investment-grade policies”) will not only present significant opportunities for investors in areas such as cleaner and renewable energy, energy efficiency and decarbonisation, but will also yield substantial economic benefits including creating new jobs and businesses, stimulating technological innovation, and providing a robust foundation for economic recovery and sustainable long-term economic growth.

In the Cancun Agreements in 2010, governments agreed to reduce global greenhouse gas emissions so as to hold the increase in global average temperature below 2 degrees Celsius. To achieve this goal, massive investment in low-carbon energy will be required. For example, in its 2010 World Energy Outlook, the International Energy Agency (IEA) has forecast that US\$13.5 trillion (or some US\$500 billion per year) in clean energy investment and spending, in addition to the commitments that have already been made by governments, will be needed between 2010 and 2035.⁷⁶

With data from the IEA indicating that global energy-related emissions of carbon dioxide (CO₂) in 2010 were the highest on record, it is clear that the need for action is urgent. However, current levels of investment in low-carbon technologies fall far short of what is needed. Private investment will only flow at the scale and pace necessary if it is supported by clear, credible and long-term policy frameworks that incentivise investments in low-carbon technologies rather than continuing to favour carbon-intensive energy sources. Therefore, as we approach the United Nations Framework Convention on Climate Change (UNFCCC) Seventeenth Conference of the Parties (COP-17) in Durban, South Africa, in November-December 2011, we wish to reiterate the calls we have made in previous Investor Statements about the importance of both domestic and international climate change policy in catalysing the required levels of investment needed to transition to a low-carbon economy, and to outline the elements of “investment-grade climate and energy policy” necessary to attract large scale investment in solutions to climate change.⁷⁷

Domestic policy recommendations

The countries that have attracted the most investment in low-carbon technologies, renewable energy and energy efficiency have generally been those that have provided long-term certainty around the structure and incentives associated with these investments. Conversely, many countries have struggled to attract investment because they do not have appropriate policies in place, because the policies are poorly implemented or because the policies do not provide sufficient incentives for investment. A more recent concern has been the move by some governments to retroactively scale back climate change-related policies and incentives, which has deterred investment in those countries.

⁷⁶ The International Energy Agency estimates that the commitments made to date equate to some US\$4.5 trillion over business as usual, over the period 2010 to 2035.

⁷⁷ This Investor Statement is supported by a report, Investment-Grade Climate Change Policy: Financing the Transition to the Low-Carbon Economy, that explains how investors make investment decisions in areas such as renewable energy, and that highlights examples of policies that have been more and less successful at encouraging investment in these areas.

Investment-grade climate change and clean energy policy is required to shift private sector investment from high-carbon to low-carbon assets. To attract private sector investment, governments need to:

1 Ensure that effective policies exist. An integrated climate change and clean energy policy framework should include:

- Clear short-, medium- and long-term greenhouse gas emission reduction objectives and targets, and comprehensive, enforceable legal mechanisms and timelines for delivering on these objectives and targets.
- Comprehensive energy and climate change policies that accelerate the deployment of energy efficiency, cleaner energy, renewable energy, green buildings, clean vehicles and fuels, and low-carbon transportation infrastructure.
- Comprehensive policies directed at reducing greenhouse gas emissions from sources other than energy, for example waste, industrial emissions, fugitives, land-use change, deforestation and agriculture.
- Policies supporting investment in renewable energy generation, including measures that support the access for electricity generated from renewable energy sources to electricity transmission and distribution infrastructure.
- Financial incentives that shift the risk reward balance in favour of low-carbon assets. This includes strong and sustained price signals on carbon, well-designed carbon markets and other appropriate incentives to enable private investment in clean energy. An integral part of this should be the removal of fossil fuel subsidies.
- Adaptation measures to reduce unavoidable climate impacts.
- Corporate disclosure of material climate change-related risks.

2 Ensure that the policies are well designed. Experience with investing in renewable energy and energy efficiency suggests that investment-grade climate change and clean energy policy should:

- Provide appropriate incentives to invest. Specifically, policy needs to recognise that investing in areas such as renewable energy and energy efficiency is not risk free, and therefore needs to be designed to allow investors to make appropriate returns relative to the risks that they are taking and the costs, risks and returns of other investment opportunities.
- Recognise that scale is critical to addressing risk and enabling low-carbon investment opportunities to be more cost-effective relative to high-carbon opportunities. Scale allows unit costs to be reduced and allows expertise in the development and deployment of new technologies to be gained.
- Be transparent. That is, it should be clear how the policy is designed and implemented (or intended to operate in the case of new legislation).
- Be of appropriate duration. Investors – in particular, those making large investments in areas such as infrastructure and power generation – need long-term policy certainty. If policy instruments have a short time horizon or there is the likelihood that future governments will significantly change the policy framework, investors will tend to invest elsewhere.
- Avoid retroactivity. Where governments wish to adapt or change policy they should commit to clear prospective timeframes and set clear criteria for these changes.
- Seek to harness the power of markets to find the least cost ways to deliver on climate change objectives.
- Align with wider policy goals including economic, energy, resources and transport policy objectives.

3 Ensure the effectiveness of the institutions charged with implementing these policies. In particular, relevant regulatory or oversight bodies should have appropriate resources, and have the ability and authority to ensure that climate change and related energy policies are effectively implemented.

International policy recommendations

While domestic legislation is the critical determinant of the level of capital flows into areas such as renewable energy and energy efficiency, a rules-based international climate change regime is critically important to send appropriate signals to global capital markets. First, it would signal serious international resolve to tackle climate change. Second, it would promote confidence and a higher level of certainty that government commitments will be delivered. Third, it would provide a forum for governments to encourage more ambitious national actions to meet the agreed longer-term objective of holding the increase in global average temperature below 2 degrees Celsius. In this context, we note that the pledges set out by national governments in the Cancun Agreements, while representing significant and important commitments, fall short of meeting this objective.⁷⁸ Fourth, it would provide the institutions and institutional frameworks necessary to provide transparency and comparability of national actions on climate change in order to assess progress towards meeting this long-term objective.

We therefore encourage governments to define a pathway towards a high ambition, multilateral, rules-based regime that builds on the work of the past two decades. In particular, we encourage governments to:

- Continue to work towards a binding international treaty that includes all major emitters and that sets short-, mid-, and long-term greenhouse gas emission reduction targets.
- Support the development of robust carbon markets that provide strong and sustained price signals on carbon, hence sending economic signals that will facilitate the flow of private capital.
- Support the development of the Green Climate Fund and other comparable funding mechanisms as part of broader efforts to scale up climate-relevant financial flows, from both public and, in particular, private sources, to developing countries.
- Accelerate efforts to reduce emissions from deforestation and forest degradation (REDD and REDD-plus).

Conclusion

Investment-grade climate change and clean energy policy will provide substantial economic benefits. Those countries that succeed in attracting private capital into low-carbon growth areas such as cleaner and renewable energy, energy efficiency and decarbonisation will enjoy multiple benefits, including new jobs, new businesses, new research and technology innovation, more resilient and secure energy systems and, ultimately, more sustainable economies.

Private investment can and must play a critical role in addressing the risks and opportunities posed by climate change. However, private sector investment will only flow at the scale and pace necessary if it is supported by clear, credible and long-term domestic and international policy frameworks – “investment-grade climate change and energy policies” – that shift the balance in favour of low-carbon investment opportunities.

⁷⁸ See, for example, United Nations Environment Programme [UNEP] (2010), *The Emissions Gap Report: Are the Copenhagen Accord Pledges Sufficient to Limit Global Warming to 2°C or 1.5°C? A Preliminary Assessment* (UNEP, Nairobi) which indicates that current pledges only takes us 60% of the way assuming that pledges are delivered in full.

Appendix 2 Acronyms

BWEA	British Wind Energy Association
CCGT	Combined cycle gas turbine
CCS	Carbon capture and storage
CDM	Clean Development Mechanism
COP	Conference of the Parties to the UNFCCC
DECC	Department of Energy and Climate Change (UK)
DFAT	Department of Foreign Affairs and Trade (Australia)
DoT	Department of Transport (US)
EPA	Environmental Protection Agency (US)
ESCO	Energy services company
EU	European Union
EU ETS	European Union Emissions Trading Scheme
EUA	European Union Allowance
GCF	Green Climate Fund
GDP	Gross domestic product
GW	Gigawatt
IEA	International Energy Agency
IGCC	Investor Group on Climate Change (Australia/New Zealand)
IIGCC	Institutional Investors Group on Climate Change (Europe)
INCR	Investor Network on Climate Risk (US)
MW	Megawatt
NGO	Non-governmental organisation
OECD	Organisation for Economic Co-operation and Development
PV	Photovoltaic
SARi	South African Renewables Initiative
TLC	Transparency, longevity and certainty
UK	United Kingdom
UNEP	United Nations Environment Programme
UNEPFI	United Nations Environment Programme Finance Initiative
UNFCCC	United Nations Framework Convention on Climate Change
US	United States

Disclaimer

This report was commissioned by the Institutional Investors Group on Climate Change (IIGCC), the Investor Network on Climate Risk (INCR), the Investors Group on Climate Change (IGCC) and the United Nations Environment Programme Finance Initiative (UNEP FI). The findings, interpretations, opinions and proposals expressed in the report do not necessarily represent the views of all members of the organisations that commissioned, sponsored or supported the report, nor do they represent the decision or the stated policy of UNEP.

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About us



About IIGCC

The Institutional Investors Group on Climate Change (IIGCC) is a forum for collaboration on climate change for investors. IIGCC brings together European investors to engage with policymakers, companies and investors on addressing long-term risks and opportunities associated with climate change. The group currently has over 70 members, including many of the largest pension funds and asset managers in Europe, representing assets of around \$10 trillion.

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About INCR

The Investor Network on Climate Risk (INCR) is a North American network of institutional investors focused on addressing the financial risks and investment opportunities posed by climate change. INCR currently has 100 members with more than \$10 trillion in assets. INCR is a project of Ceres, a coalition of investors and environmental groups working to integrate sustainability into the capital markets.

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About IGCC

The IGCC represents institutional investors, with total funds under management of approximately \$700 billion, and others in the investment community interested in the impact of climate change on investments. The IGCC aims to encourage government policies and investment practices that address the risks and opportunities of climate change, for the ultimate benefit of superannuants and unit holders.

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About UNEP FI

The United Nations Environment Programme Finance Initiative (UNEP FI) is a strategic public-private partnership between UNEP and the global financial sector. UNEP works with nearly 200 banks, investment firms, insurers and a range of partner organisations, to understand the impacts of environmental, social and governance issues on financial performance and sustainable development. Through its Climate Change Working Group (CCWG), UNEP FI aims to understand the roles, potentials and needs of the finance sector in addressing climate change, and to advance the integration of climate change factors – both risks and opportunities – into financial decision-making.

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