Introduction

I.1 BACKGROUND

This collection is one of the outputs of the project ‘Obtaining, Protecting and Using Essential Environmental Technologies: A Holistic Analysis’, which ran from 2010–11 and was kindly supported by a British Academy Small Research Grant. My interest in this field arose from long-standing work on the interface between legal fields (mainly intellectual property (IP), competition and human rights). How might this apply in different practical fields – health, communications and the environment – to increase access to technologies, while still having regard to the positive elements of IP and rights of the IP owner? As that project became a monograph Intellectual Property, Human Rights and Competition: Access to Essential Innovation and Technology published by Edward Elgar in 2012, I wished to look (even) more broadly. Exploring climate change technologies, I wished to look at more legal fields, at the views of experts from different places and from professional practice, industry, policy-making and other scholarly fields, in particular, given the focus on climate change, from geography and geoscience. Even more than most issues to which scholars devote attention, questions of climate change technologies do not exist within a scholarly or legal bubble. To what extent could arguments from the health field be used in the climate change and environmental field? Both fields are of significant public and social importance – so should solar technology be approached in the same manner as an HIV/AIDS treatment? Or might a new form of energy generation still be developed which provides a closer analogy? Do IP owners have too much power in this important societal battle? Is IP part of the answer? Or even the question?

I.2 BRITISH ACADEMY PROJECT: INITIAL PERSPECTIVES

From this base, the project explored how best to secure wider and more equitable access to technologies which can contribute to the battle against
climate change. This can cover: mitigation technology which enables greenhouse gas emissions to be reduced (e.g., more use of wind power rather than hydrocarbons), adaptation technologies which manage the impact of greenhouse gas emissions (e.g., seeds are developed which can grow in the changed environment) and also information as to its impact (e.g., software to measure weather and water levels). For ease, throughout the book references are often made to climate change technologies or environmentally sustainable technologies.

From the climate change perspective, the starting instrument was the United Nations Framework Convention on Climate Change (UNFCCC) (1992) and its Kyoto Protocol (1998) which set objectives for its members regarding the reduction of greenhouse gas emissions. Since the Bali Action Plan of 2007, technology has received increasing attention in the work of the UNFCCC, with calls for more development of it and its transfer to those who need it. International dialogue in this field continues, notably at the discussions in Durban in late 2011 at the meeting of the parties when the Technology Mechanism was established. A roadmap was also set for a legal agreement regarding emissions by 2015. These negotiations and outputs are discussed throughout this collection. 2007 also saw one significant step in recognition that action against climate change did not (as well as should not) exist only on the periphery of business, and was not only of interest to activists. In June 2007, The Economist issued a special report on business and climate change ‘Cleaning Up’.

As business and technology become more interested in climate change there is also the question of IP. At the heart of this project lies the fact that technologies relevant or important (or essential?) to mitigation, adaptation and information may be the subject of IP; and if they are, the IP owner can control their use. The health and communications experiences suggest that IP owners may not be willing to share: for example, consider the challenges made to legislation in South Africa which would enable greater access to technology which was the subject of South African pharmaceutical patents, including through requiring sharing by compulsory licensing; and the need for competition investigations into Microsoft in both the European Union and the United States regarding the uses which they make of their software technologies. The UNFCCC outputs include no means of ensuring or requiring that the owners of IP in respect of important technologies, say patents for important wave or biofuel technology, will share it.

The issue became more prominent in 2009 before the meeting of the UNFCCC parties in Copenhagen, in the light of work by scholars and non-governmental organizations (NGOs). This work did also make it
clear that there were important differences between health and climate change, considering that there may be more choices available to reduce emissions in a particular environment rather than to address a particular disease, and that there were, and should be, other forms of encouragement of investment in and transfer of technologies. Indeed, it was argued in the context of a review of the relationship between China and the United States in respect of carbon capture technology – a helpful bridge between hydrocarbon and renewable technologies – that for both states to revisit the battles which had been fought in respect of IP would be a distraction from the greater need of a cooperative approach to address climate change. Other forms of funding innovation rather than relying on private investment and IP were also explored.

Nonetheless, obstacles could be posed by IP in some situations, particularly if, say, a state requires that a particular technology is used in work with one form of renewable energy. This could lead to the creation of a standard, and if there is IP (or more likely a set of IP rights) which exist over the technology, this could lead to the IP owner being in a position of significant power and able to hold an industry to ransom. Yet the United States made it clear at the meeting in Copenhagen in 2009 that they would not agree to a compulsory licensing regime, (which could be similar to that which existed and had been affirmed in the health field in the aftermath of the South African litigation referred to above), being introduced by the UNFCCC.

There is also an important question of the extent to which any new regimes put in place by the UNFCCC, or by countries seeking to meet their obligations under the Kyoto Protocol, would be consistent with the obligations imposed on World Trade Organization (WTO) member states by the TRIPS Agreement. This sets out the protection which must be afforded to IP, although it does permit compulsory licensing in some situations and permits limits to be imposed on rights. If a state is considered by another to have acted inconsistently with its obligations under TRIPS, there is the risk of a complaint being made to the WTO dispute settlement bodies; this is so even if a state may be argued to have acted to meet its obligations under, say, the Kyoto Protocol. These issues and the other contributions which could be made by TRIPS are considered further below and in this collection.

There is also the question of the relationship between these sets of obligations and other legal fields. This is relevant in respect of human rights which relate directly to the environment, for example, in the African Charter and the Rio Declaration on Environment and Development of 1992 (and also relate less directly, such as rights to life); in respect of the procedural opportunities which arise from the contributions
of the Aarhus Convention on Access to Information, Public Participation in Decision-Making and Access to Justice in Environmental Matters of 1998; also in respect of the relationship between these and rights in respect of property, private life and reward of the creator; and in respect of the challenge of achieving a proportionate relationship between all of these. Also, can competition law intervene, as in the Microsoft case in the European Union on the basis of legislation prohibiting the abuse of a dominant position, to require greater access to say, solar technology (although the terms on which this could be done, even if it is licensing on a fair, reasonable and non-discriminatory basis, remains unclear)? Or even if there is an investigation, might the regulator or court determine that given the availability of other sources of energy (wind, wave, hydrocarbon) and means of reducing emissions (walking, taking the bus), a compulsory licence is not warranted, as there is in fact no dominant position within a market and so there could be no abuse?

Further, to what extent could regard be had to these other fields at the WTO if a dispute arises? Should a declaration be sought to make the relationship between these fields clearer? And given the outcome at Copenhagen, where should this be done? It is interesting to note that there has been growing interaction between organizations; for example, the World Intellectual Property Organization (WIPO) made contributions to the work of the UNFCCC’s Expert Group on Technology Transfer (which was replaced by the Technology Mechanism, as is discussed in this collection) and a project between the United Nations Environmental Programme, the European Patent Office and International Commission on Trade and Sustainable Development led to a report in 2010, Patents and Clean Energy: Bridging the Gap Between Evidence and Policy. Yet alongside this, there is the ongoing commitment by some to agreements which increase the power of IP owners, for example, attempts to bring about the Anti-Counterfeiting Trade Agreement, outside the network of organizations which have been discussed.

The issues explored so far were the subject of an introductory analysis I published on the Social Science Research Network (SSRN) as a University of Edinburgh School of Law Working Paper in June 2010 before the first meeting of the project. Also important is the extent to which a more collaborative approach could be taken to innovation, with other social and business practices making greater use of initiatives such as Eco-Patent Commons and open licensing, and public–private partnerships.

These elements combined to produce a rich framework for a multifaceted response to the challenges of climate change and the role which
can be played by technology. This was explored in the project ‘Obtaining, Protecting and Using Essential Environmental Technologies: A Holistic Analysis’ by an interdisciplinary team with expertise relevant to different aspects of the development of and access to technologies. Details of the project meetings and outputs are discussed below. More information about the project and associated developments has been posted from time to time on the blog ‘ipedinburgh’ (which is now ipaberdeen) and via Twitter @igftowardaccess. There is also the project website at www.law.ed.ac.uk/essentialtechnologies/, where details of presentations, expert meetings and public engagement can be found.

I.3 PROJECT MEETINGS AND MEMBERS

The first meeting was held in Edinburgh on 9 and 10 June 2010, when all experts were asked to consider the deliberately vague and controversial motion: ‘Technologies which are essential to address climate change should be made available to all’. We were joined in person by Navraj Ghaleigh, University of Edinburgh; Baskut Tuncak, Center for International Environmental Law; David McGrory, Maclay Murray & Spens; Professor Keith Culver, then Econoving International Chair in Generating Eco-Innovation, Université de Versailles Saint-Quentin-en-Yvelines; Associate Professor Kathryn McMahon, University of Warwick; Mervyn Jones, then of Aquamarine Power; Douglas Taylor, Davidson Chalmers, Edinburgh; and Dr Elisa Morgera, University of Edinburgh. Written contributions were provided by Dr Kati Kulovesi, then of Erik Castrén Institute of International Law and Human Rights University of Helsinki, now of University of Eastern Finland; Dr Suzanne Kingston, University College Dublin; and Professor Anna Davies, Trinity College, Dublin. Contributions by telephone were made by Jon Santamauro, then of Sidley Austin LLP, US; and Associate Professor (now Professor) Estelle Derclaye, University of Nottingham.

Constructive and challenging discussions took place regarding the importance of IP as encouraging or hindering the development of new technologies and their transfer; the practical impact and relative importance of obligations imposed by international treaties addressing climate change, IP, world trade, and human rights; management and economic studies regarding climate change, its impact and possible responses to it; challenges of geography in developing and developed, urban and rural areas (from the development of stoves in Darfur to reduce the need for travel to get wood in a war zone, to transport and heating in cities in France); the interests of funders in start up companies working in the
renewable energy sector; the adequacy of existing regulatory frameworks in respect of IP, tax, incentives and planning; and the contribution of competition law in respect of agreements and unilateral conduct, regulation and new forms of collaboration and sharing. Still wider questions were identified: what is the contribution of corporate power and corporate social responsibility; and should more regard be had to fundamental rights, dignity and fairness and, possibly at the other extreme, to finance?

These discussions were the base for a joint working paper to which all who participated at the meeting (which is wider than the list of formal authors) made an invaluable contribution, and I would recommend a visit to the project website to review the presentations. The working paper was again published on SSRN in late 2010. The joint working paper focuses on the roles of technology in mitigation, adaptation and obtaining information, and queries the importance of IP, given the national scope of IP rights, the importance of a multifaceted approach to climate change given the geographical differences, and the contributions to emissions made by established practices such as use of cement, as against the prospect of a disruptive innovation which could lead to a new form of energy generation. It explores how information relevant to environmental change might be accessed; the power which can arise when any technology becomes part of a standard; disclosure and licensing requirements; the essential facilities doctrine and refusals to license by non-practising entities (often termed ‘trolls’). Against this framework, the prospect of a declaration regarding licensing of climate change technologies, and its forum, is discussed and dismissed. There is also discussion of enhanced and more expeditious protection of IP in respect of technologies of interest to climate change and, from the other perspective, discussion of prizes (and the appropriateness of them – should there be ongoing focus on Carbon Capture in the United Kingdom?) and trade secrets. Further forms of rewarding the inventor and creator are also discussed, such as local initiatives in developing areas which can then be disseminated more widely, for example, using the umbrella of Technology Innovation for Sustainable Societies and green funding initiatives. Finally, there is consideration of the need for greater awareness of possible unintended consequences of regulatory action outside the renewable technology space; e.g., can planning permission be obtained to enable renewable energy initiatives to be pursued?

The joint working paper is an important output in itself; for example, it is considered in the important work by Matthew Rimmer, Intellectual Property and Climate Change which is discussed in more detail below. The paper also formed the base for our second expert meeting, which
was ultimately held in Edinburgh in April 2011, as the Scottish weather (perhaps fitting for a project on climate change) meant that a December 2010 meeting had to be cancelled. Most of the project team were able to return but because of the date change we were unable to have the benefit of the personal contributions of Estelle Derclaye or Suzanne Kingston or to welcome Professor Doreen McBarnet, universities of Oxford and Edinburgh, to our discussions (although again an important contribution from her is on the project website). However, we were able to welcome for the first time Professor Karen Yeung, King’s College London, Dr Oche Onazi, University of Dundee, James McLean, then of Burness and University of Edinburgh, Dr Ravi Srinivas, RIS, India and a contribution from Elsa Tsioumani, IISD, by Skype.

Experts were asked to comment on and respond to the joint working paper. Presentations were made in four groups: ‘GeoScience and Business’, ‘Partnerships and Sharing’, ‘Intellectual Property’ and ‘Competition and Regulation’. This was once again an exciting meeting and gave all experts the opportunity to challenge and develop their thoughts when faced with views from quite different perspectives. Presentations can once again be found on the project website and those of Karen Yeung and Elsa Tsiomani, who did not contribute chapters to this collection, are of particular interest.

Later that same day, a well-attended and stimulating public event, ‘Who Profits From Climate Change?’,\(^\text{36}\) was held at the Edinburgh International Science Festival. There were speakers from commercial, political and youth perspectives.\(^\text{37}\) After discussions and the introduction of a case study involving a new wind and wave innovation, the audience were asked to vote (1) would they patent a new technology; and (2) would they make the technology available to all, with all paying what they consider it is worth to them. Despite some strong challenges to the power of IP, the vote was 42–6 in favour of patenting and 37–7 against making it so widely available.

The event was accompanied by a display of art by primary pupils from Mile End School, Aberdeen, which explored climate change from the perspective of the UNICEF Day for Change, renewable technologies and the evolution of creatures because of climate change.\(^\text{38}\) This was a stimulating event and a helpful reminder of the wider context in which our discussions proceed.
I.4 ONGOING DEVELOPMENTS

Before reviewing the chapters of this collection which draw on the responses of experts to the joint working paper, it is helpful to reflect on the fact that the project has proceeded in parallel with the relationship between IP and climate change being the subject of increasing attention from scholars and policy-makers. The Rio +20 discussions in 2012 did consider IP and technology transfer; however, although there are frequent references to technology transfer in the outcomes document, there is limited reference to IP. At WIPO, the Standing Committee on the Law of Patents considered at its 15th meeting in October 2010 standards, health, competition, exceptions and limits, technology transfer and alternative forms of innovation, and contributions were made by activists. In the United Kingdom, the Hargreaves Independent Review of IP and Growth which reported in 2011, to which I submitted a response with a focus on climate change, included a recommendation regarding patent thickets. Thickets can be relevant to climate change technologies if the consent of many patent owners is required for there to be any work in the area, which the patent owners may, individually or collectively, refuse to provide. A report focusing on this was published by the UK Intellectual Property Office in November 2011.

Patent thickets can also raise competition questions, and the relationship between competition and the environment in the European Union was the subject of a detailed analysis by team member Suzanne Kingston in a monograph published in 2011.

The link between IP, human rights and climate change was considered by the International Council on Human Rights Policy in 2011. From the EU perspective, the contribution of the Lisbon Treaty and the regard to be had to environmental protection in the European Union has been considered by scholars, as has openness and the Eco-Patent Commons. Openness has also been discussed from the perspective of state action and procurement. The relationship between different forms of enforcement within international regimes has been the subject of significant attention in two important collections, one edited by Margaret Young and of specific interest here; and one edited by Jutta Brunnée, which explores promoting compliance in relation to climate change. In the Young collection, Stephen Humphreys’ exploration of technology transfer is highly on point and in the Brunnée collection regard should be had to Eric Dannenmaier’s ‘consideration of non-state actors’, to Catherine Redgewell’s discussion of facilitation of compliance with a
focus on technology transfer,58 and to the consideration by Jacob Werksman of compliance and trade measures, and of forum.59

Scotland has seen several instances of government action to increase the availability of renewable energy.60 In 2012, it was also announced that the UK Green Investment Bank would be based in Edinburgh.61 Continuing the commercial perspective, and combining the themes discussed so far, it is interesting to note that in the Financial Times ‘Boldness in Business’ awards of March 2012,62 two of the seven awards went to businesses in the environmental and climate change sector: in one, Helveta software is used by indigenous communities to manage and to halt logging of endangered forests, with barcodes showing if a tree is sacred (and the commentary notes the support of venture capitalists for the project); and in another Hyflux treats waste and sea water to make it potable, with the leader of the business stressing the importance of each of being a market leader, holding proprietary software (that is, IP), and obtaining contracts from governments. And coming full circle from the business perspective, the United Nations special representative on human rights and transnational cooperation issued a new report in 201163 and also endorsed guiding principles,64 which are of key importance regarding corporate social responsibility.

Regarding developing countries, James Haselip has edited an insightful collection, exploring case studies of diffusion of renewable technologies.65 Of particular interest, given the discussion in the joint working paper of regulatory interventions and incentives, is that this considers feed-in tariffs.66 In a reminder of the fact that the same issues and solutions can arise throughout the world, changes to feed-in tariffs in the United Kingdom, and the impact this could have on decisions to invest in renewable energy or elsewhere, were explored by project team member Douglas Taylor in The Scotsman in April 2011.67 Finally, readers of this collection, if they have not already done so, will find it illuminating to read the monograph by Matthew Rimmer, also published by Edward Elgar, Intellectual Property and Climate Change: Inventing Clean Technologies.68 This work engages strongly with scholarly and empirical work, and proceeds from the starting point of the link between patents and innovation, to reviews of the evolving links between IP and technology transfer, to consideration of TRIPS and the limits and opportunities it provides, to the contribution of the WIPO and the practices of national patent offices, to patent litigation which has arisen in respect of clean technologies. Rimmer calls for new approaches to be taken to patents, to play a ‘positive role in the protection of the environment, biodiversity and the atmosphere’69 and for reforms in
respect of technology transfer, grant of patents, compulsory licensing, climate innovation centres, government prizes and grants.

Important elements of this collection – discussion of different treaties and their impact, international policy battles, arguments regarding the place of innovation, relationship between organizations, use of prizes and commons based initiatives – can also be found in Rimmer. The key contribution of this collection is the variety of approaches taken to these issues, and the different fields of expertise: including legal scholarship looking beyond IP and the environment, and also geography, advocacy and consulting, industry and professional legal practice. This collection also looks more widely to the contributions which can be made by partnerships, theoretical approaches to human rights and regulatory perspectives regarding the use of human rights and competition, as tools to limit the power of IP and increase technology transfer.

1.5 REVIEW OF COLLECTION

The aim of this collection has been to bring about wider and deeper discussion regarding the many different aspects of the relationship between climate change and technology. In the light of this, this collection includes different types of contributions; in addition to more traditional scholarly works, there are pieces with a more policy, practical and industry style and focus; these all contribute in their different ways to proposals for practically important and scholarly legitimate means of taking a holistic approach to climate change.

The discussions at the second expert meeting have been the base for the chapters included in this collection, and as with the joint working paper, all those who have been involved in the project, even if not formal contributors of chapters, have played their role in the dialogue and thought which resulted from our discussions. Readers are urged to consider the collection as a whole, yet experts and those seeking information in respect of individual fields may still find it helpful to consult only individual chapters; to assist these readers, and to stimulate wider exploration, the following pages set out the key points of each chapter, and the intersections, emerging common themes, synergies and conflicts.
I.5.1 Evidence and Scepticism

The collection begins with a robust challenge by Keith Culver (legal theorist and innovation and sustainability governance expert) to the view that IP, and indeed essential technologies which are the subject of IP, provide problems and solutions to the development of climate change mitigation and adaptation technologies. Taking a geopolitical perspective, Culver argues that the most effective means of supporting equitable access is to enable countries to access finance and technical knowhow so they can implement integrated suites of existing, well-known technologies, rather than seek to develop new ones. Secondly, he stresses that solutions and technologies which are workable in one environment will not necessarily work in another, and particular reference is made to problems of the cities of the Global South and the different approaches taken by India and China to energy and renewable power. Culver considers that the role for law and regulation is rather to develop standards for information exchange and development of physical infrastructure to deliver the new energy which may be generated by different renewable sources, and to establish prizes to encourage innovation with minimum duplication and maximum alignment of expertise.

Navraj Ghaleigh (a public law and climate change scholar) introduces a different challenge to the place of IP in the climate change debate and obligations under the Kyoto Protocol. He notes the arguments made by India at the meeting of the UNFCCC parties in Durban in 2011 that IP could be essential, but queries the validity of this, carrying out a close analysis of examples of technology transfer, and drawing together the contribution by foreign direct investment, international programmes and data relating to the Clean Development Mechanism (CDM), a flexibility system established in the Kyoto Protocol to reduce emissions and raise new funding for clean technologies. After then considering the work of the Expert Group on Technology Transfer and discussions of IP at Copenhagen and Cancun leading to the Technology Mechanism, he reviews, under the heading ‘We are being Watched: Enter the IP Lawyers’, the evolving literature from IP lawyers addressing climate change. He notes the lack of a reciprocal body of work. He considers and dismisses, as does Culver, arguments that the climate change/technology control debate is similar to that in respect of HIV/AIDS.

Ghaleigh stresses the contribution of the renowned McKinsey Curve, the costs of options available to states to reduce emissions and the other legal, regulatory and practical barriers and opportunities which exist regarding technology, including lack of production base and knowhow, and the importance of tax incentives and pricing. Ghaleigh argues that IP
can be a small part of overall costs involved in a project, and that substitutes can often be obtained through the payment of a licence fee, with their development encouragement by governments. He argues that more licensing may be available given an increased focus on openness in work in climate change, for example, through UK work on Carbon Capture and the ‘Emailgate’ saga regarding disclosure of information. Like Culver, though from a different perspective, he argues for more research with a focus on the real contribution of IP and other factors to technology transfer, with regard to specific technologies and environments, and refers to existing policy and empirical studies in the United Kingdom, India and China.

I.5.2 Contribution of IP

Jon Santamauro, formerly of Sidley LLP and United States Trade Representative, then reminds us of the contribution which can be made by IP in enhancing wider and more equitable use of climate change technologies. After reviewing the UNFCCC and the Bali Action Plan, Santamauro provides a detailed analysis of TRIPS and its possible relevance to climate change. Like Culver and Ghaleigh, Santamauro from his own perspective argues that IP can create a North/South imbalance or difference, and notes the focus on this through the negotiating texts of the Cancun Agreement, when suggestions as to greater limits being imposed on IP were considered.

Santamauro suggests that these arguments are advanced by bodies opposed to IP, and that it is unclear how they align with the economic interests of developing and developed countries. He considers that objections of the United States to proposals limiting the power of the IP owner have their base in concern at potentially preventing the development of technologies in the first place – without which there would be nothing to transfer. If there is to be work with an IP focus, be that extending or limiting, he argues that it should proceed within the WTO or WIPO, not UNFCCC, and have an innovation rather than climate change focus. This point is made not to contribute to the debate on regime shifting and the battle as to where any change should take place,\textsuperscript{70} indeed from the perspective of the Kyoto Protocol and its objectives, he considers that ‘[t]he lack of text on intellectual property is consistent with the view that it is better to focus on pragmatic objectives rather than resolve intractable ideological disputes’.\textsuperscript{71}

On the other hand, he considers that there is room for more than a ‘do nothing’ approach to intellectual property in this area.\textsuperscript{72} He reviews studies arguing the need for more innovation, for example, a report by
the International Energy Agency, and then reviews the arguments which are, for some, well established, that IP has an important role in encouraging and rewarding innovation and in return confers limited rights. He argues, building on steps taken in the United States, Canada, Australia and the United Kingdom, that Patent Offices should grant green patents more quickly and at a lower cost; for term extension opportunities for patents which relate to greenhouse gas emissions; and for minimizing the differences in approaches taken between countries. He argues that this would assist in reducing obstacles to technology transfer, encourage the work of small and medium-size enterprises and also be consistent with the ongoing work of the World Intellectual Property Organization’s Development Agenda and its Patent Standing Committee.

Santamauro also notes, with reference to scholarly and policy literature, that although much technology used in the climate change area is not the subject of IP, either at all or in many developing countries, many developing countries do have a strong IP system, which can be linked with increased technology transfer. Santamauro reviews the public health and IP developments and the Declaration at Doha in 2001 and the proposed arrangements for compulsory licensing export in 2003, again at Cancun, and the proposed formal amendment of TRIPS in this respect. Continuing his pragmatic focus, he notes the challenges which have been made to its workability and that other solutions have evolved such as the Drugs for Neglected Diseases public–private partnership initiative. He considers analogous projects in the climate change field, the EU Green Cars initiative and work on Ethiopian Sif, a drought resistant crop.

Like Culver, Santamauro notes the strong arguments that other forms of encouragement do exist, particularly in areas in need of particular attention, say through prizes and he also, with echoes of calls for new approaches suggested by Culver, suggests exclusive marketing rights in the early innovation stage. And while Santamauro considers that there is an important place for IP, he also argues, consistent with points by Culver and Ghaleigh, that more than IP is required to deliver an enabling environment.

I.5.3 Place and Partnership

Building on these calls for a wider approach, Anna Davies (academic geographer) provides quite a different perspective on innovation. She approaches essential environmental technologies as those which provide fundamental goods and services for survival of people and the planet, from the perspective of justice, equity and burden sharing, and takes a wide approach to technologies, referring to them more as ‘socio-technical
regimes’. With resonance of the discussion of neglected diseases by Santamauro, she focuses on ‘innovation that created those technologies beyond the mainstream for-profit marketplace where IP … issues are less pronounced’.

There are strong synergies between this piece and that of Culver, with its consideration of the importance of geography and the importance of large cities, with reference made to transition town movements. She reviews initiatives beyond the mainstream, which have a common theme of more collaboration between partners and of involving new forms of governance. There is another consistency with Culver and Santamauro in the reference to challenges and prizes – but to different types of prizes; she refers to the Kyoto Box and SunNight Solar, and considers there to be few prizes within the not-for-profit space which have a focus on climate change and the environment. She calls for further work, such as that by the Rockefeller Foundation’s establishment of the Advancing Innovation Processes to Solve Social Problems initiatives, to assist in the possible up-scaling and greater dissemination of the results of these projects.

Davies also notes, consistent with the contribution on the project website by Doreen McBarnet, the importance of corporate social responsibility in this field, and uses as two of her examples a collaboration between the United States Foundation and Royal Dutch Shell to raise funds to provide clean burning stoves and address health and environmental issues faced as a result of existing stoves, and also, building on the discussion in the joint working paper, the Berkeley Darfur Stove project, which has directors drawn from across the corporate, scholarly and NGO community. She calls for more analysis and empirical work, and a focus on ‘the bottom of the pyramid (the majority world)’.

Elisa Morgera (EU and international environmental law scholar and NGO adviser) and Kati Kulovesi (NGO adviser and world trade, climate change and human rights scholar) focus in their turn on new forms of partnership, process and forms of governance. They stress the important role for technologies, including, like Culver, existing technologies, in meeting emissions targets, and refer in particular to technologies relevant to crop management, irrigation and deforestation. They review the progress of the UNFCCC’s negotiations relating to technology, from the Expert Group on Technology Transfer (EGTT) to the Technology Mechanism and the Technology Executive Committee established in Durban in 2011, referring also to Technology Needs Assessments by some developing countries, and the Global Environment Fund which operated until 2010.

Morgera and Kulovesi note the key role of the private sector in developing these technologies and the challenge of the lack of finance.
Consistent with all the previous chapters, they consider that a multifaceted approach is required and they refer in particular to state regulation, to feed-in tariffs (which were discussed in the joint working paper and also referred to above), and to new forms of subsidy and capital grants. In respect of market-based solutions, Morgera and Kulovesi consider (like Ghaleigh) the CDM, and they do so from the perspective of the involvement of the private sector as project owners and operational entities. They note the criticism of the system, and of the place of the private sector in meeting public objectives, and they then review empirical data and literature, to argue that technology transfer under the CDM has decreased, particularly in China, India and Brazil which host most projects. Importantly, they note that although there has been some IP and licensing discussion in relation to CDM the issue has not (as also noted by Ghaleigh in respect of his wider discussion about the IP and climate change interface) received significant attention.

Morgera and Kulovesi note the growth of new institutional arrangements, such as the Green Climate Fund and Technology Mechanism and call, like Santamauro and Davies from their own perspectives, for more public–private partnership, and draw on examples from other multilateral environmental agreements, notably the Mobile Phone Partnership under the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal.

Developing their arguments for private and public collaboration, they consider (like Davies but from the space perspective, and like McBarnet’s contribution on the project website), the legal place of corporate social responsibility. They refer to the 2009 Guidelines on Cooperation between the United Nations and the Business Sector which might help in introducing more uniformity in, and monitoring of, businesses’ approach. Importantly, they stress that although initiatives focusing on increased development and technology transfer may be voluntary, legal obligations can still arise, for example, under the contract between those involved. The contract and management must ensure that risks are managed, targets agreed, and transparent governance put in place, and Morgera and Kulovesi see a role for the Technology Executive Committee and the CDM to have a place in this.

Ravi Srinivas (IP and development legal scholar) echoes Santamauro in stressing the need for an enabling environment, which must look more widely than IP. In a contribution based in deep analysis of legal scholarship and also empirical data, Srinivas echoes the need for changes within the patent system, with a particular focus on green technology, and considers new initiatives which have been put in place in Brazil. Like Culver and also Davies, Srinivas stresses the differences of space, and
also that technology transfer should not just involve North–South transfers but also South–South transfers and also North–South–North transfers.

Srinivas notes the power and consensus in respect of technology which can be identified within the G77/China group of developing countries, and argues for other ‘push and pull’ forms of encouragement of technology transfer to be put in place, including tax regimes and advance purchasing systems. He also makes a different call for a WTO declaration in respect of climate change; one which, like Doha, clarifies TRIPS, but this time in respect of the technology transfer provisions in Article 66 TRIPS. He also suggests greater guidance as to possible partnership frameworks.

I.5.4 Yet More Legal Fields?

Building on these discussions of governance, institutions and empirical analysis (or lack of it), geography and pragmatic solutions, the next set of chapters explore the contributions which can be made by different legal fields. Oche Onazi (human rights and legal theory scholar) argues that human rights should be the priority when one considers the relationship between climate change and poor communities. He reminds us that ‘vulnerability and adaptation … require different initiatives to respond to climate change, including (but not always) the role of information and a range of technologies… [which] entails the protection of the needs of the vulnerable, which can be easily overlooked in the process of developing partnerships and cooperative activities’.75

Taking a perspective quite different to that explored so far in this collection, Onazi argues that failing to grasp the ‘dark history’76 of IP can have negative consequences for the poor, no matter how positive it is for others. Onazi argues that the market should not be treated as able to provide the answer; and, identifying a different base for analogy with publichealth, argues that there has been too big a role in the publichealth debate of the interest of pharmaceutical firms, and not enough regard had to the interests of those in need. He considers that human rights can provide a response to this, and they should not be seen as exceptions to what some might consider the main narrative of TRIPS and its flexibilities and the innovative incentives of IP, as explored in Santamauro and the joint working paper. Indeed, Onazi dismisses a utilitarian approach.

At a practical level, like Culver and Morgera and Kulovesi, Onazi argues there is a need to transfer new and also existing technologies; and, like Culver and Davies and the work of environmental justice activists,
identifies a need to look beyond the ability to make technologies and have regard to specific inequalities of technical development and to enable redistribution. Linking with the contributions of Morgera and Kulovesi, Davies and McBarnet, Onazi argues that human rights can provide a mechanism by which claims for recognition, differentiation and participation can be articulated. Indeed, Onazi argues that ‘[a]ccess to knowledge, information and technology would easily form part of the responses to climate change, once they are linked up with debates about the depletion of the earth’s natural resources and the enjoyment of various human rights’.77

Consistent with the initial objectives of the project, and the intertwining of themes and fields introduced so far, in my chapter I consider (building on ten years’ professional practice in technology, commercial and competition litigation in Scotland, England and Australia, and an academic career exploring the links between different legal fields) the contribution to be made by combining IP, competition and human rights. I also explore the place of more open innovation and standards, and the need for a new tribunal to require greater sharing. An EU approach has been taken, given the (comparatively) high level of consideration of IP, competition and human rights there, and the EU’s sophisticated forms of regulation and dispute resolution. The contribution which can be made by combining IP, competition and human rights is considered in respect of identifying essential technologies, and also, building on the points made by Culver and Davies, the contribution to delivering more access to all technologies which have a role in climate change.

Merely because the test for different IP rights (which were considered by Santamauro) to exist has been met does not mean that a technology is essential; the IP criteria do not have regard to the existence of other options from the supply or demand perspectives and geography (which are considered by competition law and were also addressed by Ghaleigh, Culver and Davies). The IP criteria also do not consider the social goals which might be met by the technology (which are considered by human rights law and which, as noted above, can involve rights to life and also rights in respect of reward of the creator and property). A combined approach to all these factors is suggested to identify essential technologies.

In parallel with this, I have argued, with echoes of points made by Santamauro and Davies, that competition and human rights can also support a more open approach to be taken to all innovation, building on the EU 2020 Innovation Union, standards initiatives such as Sunspec, as well as (once again) the Eco-Patent Commons and Drugs for Neglected Diseases work, and, of course, obligations under the Kyoto Protocol.
Competition may also pose obstacles to more collaborative work, however, and regard must be had to guidelines and legislation which are regularly being developed in this field.

But even if states and IP owners choose to encourage and pursue a more open approach, encouraged perhaps by the arguments of Morgera and Kulovesi and of Onazi, the power of the IP owner will remain. To address this, it is argued that the human rights obligations of decision-makers mean that they must take a new approach to competition law and the essential facilities doctrine; and that when the weighting of human rights which are engaged favours access, and market definition analysis reveals that technologies exist in a market of their own, greater access can be provided. These arguments draw in particular from legal (rather than practical) analogies in public health in South Africa, where the three fields have been combined, thus creating another new analogy between climate change and health. Rather like Santamauro, this chapter seeks a pragmatic solution as to where these arguments can be advanced. Given that EU law poses obstacles to the establishment of new tribunals, as seen most recently in respect of a proposed Community Patent and Court, this chapter focuses on the opportunity and obligation of the European Commission to combine IP, competition and human rights when considering complaints which could be made to it regarding greater access to material the subject of IP. Complaints of this nature have been made in cases involving communications, health and, in respect of labelling, the environment.

This final set of arguments would apply only to essential technologies, a narrow group. Yet, any decisions by the European Commission finding that there has been abuse through refusal to license may lead to a broader willingness to share and take new approaches to innovation, as suggested by Davies and by Morgera and Kulovesi, and also in the making of choices as to raising proceedings. This could lead to greater access to all technologies, which Culver urges be provided.

Baskut Tuncak (practising lawyer with international environmental advocate group) calls for new approaches to IP with a focus on food. He argues that the food system is broken and that there is a strong link between this and climate change, referring, as did Onazi, to water shortages and also to soil erosion, toxic chemicals, fisheries and crop devastation and loss of biodiversity. Tuncak considers IP law, but also competition law (and he considers in particular challenges which could be made to the power of Monsanto in the light of its patent actions against farmers in Canada), human rights and environmental laws as possible means to manage the powers of large companies. Like Davies and Culver, he stresses the different challenges posed by geography and,
like Onazi, human rights are at the heart of Tuncak’s arguments. But where Onazi took a more theoretical approach to human rights, Tuncak focuses on the right included in international treaties and found in governmental action plans to available, accessible and adequate food. He discusses the relationship between this and the IP and food-related treaties such as TRIPS, the Convention on Biological Diversity and the International Treaty on Plant Genetic Resources for Food and Agriculture, and the work of the UNFCCC in relation to food security.

In contrast to the pro-IP approach taken by Santamauro, Tuncak calls for an end to the patenting of climate resistant varieties; rather, again like Onazi, Tuncak calls for a rights-based approach to ensure ‘the effectiveness of efforts for climate change mitigation and adaptation’. He argues that a focus on the right to food could deliver new approaches to financing, new tax breaks and subsidies, which were also considered by Ghaleigh and by Morgera and Kulovesi; assist those in both the private and public sectors in prioritizing how to work with limited resources, and in this respect reference is made to the work of the Consultative Group on International Agricultural Research (CGIAR) (although Tuncak notes that the annual research budget of Monsanto is twice that of the annual budget of CGIAR); and he considers that this could empower the development of different structures of innovation, as considered in particular by Davies and by Morgera and Kulovesi.

1.5.5 The Real World

Building on the points just made, the final set of contributions explore the extent to which the proposals made in this collection could be pursued, or whether existing legal regimes, attitudes of funders, and the reality of business in the climate change sector, render them unattainable or inadvisable. And should yet other approaches be considered?

James McLean (a competition, IP and procurement practitioner and teacher) provides a detailed and practical review of the wide range of legal provisions and cases which are relevant to the proposals put forward in the collection so far. Like Santamauro, he reviews TRIPS (including regarding compulsory licensing) and considers, like Brown, the limits on the rights and the thresholds which must be met for IP to exist in the first place; he also considers the fact that IP is a property right, and the relevance of this from the perspective of theory and international and regional instruments. McLean then provides a detailed analysis of the EU IP and competition cases referred to by Brown regarding the extent to which a refusal to license or charging a very high price can be an abuse of a dominant position, and argues that not only will compulsory
licensing of climate change technologies require new legislation, but that this would have an impact on property rights which are in turn protected. He queries whether or not this is required and also if it would be warranted given the existing compulsory licensing opportunities, in TRIPS, the Paris Convention and in national (e.g., Crown use in the UK Patents Act 1977) and EU (e.g., regarding design) laws and other EU obligations. As considered by Brown, McLean notes the limits of EU law regarding a proposed Regulation on a Community Patent, although it is noteworthy that at the time of writing discussion continues regarding the Unified Patent Court.

McLean then considers the EU Procurement Directive, provisions of what is now the Treaty on the Functioning of the European Union and decisions relevant to state ownership and state aid. These final provisions and contributions are valuable, given the suggestions throughout this collection (by Culver, Davies, Morgera and Kulovesi and by Tuncak, including in relation to state prizes), that new approaches should be taken by states to meeting their Kyoto Protocol obligations. McLean sets out insightful questions to be borne in mind and concludes that if (on which he is sceptical) it can be shown that access to IP on fair and reasonable term is indispensable to the delivering of energy, and this cannot be met from another EEA state, then there must be EU legislation to enable individual Member States to bring this about within their territory.

It might be tempting to see this approach as too legal, too removed from the real problems of environmental justice, addressing poverty and the reduction of emissions. Yet, as recognized at the start of this project, these fundamental principles exist alongside existing (and potentially conflicting) legal frameworks, which may have stronger supporters (as was seen in the negotiation of the Anti-Counterfeiting Trade Agreement (ACTA) and more robust enforcement frameworks (like TRIPS)). It is the more fundamental questions which can, sadly, be more readily cast aside – or at least be considered not to be relevant to the questions before a court or business.

The collection closes with contributions from industry and professional legal practice – these are written from practical, rather than scholarly perspectives, and are a highly compelling reminder of the wider practical context within which discussions on climate change and technology subsist. Mervyn Jones (experienced businessman and former Chair of a Scottish renewable energy company) argues, like Culver in the first chapter, that there is a risk in viewing environmental technologies as one, and more so when one considers the impact of IP. He considers that the need for development of renewable energy technology to address climate change has been brought about by man-made emission of greenhouse...
gases, a belief that these technologies can be an opportunity for more equal balance of resources, and a desire for more energy self-reliance from countries which are less rich in hydrocarbon-based natural resources. Like Davies, he notes the scope for a range of solutions to development of technologies in varying environments and also stresses, like McLean and Ghaleigh from different perspectives, the need for wide and informed regulatory action. Jones argues that ‘confusion about which challenge is being addressed can lead to policy confusion’ and he notes that a change in UK government support to small solar farms led to the development of fewer larger solar farms; and that the larger farms would have contributed more, through economies of scale, to meeting the challenge of climate change.

Further, Jones provides essential context to this entire debate, with the point that renewable energies still cannot compete with hydrocarbon sources and argues that to change this, both private sector and public sector support is required. In some technologies (including those which Brown argued might be essential technologies in this introduction and her chapter, using tidal energy in Scotland as an example), he points out that investment is secured based on the extent and rate at which the technology can improve and obtain protection from IP. Competitors will then seek to innovate further. He consider that ‘[i]t is this cycle of technology innovation which drives the improvement in cost competitiveness that will make these technologies not only renewable but sustainable’. He considers that there is also a role for industry-led collaboration such as the UK’s Technology Strategy Board and also once again the Eco-Patent Commons; but that to remove the IP part of the equation in a nascent industry would undermine the goal of developing new technologies.

Further, as also argued by Culver, Davies and Ghaleigh from their different perspectives, Jones considers that IP is rarely a, or the, significant barrier to technology transfer. More relevant are government policy, pricing, infrastructure, planning, supply chain, skilled workforce and other intellectual assets, looking much more widely than IP. Regard should be had to all these factors, rather than seeing IP and its problems as a means of ignoring them. In a similar vein and like Santamauro, Jones argues that it would be unwise to impose international systems which could slow down innovation and investment and disrupt the innovation cycle. A more workable and effective innovation and transfer environment is required now, and there should not be too much focus on peripheral and future challenges from possible essential technologies.

Finally, David McGrory, corporate lawyer, shares his rich expertise in advising private institutional investors, often known as venture capitalists,
as they choose how, and on what terms, to invest in business. Consistent with the points made by Culver, Ghaleigh and by Morgera and Kulovesi, he identifies the need for funding to enable important innovation to be brought about. In delivering this funding, McGrory stresses the need for private institutional investors. Small businesses, say academic start up ones who may often be involved in innovations of interest to climate change, will rarely be attractive to bank or debt finance providers, because of the lack of assets on which to secure the loan.

Although the possibility of international institutional or public–private partnership funding is acknowledged, McGrory considers that venture capital funding may often be the only source available. This funding is invested based on the view taken of the business’ success; and the existence of obstacles to others entering the field (so objectionable to competition law) is attractive to investors. IP is an important obstacle; and if there is a risk that IP owners can be required to share the IP, then investors will look elsewhere. McGrory stresses that in the commercial world they will do so, even against the backdrop of policy-based arguments in the light of the common good – and then, as argued by Santamauro, there will be no investment and fewer opportunities for innovation to be brought to market. Accordingly, McGrory calls for caution in respect of future approaches to IP.

I.6. SUMMARY AND WHERE NEXT?

The project sought to identify new approaches for how the development of technology, and its transfer, can be encouraged and secured as effectively and fairly as possible. A strong message from the project is that the problem, and the solution, lie not in IP in isolation. It is tempting, but not legitimate, to see straightforward analogies between IP, health and climate change. IP can indeed lead to private companies being able to control technologies which are important to society; but the delivery of access to technologies which are important to adapting, mitigating and learning about climate change has significant differences to access to essential medicines, as identified in early work by Barton – other options frequently exist both in terms of technology and style of living. Yet analogies can arise, say in respect of new seeds and new forms of energy generation which are of value to particular circumstances, and more widely, in respect of the control of information which reveals the extent of climate changes and also of ownership of software which operates grid delivery systems. For these, the power of IP remains a concern. Accordingly, and given the strong arguments made in this
collection for the valuable contribution IP can make in the climate change field, there should be greater awareness on the part of the climate change policy and activist community of the contribution – positive, negative and neutral – which can be made by IP to the development of climate change technologies. Further, even if IP may only be one small part of the encouragement of innovation and the transfer of technology, there is a need for patents to be obtained more quickly and clearly to assist businesses and investment which continue to be based in IP.

More fundamentally, what is required for climate change is the efficient development of a range of technologies and for them to be disseminated widely (together with existing technologies), whether or not they are the subject of IP. This is consistent with the approach taken by the Kyoto Protocol and most of the UNFCCC, particularly at the meetings of the parties at Cancun and Durban, and renders practically irrelevant questions of why IP is so absent. To enable effective development and dissemination, regard should be had to geography and specific needs. There is a need on the part of advocates, practitioners, funders of IP and those who include it as part of their business plan, and those working with energy sources of all kinds, to have greater awareness of the importance of principles such as dignity and respect for life and as to why these factors should be considered by them. Human rights can provide a legal and ethical force for this to be done; and corporate social responsibility and innovative collaboration programmes do suggest growing reasons for and willingness to share essential or important IP, or develop and disseminate ‘bottom of the pyramid’ technology.

There is also more collaboration between international organizations and between the public and private sectors. Regard should be had to competition law regarding opportunities for requiring sharing if there are some essential technologies, and greater use of standards. Further, particularly in the European Union, one should bear in mind the obstacles which competition law might pose to state actions and new collaborations; more regard is now able to be had, however, to environmental factors in considering collaborative agreements and new state approaches to funding. When considering state actions, different parts of governments must be aware of the wide framework within which technology transfer exists; there is not just the need to meet climate change emissions, to address IP or provide funding for specific prizes, but also a place for wisely structured regulatory and tax incentives and complementary parallel regulatory regimes, such as planning.

Such a pragmatic and business focused (or at least consistent) approach, and a lack of a focus on direct engagement with possible legal conflicts between IP, competition, trade, climate change and human
rights, is wise. As noted in the joint working paper and discussions in the Young and Brunnée collections referred to above, debate continues, in different fora, as to how legal fields do relate; this is valuable work, but too much focus on this can move funding and attention away from those directly in need. Experience in health and climate change at international policy level suggests that IP owners are frequently willing to engage in individual sharing and collaborative activities, but are strongly reluctant to accept (wherever it might be made) an imposed compulsory licensing scheme or a new treaty or instrument which would interfere with the power of their IP. IP might not be a significant or any barrier in some cases; but the negotiations at the UNFCCC and ACTA show that the IP owners are a significant force; if engaging with them could be, as has been argued, a distraction, it is wise to avoid it. Further, although competition can require sharing of technology, and may do so more if greater regard is had to human rights, in many cases there is no dominant position in a marketplace; the technology sought is much more humble – but for those in need it is still, for them, essential.

To conclude, the answer to bringing about greater and more equitable access to climate change technologies is indeed a holistic one. Throughout this book there are strong synergies as to what that should entail, even across the wide range of climate-related situations which have been identified by contributors; there has been more conflict as to what is the starting point, and what field is more important. Going forward, all those involved in climate change as investors, inventors, business leaders, scholars in their fields, policy-makers, activists and advisers would benefit from looking around, across professional, scholarly, departmental and funding barricades. Addressing climate change requires more conversations. It has been a pleasure to be involved in this one.

NOTES

5. E. Duncan, ‘Cleaning up’, The Economist (June 2007).
Introduction


13. Letter from United States Senators to the President of the United States, 2 November 2009 (copy available with the author, no longer available online). See also discussion of the negotiations in C. Gerstetter et al., ‘Technology transfer in the international climate negotiations: the state of play and suggestions for the way forward’ (2010) 1 CCLR 3.


16. See e.g., Arts 27, 28, 30, 31 TRIPS and note also Arts 7 and 8 TRIPS.

17. See Art. 64 TRIPS and Annex 2 to WTO Agreement.


20. See e.g., Art. 2 of the International Covenant on Civil and Political Rights (ICCPR, 1966) 999 UNTS 171.


22. Article 1 of Protocol No. 1 to the European Convention on Human Rights (ECHR) 213 UNTS 222.

23. Article 8 ECHR.


27. See http://unfccc.int/ttclear/jsp/EGTT.jsp.
Environmental technologies, intellectual property and climate change


34. A 2012 example of this involves a proposed wind farm in the seas off Aberdeen, and a proposed hotel to be built by Donald Trump, to serve a new golf course: see M. Small, ‘The Donald Trump wind turbine fiasco could be defining for Scotland’, The Guardian, 24 February 2012, available at www.guardian.co.uk/commentisfree/2012/feb/24/donald-trump-wind-turbine-fiasco-scotland; and details of the regulatory framework at www.scotland.gov.uk/Topics/marine/marineenergy/wind; the golf course itself had a controversial history, see also P. Macari, ‘Contested call’ (2008) 53(6) JLSS 64.


36. Kindly supported by the SCRIPTI/AHRC Centre for Research in Intellectual Property and Technology at the University of Edinburgh.

37. The panel comprised Martin McAdam of Aquamarine Power, Steve Burgess of the Scottish Green Party and Dhanesh Dinush, British Council Climate Champion for Scotland.

38. See A. Brown, ‘Who profits from climate change’, NewsXchange (July 2011); my thanks to all at the Edinburgh International Science Festival, the speakers, Jamie Mundie and all the artists from Mile End School, Aberdeen.


56. S. Humphreys, ‘Structural ambiguity: technology transfer in three regimes’ in ibid.
57. E. Dannenmaier, ‘The role of non-state actors in climate compliance’ in ibid.
58. C. Redgwell, ‘Facilitation of compliance’ in ibid.
59. J. Werksman, ‘Compliance and the use of trade measures’ in ibid.
65. J. Haselip et al. (eds), Diffusion of Renewable Energy Technologies: Case Studies of Enabling Frameworks in Developing Countries, Technology Transfer Perspectives Series (UNEP Risø Centre, Denmark, 2011), also available at www.tech-action.org/Perspectives/DiffusionRenewableEnergyTechnologies.pdf. This is considered by Krishna Ravi Srinivas in Chapter 6.
Environmental technologies, intellectual property and climate change


71. See Chapter 3.

72. See Chapter 3.

73. See Chapter 4.

74. See Chapter 4.

75. See Chapter 7.

76. See Chapter 7.

77. See Chapter 7.

78. See Chapter 11.

79. See Chapter 11.