



UK—India

Business Leaders
Climate Group

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UK—India Collaboration for a Prosperous Low Carbon Economy: Opportunities, Challenges and Recommendations



Charter of Principles

An introduction

The UK-India Business Leaders Climate Group was launched in February 2010 to provide recommendations to the governments of the UK and India on how to accelerate collaborative, climate-friendly economic growth. Its members are drawn from a broad range of sectors including business associations, educational institutions and commercial organisations in media, banking, IT, energy, and manufacturing. Their organisations are all leaders in sustainability and innovation.

The UK-India Business Leaders Climate Group believes that moving to a low carbon economy is an essential part of a strategy to combat the impacts of rising energy prices, enhance energy security and reduce the risk of human-induced global climate change.

Furthermore, the Group believes that the shift to low carbon technologies and processes provides major business opportunities: it increases resource efficiency, productivity and competitiveness, and leads to the creation of high quality jobs across a range of sectors.

A combination of leadership by businesses and clear policies from government to eliminate the barriers to increased investment and support climate-friendly growth is needed - both domestically and on the international stage - to ensure that these opportunities are fully realised.

Members of UK-India Business Leaders Climate Group

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The history of political and business links between India and the United Kingdom, together with their complementary set of skills and resources, means that expanded collaboration in the areas of policy design, investment, innovation and technology transfer and deployment can significantly accelerate low carbon growth, reduce the cost of both countries' efforts to mitigate climate change and strengthen their international leadership.

This Charter of Principles is designed to enhance collaboration that builds on the relative strengths of the Indian and UK business communities and puts business at the heart of a prosperous climate-friendly economy. Implementation of these principles and actions will address some of the principal barriers to greater collaboration between the two countries and in so doing, unlock the potential for investment in low carbon growth.

The UK-India Business Leaders Climate Group is committed to advancing these principles through implementation of the actions. Where relevant, we recommend partnering with existing initiatives and institutions so as to leverage the progress made to date and draw on the support of a broad stakeholder base. Finally, the Group believes that policy making, both domestic and international, would benefit from greater involvement by progressive businesses and encourages the Governments of the UK and India to support this engagement.

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Charter of Principles

Principle One

Development of joint demonstration projects will raise awareness of opportunities for low carbon economic growth and provide impetus for investment.

Action Design a select number of business-led demonstration projects in critical sectors where significant carbon mitigation opportunities can be found and create a mechanism for disseminating the lessons learned.

Principle Two

Innovative financing instruments and the removal of barriers to capital flows are needed to stimulate investment in the low carbon economy.

Action Recommend and provide technical guidance on instruments for increasing investments in low carbon activities across the economy.

Action Provide clear proposals for the elimination of barriers and administrative requirements to domestic and foreign low carbon investment.

Action Organize a business-led high-level Low Carbon Economy Summit between the UK and India to raise awareness of investment opportunities and promote solutions to barriers to this investment focussing, in particular, on venture capital, institutional investment, and intellectual property.

Principle Three

Improved exchange and dissemination of information are needed to support low carbon business decisions and collaboration.

Action Create a vehicle for the timely communication of information on recent technology developments, examples of successful deployment and effective business models in order to attract investors and demonstrate opportunities.

Action Commission an analysis of India’s state-level regulatory and financial landscape and a ranking of ‘climate business attractiveness’ of states.

Principle Four

Joint R&D programmes and skills exchange are necessary to accelerate low carbon innovation and technology development.

Action Establish an entity comprising leading universities and companies to define and oversee the delivery of low carbon technology research programmes, building where appropriate on existing collaborations.

Action Create a prestigious fellowship exchange programme that includes several leading universities in both countries.

Principle Five

Effective regulatory frameworks are needed to support the transition to a prosperous low carbon economy.

Action Propose to government specific regulatory changes and international policy improvements necessary to address barriers to climate-friendly economic development based on business experience of existing policies and ongoing demonstration projects.

Action Propose key IPR reforms to support clean technology development and diffusion, and formally request that agencies in India and the UK cooperate in ensuring effective levels of protection in the application of IP law.

Achieving Low Carbon Prosperity in India and the UK: Challenges and Opportunities

Low carbon prosperity is of particular importance to both India and the UK. Fuelled by economic liberalisation and globalisation, India aims to sustain its rapid economic growth, as well as deliver energy access to the 450 million people who currently lack electricity, and protect the vulnerable segments of its society and climate-sensitive sectors from the negative impacts of climate change.¹ The UK, with declining fossil fuel resources, is working to transition to a more energy efficient, low carbon economy.

The UK's path to a low carbon economy

Reaching beyond its international obligations, the UK Government has set itself ambitious greenhouse gas (GHG) emission reduction targets: a 34%-42% reduction by 2020, and 80% by 2050 compared to 1990 levels.² To achieve these targets, the UK has been pursuing a range of measures to decarbonise its economy.

One course of action has been to reduce emissions from the power sector, in particular through the increased use of renewables. Current incentives include the Renewables Obligation for utilities; feed-in tariffs for small-scale renewable electricity generation; and capital grants and tax allowances for businesses. In addition, the UK Government has renewed its support for nuclear generation, and is working with industry to develop and expand the domestic technical capacity to support nuclear new build.

Since the 1980s, the UK government has used various programmes to promote energy efficiency in industrial, commercial and residential sectors (e.g. the Low Carbon Transition Plan, and the Energy Efficiency Action Plan). Delivery mechanisms have included taxation (e.g. the Climate Change Levy), a climate change and energy saving scheme for large electricity users (the CRC Energy Efficiency Scheme); grants (e.g. Warm front); and legislative requirements (e.g. the Carbon Emission Reduction Target and smart metering). In addition, the largest UK industrial installations are covered by the EU Emissions Trading System (EU ETS), the main European mechanism for meeting the EU-wide GHG reduction target of 20% by 2020.

Despite all these measures, the UK's attainment of long term energy and carbon targets is not certain. Recently, the National Audit Office announced that the UK has failed to meet its target of generating 10% of electricity from renewable sources by 2010. There are also concerns about whether the UK will meet its 2020 targets for carbon reduction and energy from renewables.³ A report from the Green Investment Bank Commission estimated that the UK would need a £550 billion investment to meet its climate change and renewable targets between now and 2020.⁴

With this challenge also comes opportunity: the UK already has a 3.5% share of the £3 trillion global market for low carbon and environmental goods and services.

With the global market expected to grow to over £4.3 trillion by 2015, the UK market could by then be worth as much as £150 billion⁵ and employ over 1.2 million people.⁶

India's response to the climate change challenge

Although on a per capita basis India's carbon emissions remain a small fraction of those of developed countries such as the UK, the country's rapid economic growth has also brought with it higher emissions. As a result, the Indian Government has implemented policies to maintain a low carbon growth profile. In 2008, India released its first comprehensive and dedicated policy document on climate change, National Action Plan on Climate Change (NAPCC), outlining existing and future mitigation and adaptation policies and programmes. India has also announced a voluntary target of reducing emissions intensity by 20-25% by 2020, against a 2005 baseline, excluding the agriculture sector.

However, India faces a number of challenges beyond the necessity of meeting its development goals and addressing climate change. In particular, India's power sector has been affected by a shortfall in both generation and transmission investment which has hindered smooth economic growth. To achieve its 2012 target of making 1,000kWh per capita consumption available, an estimated 100GW of installed capacity will need to be added to the Indian energy system.⁷ To this end, the Government of India has established short term renewable energy targets (some 25GW of total renewable capacity by 2012) as well as longer-term targets for specific technologies (such as 20GW of solar alone by 2022).^{8,9} The Government of India has also launched an ambitious nuclear programme, aiming at increasing installed nuclear capacity from the current 4.12GW to about 35GW by 2020.¹⁰ The remainder of the generating requirements are expected to comprise clean coal and other efficient plant technologies, such as supercritical coal technologies.¹¹

Inadequate infrastructure is a significant bottleneck both to attaining India's targeted growth and to meeting its carbon intensity reduction targets. The Government of India Planning Commission estimated in 2006 that almost US\$23 billion of investment would be required to develop India's energy infrastructure.¹² There are further key challenges to overcome, including information and skills disparities and intellectual property rights enforcement. Finally, technology transfer has been slow due to the absence of policies to promote investment in innovation and technology development, lack of technology commercialisation models and slow adoption and diffusion across all stakeholders.

Low carbon initiatives in India could result in investments of over US\$1 trillion over the next decade.

Investments of approximately US\$65 billion will be required for just two of the eight missions under India's NAPCC, the National Mission on Enhanced Energy Efficiency (NMEEE) and National Solar Mission (NSM).^{13,14} Research undertaken by the Global Climate Network has estimated that the NSM (with its stated objective of achieving 20GW of installed solar capacity by 2022) has the potential to create around 230,000 jobs in areas such as research, development, diffusion, operation and maintenance. If ambitious targets to increase wind capacity in India are met, and 2GW of additional wind capacity is installed annually to 2020, then in the region of 240,000 jobs are expected to be created mainly in construction and installation and, to a lesser extent, in operation and maintenance.¹⁵ Significant employment potential also exists in the area of biofuels. It has been estimated that the Government's plans to increase industrial and village-level biofuel production have the potential to create ten million jobs across the country.¹⁶



¹ Technology Development and Transfer, Delhi High Level Conference on Climate Change, FICCI, 2009

² UK Low Carbon Transition Plan, 2009; Climate Change Act, 2008

³ Government funding for developing renewable energy technologies, National Audit Office, June 2010, http://www.nao.org.uk/publications/1011/renewable_energy.aspx

⁴ Unlocking investment to deliver Britain's low-carbon future, Green Investment Bank Commission, June 2010

⁵ Low Carbon and Environmental Goods and Services: an industry analysis, Innovas, 2009, <http://www.berr.gov.uk/files/file50254.pdf>

⁶ The UK Low Carbon Transition Plan: National strategy for climate and energy, HM Government, 2009, http://www.decc.gov.uk/assets/decc/white%20papers/uk%20low%20carbon%20transition%20plan%20wp09/1_20090724153238_e_@_@_lowcarbontransitionplan.pdf

⁷ Power sector in India, KPMG, 2010, http://www.in.kpmg.com/TL_Files/Pictures/PowerSector_2010.pdf

⁸ Eleventh five year plan 2007-12, Vol 3, Planning Commission, Government of India 2008,

http://planningcommission.nic.in/plans/planrel/fiveyr/11th/11_v3/11th_vol3.pdf

⁹ Jawaharlal Nehru National Solar Mission, 2010,

<http://www.india.gov.in/outerwin.php?id=http://mmre.gov.in/pdf/mission-document-JNNSM.pdf>

¹⁰ Civil nuclear liability bill, CSTEP, 2010, http://www.cstep.in/docs/NuclearLiability_CSTEP_PolicyBrief3.pdf; Economic Times <http://economictimes.indiatimes.com/articleshow/5709153.cms>

¹¹ Development of large size ultra mega projects, Ministry of Power, http://pfc.gov.in/MQP_LMPP.pdf

¹² Integrated Energy Policy: Report of the Expert Committee, Government of India Planning Commission, New Delhi, 2006,

http://planningcommission.nic.in/reports/genrep/rep_intengy.pdf

¹³ Cabinet approves mission to cut greenhouse emissions, The Economic Times, 25 June 2010,

<http://economictimes.indiatimes.com/news/politics/nation/Cabinet-approves-mission-cut-greenhouse-emissions/articleshow/6088878.cms>

¹⁴ Solar Energy mission target may stand reduced, The Hindu, 10 January 2010, <http://hindu.com/2010/01/10/stories/201001055581300.htm>

¹⁵ Low Carbon Jobs in an Interconnected World, Global Climate Network Discussion Paper no.3, Global Climate Network, March 2010

¹⁶ Ibid

Principles and Recommended Actions to Build Low Carbon Prosperity

A common path forward

The UK and India share similar motivations for greening their economies. Both aim to address the climate change challenge, while seeking to reduce reliance on imported fossil fuels, increase energy security, and create new employment opportunities.

These common objectives for future growth create opportunities for stronger cooperation between businesses and governments of both countries.

Low carbon growth opportunities exist across a range of sectors, in particular water, waste management, clean energy, urban design, buildings and transportation. Improving resource efficiency can be both highly profitable and support conservation and access goals. In many cases, significant progress can be made through the widespread deployment of existing technologies, many of which are already commercially competitive.

One area of particular interest in India and the United Kingdom is the expansion of locally generated power which reduces transmission and distribution losses. Centralized generating capacity is under strain in both countries, with some 450 million people in India having little prospect of being connected to grid electricity any time soon. The feedstock for this decentralized generation can come from both locally-available methane – for example, from sewage and food/farm waste – and renewable energy resources, including small-scale wind and hydro, solar and geothermal.

The benefits of using methane are particularly important, as it is over twenty times as damaging in terms of global warming potential as carbon dioxide, and can substitute kerosene or wood for cooking and heating purposes as well as for power generation. The technology now exists to capture and distribute methane and to use fuel cells to convert this gas into electricity and hot water, using a chemical process that has now been proven in operation in both Britain and North America.

Such technologies need to be harnessed to address the huge challenge and global business opportunity that is now available: to develop, manufacture and install distributed power systems in rural communities using locally-available raw materials and to develop financing mechanisms that allow local people to “sell” their resources in return for electricity and hot water. The prize would be very great: transformation of the lives of millions of people, less damage to the world’s climate and a massive business opportunity in producing, installing and servicing local energy supply systems to rural communities around the globe.

Technology development, transfer and deployment emerge as key elements of cooperation that will unlock these opportunities. India offers a strong science and engineering educational base fuelled by its large pool of low cost, but highly skilled and educated labour. As a mature economy, the UK brings experience, access to up-to-date technologies and financing. With each country bringing different pieces of the puzzle to the table, cooperation offers win-win benefits: for India, sufficient technology and capacity to narrow the gap with mature economies; and for the UK, a partner in its low carbon efforts at the national and international level.

Based on a series of interviews and working discussions and research and analysis on key economic and sustainability issues, the UK-India Business Leaders Climate Group has developed a Charter of Principles, designed to enhance collaboration, build on the relative strengths of the Indian and UK business communities, and put business at the heart of a prosperous, climate-friendly economy. The Charter includes a series of actionable recommendations; implementing these will address some of the principal barriers to greater collaboration between the two countries and, in so doing, unlock the potential for investment in low carbon growth.

The Principles are as follows:

Principle One

Development of joint demonstration projects will raise awareness of opportunities for low carbon economic growth and provide impetus for investment.

Principle Two

Innovative financing instruments and the removal of barriers to capital flows are needed to stimulate investment in the low carbon economy.

Principle Three

Improved exchange and dissemination of information are needed to support low carbon business decisions and collaboration.

Principle Four

Joint R&D programmes and skills exchange are necessary to accelerate low carbon innovation and technology development.

Principle Five

Effective regulatory frameworks are needed to support the transition to a prosperous low carbon economy.



Principle One

Development of joint demonstration projects will raise awareness of opportunities for low carbon economic growth and provide impetus for investment.

Businesses in both India and the UK see opportunities to engage with each other through practical low carbon demonstration projects.

Such projects would spur further business collaboration, raise awareness of existing competitive technologies, and highlight the investment opportunities available to potential investors. Demonstration projects – with government support where relevant on a case-by-case basis – can help unlock private sector funding to enable the scale up of low carbon technologies at the research grant and commercialization “valley of death” stages.

The delivery mechanism for the demonstration projects could take two forms:

- Where projects are of a proprietary nature, governments could take an active role in supporting the development of the operational framework, and, if needed in specific cases, provide seed money to facilitate interest and engagement by the business community. Under this framework, Indian and British businesses could collaborate on joint projects in order to test and deploy proprietary innovations.
- For projects that do not have a proprietary component, demonstration projects could be coordinated with industry associations in both countries to help disseminate lessons learned and demonstrate replicability.

In both cases, it is important that mechanisms are created both for assessing the success of demonstration projects and ensuring that lessons are learned, and opportunities for replication are widely disseminated. Projects could involve both proven technologies that require scaling, and new technologies that need further testing under commercial conditions. Particular opportunities highlighted in interviews include smart grids and networks, demand-side management, distributed and renewable energy systems, energy efficiency – in particular on the demand side, blast furnace gas recycling, carbon capture and storage, fuel cells, water management and sustainable agriculture and forestry. Once a framework has been established, it would also be opportune to encourage businesses and business organisations in both India and the UK from outside the core membership of the UK-India Business Leaders Climate Group to develop and deliver further demonstration projects.

Action

Design a select number of business-led demonstration projects in critical sectors where significant carbon mitigation opportunities can be found and create a mechanism for disseminating the lessons learned.

Principle Two

Innovative financing instruments and the removal of barriers to capital flows are needed to stimulate investment in the low carbon economy.

There is an opportunity to leverage London’s position as the centre of the global carbon market and as a global leader in financial services, to transfer this expertise, and to facilitate the involvement of the Indian financial sector in low carbon initiatives.

The Indian NAPCC emphasizes the need for the transfer of cost-effective and locally appropriate low carbon technologies – highlighting the great potential for companies offering low carbon technologies or services. While India has benefited under the Clean Development Mechanism (CDM), accounting for approximately 22% of all registered projects,¹⁷ there is currently very little in the way of a fund management response to climate change in India.

Further, British expertise can help strengthen understanding in India of the ways in which financial instruments and systems can be used as vehicles for increasing foreign capital flow into low carbon technologies, thus accelerating the pace of change. Such instruments include early-stage venture capital, clean technology and microfinance funds/bonds. More low carbon funds, such as clean tech funds, are needed on India’s stock market, along with greater promotion of these funds to global institutional investors.¹⁸ The proposed Green Investment Bank (GIB) in the UK provides one potential model for enhancing the Indian financial sector’s involvement in low carbon markets. The GIB is expected to provide a range of financial products such as equity co-investments, wholesale capital, and early stage grants to low carbon technology and infrastructure projects in the UK.¹⁹

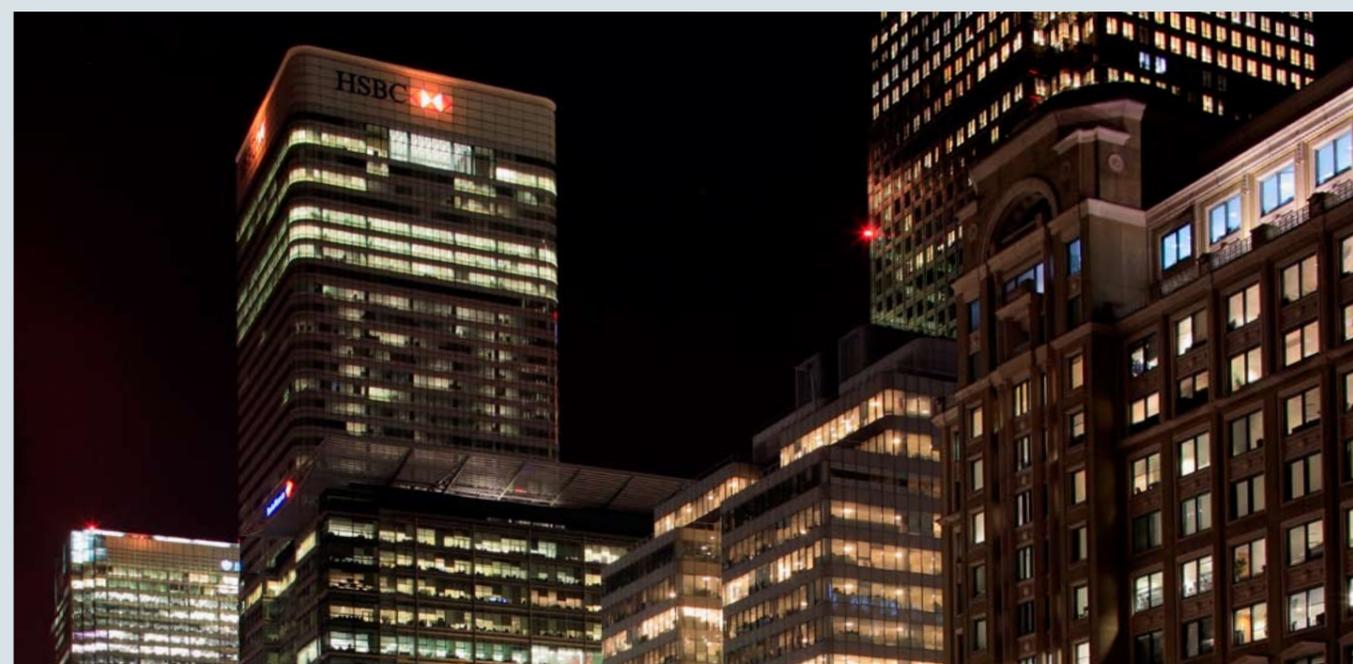
In developing linkages between the Indian and UK financial sectors, additional goals could include:

- Promoting the key conditions for institutional investment in low carbon technologies and systems (e.g. transparency, governance and risk management);
- Highlighting the opportunities to use stock exchange listings to obtain international investment in low carbon technologies and systems – for example, on the Alternative Investment Market (AIM) of the London Stock Exchange (LSE) and on India’s National Stock Exchange (NSE);
- Providing a forum to raise awareness of attractive UK-Indian investment opportunities, such as in specific technologies and companies, for the venture capital/private equity community.

Across all three of these areas, using public sector balance sheets and targeted government support to leverage large-scale private sector investment will be a key success factor.

Action

Recommend, and provide technical guidance on, instruments for increasing investments in low carbon activities across the economy.



The UK is the world’s second largest outward investor, with total investment in other countries exceeding £1,000bn in other countries in 2008. Currently, however, only 0.4% of the annual investment goes to India.²⁰ Since 2005, India has liberalised its strict foreign direct investment (FDI) policies; however, because local (state) authorities have their own FDI rules, the approval process can be slow. India does not, therefore, receive all the FDI that the federal government approves.²¹ Some restrictions exist in certain parts of the power market; here it is important to establish a level playing field that balances support for local manufacturing with attractiveness to investors if the benefit of low carbon FDI is to be maximised.

The private sector plays a central role in investment and will need to provide an estimated 80%-90% of the funds required to meet the climate change challenge.^{22&23}

At present, however, there are multiple reasons why the private sector is unable to provide the level of investment needed, including:

- The availability of debt financing, which is a significant issue for large projects and a problem made even more acute in the current global economic context;
- Low returns on low carbon investments relative to the risks which include geo-political risk, policy and regulatory risk (including a lack of long term policy signals, or risk of policy changes), currency risk (exchange rate fluctuations), and deal flow problems (insufficient numbers of attractive projects).²⁴

Many of India’s proposed low carbon policy initiatives, such as the NMEEE (energy efficiency) and the NSM (solar) rely on markets to support their implementation. This provides specific opportunities for investment and technology flows. It will therefore be important for Government of India officials to understand the issues faced by UK investors, and develop solutions that could improve capital flow. Engagement by the UK financial community and other investors could be supported by Government stimulus measures such as grants for collaborative R&D; investment guarantees or insurance against risk; beneficial tax treatment; refinement of ‘local content requirements’; and favourable access to land, buildings and other assets. A high-level conference involving a range of stakeholders could facilitate dialogue on these issues and provide an important first step to improving foreign and domestic low carbon investment.

Action

Provide clear proposals for the elimination of barriers and administrative requirements to domestic and foreign low carbon investment.

Action

Organize a business-led high-level Low Carbon Economy Summit between the UK and India to raise awareness of investment opportunities and promote solutions to barriers to this investment focussing, in particular, on venture capital, institutional investment and intellectual property.

¹⁷ UNEP Riso CDM Pipeline, <http://unepriase.org/>
¹⁸ How India’s commodity appetite can reap a carbon dividend, A. Damodaran, Wall Street Journal, <http://www.iimb.ernet.in/node/1851>
¹⁹ Unlocking investment to deliver Britain’s low-carbon future, Green Investment Bank Commission, June 2010
²⁰ Statistical bulletin foreign direct investment 2008, Office for National Statistics, 11 December 2009, <http://www.statistics.gov.uk/pdfdir/fdi1209.pdf>

²¹ Foreign Direct Investment in India, Economy Watch, <http://www.economywatch.com/foreign-direct-investment/fdi-india/>
²² Address by Yvo de Boer, Executive Secretary, UNFCCC, Pensions 80 Seoul Summit 2010, June 2010, http://unfccc.int/files/press/news_room/statements/application/pdf/100618_yvo_speech_seoul.pdf
²³ Catalysing low-carbon growth in developing economies: Public Finance Mechanisms to scale up private sector investment in climate solutions, UNEP, October 2009, <http://www.energy-base.org/fileadmin/media/sefi/docs/publications/PublicPrivateWeb.pdf>
²⁴ Ibid

Principle Three

Improved exchange and dissemination of information are needed to support low carbon business decisions and collaboration.

Information sharing on market opportunities and participants is important for both countries if they are to facilitate trade and investment. This includes details of regulations at different levels of government and specific plans for the implementation of high-level climate declarations; as well as information on the demand for and deployment of new technologies around the world. Lack of transparency around these requirements plays a significant role in delaying projects and increasing costs, and has been a barrier to progress.

Many of the stakeholders interviewed felt that there are untapped opportunities for greater collaboration in information exchange and dissemination, particularly for investors in early stage technology.

A lack of information on local regulatory requirements was noted, as was an analytical gap in investor understanding of the Indian state-level opportunities for low carbon investment.

Improving the understanding of low carbon opportunities in India for UK institutional investors is an important first step in facilitating investment in India. Information products, such as research reports, provide a practical way of assisting potential investors by highlighting low carbon business and investment opportunities and reducing investment risk in India. This is particularly relevant for early stage technology.

Action
Create a vehicle for the timely communication of information on recent technology developments, examples of successful deployment and effective business models in order to attract investors and demonstrate opportunities.

Action
Commission an analysis of India's state-level regulatory and financial landscape and a ranking of 'climate business attractiveness' of states.



Principle Four

Joint R&D programmes and skills exchange are necessary to accelerate low carbon innovation and technology development.

Currently, most academic interaction between the UK and India is based on peer-to-peer networks. In terms of joint collaboration, academics are generally cautious about the inclusion of an international component within domestic grant applications, and 'double jeopardy' rejections associated with 'international' domestic applications.²⁵ There are schemes such as the UK-India Education and Research Initiative, which have aimed to bridge the gap; however, while funding has supported some collaborative projects, it has primarily provided support for researcher mobility and interaction. This point has been reiterated by academics, who feel that

current schemes do not sufficiently address the key area of need: joint research initiatives, of which there are currently very few occurring between the UK and India.

Collaborative efforts between universities/research institutions and industry can provide a framework to close these gaps.²⁶

UK-India joint R&D programmes present significant opportunities for international collaboration on low carbon technologies and systems. These must go beyond past efforts by focusing on face-to-face exchange of knowledge and ideas within an international framework of academic and business collaboration and funding. A potential model for such a programme is a UK-India public-private partnership based around a single entity, formed of UK and India academic and private sector representatives.

The entity's role would be to define the programme, develop the business plan, establish funding protocols, and identify and be responsible for tangible deliverables. The programme needs long term commitments from governments and other parties to allow time for relationships to build and research to evolve. Further, it must incorporate a framework for bringing people from the two countries together.

The objective of this cooperative effort would be to maximize the best work of the participants and to direct these efforts toward the goal of generating new low carbon technologies, systems and processes for the marketplace. This framework would allow for shared costs, shared risks, shared facilities and shared expertise.

One existing partnership that demonstrates aspects of this proposed approach is the Climate Knowledge and Innovation Community (KIC), a partnership of leading European universities and ten core corporate partners, focused on addressing climate change and adaptation.

Action
Establish an entity comprising leading universities and companies to define and oversee the delivery of low carbon technology research programmes, building where appropriate on existing collaborations.

In addition, in order to scale up academic knowledge exchange and face-to-face collaboration, a high-profile, science and technology-focused fellowship exchange programme is needed. Attracting the best post-doctoral researchers from the UK and India requires a prestigious and structured programme that integrates leading universities and companies in the two countries. The 'Rhodes Scholarship' programme provides a comparable model. This initiative should be pursued in parallel to the collaborative research partnership outlined above, and could help provide the programme's specific research priorities.

Action
Create a prestigious fellowship exchange programme that includes several leading universities in both countries.



²⁵ Study on collaborations between UK universities and their counterparts in China and India, International Unit Government Office for Science, May 2008

²⁶ UK-India collaboration to identify the barriers to the transfer of low-carbon energy technology, UK Department for Environment Food and Rural Affairs (Defra), March 2007

Principle Five

Effective regulatory frameworks are needed to support the transition to a prosperous low carbon economy.

The Government of India has introduced a number of regulatory measures that encourage the shift towards a low carbon economy (listed in the Appendix). Nonetheless, clearer policies, simplified regulations and their transparent implementation would facilitate better compliance and encourage emission reductions. Alongside this, better coordination is needed between state-level actions and the central Government's initiatives.

A review of existing policy frameworks should be undertaken to evaluate how incentive mechanisms can be used to reward sustainable initiatives. Part of the solution lies in tax or other financial incentives (e.g. grants, feed-in tariffs, accelerated depreciation and low interest loans) linked to specific investments (e.g. energy efficient equipment and renewable technologies). The Government of India could consider re-introducing instruments such as an enhanced capital allowance, or tax rate discounts. It would be important, however, to ensure that such instruments reward operational performance of the technology, rather than simply its installation.

Potential policy actions to encourage low carbon investment could include regulations or incentives to encourage early-stage venture capital investments, and Government provision of leveraged returns for private investments in innovation areas overlooked by the market (such as agriculture). The latter would help reduce investment risk and fill financing gaps that a technology may encounter as it proceeds from R&D through to commercialization and full-scale deployment.



The appropriate policy depends on where in the technology development chain Government intervention is required. For example, feed-in tariffs are seen as being the most effective way of scaling up deployment of established technology, while other kinds of intervention are needed to support innovation. The UK has considerable, transferable experience in supporting the development of early stage businesses, including low carbon technology development and commercialization. This experience encompasses provision of an enabling regulatory framework; finance (e.g., grants, discounted loans and angel/venture equity capital); public investment in clean-tech funds;²⁷ researcher-business knowledge transfer; and provision of discounted premises e.g., business incubators, innovation centres and science parks) for technology businesses with high growth potential.

Although India and the UK are vastly different in terms of demography and geographical scale, some scope exists for sharing experience between regulatory bodies on the effective alignment of local, regional and national needs for implementing low carbon policies. For example, considering that the Government of India is currently developing the Perform, Achieve and Trade (PAT) scheme, UK officials and businesses could provide insights from their experience with the UK Emissions Trading Scheme (ETS), the EU ETS, and the recently implemented Carbon Reduction Commitment Energy Efficiency scheme. UK experience with the Climate Change Levy and voluntary Climate Change Agreements, which have encouraged large energy efficiency improvements in heavy industry, is also likely to be adaptable to India.

Business perspectives are invaluable in understanding the impact of regulations and issues surrounding their enforcement. Businesses can thus support their Governments in designing regulation that actively supports low carbon economic growth

helping ensure both that government objectives are met and that this is achieved in way that maximises the opportunities for innovation, trade and job creation. An important first step will be for the UK-India Business Leaders Climate Group to prepare a set of concrete proposals for policy reform at the local, national and international levels, drawing on experience to date and the results of ongoing demonstration activities.

²⁷ For example, UK Innovation Investment Fund (UKIIF) which operates on a 'fund of funds' basis to invest public money in a select few technology fund that have specific expertise in particular markets.
<http://www.dius.gov.uk/policies/innovation/business-support/ukif/about>



Action

Propose to government specific regulatory changes and international policy improvements necessary to address barriers to climate-friendly economic development, based on business experience of existing policies and ongoing demonstration projects.

India's relationship with intellectual property rights (IPR) has evolved from limited protection in the early 1970s to strengthening laws to protect patents, copyrights and trademarks in the late 1990s, following India's joining the World Trade Organisation (WTO) and agreement on Trade Related Aspects of Intellectual Property Rights (TRIPS). These laws have been further reinforced over the past decade, leading to the recent introduction of university patent protection through the Protection and Utilisation of Public Funded Intellectual Property Bill which, although not yet law, aims to cultivate R&D investment and innovation.

As a relatively new system that is evolving and improving, specific weaknesses have been noted within the enforcement departments and mechanisms. For example, while there is greater IP awareness amongst officials in enforcement departments, further progress is required. Additionally, implementation of IPR enforcement mechanisms requires strengthening, with limitations noted in the number of trained judges and prosecutors, and corollary concerns about the length and uncertainty of legal proceedings.

Members of the UK-India Business Leaders Climate Group form two groups: those engaging in business that does not require IP protection; and those trading technical innovations that involve patent protection. UK firms in the latter group have no concerns about IP protection in India. Rather, they believe the technology development challenges posed by their Indian customers present IP development and export opportunities.

However, there are a number of factors that may influence the impact of IPR on technology transfer. Generally, innovation is strongly correlated with entrepreneurship, which is a driver for economic growth. However, IPR regimes also need to be sufficiently sensitive to the imperatives of affordability and diffusion. An exchange of experiences and expertise between IPR institutions in India and the UK would help foster greater understanding of the issues and potential solutions.

As the UK IP system is relatively mature, its experience can be drawn upon to help strengthen institutional enforcement capabilities in India. A Memorandum of Understanding should be signed between the UK Intellectual Property Office and the Indian office of the Controller General of Patents, Designs and Trademarks, to build on the 2006 agreement between the two countries to take forward a work plan on intellectual property and strengthen collaboration in this area.²⁸ Specific areas of focus should be capacity building of officials and judges, sharing of best practice and collaborative academic partnerships. A capacity building programme could be developed involving secondments and knowledge exchange.

Action

Propose key IPR reforms to support clean technology development and diffusion, and formally request that agencies in India and the UK cooperate in ensuring effective levels of protection in the application of IP law.

Moving to a low carbon economy is an essential part of a strategy to combat the impacts of rising energy prices, enhance energy security and reduce the risk of human-induced global climate change. Moreover, the shift to low carbon technologies provides major business opportunities: it increases resource efficiency, productivity and competitiveness, and leads to the creation of high quality jobs across a range of sectors. Leadership by businesses, combined with clear policies from Government, is needed to ensure that these opportunities are fully realised.

The history of political and business links between India and the United Kingdom, together with their complementary set of skills and resources, means that expanded collaboration in the areas of policy design, investment, innovation, and technology transfer and deployment can significantly accelerate low carbon growth, reduce the cost of both countries' efforts to mitigate climate change and strengthen their international leadership.

²⁸ Joint Statement of Intent on Bilateral Cooperation between India and the United Kingdom on Intellectual Property Rights, June 2006.
http://dipp.nic.in/acts/Joint_Statement_of_Intenton_bilateral_cooperation_between_India_and_the_UK_on_IPRs_with_UK.pdf

Annex

1. Policy context – UK

Key UK legislation and Government strategy

Climate Change Act 2008: Established a framework for legally binding carbon budgets and targets of 34% by 2020 and 80% by 2050 (both compared to 1990 levels).

Led to creation of the independent Committee on Climate Change to set carbon budgets and provide advice.

http://www.decc.gov.uk/en/content/cms/legislation/cc_act_08/cc_act_08.aspx

Energy Act 2010: Contains provisions on supporting CCS (e.g. the creation of a financial incentive, funded by electricity suppliers, to support up to four CCS commercial-scale demonstration projects), introducing mandatory social price support, and fairness of energy markets.

http://www.decc.gov.uk/en/content/cms/legislation/energy_act_10/energy_act_10.aspx

UK Low Carbon Transition Plan 2009: Strategy for how reductions in the power sector and heavy industry; transport; homes and communities; workplaces and jobs; and farming, land and waster sectors could enable the carbon budgets to 2022 to be met.

http://www.decc.gov.uk/en/content/cms/what_we_do/lc_uk/lc_trans_plan/lc_trans_plan.aspx

UK Renewable Energy Strategy 2009: Strategy document setting out plans to increase renewable energy in order to achieve its target of 15% of energy from renewables by 2020.

http://www.decc.gov.uk/en/content/cms/what_we_do/uk_supply/energy_mix/renewable/res/res.aspx

Renewables Obligation (2002): The main mechanism for supporting large scale generation of renewable electricity. A certificate-based mechanisms placing an obligation on licensed electricity suppliers to source a specified and annually increasing proportion of their electricity sales from renewable sources, or pay a penalty.

http://www.decc.gov.uk/en/content/cms/what_we_do/uk_supply/energy_mix/renewable/policy/renew_obs/renew_obs.aspx

Feed in Tariff for electricity (2010): Provides financial incentives for small scale renewable electricity systems.

http://www.decc.gov.uk/en/content/cms/what_we_do/uk_supply/energy_mix/renewable/feedin_tariff/feedin_tariff.aspx

Renewable Heat Incentive (from June 2011): Proposals are currently under consultation for plans to provide financial support for renewable heating systems.

http://www.decc.gov.uk/en/content/cms/what_we_do/uk_supply/energy_mix/renewable/policy/renewable_heat/incentive/incentive.aspx

Climate Change Levy and Climate Change Agreements (2001): A tax on the use of energy, and discount mechanism, respectively.

CRC Energy Efficiency Scheme (2010): A climate change and energy saving scheme covering large private and public organisations

http://www.decc.gov.uk/en/content/cms/what_we_do/lc_uk/crc/crc.aspx

Enhanced Capital Allowances: Enables businesses to claim 100% first-year capital allowances on their spending on qualifying, low carbon or water, plant and machinery.

<http://www.eca.gov.uk/>

Carbon Emission Reduction Target (since 2005) and Community Energy Saving Programme (since 2009): Obligations on energy suppliers to undertake measures within the residential sector.

http://www.decc.gov.uk/en/content/cms/what_we_do/consumers/saving_energy/cert/cert.aspx

http://www.decc.gov.uk/en/content/cms/what_we_do/consumers/saving_energy/cesp/cesp.aspx

Grant schemes, e.g. Warm Front (2000): Funding schemes for improving energy efficiency and reducing fuel poverty in the residential sector.

Pay as You Save (2010): A pilot programme of financing low carbon refurbishment (energy efficiency and microgeneration) in the household sector.

<http://www.energysavingtrust.org.uk/Home-improvements-and-products/Pay-As-You-Save-Pilots>

Green Deal for energy efficiency (from 2013).

Smart Metering Implementation Programme: Prospectus: Proposals for the roll-out of smart meters.

http://www.decc.gov.uk/en/content/cms/consultations/smart_mtr_imp/smart_mtr_imp.aspx

Carbon Capture and Storage: The Government will provide £1bn in capital expenditure for the first commercial-scale CCS demonstration project. Decisions on the funding mechanism for the additional 3 CCS projects, i.e. whether through a specific CCS levy or through general public expenditure, will be made following completion of work in Spring 2011, on the reform of the Climate Change Levy to provide support to the carbon price.

http://www.decc.gov.uk/en/content/cms/what_we_do/uk_supply/energy_mix/ccs/ccs.aspx

Green Investment Bank (proposed): The Government will provide £1 billion in funding to encourage the financing of green infrastructure.

2. Policy context – India

Key India legislation and Government strategy

National Action Plan on Climate Change (2008): Outlines existing and future mitigation and adaptation policies and programs. Recently, for the Copenhagen

Accord, the NAPCC was extended to incorporate a voluntary emissions intensity target of 20-25% by 2020 against a 2005 baseline.

http://pmindia.nic.in/climate_change.htm

National Mission on Enhanced Energy Efficiency (2010): The national action plan for improving energy efficiency, approved by the Union Cabinet on 24 June 2010, includes mandating setting up a trading system for energy efficiency improvements in large industries (see PAT below), energy incentives such as reduced taxes on energy-efficient appliances; and financing through public-private partnerships for demand-side management programs.

<http://india.gov.in/allimpfrms/alldocs/15659.pdf>

Perform Achieve & Trade scheme (2011): A market-based energy efficiency trading scheme in nine sectors (power, fertilizers, chlor-alkali, cement, iron & steel, Aluminium, textiles, pulp and paper, railways) covering 700 units. Units that exceed their efficiency targets will be given certificates that they can trade. Units unable to meet their targets will pay a penalty or comply by purchasing certificates.

<http://india.gov.in/allimpfrms/alldocs/15659.pdf>

Energy Conservation Building Codes for commercial buildings (2009): Voluntary minimum efficiency standards for external wall, roof, glass structure, lighting, heating, ventilation and air conditioning of commercial buildings. Introduced in 2009, They are expected to become mandatory, possibly during 2011, once certain issues such as skills, awareness and technical capacity have been addressed. State governments have the flexibility to amend these codes to suit local or regional needs and notify them accordingly.

<http://www.bee-india.nic.in/content.php?page=schemes/ecbc.php>

Appliance Labeling (2006): The star-based system for rating the energy efficiency of appliances. Currently covers 11 categories of equipment. Initially voluntary, from January 2010, labeling in 4 categories became mandatory.

http://www.emt-india.net/Standards_Labeling/main.htm

National Mission on Solar Energy (2010): Establishes a goal of increasing energy production from Solar PV and Thermal to 22 GW by 2022. Other objectives include creating a solar research centre, increased international collaboration on technology development, strengthening of domestic manufacturing capacity, and increased government funding and international support.

<http://www.indiaenvironmentportal.org.in/content/national-solar-mission-final-draft>

Renewable Purchase Obligations (2003): Established through The Electricity Act (2003) puts a renewable electricity supply obligation on all major State Electricity Regulatory Commissions of between 1% and 10%. A Renewable Energy Certificate (REC) trading mechanism is expected by 2011.

<http://pib.nic.in/release/release.asp?relid=57007>

Feed in Tariff for electricity: Established through The Electricity Act (2003). Central Electricity Regulatory Commission issued comprehensive guidelines for different renewable energy types.

http://www.powermin.nic.in/acts_notification/electricity_act2003/preliminary.htm

Energy Conservation Act (2001): The Act was introduced an institutional framework for improving energy efficiency through establishment of the Bureau of Energy Efficiency (BEE) as the coordinating body with the assistance of the State Designated Agencies. Focus is on demand side management. Energy audits are now mandatory for large energy-consuming industries.

<http://www.bee-india.nic.in/>

Clean coal technology initiatives: A range of activities are currently being undertaken to overcome regulatory, licensing, financing and technical barriers.

3. Policy context – trade agreements and UK-India initiatives

Key trade agreements

New Delhi Declaration 2002, India And United Kingdom: Partnership For a Better and Safer World.

India-UK Joint Declaration 2004.

India-UK Strategic Partnership - Joint Declaration 2008.

Civil Nuclear Accord (2010).

DFID's bilateral programme in India, £825m over 2008-11.

India-EU FTA being negotiated at present.

India-EU Strategic Partnership- Joint Declaration (2005 and 2008).

Key UK-India initiatives

UK India Business Council. Originally established in 1993 as the Indo-British Partnership.

UK-India Round Table, set up in 2000, to discuss issues that may affect the bilateral relationship and to reflect on ways in which it can be strengthened.

UK India Research Collaboration Funding Opportunities.

Memorandum of Understanding between the Indian Department of Science and Technology and the UK Department of Business, Innovation and Skills, which affirms their mutual interest in promoting long-term research, development and innovation cooperation. Actions include new collaborative initiatives to promote technology and knowledge transfer in India: PraxoUnico Technology Transfer courses; and IMPACTS interactive workshop and the UK-Indian Education and Research Initiative.

Key UK-India emissions reduction collaborations

Indo-UK Programme on Climate Change Impacts and Adaptation.

UK-India collaboration on low carbon technology transfer (by Tyndall Consortium Institution) – Phase I (2007) and Phase II (2009).

British Council India – Climate change project. Included a workshop for Indian scientists collaborate with UK to develop low carbon technologies.

Research programmes to develop cost-effective and efficient solar energy solutions - Research Councils UK (RCUK) and the Indian Department of Science and Technology (DST) have each committed up to £5 million each over a three-year period for two research projects. Build on the success of the solar initiative, agreement has been signed between the RCUK Energy programme, led by the EPSRC and the DST to begin planning two further collaborative research programmes:

“Bridging the Urban/ Rural Divide” and “Materials for Fuel Cells”.

UK FCO Low Carbon High Growth Programme (Climate Change and Energy) involves a number of ongoing projects on themes such as scaling up renewable energy in India, low carbon public transport mobility solutions for rapidly growing Indian cities, making climate change part of doing business in India, Clean Energy Technology Action Plans for Climate Mitigation in Indian States among others.

MOU signed in February 2010 between the UK Natural Environment Research Council (NERC) and the Indian Ministry of Earth Sciences (MoES) to collaborate on understanding around changing water cycles.

India- UK Joint Economic and Trade Committee (JETCO): February 2010 sessions included agreement on environmental issues and investments.