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Demand-side frameworks for patented inventions: analysing the licences of right system and the FRAND licensing system

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Abstract

This paper examines the licences of right system in English law and the ETSI FRAND licensing system to explore underlying reasons and approaches informing the establishment and design of these voluntary licensing schemes. It is argued that both these systems were established to advance specific demand-side objectives. At the national level, the licences of rights system functions as a demand-side framework within the patent system to promote local working of inventions, complementing the supply-side oriented structure for patent grant. At the international level, the FRAND licensing system serves as a global demand-side framework to promote the working of inventions on a worldwide scale. The institutional arrangement of these frameworks closely aligns with the commons management strategy applied to traditional infrastructural resources, characterised by public access to inventions on non-discriminatory terms. This alignment facilitates public access to inventions for productive activities. However, their institutional arrangements are further qualified by the underlying demand-side objectives that initially motivated their creation. The development of such a demand-side framework must devise mechanisms to mitigate the barriers to public access created by patent rights, while simultaneously preserving incentives for patentees to contribute their inventions to demand-side frameworks.

Keywords: intellectual property law; patent law; licence of right; FRAND licensing; statutory licensing scheme; infrastructure theory

Introduction

Jessica Lai's paper in a recent issue of this journal identifies a notable shift in the underlying interests for the grant of patents: from the demand-side objective of promoting local working of inventions for public interest, to the supply-side objective of maximising patent exploitation for the benefit of patentees and investors.[1] This transformation prompts Lai to advocate for a reconsideration of mechanisms within the patent system that could reinvigorate the demand-side objective.[2]

This paper concerns one such mechanism, overlooked in the literature – the voluntary licensing scheme. Such schemes operate at both national and international levels, with the licences of right system serving as a notable example in domestic jurisdictions,[3] while the international sphere is exemplified by the FRAND licensing system of the European Telecommunications Standards Institute

[1]L Lai 'The changing function of patents: a reversion to privileges?' (2017) 37 LS 807 at 835.
[2]Ibid, at 837.
[3]See eg Patents Act 1977 in English law, s 46 (as amended).

(ETSI).[4] Despite their significance, the relationship between these systems and the demand-side objective of promoting the working of patented inventions have received scant attention in legal scholarship. This oversight is pronounced in the case of the licences of right system, notwithstanding its century-long existence and widespread adoption across various jurisdictions. Current understanding of these systems appears limited, often reduced to mere facilitative mechanisms for licensing patented inventions under specified requirements and conditions.[5]

This paper addresses a fundamental question concerning these voluntary licensing schemes: what underlying reasons and approaches inform their establishment and design? The purpose of this paper is to deepen our understanding of voluntary licensing schemes while also providing insights for countries considering the establishment or refinement of such schemes within their patent systems.[6]

To explore this question, Section 1 introduces the demand-side economic theory of infrastructure.[7] As will be discussed, intellectual property such as inventions and infrastructure exhibit striking parallels both in their supply-side challenges and solutions, and in their economic functional roles on the demand side. This demand-side similarity is particularly pronounced when the subject matter of an intellectual property right itself manifests characteristics of infrastructural resource. These similarities invite an exploration of the demand-side theory of infrastructure as an analytical lens through which to view and examine these voluntary licensing schemes. Section 2 examines the licences of right system through the lens of this demand-side theory of infrastructure. It assesses the degree to which the institutional arrangement of the licences of right system aligns with or deviates from this demand-side theory of infrastructure. By teasing out the reasons for these alignments and discrepancies, this paper develops a demand-side account of voluntary licensing schemes. Building on this analysis, Section 3 presents a comparative study of the licences of right system and the ETSI's FRAND licensing system. This comparison illuminates the similarities and differences between these two frameworks, providing further support to the demand-side account of voluntary licensing schemes developed before. The final section consolidates all the insights from the above discussion.

1. The infrastructure theory and the patent system

(a) Similarities between infrastructure and intellectual property on the supply side

The concept of infrastructure is commonly understood to refer to the fundamental framework or foundation of a system, often conjuring images of large-scale physical resources created by humans for public consumption.[8] This encompasses entities like road systems for transportation, or telecommunication grids for information exchange and connectivity. Infrastructure plays a fundamental role in fostering economic and social progress. It forms the backbone of various human activities, influencing people's actions and choices by offering and moulding the opportunities available to engage with these systems and interact with one another.[9]

Investing in infrastructure can generate multifaceted positive externalities that extend well beyond the benefits received by individual providers and consumers.[10] Productivity gains, improved living

[4]ETSI 'ETSI intellectual property rights policy' (29–30 November 2022), available at https://www.etsi.org/images/files/ipr/etsi-ipr-policy.pdf.

[5]See eg Australian Law Reform Commission (ALRC) *Genes and Ingenuity: Gene Patenting and Human Health* (ALRC Report 99, 2004) pp 545–547.

[6]Recently, the licences of right system has been transplanted into Chinese law: see Patent Law of the People's Republic of China, Arts 50–52. In addition, the ALRC considered establishing a statutory voluntary licensing scheme in 2004. While the ALRC decided not to recommend the introduction of such a scheme under the Patents Act due to a lack of demonstrated need at that time, it suggested that, should evidence of need emerge, the creation of such a scheme based on the licences of right system in English law remains a viable option. See ALRC, *Genes*, above n 5, ch 23.

[7]B Frischmann *Infrastructure: The Social Value of Shared Resources* (Oxford: Oxford University Press, 2012) p 3.

[8]Ibid, p 3.

[9]Ibid, p xi.

[10]Ibid, p 5.

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standards, and enhanced economic growth represent just a few of the far-reaching social benefits unlocked by infrastructure development.[11] As such, infrastructure provision becomes a crucial lever for catalysing a more prosperous society.

Traditional economic theories on infrastructure heavily emphasise supply-side issues, particularly the need to secure substantial investment for adequate provision of infrastructural resources.[12] This framing arises from the enormous upfront costs, long-term nature, and ongoing maintenance requirements of infrastructure, as well as its critical role in driving economic growth.[13] The public good aspects of many infrastructure resources further complicate funding, often necessitating government investment and complex financing mechanisms.[14] Economists concentrate on these supply-side challenges because they represent fundamental hurdles to infrastructure development.[15] The supply-side challenges for infrastructural resources are typically addressed through two primary solutions: monopoly and government provision.[16] This approach is exemplified in the US, where road infrastructure is predominantly under public ownership, while telephone infrastructure is largely privately controlled.[17]

Intellectual property and infrastructure share striking parallels in their supply-side challenges and solutions. The supply-side of intellectual property, especially as applied to resources such as inventions, grapples with the free-rider issue, where individuals benefit from others' innovations without contributing fairly to the costs involved in their production or without permission – raising the risk of limited investment in, and consequent under-supply of these important resources.

The concern of undersupply shapes the institutional solutions, resulting in two primary approaches: intellectual property rights (IPRs) and government subsidisation.[18] IPRs provide artificially constructed but legally sanctioned right to exclude, a property-based framework intended to restore some level of market control to IPRs holders, enhancing their incentives to create intellectual resources.[19] This is the traditional justification for IPRs.[20] When this propertisation model proves inadequate, the standard supply-side playbook then turns to government subsidisation as the primary alternative.[21] Grants, tax benefits, and prizes are allocated to selected research activities, fostering the creation of intellectual resources.[22]

Indeed, the changing functions of patent grant over time reveal the patent system's growing preoccupation with the supply side. Jessica Lai's scholarship delineates this evolution, tracing the trajectory from the Elizabethan era to the present day.[23] Initially, patents served as privileges for trade introduction and local working of inventions, focusing primarily on demand-side considerations and public interest.[24] However, in more modern times, the system's focus shifted dramatically towards supply-side concerns. Patents transformed into incentives for the creation of inventions, addressing the risk of undersupply.[25] This evolution culminated in the contemporary conceptualisation of patents as property designed to secure post-grant investment for commercialising inventions.[26] This latest function highlights that the current system is predominantly anchored in the supply side, focusing on the interests of patentees and investors.

[11]Ibid, pp 5–6.
[12]Ibid, pp xi, and 5–6.
[13]Ibid, pp xi, 5–6, and 168.
[14]Ibid, p xi.
[15]Ibid, p xi.
[16]Ibid, pp 189 and 213.
[17]Ibid, p xvi.
[18]B Frischmann et al *Governing Knowledge Commons* (Oxford: Oxford University Press, 2014) p 8.
[19]Ibid, p 5.
[20]Ibid, p 5; M Lemley 'Property, intellectual property, and free riding' (2005) 83 Texas Law Review 1031 at 1075.
[21]Frischmann et al, above n 18, p 8.
[22]Ibid, pp 7–8.
[23]Lai, above n 1.
[24]Ibid, at 808–811.
[25]Ibid, at 811–816.
[26]Ibid, at 816–823.

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While the shift towards supply-side considerations has strengthened incentive structures, it has simultaneously marginalised the pursuit of demand-side objectives that were once central to the patent system. Historically, patents granted as privileges were tied to local working requirements, embodying a duty oriented towards public interest.[27] Patentees had a duty to work their inventions locally, ensuring that industrial expertise became accessible to the broader community.[28] As Lai reminds us, local working was sought after due to the substantial social benefits derived from the working of inventions.[29] It was believed that local working of inventions enriched the community by introducing new trades and manufacturers, thereby not only advancing technological innovation but also creating employment opportunities that fuelled local economic growth.[30] The focus was less on maximising the interests of patentees and investors without regard to the needs and good of society.[31]

In contrast, contemporary patent grants impose no positive obligation on patentees to work their inventions.[32] The contemporary view on patent grant suggests the assetisation of patents, where patents function to secure and support investment in post-grant activities.[33] It results in a narrow economic analysis of patents that prioritises economic maximisation for patentees and investors.[34] This contemporary view on patent grants, as Lai cautions, carries the implication of potentially precluding the conceptualisation of patents as instruments for the benefit of society through the working of inventions.[35]

The recognition of this historical deviation from demand-side to supply-side focus raises a pressing question: how might we develop approaches within the patent system to recapture and advance demand-side objectives? The supply-side oriented approach offers little guidance for advancing demand-side objectives. As Brett Frischmann critiques, the supply-side approach's narrow focus on the free-rider problem and the risk of undersupply limits the exploration of alternative institutional frameworks for intellectual property governance.[36] For example, this narrow conceptualisation 'rarely describe[s] shared resource settings in a sufficiently complete manner to qualify as a useful theory for making predictions or prescribing solutions'.[37]

This gap calls for a new theoretical lens to guide the development of approaches within the patent system that advance demand-side objectives. The parallels between intellectual property and infrastructure on the supply side, coupled with the limitations of the supply-side oriented approach, invites an exploration of the demand-side theory of infrastructure. As discussed below, this theoretical cross-fertilisation not only provides valuable insights that may guide us in conceiving alternative mechanisms to better serve demand-side objectives, but also offers a fresh lens through which to view and evaluate voluntary licensing schemes.

(b) Implications of the demand-side theory of infrastructure for the patent system

Frischmann's ground-breaking work, *Infrastructure: The Social Value of Shared Resources*,[38] provides a demand-side theory of infrastructure, representing a leap beyond the traditional supply-side focus on

[27]Ibid, at 836.
[28]P Drahos *A Philosophy of Intellectual Property* (ANU eText, 2016) p 222.
[29]Lai, above n 1, at 836.
[30]Ibid, at 832.
[31]Ibid, at 832.
[32]Ibid, at 834.
[33]Ibid, at 832 and 825–827.
[34]Ibid, at 835.
[35]Ibid, p 832, as Lai suggests post-grant justifications for patents would mean that 'we cannot theorise patents today around local working to benefit local society'.
[36]For a detailed discussion, see Frischmann et al, above n 18, pp 6–10.
[37]Frischmann et al, above n 18, p 10.
[38]Frischmann, above n 7.

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infrastructure. The aim of Frischmann's work is to advance strong economic arguments for managing and sustaining infrastructural resources as commons in a particular manner.[39]

Two insights within Frischmann's work are particularly relevant to this discussion. First, it provides an empirical observation on a widely adopted commons management strategy for infrastructural resources, accompanied by economic rationales. Secondly, Frischmann extends his analysis to propose an economic policy recommendation for managing diverse resource types, including intellectual property.

Commons in Frischmann's work means as a type of resource management strategy.[40] The specific commons management strategy for infrastructural resources, as advocated by Frischmann, is that 'a resource is accessible to all members of a community on non-discriminatory terms, meaning terms that do not depend on the users' identity or intended use'.[41] As Frischmann emphasises, 'we should share infrastructure resources in an open, non-discriminatory manner when it is feasible to do so'.[42]

The above positions are supported by both theoretical analysis and empirical evidence. Through an examination of management strategies employed for various physical infrastructural resources, including road and telephone infrastructure, Frischmann observes that 'both are sustained as commons, accessible to the public on non-discriminatory terms',[43] although they differ in the supply-side stories.

Managing infrastructural resources in this way facilitates public involvement in a range of productive activities that are socially beneficial.[44] Frischmann argues that

> [t]he key insights from this analysis are that infrastructure resources are basic inputs into a wide variety of productive activities and infrastructure users who choose to engage in such activities often produce public and social goods that generate spillovers that benefit society as a whole. Managing such resources as commons may be socially desirable from an economic perspective because doing so facilitates these downstream productive activities. For example, managing the Internet infrastructure in this manner facilitates active citizen involvement in the production and sharing of public and social goods. Over the past decade, this has led to increased opportunities for a wide range of citizens to engage in entrepreneurship, political discourse, social network formation, and community building, among many other socially valuable activities.[45]

This commons management strategy is considered as an attractive public strategy by Frischmann. The economic rationale, as argued by Frischmann, is centred on the idea that adopting this approach can lead to an environment rich in spillovers for the public interest. Frischmann argues that:

> commons management can be understood as serving two public functions: First, it diffuses pressure within both market and political systems to 'pick winners and losers' and leaves it to users to decide what to do with the opportunities (capabilities) provided by infrastructure. Second, it functions like an option – a social option. When there is high uncertainty about which users or uses will generate social value in the future, as is typically the case for public, social, or mixed infrastructure, managing the infrastructure as a commons sustains the generic nature of the infrastructure, precludes optimization for a narrower range of activities, and avoids social opportunity costs associated with path dependency. Together, these public functions suggest a third public function: Commons management structures the relationships between infrastructure and infrastructure-dependent systems in a manner that creates a spillover-rich environment, where spillovers flow from the

[39]Ibid, pp xii–xiii.
[40]Ibid, p 7.
[41]Ibid, pp 7 and 92.
[42]Ibid, p xiii.
[43]Ibid, p xvi.
[44]Ibid, pp xv and 94. Also see P Lee 'The evolution of intellectual infrastructure' (2008) 83 Washington Law Review 39.
[45]Frischmann, above n 7, pp xii–xiii.

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> many productive activities of users. These activities yield new and unanticipated innovations, knowledge, social capital, and other public and social goods that lead to economic growth and development as well as social welfare improvements not fully reflected in traditional economic measures.[46]

Frischmann's work offers another contribution through his demand-side analysis of traditional infrastructure and other types of resources, including environmental and intellectual resources.[47] He identifies three economic criteria common to these seemingly disparate resource types, which enables him to redefine infrastructural resources based on their economic functional role on the demand side. According to Frischmann, infrastructure satisfies the following three functional economic criteria:

(1) the resource may be consumed non-rivalrously for some appreciable range of demand;
(2) social demand for the resource is driven primarily by downstream productive activities that require the resource as an input;
(3) the resource may be used as an input into a wide range of goods and services, which may include private goods, public goods, and social goods.[48]

Frischmann's identification of demand-side parallels across various resource types culminates in a policy recommendation: the extension of the commons management strategy, applied to traditional infrastructural resources, to other types of resources that meet his expanded definition of infrastructure.[49] Frischmann's rationale for this approach is rooted in the potential for substantial social benefits: '[w]hen feasible, society benefits tremendously by leveraging nonrivalry to support non-discriminatory access to such resources because doing so enables the public to participate productively in a wide range of socially valuable activities'.[50]

This demand-centric framing shifts the approach to resource management by elevating the demand-side considerations as a primary focus. However, it is important to stress that this demand-side lens does not carry a normative implication that all resources meeting this expanded definition of infrastructure should be managed through a commons-based approach. Rather, it offers an option for reconsidering the governance of these resources from a demand-side perspective. This approach could open up new possibilities for the management framework of these resources, transcending the private property versus public ownership dichotomy.

Given this context, what implications does this demand-side theory of infrastructure hold for the patent system? At its core, it proposes subjecting resources, including intellectual property,[51] to a commons-based approach. For the patent system, this could involve developing a demand-side framework aligned with this strategy, facilitating public access to inventions for productive use.

To explore these implications in depth, the subsequent analysis will examine the licences of right system in English law through the lens of this demand-side theory of infrastructure. This system presents an apt case for such scrutiny for two primary reasons. First, this system's objective aligns with the demand-side agenda of this theory. As will be elaborated upon, the licences of right system is oriented towards a demand-side objective: the promotion of working of inventions within the UK.

Secondly, through the lens of the expanded definition of infrastructure, many inventions emerge as assets meriting infrastructural status. Inventions, being intangible property, are characterised by their non-rivalrous nature. In theory, inventions can be accessed simultaneously by numerous users for multiple and diverse purposes. Moreover, while something as simple and discrete as an invention for a

[46]Ibid, pp xv, 94 and 113.
[47]Ibid, p xiv and ch 4.
[48]Ibid, p 61.
[49]Ibid, pp xii–xiii and xvi–xvii.
[50]Ibid, p xvi.
[51]See Frischmann, above n 7, ch 12.

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hairpin might not meet the other two criteria, there are still many inventions serving as versatile inputs across a wide range of goods and applications. For example, as discussed in Section 3, patented inventions for wireless communication certainly fall within the scope of this broadened definition.

The analysis will assess the degree to which the institutional arrangements of the licences of right system aligns with or deviates from this demand-side theory of infrastructure. Teasing out the reasons for these alignments and discrepancies will not only deepen our understanding of the licences of right system but also to illuminate the feasibility and implications of adopting a commons-based approach for developing a demand-side framework within the patent system.

2. The demand-side considerations of the licences of right system

The licences of right system in English law has its origins embedded within the country's legislation. First introduced in the Patents and Designs Act 1919 (the 1919 Act),[52] this statutory voluntary licensing scheme has persisted with remarkable continuity,[53] finding its way into both the Patents Act 1949 (the 1949 Act) and the Patents Act 1977 (the 1977 Act).[54]

The US patent system does not have a similar institution in place; among common law jurisdictions, two notable adopters of this system are Ireland[55] and Singapore.[56] However, its influence has traversed the European continent.[57] Several countries including Germany, Spain, and Italy have integrated the licences of right system into their patent systems.[58] Most recently, the licences of right system has been transplanted into Chinese law, rebranded as the open licence system.[59]

This section will focus on the provisions outlining the licences of right system in the current UK legislation, the Patents Act 1977. The 1977 Act establishes two distinct mechanisms through which a patent can be made available under the licences of right system: voluntary endorsement of licences of right and compulsory endorsement[60] of licences of right.[61] Given the scope of this paper, the analysis will focus on the voluntary endorsement mechanism.[62] Lastly, it is important to note that the operation of the UK's licences of right system has been significantly influenced by the decision of the European Court of Justice (ECJ) in *Allen and Hanburys v Generics*.[63] Its implications will be addressed in the latter part of discussion.

Voluntary endorsement of licences of right, as explained by Lord Justice Birss, is the process where 'the patentee has voluntarily thrown his invention open to anyone who cares to ask for a licence on terms

[52]Patents and Designs Act 1919, ss 24 and 27 (original version as enacted).

[53]*Allen & Hanburys Ltd v Generics (UK) Ltd* [1986] RPC 203 at 248 per Lord Diplock.

[54]See Patents Act 1949, s 35 (original version as enacted); Patents Act 1977, s 46 (as amended).

[55]See ss 68 and 69 of Patents Act 1992 in Irish law.

[56]See ss 53 and 54 of Patents Act 1994 in Singapore law.

[57]Regulation (EU) No 1257/2012 of the European Parliament and of the Council of 17 December 2012 implementing enhanced cooperation in the area of the creation of unitary patent protection [2012] OJ L 361/1, Art 8.

[58]C Jewell 'Licences of right in European Patent Convention (EPC) territories and with respect to European unitary patents' *BeckGreener* (September 2017), https://www.beckgreener.com/licences-of-right-in-european-patent-convention-epc-territories-and-with-respect-to-european-unitary-patents/. For example, see German Patent Act, s 23.

[59]See Patent Law of the People's Republic of China, Arts 50–52.

[60]Regarding compulsory endorsement of licences of right, if a patentee is found to have abused their monopoly under s 48 of the 1977 Act (as amended), the Comptroller may, as a remedy, issue an order making the patent available for licences as of right. See s 48(1)(b) and 48(2)(b) of Patents Act 1977 (as amended).

[61]There was a third type of endorsement, statutory endorsement. The 1977 Act extended the term of all existing patents under the 1949 Act that had at least five years remaining, from 16 to 20 years. However, for the duration of this extension, these patents were treated as endorsed with licences of right. This provision now only holds historical interest as all such endorsed patents have since expired. See Lord Justice Colin Birss et al *Terrell on the Law of Patents* (Sweet & Maxwell, 19th edn, 2023) at para 17-168, and *Allen*, above n 53, at 244 per Lord Diplock.

[62]Voluntary endorsement of licences of right is contained in s 46 of the 1977 Act titled 'Patentee's application for entry in register that licences are available as of right'.

[63]*Allen and Hanburys Ltd v Generics (UK) Ltd* [1988] FSR 312.

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to be agreed between the parties or in default of agreement on terms settled by the Comptroller'.[64] In return, the patentee receives a reduction in the patent renewal fee (usually a 50% reduction),[65] and can gain reasonable revenues from offering non-exclusive licences.[66] When licences under the patent are to be available as of right, any person is entitled, at any time thereafter, to obtain a licence under the patent on terms agreed upon by the parties or, failing such agreement, on terms determined by the Comptroller upon application by the proprietor or the prospective licensee.[67]

Central to the licences of right system are the key actors who collectively shape and sustain the licences of right system. Patent owners serve as the primary resource contributors to the system, making their inventions available for non-exclusive licensing. Licensees are the active users of these inventions, accessing them through the payment of royalties. Overseeing the smooth functioning of the system is the Comptroller, a central administrative authority vested with critical responsibilities,[68] including evaluating applications for registration under the licences of right system, determining the terms of individual licences, ensuring compliance with the system's rules, and adjudicating any disputes that may arise between the participating parties. In instances where judicial interpretation of the system's rules is required or the decisions by the Comptroller are appealed, the courts may also become involved.[69]

(a) The licences of right system through the lens of infrastructure theory

The institutional arrangement of the licences of right system aligns closely with the commons management strategy advocated by Frischmann, characterised by its open and non-discriminatory nature.

At the participation level, the system exhibits a striking degree of openness. It is open to any patentee to participate in the creation of resources.[70] The process for participation is that any patentee can make an application to the Comptroller indicting his or her intention to make the licence under the patent available as of right.[71] The Comptroller will allow such an application and make an entry in the register if no contract precludes the patentee from granting a licence.[72] Then patents endorsed with licence of right are listed on a dedicated webpage for the licences of right system provided by UK Intellectual Property Office.[73]

The access rule is equally unbounded in its openness. Anyone in the world can obtain a licence for the use of the resources.[74] Once a patent is endorsed with the words 'licences of right' and enters the system, anyone is 'entitled as of right to a licence under the patent on such terms'[75] as agreed by the parties or

[64] *Merck Canada Inc v Sigma Pharmaceuticals plc* [2012] EWPCC 18, [2013] RPC 1; Birss et al, above n 61, at para 17-164; Patents Act 1977, s 46(1) (as amended). A patentee may apply to the Comptroller, indicating their intention to make the licence under the patent available as of right. The application is submitted using Patents Form 28. If no contract prevents the patentee from granting a licence, the Comptroller will approve the application and record the entry in the register. See Patents Act 1977, s 46(2) (as amended) and Patents Rules 2007, r 43(1). Then patents endorsed with licence of right are listed on a dedicated webpage for the licences of right system provided by UK Intellectual Property Office at https://www.ipo.gov.uk/p-dl-licenceofright.htm.

[65] Patents Act 1977, s 46(3)(d) (as amended).

[66] Birss et al, above n 61, at para 17-164.

[67] Patents Act 1977, s 46(3)(a) (as amended); Birss et al, above n 61, at para 17-169.

[68] The Comptroller is the person at the UK Intellectual Property Office who is centralised with managing and adjudicating intellectual property-related matters. One of the Comptroller's responsibilities is to decide on most disputes concerning patents. For the role of the Comptroller in resolving patents-related disputes, see UK Intellectual Property Office 'Patents: deciding disputes' (2019), https://assets.publishing.service.gov.uk/media/5cc03c46e5274a4678b80f03/Deciding-Disputes-rebrand-2019.pdf.

[69] See eg Patents Act 1977, s 46(3)(c), 46(3A) and 46(4) (as amended).

[70] Ibid, s 46(1) (as amended).

[71] Ibid, s 46(1).

[72] Ibid, s 46(2).

[73] See above n 64.

[74] Patents Act 1977, s 46(3)(a) (as amended); Birss et al, above n 61, at para 17-169.

[75] Patents Act 1977, s 46(3)(a) (as amended).

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settled by the Comptroller. A licence must be granted if required,[76] since anyone has a right to it.[77] Consequently, this right to a licence transcends the circle of resource contributors, extending the benefit to even outsiders who did not participate in resource creation.

The commitment to non-discrimination is manifested in the methodical approach employed by the Comptroller to establish licensing terms. Both the patentee and the licensee have the autonomy to negotiate the terms of a licence.[78] In instances where an agreement on the terms of a licence cannot be reached, either party is entitled to seek the intervention of the Comptroller to establish the terms.[79] A term that the Comptroller often decides upon is the royalty term, which is set based on what a willing licensor and a willing licensee would agree upon.[80] The primary method employed by the Comptroller for setting royalties is the comparable licence approach, which involves ascertaining the term by reference to pre-existing agreements between the patentee and other licensees for the same or similar products.[81] By grounding the royalty determination in these analogous licence agreements, this approach ensures that the outcome does not depend on the identity of an individual licensee.

The very objective animating the establishment of licences of right system mirrors another alignment with the demand-side theory of infrastructure. As discussed in the previous section, a demand-side agenda of promoting productive activities sits at the very heart of this theory. In line with this, the licences of right system is aimed at advancing a demand-side objective, which is to encourage the working of inventions within the UK.

This demand-side objective was consistently pursued from the 1919 Act through to the 1977 Act.[82] In the 1919 Act, the Comptroller, when settling the terms of a licence for a patent under the licences of right system, was directed to

> … endeavour to secure the widest possible user of the invention in the United Kingdom consistent with the patentee deriving a reasonable advantage from his patent rights.[83]

This demand-side pursuit is continuously pursued in section 50(1) the 1977 Act, which directs the Comptroller, when settling licence terms, to ensure that

> inventions which can be worked on a commercial scale in the United Kingdom and which should in the public interest be so worked shall be worked there without undue delay and to the fullest extent that is reasonably practicable.[84]

To achieve this demand-side, the licences of right system serves as a mechanism to catalyse the early working of patented inventions in the UK by offering financial incentives to resource-constrained patentees. This approach helps address two challenges faced by these patentees in patent commercialisation: securing

[76] *Allen*, above n 53, at 248 per Lord Diplock; *EI Du Pont de Nemours & Co (Blades') Patent* [1988] RPC 479.

[77] *Allen*, above n 53, at 256 per Lord Templeman; *Casson's Patent* [1971] RPC 91; *Hoffmann-La Roche AG & Geigy SA v Inter-Continental Pharmaceuticals Ltd (Patent, Interlocutory Injunction CA)* [1965] RPC 226 at 233.

[78] Patents Act 1977, s 46(3)(a) (as amended); *Merck*, above n 64.

[79] Patents Act 1977, s 46(3)(a) and (3)(b) (as amended); *Merck*, above n 64.

[80] *Smith Kline & French Laboratories Ltd's (Cimetidine) Patents* [1990] RPC 203.

[81] Ibid; UK Intellectual Property Office *Manual of Patent Practice* (2023) s 46.36.

[82] *Research Corporation's (Carboplatin) Patent* [1990] RPC 663 at 693 per Hoffmann J; *Allen*, above n 53, at 248–250 per Lord Diplock.

[83] Patents and Designs Act 1919, s 24(1)(b)(i) (original version as enacted); *Allen*, above n 53, at 246 per Lord Diplock.

[84] Patents Act 1977, s 50(1)(a) (as amended). While the objectives outlined in s 50(1) of the 1977 Act are for the exercise of power by the Comptroller under compulsory endorsement of licences of right, Lord Diplock in *Allen*, the leading case by the House of Lords concerning the licences of right, held that these objectives also need to be secured when the Comptroller determines the terms of a licence of right under voluntary endorsement, since compulsory endorsement and voluntary endorsement have the same effect for all purposes by s 53(4) of the 1977 Act: see *Allen*, above n 53, at 247–249 per Lord Diplock. For this demand-side objective in the 1949 Act, see s 39(1)(a) and s 45(2) of the 1949 Act (original version as enacted).

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adequate finance for bringing inventions to market; and managing the high costs associated with obtaining and maintaining patent protection.

First, the licences of right system targets these resource-constrained patentees who struggle to secure sufficient financial backing for commercialisation, as emphasised by Lord Birkenhead during the parliamentary debates on the Patents and Designs Bill, which led to the enactment of the Patents and Designs Act 1919. He highlighted that the system is:

> … specially designed to encourage the bringing of inventions to commercial use at the earliest possible moment, and it is hoped also that this clause will be of great assistance to the poorer inventor. … It is hoped that this provision will be a great boon to the poorer inventor who cannot find sufficient financial support and who is often unable to place himself in touch with those who might be disposed to utilise his invention. It is also believed that it will be found an advantage to those manufacturers who desire to make an early use of any important improvements in processes or in machinery.[85]

As to the second challenge, historically, the financial burden of obtaining and maintaining patent protection has been substantial.[86] As early as 1907, the patent application fee in the UK was set below £10.[87] However the aggregate fees for renewing patent protection throughout a patent's lifespan approached £150.[88] These cumulative renewal fees saw a steady increase, rising to £190 as per the 1949 Act,[89] then to £1,828 according to the Patents Rules of 1982,[90] and reaching £3,310 with the Patents (Fees) Rules 2007.[91] Present-day figures indicate that the total renewal fees for a patent's entire duration now stand at £4,640.[92] Importantly, these amounts do not include the escalated patent application fees and the professional charges levied by patent attorneys, which would substantially contribute to the total expense of securing and maintaining patent protection.

The licences of right system emerges as a strategic solution to both of these challenges. The system enables financially constrained patentees to reap a reasonable return on their inventions through a non-exclusive licensing arrangement, while alleviating their onerous patent renewal fee burden. Meanwhile, by mitigating the barrier of securing a licence for the freedom to operate, the licences of right system facilitates a prompt access by the public to patented technologies. This approach encourages the rapid spread of production across multiple producers, addressing a frequent issue within the patent system: the slow expansion of the production of patented articles, often due to the uncertainties around licensing.[93]

By analysing the licences of right system through the lens of the demand-side theory of infrastructure, we can now develop a demand-side account for understanding voluntary licensing schemes.

First, as discussed in the previous section, the implication of the demand-side theory of infrastructure for the patent system is to develop a demand-side framework aligned with the commons management strategy suggested by Frischmann, thereby facilitating public access to inventions for productive use. However, the introduction of such a demand-side framework within the patent system raises a crucial question about its coexistence with the established supply-side-oriented structure for the grant of patents. This consideration is particularly relevant given two key factors: (i) not all inventions meet

[85] *Hansard* HL Deb, vol 37, cols 221–239, 12 November 1919, per Lord Birkenhead.

[86] R Burrell and C Kelly 'Public rewards and innovation policy: lessons from the eighteenth and early nineteenth centuries' (2014) 77 Modern Law Review 858; B Sherman and L Bently *The Making of Modern Intellectual Property Law: The British Experience, 1760–1911* (Cambridge: Cambridge University Press, 2003) pp 81–82, 91 and 98.

[87] See Patents and Designs Act 1907, Sch 1 (original version as enacted).

[88] Ibid.

[89] See Patents Act 1949, Sch 1 (original version as enacted).

[90] See Patents Rules 1982, SI 1982/717, Sch 1 (original version as enacted).

[91] See Patents (Fees) Rules 2007, SI 2007/3292, Sch 2 (original version as enacted).

[92] See Patents and Patents and Trade Marks (Fees) (Amendment) Rules 2010, SI 2010/33, r 11; Patents and Patents (Fees) (Amendment) Rules 2017, SI 2017/1100, r 10.

[93] A Plant 'The economic theory concerning patents for invention' (1934) 1 Economica 30.

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the criteria for infrastructural resources, and (ii) there remains a legitimate concern over the potential undersupply of intellectual property. Consequently, the wholesale replacement of the current supply-side oriented structure with a demand-side framework, or the indiscriminate application of such a framework to every invention, would be both unnecessary and unfounded.

A pragmatic way is to position the demand-side framework as a complementary element to the existing supply-side-oriented structure for patent grant within the patent system. Rather than disrupting or interfering with the current framework for patent grant, the demand-side framework functions as an additional layer that targets already patented inventions. Importantly, this incremental strategy allows the patent system to maintain its established supply-side mechanisms – focused on incentivising the creation of inventions – while simultaneously addressing demand-side considerations. By working within the contours of the existing system, this strategy offers a potentially more feasible and less disruptive pathway for integrating demand-side considerations.

The licences of right system exemplifies such a complementary demand-side framework within the patent system. Designed to promote the local working of patented inventions in the UK, this system only targets the existing inventions within the patent system, using financial incentives to encourage patentees to contribute their patented inventions into the licences of right system. In doing so, it avoids disrupting the supply-side structure of the patent system. In addition, the licences of right system reconfigures inventions contributed by patentees into shared resources, making them accessible to anyone in the world on non-discriminatory terms. This commons-based approach shifts decision-making to the public, allowing individuals and entities to determine how best to utilise a diverse pool of inventions with uncertain future social value. Such a model reflects the public functions of commons management by enabling non-exclusive licensing, where the public gains access to resources for productive activities. This design aligns closely with Frischmann's economic policy recommendation, which advocates leveraging nonrivalry to support non-discriminatory access to resources for productive use.

Secondly, positioning the demand-side framework as a complement to the supply-side oriented structure for patent grant faces a new challenge, which stems from the fundamental nature of patent rights. Existing patented inventions begin their lifecycle rooted in the realm of private ownership. Patent rights are designed to exclude others from accessing the invention without permission. This initial private status inherently contradicts the commons management strategy advocated by Frischmann. This exclusive nature presents a substantial obstacle to the operation of a demand-side framework, which relies on open access and shared use. For inventions to transition into a shared resource setting within a demand-side framework, it necessitates the development of mechanisms that can effectively bridge this gap.

The licences of right system offers a solution to this challenge by implementing a conditional suspension of patentees' control over the use of the invention through their exclusive rights.[94] A key feature of this system is the statutory limitation on injunctive relief where no injunction shall be granted against an infringer of a patent within the licences of right system, provided the infringer undertakes to take a licence for local working of the invention.[95] The substance of the patentee's exclusive rights is appreciably altered as a result.[96]

Thirdly, another question emerges regarding the licences of right system: given that participation requires patentees to suspend the exclusive rights granted by the patent system's supply-side structure, what motivates them to voluntarily subject their inventions to this demand-side framework?

The solution offered by the licences of right system is founded on two key principles that address both the economic interests and autonomy concerns of patentees. First, the system employs targeted financial incentives to motivate participation. The system provides patentees with a means of recouping reasonable return on their inventions through non-exclusive licensing,[97] while simultaneously alleviating the

[94] *Allen*, above n 53, at 255–256.
[95] Patents Act 1977, s 46(3)(c) (as amended); *Allen*, above n 53, at 258 per Lord Diplock.
[96] *Allen*, above n 63, at 324.
[97] Patents Act 1977, s 50(1)(b) (as amended); *Allen*, above n 53, at 256.

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burden of patent renewal fees. Secondly, it maintains the voluntary nature of participation, allowing patentees to determine the duration of their involvement and providing the option to withdraw their inventions from the system,[98] subject to predefined conditions.[99] The financial incentives and autonomy for participation are designed to balance the competing interests of private ownership and public access, facilitating the transition of privately held inventions into shared resources.

Overall, the licences of right system offers a compelling example of a complementary demand-side framework within the patent system. The development of such a demand-side framework faces a new supply-side challenge. This challenge centres on reconciling the exclusive nature of patent rights with the open-access nature of a commons-based approach. The demand-side framework must devise mechanisms to mitigate the barriers to public access created by exclusive patent rights, while simultaneously preserving incentives for patentees to contribute their inventions to the demand-side framework.

(b) The objective-driven approach for developing a demand-side framework

While the licences of right system aligns closely with the commons management strategy advocated by Frischmann, it has one notable departure in terms of intended use. Access to inventions under the licences of right system is not indiscriminately granted for any intended use. Instead, it does depend on the nature of intended use, thereby excluding certain applications from the scope of access. Specifically, under the licences of right system, if a prospective licensee's intended use is deemed to conflict with the system's demand-side objective, an application for such a licence can be denied. This limitation was determined in the landmark decision by the House of Lords in *Allen & Hanburys Ltd v Generics (UK) Ltd.*[100]

In this case, Allen & Hanburys Ltd (Allen) held a patent for salbutamol, a medication used to alleviate asthma and other respiratory disorders. This patent was listed in the licences of right system. Generics, a pharmaceutical company specialising in generic drugs, sought to import salbutamol manufactured in Italy into the UK and applied to Allen for a licence that would allow it to legally import the generic drugs. After being refused by Allen, Generics sought the Comptroller's intervention for determining the terms of the licence while notifying Allen about its imminent plans to import and sell the drug. In response, Allen brought an action for infringement in court, resulting in an injunction against the importation.[101] This injunction was later overturned by the Court of Appeal.[102] Allen then appealed to the House of Lords.

The main issue considered by the House of Lords was whether the Comptroller has a discretion under the 1977 Act to incorporate a term in a licence of right that either prohibits or limits the importation of patented products into the UK.[103] Generics argued that the Comptroller's discretion should be narrowly construed, limited to setting the terms of royalty fees and payment security.[104] However, the House of Lords rejected this interpretation and held that the Comptroller has the discretion to incorporate such a term.

In the leading judgment, through a close textual analysis of the relevant provisions of the licences of right system in the 1977 Act, Lord Diplock held that the Comptroller's discretion to settle terms in such a licence is, in fact, quite broad and expansive.[105] Then, Lord Diplock recognised that, since a licence settled by the Comptroller simply makes the licensee's actions lawful, the terms settled by the Comptroller 'cannot impose upon the licensee any positive obligation to do any of the acts so licensed'. [106] Lord

[98]Patents Act 1977, s 47(1) and (5) (as amended).
[99]Ibid, s 47(2) and (4).
[100]*Allen*, above n 53.
[101]*Allen & Hanburys Ltd v Generics (UK) Ltd (No 1)* [1985] FSR 229.
[102]*Allen & Hanburys Ltd v Generics (UK) Ltd (No 1)* [1985] FSR 610.
[103]*Allen*, above n 53, at 249 per Lord Diplock.
[104]Ibid, at 248 per Lord Diplock.
[105]Ibid.
[106]Ibid.

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Diplock considered these are the only constraints on the Comptroller's discretion to settle the terms of a licence of right and determined that:

> [t]he power of the Comptroller to impose limitations and conditions in a licence of right [i]s wide and fettered only in that there could be no positive obligation on the licensee to do any of the licensed acts and no term having the effect of debarring another person from applying for a similar licence. Recourse could be had to the provisions of section 48(3) and section 50 to identify the policy to be achieved [in exercising this power].[107]

Crucially, Lord Diplock then turned to the underlying legislative objectives of the licences of right system as embodied in section 50 of the 1977 Act.[108] His Lordship emphasised that these objectives form the essential context within which the Comptroller's discretion must be interpreted and exercised.[109] Notably, while section 50 explicitly addresses the exercise of power by the Comptroller in cases of compulsory endorsement of licences of right,[110] Lord Diplock extended this interpretative framework to voluntary endorsement.[111] This extension is based on section 53(4) of the 1977 Act, which provides that compulsory and voluntary endorsements have the same effect for all purposes.[112]

Lord Diplock's examination of the legislative objectives led him to reject the narrow construction proposed by Generics. He observed that patentees' entitlement to reasonable remuneration constitutes merely one of several objectives provided in section 50 that the Comptroller should secure when determining terms of a licence of right.[113] Crucially, section 50 also incorporates references to public interest and public advantage,[114] which are included in provisions aimed at promoting local working of inventions. This interpretation led Lord Diplock to conclude that, for patents under the licences of right system, the Comptroller has a discretion to incorporate a term in a licence of right that prohibits or restricts the importation of patented products into the UK.[115]

Lord Templeman's judgment in *Allen* provided a more explicit perspective on this. While dissenting from Lord Diplock's finding that the Comptroller has a wide discretion to impose limitations or conditions in a licence of right,[116] his Lordship concurred that the Comptroller has the power to prohibit or control importations when granting such a licence.[117] His Lordship emphasised that one of the grounds for compulsory endorsement of a licence of right is the importation of patented products from abroad when such importation hinders the working of inventions within the UK.[118] Lord Templeman also interpreted this explicit statutory recognition as a clear indication that the Comptroller should be empowered to prohibit or restrict licences granted solely for the purpose of importing patented products.[119] His Lordship emphasised that the purpose for such an endorsement would be wholly defeated unless the Comptroller is empowered to do so.[120]

[107]Ibid, at 205 and 248, modification added. In *Allen*, above n 53, Lord Diplock and Lord Bridge concurred that the Comptroller possesses a wide discretion in setting the terms of a licence of right, while Lord Templeman disagreed. Lord Fraser and Lord Brightman reserved their opinions on the issue. However, the House of Lords were unanimously agreed that the Comptroller has the discretion to incorporate a term in a licence of right that either prohibits or limits the importation of the patented products by the applicant. Subsequent court decisions have thus far leaned on the interpretation provided by Lord Diplock. See UK Intellectual Property Office *Manual of Patent Practice* (2023) ss 46.27 and 46.28.

[108]Patents Act 1977, ss 48 and 50 (original version as enacted).

[109]*Allen*, above n 53, at 249–250.

[110]Patents Act 1977, s 50(1) (original version as enacted).

[111]*Allen*, above n 53, at 249.

[112]Patents Act 1977, s 53(4) (original version as enacted).

[113]*Allen*, above n 53, at 248.

[114]Ibid, at 249–250.

[115]Ibid, at 249–250.

[116]Ibid, at 255.

[117]Ibid, at 257.

[118]Patents Act 1977, s 48(3)(c) (original version as enacted); *Allen*, above n 53, at 257.

[119]*Allen*, above n 53, at 257.

[120]Ibid, at 257.

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Allen illustrates that the licences of right system is not open to any intended use and it does discriminate certain access. This decision reveals a nuanced departure from the commons management strategy as advocated by Frischmann. However, this deviation should not be read as a wholesale rejection of this strategy. Instead, it points to an objective-driven implementation strategy.

Central to this approach is the demand-side objective underpinning the establishment of a demand-side framework. As in the licences of right system, the objective of encouraging domestic working of inventions in the UK serves as the fundamental driving force behind the system's establishment and operation. Without the aim of pursuing this objective, the system would likely not exist, leaving inventions as disparate private assets lacking an organised framework for shared use.

Allen illuminates the importance of positioning the demand-side objective as a central role in shaping the access to inventions, since certain types of access may defeat the demand-side objective pursued by a demand-side framework. Moreover, the judgments from Lord Diplock and Lord Templeman suggest that the level of openness and non-discrimination of the system can be instrumentally adjusted to further its objective. The system's focused pursuit of promoting domestic manufacturing of inventions logically precludes the grant of licences for intended uses that would defeat this objective. Whether through the imposition of negative obligations barring certain uses or the outright refusal to grant a licence, this objective-driven approach is essential for ensuring that the system's objective is not defeated.

Recognising the demand-side objective as foundational allows us to reframe the deviation from Frischmann's commons management strategy. While the strategy directs us to construct a demand-side framework in an open and non-discriminatory manner, as exemplified by the participation and access rules of the licences of right system, the English law experience in *Allen* suggests an objective-driven approach that the implementation should be calibrated to give effect to the specific demand-side objective at hand. This means that the level of openness and the degree of non-discrimination of a demand-side framework should be calibrated to align with and support its underlying demand-side objective.

Lastly, the ECJ's decision in *Allen* helps illustrate the influence of EU law on the operation of the licences of right system.[121] The House of Lords referred several questions to the ECJ for a preliminary ruling on the interpretation of Articles 30 and 36 of the EC Treaty.[122] This referral aimed to determine the compatibility of the rules concerning licences of right in English law with the Treaty's provisions on the free movement of goods.[123] Importantly, the ECJ ruled that Articles 30 and 36 of the EC Treaty preclude Member State courts and competent administrative authorities from granting injunctions or imposing terms on licensees that prevent the importation of products covered by a patent endorsed licence of right from other Member States.[124] The ECJ determined that such actions against an importer-infringer, under the circumstances presented in *Allen*, would constitute arbitrary discrimination prohibited by Articles 36 of the Treaty.[125] Moreover, the ECJ held that such discrimination could not be justified on the grounds of protecting industrial and commercial property.[126]

The ECJ's decision significantly undermines, if not entirely defeats, the demand-side objective the licences of right pursues. This ruling effectively allows licensees to exploit cost differentials across the EU, potentially relocating production to other Member States with lower manufacturing costs. Subsequently, these licensees can apply for a licence through the licences of right system to import the patented products into the UK. Therefore, this ruling creates a pathway for licensees to exploit the licences of right system in a manner that does not align with its demand-side objective of promoting the working of inventions in the UK.

[121] *Allen*, above n 63.

[122] Ibid, at 321–323. Consolidated versions of the Treaty on European Union and the Treaty on the Functioning of the European Union [2016] OJ C202/1, Arts 30 and 36.

[123] *Allen*, above n 63, at 321.

[124] Ibid, at 325–326.

[125] Ibid.

[126] Ibid.

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Nevertheless, the objective-driven approach established in *Allen* has been followed in the subsequent cases involving applications for licences for importation outside of the EU. In *Ciba-Geigy AG's Patent*,[127] the patent in question concerning the production of triaryl phosphates was endorsed with licence of right. FMC Corporation approached the patentee, Ciba-Geigy AG, seeking a licence to import the patented product from the US. After being rejected by the patentee, FMC Corporation sought Comptroller's intervention to determine the terms of the licence. The Comptroller allowed a licence to import. However, when the patentee appealed to the patent court, the Comptroller's decision was set aside by Falconer J.

Falconer J followed the decision from Lord Diplock in *Allen* and held that the Comptroller must align the exercise of his power with the policy objectives of the 1977 Act when determining the terms of a licence of right.[128] Falconer J considered that the patentee had established a stable manufacturing of the patented product in the UK.[129] Secondly, there was no indication that the patentee was failing to meet all the domestic demands for the patented product or failing to work the invention to the fullest extent.[130] Consequently, it was held that

> granting F.M.C. a licence to import, if it is taken up, as is indeed their stated intention, would inevitably mean that part of the whole demand would be met by that importation and therefore would not be met by working of the invention in the United Kingdom. That is a result quite contrary to the purpose set out in section 50(1)(a) and the policy of the Act as found in the fasciculus of sections dealing with compulsory licences.[131]

Similarly, in *Research Corporation's (Carboplatin) Patent*[132] an application for a licence under a patent endorsed with licence of right for the drug carboplatin was rejected by the court, since the applicant aimed to use the licence only to import the drug from Australia. Hoffmann J observed that:

> As Lord Diplock explained in *Allen & Hanburys Ltd. v Generics (UK) Ltd* the discretion to settle the terms of a licence of right must be exercised in accordance with policy which the legislation shows that licences of right were intended to implement. These provisions which go back to 1919 show that one of their principal purposes was to encourage the working of the invention in the United Kingdom.[133]

Hoffmann J held that granting such a licence allowing importation from outside the European Community would be contrary to this policy objective.[134] Moreover, the demand for this drug was being fully met on reasonable terms by the working of the invention in the UK.[135] Therefore, such an importation should be prohibited.[136]

3. The FRAND licensing system of the ETSI

This section conducts a comparative analysis between the licences of right system and another demand-side framework operating at the international level: the FRAND licensing system of the ETSI. As noted

[127][1986] RPC 403.
[128]Ibid, at 412.
[129]Ibid, at 415.
[130]Ibid.
[131]Ibid.
[132]*Research Corporation's (Carboplatin) Patent*, above n 82.
[133]Ibid, at 693.
[134]Ibid, at 694.
[135]Ibid, at 696.
[136]Ibid, at 696.

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by Advocate General Wathelet in *Huawei Technologies Co Ltd v ZTE Corp*,[137] these systems exhibit notable similarities.[138] This comparative examination serves two primary purposes. First, by exploring the similarities between these frameworks, it provides further support for the demand-side account of voluntary licensing schemes developed above. Secondly, the analysis of differences between the two systems illuminates how the objective-driven approach, proposed in the preceding section, is reflected in the FRAND licensing system. This comparison not only enhances our understanding of demand-side frameworks in different contexts but also offers insights into the adaptability of the objective-driven approach across varying scales and objectives within the broader intellectual property landscape.

(a) The standard development phase

A technical standard is a documented specification that outlines the technical requirements and solutions for a particular product, service, or system.[139] In the telecommunications industry, telecommunications technical standards ranging from 2G (GSM) to the latest 5G (5G NR) set forth the technical requirements and solutions for the wireless transmission of voice and data between mobile devices and base stations.[140]

These standards serve two primary purposes: ensuring interoperability and facilitating cross-border communication.[141] Interoperability allows products and services from various manufacturers and providers to function together seamlessly, enabling devices from different brands to communicate without compatibility issues.[142] Furthermore, these standards ensure that communication systems and data exchange can occur across international boundaries.[143] This consistency guarantees that telecommunications equipment and services operational in one jurisdiction can function seamlessly in another, thus supporting global connectivity.[144]

The ETSI is a standards setting organisation in the EU, dedicated to developing telecommunications standards.[145] ETSI's core mission is to achieve the objectives of producing 'the technical standards which are necessary to achieve a large unified European market for telecommunications…' and contributing 'to world-wide standardization' in that field.[146]

ETSI achieves the first objective by establishing telecommunications standards that harmonise the technologies required for wireless communication. This process is known as the standard development phase.[147] The standard development process involves ETSI inviting industry participants to submit their inventions as potential solutions to the technical challenges as specified in standards.[148] At this juncture, patentees must make a consequential choice, whether to have their patented inventions included in a standard.[149]

[137]Case C-170/13, EU:C:2015:477, [2015] 5 CMLR 14, [2016] RPC 4.

[138]Ibid, at 278.

[139]K Maskus et al (eds) *Patent Challenges for Standard-Setting in the Global Economy: Lessons from Information and Communication Technology* (The National Academies Press, 2013) p 1; M Lemley 'Intellectual property rights and standard-setting organisations' (2002) 90 California Law Review 1889 at 1896.

[140]N Abdelkafi et al *Understanding ICT Standardization – Principles and Practice* (ETSI, 2018) pp 1–12.

[141]*Unwired Planet International Ltd and Another v Huawei Technologies (UK) Co Ltd and Another* [2020] UKSC 37 at [4]; Abdelkafi et al, above n 140, p 16.

[142]Ibid.

[143]Ibid.

[144]Ibid.

[145]*Unwired*, above n 141, at [5].

[146]ETSI 'Statutes of the European Telecommunications Standards Institute' (1 December 2021) Art 2, https://portal.etsi.org/directives/46_directives_dec_2022.pdf; *Unwired*, above n 141, at [9].

[147]For a detailed explanation of standard development process, see I Nikolic *Licensing Standard Essential Patents: FRAND and the Internet of Things* (Oxford: Hart Publishing, 2021) ch 1.

[148]Nikolic, above n 147, pp 22–24; *Unwired*, above n 141, at [5].

[149]*Unwired*, above n 141, at [4]–[6].

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The implications of this inclusion are profound. The inclusion means patentees' inventions will be recognised as essential for compliance with a particular standard. The term essential here is of critical significance. This means that 'it is not possible …to make, sell, lease, otherwise dispose of, repair, use or operate EQUIPMENT or METHODS which comply with a STANDARD without infringing that IPR'.[150] In other words, to comply with a particular standard, it is necessary to use the inventions included in a standard to manufacture, sell, use, or operate standard-compliant products.

When considering whether to include a patented invention in a standard, ETSI requires patentees to give an irrevocable undertaking to grant licences for the use of its inventions on fair, reasonable, and non-discriminatory terms to implementers (FRAND commitment).[151] If a patentee opts to include its patented inventions into a standard, it must both disclose its patents and give the FRAND commitment to ETSI through a formal declaration.[152] Patents that cover inventions included into a standard are known as Standard Essential Patents (SEPs). Telecommunications standards developed by ETSI involve a vast number of SEPs, with estimates suggesting over 39,000 SEPs declared essential for 3G UMTS, over 45,000 for 4G LTE, and over 95,000 for 5G NR.[153]

(b) The FRAND licensing system and the standard implementation phase

To facilitate the achievement of the objective of contributing to worldwide standardisation in the field of telecommunications, ETSI has established the FRAND licensing system which enables any party interested in implementing a standard (the implementer) worldwide to access the inventions included in a standard.[154] Then implementers of a standard use these inventions to manufacture products that are compliant with a particular standard. This process is the standard implementation phase.

The FRAND licensing system shares several demand-side similarities with the licences of right system, yet their nuanced differences demonstrate how, just like the licences of right system, the FRAND licensing system's design is calibrated to its specific objective. First, like the licences of right system, the FRAND licensing system is a licensing framework established to promote a demand-side objective. However, while the licences of right system aims to promote the working of inventions locally in the UK, the FRAND licensing system's objective is to contribute to worldwide standardisation in the field of telecommunications. This global focus is particularly noteworthy,[155] as it aims to promote the working of inventions included in a standard on a global scale.

To support its demand-side objective, the FRAND licensing system is structured as an international licensing framework. Patents are inherently territorial in nature. Patentees can secure protection for the same invention through patents across multiple jurisdictions. This is particularly the case for the inventions included in a standard.[156] The FRAND licensing system's global approach enables implementers to obtain licences that permit the manufacture, sale, use, or operation of standard-compliant products across these various jurisdictions.[157]

Another similarity is that the access rule of the FRAND licensing system also aligns closely with the commons management strategy advocated by Frischmann, exhibiting a high degree of openness and non-discrimination. This system extends open access to the inventions included in a standard to any party worldwide interested in implementing the standard, as expanding the global community of standard implementers is instrumental in realising the demand-side objective of promoting a globalised

[150]ETSI 'ETSI intellectual property rights policy', above n 4, Art 15.6; See also *Unwired*, above n 141, at [6].

[151]ETSI 'ETSI intellectual property rights policy', above n 4, Art 6.1; *Unwired*, above n 141, at [6].

[152]ETSI 'ETSI intellectual property rights policy', above n 4, Arts 4 and 6; *Unwired*, above n 141, at [4]–[6].

[153]Nikolic, above n 147; J Baron and T Pohlmann 'Mapping standards to patents using declarations of standard-essential patents' (2018) 27 Journal of Economics & Management Strategy 504 at 521.

[154]*Unwired Planet International Ltd v Huawei Technologies Co Ltd* [2017] EWHC 2988 (Pat), [2017] RPC 19, at [806].

[155]*Optis Cellular Technology LLC and Athers v Apple Retail UK Ltd and Others* [2022] EWCA Civ 1411 at [6]; *Interdigital Technology Corpn and Others v Lenovo Group Ltd and Others* [2024] EWCA Civ 743 at [7].

[156]*Unwired*, above n 141, at [11].

[157]Ibid, at [11]-[12]; *Panasonic Holdings Corpn v Xiaomi Technology UK Ltd and Others* [2024] EWHC 1733 (Pat), at [4].

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telecommunications market. Moreover, the system's commitment to non-discriminatory terms means, as explained by the UK Supreme Court, that it requires patentees to grant licences on 'the same or similar terms to all similarly situated licensees, unless it can be shown that there are objective grounds for treating them differently'.[158] It guarantees comparable terms irrespective of an implementer's identity or other idiosyncratic characteristics.[159]

Under this system, inventions included in a standard become shared resources accessible to implementers worldwide for productive activities. Importantly, these inventions fit into Frischmann's expanded definition of infrastructural resources. First, since manufacturing standard-compliant products requires to use these technologies as inputs, the social demand for them is driven by downstream productive activities. Moreover, these technologies enable the creation of standard-compliant products across various categories, including private goods, public goods, and social goods. Private goods like smartphones benefit from these technologies to enhance user connectivity and experience. Public goods, such as the infrastructure within smart cities, leverage these technologies to bolster public services like road safety. Social goods, such as wireless technologies in smart health devices to facilitate real-time medical video consultations, significantly improve healthcare delivery in remote and underserved regions.

The spillover generated by these productive activities are substantial. The widespread adoption of standard compliant products for telecommunications is evident in the estimated 16.7 billion devices[160] comprising the Internet of Things (IoT).[161] The economic impact of the IoT is projected to reach US$5.5 trillion to US$12.6 trillion by 2025.[162] Therefore, the FRAND licensing system is a demand-side framework that exemplifies Frischmann's recommendation of leveraging nonrivalry to support open and non-discriminatory access for productive use that generates positive spillovers for society.

Nevertheless, the necessity of bridging the gap between the exclusive nature of patent rights and the open-access nature of a commons-based approach is particularly pressing in the context of the FRAND licensing, more so than in the licences of right system, for two key reasons. First, standard implementers need to utilise the inventions included in a standard to manufacture compliant products. Non-availability of these inventions can lead not only to the waste of investment in 'the preparation, adoption and application' of a particular standard,[163] but also potentially to its abandonment.[164] Secondly, the private nature of these inventions empowers patent owners to potentially prohibit their use in specific national jurisdictions through injunctions or to demand excessive royalties under the threat of injunctions.[165] This is known as the issue of patent holdup, 'the ability of the owner of a SEP to hold implementers to ransom by reason of the incorporation of the invention into the standard by declining to grant them a licence at all or only granting one on unfair, unreasonable or discriminatory terms'.[166]

[158] *Unwired*, above n 141, at [106].

[159] Ibid, at [122].

[160] S Sinha 'State of IoT 2023: number of connected IoT devices growing 16% to 16.7 billion globally' *IoT Analytics* (24 May 2023), https://iot-analytics.com/number-connected-iot-devices/.

[161] IoT is the network of physical objects, embedded with wireless technologies, which relies upon the interoperability facilitated by telecommunications standards to seamlessly connect and exchange data with other devices and systems across the vast expanse of the internet. See Federal Trade Commission 'Internet of Things: privacy & security in a connected world' (2015), available at https://www.ftc.gov/system/files/documents/reports/federal-trade-commission-staff-report-november-2013-workshop-entitled-internet-things-privacy/150127iotrpt.pdf.

[162] M Chui et al 'The Internet of Things: catching up to an accelerating opportunity' (November 2021), https://www.mckinsey.com/~/media/mckinsey/business%20functions/mckinsey%20digital/our%20insights/iot%20value%20set%20to%20accelerate%20through%202030%20where%20and%20how%20to%20capture%20it/the-internet-of-things-catching-up-to-an-accelerating-opportunity-final.pdf.

[163] ETSI 'ETSI intellectual property rights policy', above n 4, Art 3.1; *Unwired*, above n 141, at [12].

[164] ETSI 'ETSI intellectual property rights policy', above n 4, Art 8.2; *Unwired*, above n 141, at [12].

[165] *Unwired*, above n 141, at [4].

[166] *Unwired*, above n 154, at [92]. Also see *Unwired Planet International Ltd and Others v Huawei Technologies Co Ltd* [2018] EWCA Civ 2344 at [4]; *Unwired*, above n 141, at [4]. For commentary see M Lemley and C Shapiro 'Patent holdup and royalty stacking' (2007) 85 Texas Law Review 1991.

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This feature gives patent owners undue power to disrupt an otherwise global market to the detriment of implementers who manufacture equipment using these inventions.[167]

The mechanism designed to reconcile the tension between private assets and shared resources in the context of FRAND licensing bears striking similarities to that of the licences of right system. First, as suggested by the UK Supreme Court, the FRAND commitment in the ETSI intellectual property rights policy is a contractual derogation from a patent owner's right under general law to pursue injunctive relief for patent infringement.[168] This approach, akin to that of the licences of right system, imposes a suspension of patentees' control over the use of their inventions through their exclusive rights. Secondly, the FRAND commitment given by patentees establishes a contractual obligation to grant a licence to an implementer on FRAND terms.[169] As a result, any implementer of a standard can enforce this commitment against a patentee to obtain such a licence.[170] In instances where parties fail to reach an agreement on FRAND terms, the court can determine these terms on their behalf.[171]

The FRAND licensing system, however, adopts a different incentivising mechanism. It offers patentees a guaranteed market for licensing their SEPs to ensure that they are 'adequately and fairly rewarded'.[172] It serves an incentive to have and maintain their inventions included in a standard for shared use by implementers.[173] This approach leverages the inherent demand created by the standard where implementers must use these inventions to manufacture standard-compliant products, thereby inevitably seeking licences from the respective patentees and compensating them through royalty payments. Consequently, the inclusion of inventions in a standard ensures patentees a stable revenue stream through licensing practices.[174]

This arrangement creates a bargain between ETSI and patentees: a guaranteed licensing market is exchanged for the global shared use of these inventions among all implementers. The fundamental driving force behind this bargain is the demand-side objective of the FRAND licensing system, because the bargain aims to ensure the availability of these inventions for effective standard implementation on a global scale.

Therefore, the FRAND licensing system, in its essence, imposes a nuanced restriction on access, limiting it to implementers willing to enter into licences on FRAND terms, particularly those prepared to pay FRAND royalties. This limitation is indeed fundamental to ensure effective standard implementation, which relies on patentees receiving the economic benefits promised in the bargain, without the spectre of injunctive relief holding up the implementation of a standard.[175] By calibrating access in such manner, the system aims to strike a balance between 'the needs of standardization for public use in the field of telecommunications and the rights of the owners of IPRs',[176] which is instrumental to the demand-side objective.

Overall, like the licences of right system, the FRAND licensing system represents a demand-side framework designed to ensure open access to patented inventions on non-discriminatory terms, thereby promoting their productive use. Both systems incorporate mechanisms to mitigate barriers to public access imposed by patent rights. However, the distinctions identified above emphasise the objective-

[167] *Unwired*, above n 141, at [4].
[168] Ibid, at [14].
[169] Ibid, at [14].
[170] Ibid, at [14].
[171] Ibid, at [14]. Such FRAND terms have been determined by English courts in *Unwired*, above n 154; *Optis Cellular Technology LLC and Others v Apple Retail UK Ltd and Others* [2023] EWHC 1095 (Ch); and *InterDigital Technology Corpn and Others v Lenovo Group Ltd and Others* [2023] EWHC 539 (Pat).
[172] ETSI 'ETSI intellectual property rights policy', above n 4, Art 3.2.
[173] *Unwired*, above n 141, at [5].
[174] Conversely, inventions not included in a standard risk becoming obsolete and may eventually disappear from the market. See *Unwired*, above n 141, at [5].
[175] *Unwired*, above n 141, at [10].
[176] ETSI 'ETSI intellectual property rights policy', above n 4, Art 3.1; *Optis*, above n 171, at [6]; *InterDigital*, above n 171, at [7].

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driven design of the FRAND licensing system, with its tailored features underscoring alignment with its global demand-side objective.

Conclusion

After analysing these two demand-side frameworks, we can consolidate insights into the underlying reasons and approaches that inform the establishment and design of these voluntary licensing schemes. First, these schemes are established to advance specific demand-side objectives. At the national level, the licences of right system functions as a demand-side framework within the patent system to promote local working of inventions, complementing the supply-side oriented structure for patent grant. At the international level, the FRAND licensing system serves as a global demand-side framework to promote the working of inventions on a worldwide scale.

Secondly, the institutional arrangement of these frameworks closely aligns with the commons management strategy applied to traditional infrastructural resources, characterised by open access to inventions on non-discriminatory terms. This alignment facilitates public access to inventions for productive activities. However, their institutional arrangements are further qualified by the underlying demand-side objectives that initially motivated their creation. This objective-driven approach carries normative implications, aiming to facilitate the achievement or prevent the defeat of the specific demand-side objectives underpinning the establishment of these frameworks.

Thirdly, the development of such a demand-side framework faces a new supply-side challenge: bridging the gap between the exclusive nature of patent rights and the open-access nature of a commons-based approach. The demand-side framework must devise mechanisms to mitigate the barriers to public access created by patent rights, while simultaneously preserving incentives for patentees to contribute their inventions to demand-side frameworks. This balance enables the operation of demand-side frameworks that rely on public access and shared use.

As exemplified by the British patent system, the mechanisms for advancing demand-side objectives have shifted from relying on granting privileges in exchange for the obligation of working inventions locally by patentees, to more sophisticated mechanisms, including integrating a demand-side framework within the patent system. The UK's licences of right system has been significantly frustrated in achieving its demand-side objective due to the constraints imposed by EU law, but other countries outside the EU have not been similarly affected. These countries may find value in referencing the UK model when developing their own structures tailored to their own demand-side objectives. In addition, in the post-Brexit era, the UK may consider deviating from the ECJ's decision in *Allen* to revitalise the function of its licences of right system. Last, the global proliferation of standards across diverse industries presents new avenues for countries to advance demand-side objectives through participation of local firms in the manufacture of standard-compliant products, either as component suppliers or end-product manufacturers. This pathway offers a means to foster a country's industrial development, particularly given the expansive global market for standard-compliant products.

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