11. A view from inside the renewable energy industry

Mervyn D. Jones

11.1 INTRODUCTION

The chapters in this book portray the breadth of activity and technology encompassed by the term ‘renewable energy’ and even more so when extended to ‘environmental technology’. Whilst this is encouraging in that it highlights the awareness that there is of the breadth of influence that the human race has in the ecology of the planet, there is a risk of implying that unifying policies can be applied to anything under one of these banner titles without recognizing the very varied landscape within them. In examining the question of whether the protection of Intellectual Property (IP) is constraining the implementation of environmental technologies and, hence, the pace at which a number of global challenges can be addressed, we need to be very conscious of this risk. In this commentary, reflecting on some of the points raised in the book, I will address two questions which sit alongside the IP question, namely, which global challenge are we addressing and, then, what are the key bottlenecks and constraints to addressing that challenge?

11.2 GLOBAL CHALLENGES

The need for the development of renewable energy technologies has been brought about through the convergence of three challenges:

- the need to address the impact of climate change brought on by the emission of greenhouses gases by man’s economic activities;
- a belief that such technologies may provide the opportunity for a more equal balance of the world’s energy resources between industrially progressive countries and those that are less so;
- a growing desire for greater energy self-reliance and technology

self-reliance from countries with a substantial deficit or future deficit in hydrocarbon natural resources.

These challenges often invite different technologies and different scales of operation to address each of them – a large offshore wind farm in Europe addresses different challenges from those of cooking technology for sub-Saharan Africa. It is also the case that similar technologies can be installed to address different challenges and confusion about which challenge is being addressed can lead to policy confusion. For example, within the United Kingdom, a change in government support towards solar farms of less than 50kW in order to encourage greater personal energy self-sufficiency has caused a crisis in the development of larger farms, whose economies of scale would better address the challenge of climate change. I think that clarity of the challenge being addressed will enhance an understanding of the role of intellectual property rights (IPRs).

Of the three challenges described above, I will take climate change as the most critical at the global level and, with the spectrum of technologies currently available across the renewable energy space, suggest that medium-large scale renewable energy technologies are best placed to address the challenge. This is the essence of the *IPCC Special Report on Renewable Energy Sources and Climate Change Mitigation* (SRREN) looking forwards from 2011.¹ These technologies are also globally mobile, have sectors (for example, wind, marine, solar, geothermal, bioenergy and carbon storage) with a plethora of individual technologies and are able to compete with each other across and within sectors.

11.3 ADDRESSING THE CLIMATE CHANGE CHALLENGE

To understand the status of medium-large scale renewable energy development in addressing the climate change challenge, we need to look at the different perspectives of technology advancement and technology roll-out. In doing so, we will address the question of whether the protection of IP is causing a failure to install sufficient capacity.

11.3.1 Technology Advancement

Learning curve indicators that show the extent to which renewable energy technologies have reduced their unit costs through innovation, such as those described in the Parsons Brinkerhoff, *Powering the Nation* update

report from 2010,² give a consistent message of significant progress during recent decades. They also show, however, that renewable energy technologies still do not compete, on a stand-alone basis, with hydrocarbon-based energy and require significant innovation to meet expectations of energy availability at competitive prices (even solar PV is at least five years away from such a position). This innovation requires both significant private sector investment (the National Science Federation in the United States reports that 70 per cent of R&D investment is from the private sector)³ and significant support from government through granting and pricing support.

At the level of a specific technology, investment is secured on the extent and rate at which the specific technology can progress along its own learning curve through innovation and the scope to secure some of the innovation through protected IP. The challenge of the innovation cycle for competitors is to then innovate further to create technologies which out-compete those that have been protected. It is this cycle of technology innovation which drives the improvement in cost competitiveness that will make these technologies not only renewable but sustainable.

How is this reflected in terms of technology availability at the moment? I could cite a business case for a wind farm development for which six different turbines have been shortlisted from three manufacturers, each of which has a competitive edge in one aspect or another. Similarly, for a sector at an earlier stage in its development, one only has to look at the number of technologies being promoted for tidal energy development in Scotland to appreciate the innovation race that is on. All of this is underpinned by R&D funding that is further underpinned by some IP protection.

Whilst this discussion has described technology-specific innovation cycles, the scale of the challenge is such that there is undoubtedly the scope for industry-led collaboration within and across sectors also, to address the many common challenges that are faced. This has been the focus for the UK's Technology Strategy Board;⁴ may be covered by something similar to the Eco-Patent Commons discussed by Davies in this collection; and has been used in the hydrocarbon industries through such as the Industry Technology Facilitator.⁵ The key to successful schemes is that they are industry led, encourage collaboration and are not mandated, thereby bringing willing players rather than defensive players to the scene.

In summary, whether the innovation is technology-specific or has the scope for industry-wide collaboration, it is against a background of energy sectors which are highly competitive internally and with each

other, but are not yet competitive with the hydrocarbon-based alternative – they are still evolving. They have to be seen (as also discussed in this collection by Culver, Ghaleigh and Santamauro) as being in a very different world from the drug application parallels that have driven much of the IP debate. It seems to me that to take the control of IP away from the innovators just at the time when we are demanding greater innovation runs the risk of undermining the goal that we are all striving for.

11.3.2 Technology Roll-out

The SRREN Report referred to above identifies the need for an increase in the installation of renewable generation capacity and sets out many of the issues that need to be addressed. Any review of the renewable energy press gives a similar insight (for example, Tim Yeo, the chair of the UK Energy Select Committee, argued in the *Guardian* in May 2011 that UK energy market reform plans must be more ambitious).⁶ Some of these issues relate to the competitiveness of technologies as described above, but hardly ever is the protection of IP raised as a significant barrier. Instead, the issues of consistent government policies and pricing strategies, the ambiguity or uncertainty of consenting policy at national and local levels, and inadequate infrastructural capacity are raised as major hindrances to development. These issues then translate into higher risk for potential investors and, thereby, a conservative approach to investment. In many sectors of the renewable energy generation industry, it has become the case that much of the value is to be found in securing permitted sites for the installation of generation capacity, as the battle to secure legislative requirements becomes the critical path to securing value, to the extent that companies have grown up solely with this purpose in mind. It is not uncommon for sites to be secured on a technology neutral basis – surely a vote of confidence in being able to acquire technologies.

There is no country in the world that is immune from these challenges and they are present even in the most climate change-responsive countries, often simply because infrastructure and capabilities have been built around historic hydrocarbon-based energy supply. If this is a constraint to implementation in these countries, it is not surprising that there is need for a further step change to achieve the desired implementation rates at the global scale.

Beyond the climate change-responsive nations, the issues of legislative structure and infrastructural capacity become more acute and are exacerbated by a dearth of broader technology installation capacities, such as supply chain capabilities, technical skills and the knowhow of how to

make it happen – broader intellectual asset (IA) capabilities. For those nations or regions that are ‘industrial’ but are, as yet, not substantially climate change-responsive, the development of these IA capabilities to progress renewable technologies at a scale to address climate change challenges is critical. For ‘non-industrialized’ nations and regions, smaller scale or localized implementation of technologies, possibly different technologies with a different economic language, becomes a valid engagement in the second of our challenges referred to above, the spreading of energy wealth. Whilst this activity is unlikely to be a major player in terms of the first challenge of climate change, simply because it does not have sufficient scale, it can be the start of the journey to something larger.

In summary, the roll-out of renewable energy technologies, in many nations, demands an expansion of IA more than a relaxation of IP and, where IP has been highlighted as an issue, I would question whether this is more about not facing up to the challenges of legislation, infrastructure and IA.

11.3.3 Who Is Best Placed to Progress a Global IP Issue?

In this book there is discussion about which organization is best placed to oversee the management of IP of renewable (environmental) technologies. Is it the World Intellectual Property Organization (WIPO) – it is their field of expertise; or the World Trade Organization (WTO) – they understand the wider trade implications; or the United Nations Framework Convention on Climate Change (UNFCCC) itself – they would understand wider societal issues; or something with teeth like a ‘Global Institute for Justice in Innovation’ to force licensing, as was discussed in one of our project meetings? We have to be very careful that in trying to control an issue, which I would argue is not the most critical issue at this moment in time anyway, we create control and centralization which slows down due process, increases risk, deters investment and disrupts the innovation cycle which is critical to addressing the challenges of climate change. If anything, a more rapid, secure and effective IP system may be the most beneficial to the issue.

In terms of ‘what-ifs’, when asked, ‘what if a single large-scale technology does make a significant cost breakthrough but its roll-out is restricted by strong protective patents’, my response is that we need an IP environment today which is tuned to the innovation challenges of today rather than those of a hypothetical future.

11.4 CONCLUSION

The drive to advance the installation of renewable energy technologies can be expressed in terms of a number of challenges, addressing climate change, energy security or energy fairness. The challenge of the former is so great, both in terms of scale and pace, that in making it the focus for renewable energy strategies, it will address many of the other challenges.

However, the multiplicity of technologies under the label of 'renewable' and their various stages of evolution mean that, unlike a specific disease–drug relationship, the challenge is more than the need for a financing model to encourage global roll-out. Few renewable energy technologies are competitive with hydrocarbon-based energy technologies on a stand-alone basis. To achieve such a position will require significant levels of private sector R&D financial investment, itself responsive to supportive government policies and securing the value of innovation. To undermine this by opening up all IP is more likely to inhibit the required innovation and hence the pace of roll-out needed to address the climate change challenge.

Much of the challenge in rolling out renewable technologies is in the broader capabilities of a nation or region to make it happen. Much of the value in a renewable energy company is in knowhow; much of what distinguishes the climate change-responsive nations from those that are not is having the capabilities and infrastructure to make it happen. The diffusion of IA will provide a far greater stimulus to the spread of renewable energy than any loosening of IPRs.

NOTES

1. See www.ipcc-wg3.de/publications/special-reports/srren.
2. See www.pbworld.com/pdfs/regional/uk_europe/pb_ptn_update2010.pdf.
3. National Science Federation, *National Center for Science and Engineering Statistics, Science and Engineering Indicators* (2012), available at www.nsf.gov/statistics/seind12/.
4. See www.innovateuk.org/ourstrategy/sustainability.ashx.
5. In the energy industry, see www.itfenergy.com/.
6. T. Yeo, 'UK energy market reform plans must be more ambitious', *Guardian*, 16 May 2011, available at www.guardian.co.uk/environment/2011/may/16/energy-market-reform-plans-uk.