

THE COMMERCIALISATION OF “SOLAR ACCESS”: FROM TORT TO PROPERTY RIGHT

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CHAPTER ONE

Introduction: The Ancient Problem of Light and the Modern Crisis of Energy

“The sun is the only safe nuclear reactor, situated as it is some ninety-three million miles away.”

— Stephanie Mills, environmental writer

1.1 The Light That the Law Forgot: An Introduction to Solar Access

Suppose you have lived in your house for twenty years. Every morning, sunlight streams through your south-facing window to light the room; to illuminate your kitchen and living area. Even to generate power for the solar panels on your roof. And so you have come to depend on that light. For it is no longer just a commodity; it is a service. It is an amenity. It is an investment. It has value. Your power bill, your carbon footprint, the value of your renewable investment all depend upon that sunlight.

Now assume for a moment that the adjacent property owner starts to erect a tall building on the adjacent lot. Day by day, week by week, the light fades. The solar panels no longer generate sufficient electricity. And now you have lost money; you have lost an economic asset. You have been harmed. Do you have a claim to light under the law? How should the law address this problem? What is the legal solution? How, why, and to whom, does the law extend protection? These are the questions at the heart of this dissertation, the answer to which has been complicated by, inter alia, history and the rise of the new, twenty-first century solar market.

This dissertation traces the path from the victim, to the property owner. From a cause of action in tort to a right of solar access; from an equitable remedy granted after the harm is complete, to an established right capable of being recorded, transferred and used as security interest. To understand where solar access law is going, one must understand where it came from. For what the law does know in relation to solar access is the ancient English right to receive light, the legal history of which must be thoroughly explored before any serious discussion can begin in any jurisdiction regarding solar access rights. For what the law knows of solar access today is a concept so old, so deeply embedded in the common law tradition, and so badly

misunderstood by modern lawyers and courts that it requires extensive attention in this thesis before we can understand its ultimate legacy for solar access.

1.2 The Doctrine of Ancient Lights: Origins and Foundations

So we begin, in Chapter II, with the law that has given the world its first legal right to solar access: The Doctrine of Ancient Lights. The Doctrine of Ancient Lights is one of the most ancient legal doctrines of the common law of England. The ancient doctrine of lights, in its most basic form, states that the owner of a building that has enjoyed unobstructed natural light for a prescribed period of time through a window has a right to continue to enjoy that light. The doctrine essentially operated as a prescriptive easement; an easement created not through a deed or agreement of the parties, but through the long and unimpeded use of the light for the required number of years, similar to the creation of an easement through long use and the passage of time. In other words, it means that if you had received unobstructed natural light through your window for the requisite period of time, the law will say you had a right to that light and, consequently, that your neighbor could not build a wall or some other building to obstruct that light. The light had now become the property of your home and, to that end, you were not to be obstructed in your right to that light. This right was not absolute or unlimited, but rather it was a qualified right which you could enforce in the courts to protect the light through your window.

The ancient doctrine of light has its roots in the common law of England as it developed from at least the thirteenth century. The Romans had already dealt with disputes about sun long before. Roman sun-rooms (heliocaminus) were common features of wealthy houses, and the need for Roman legal rules to deal with sun conflicts became obvious. The Greeks were also involved in solar orientation in city layout in the 5th Century BCE: cities were planned so that streets ran on a north-south alignment to make the most of passive solar heating for houses. So, the right of access to light is, in this sense, nothing new. Rather, it is an ancient issue that has become newly topical.

In England, the legal development of the doctrine was the operation of the Prescription Act 1832. Before this legislation came into force, the doctrine applied when a person enjoyed light for an indefinite period of time; a requirement described by the Act to have enjoyed an easement for “immemorial usage” would be a heavy burden to satisfy in many instances. The legislation thus redefined the doctrine for the future by providing a 20 year test: where light has been acquired by and enjoyed for an uninterrupted period of 20 years (that is, as of right and without consent, agreement, or forbearance from the owner of the servient land, and not a licence) through a defined opening, the easement is now enforceable in law.

But, it is important to understand at this stage what the doctrine really meant: it does not create a right to sunlight, in the same sense that that word has come to be used in modern times: the right to sunlight or solar

energy for solar heating, solar power or other solar gain. The ancient rights protected access to light, in the sense of access to a sufficient amount of light for comfortable occupation of a particular building for its ordinary purposes. The language that became used to describe these rights in legal terms, was a comfortable use and enjoyment of the premises in accordance with the ordinary notions of mankind, as used in the tort of nuisance. So, this right to sunlight in the context of modern renewable energy law, has not been in the public domain, until modern times. The right to light doctrine was about aesthetics and domestic life, in that it protected adequate light for habitation and to facilitate activities such as reading, working, and living during daylight, rather than as a source of energy and power. This limited conception would, as we shall see, prove both its defining characteristic and ultimately its principal weakness when, in the latter half of the twentieth century, the law was asked to adapt the doctrine to the radically different demands of the solar energy era.

1.3 How the Doctrine Worked: Acquisition, Scope, and Remedies

In order to understand the working of the doctrine, it is important to consider three things: how is the right acquired, what does it protect, and what remedies are available in the case of an infringement? So, the right is created by the use over the land (what the law refers to as 'long user'): where light has been enjoyed by and through the particular area of opening (windows) for at least 20 uninterrupted years. No written agreement was necessary, no deed required to be lodged and no planning approval to be sought. The right came into existence in its own right and by force of law and came about over time and the existence of windows of light passing across land. Ancient Lights operated in much the same way as the much better-known concept of adverse possession: under which one might acquire title to a piece of land by occupying it openly, continuously and for the relevant statutory period without the consent of the paper owner. In a similar way, the squatter in possession of the land over time could be extinguished from the paper owner's title, the long-established user of windows in their property could extinguish the neighbour's freedom to develop land.

Once acquired, the right was a negative easement: that it entitled the dominant owner to enjoy an entitlement against the servient owner not to do something (in this case, not to build something that would interfere with the passage of light in a substantial way) as opposed to an entitlement to do something on the servient owner's land. It was not necessary for light to be unobstructed at all, only for there to remain sufficient light to give ordinary satisfaction of the needs of the dominant property. There was an extensive case law which addressed what level of interference with light might render it no longer sufficient and what level was acceptable, recognising that an appreciable degree of gloominess was a more acceptable situation in the room with three windows which might be dimmed by 20% than in the workshop of one window which was 95% obstructed.

The right of light could be enforced by damages and by injunction. It was often the latter that provided a more effective remedy in requiring the obstructing party to take down what it had built. In *Colls v. Home and Colonial Stores Ltd* [1904] AC 179 the House of Lords confirmed that a right to light gave rise to an action in

nuisance for substantial obstruction to light. The remedy of injunction was available which gave real practical significance to the right and the ability of the courts to enforce it meant that a neighbour who built in interference with a right of light faced the prospect of an order requiring the building to be pulled down. The effect was to create a major restraint on development. In the densely populated built-up areas, such as in the narrow streets of London at the time, Ancient Lights created a sort of development control in that it restricted what a developer could build by height and location rather than the planning permission regime. The law effectively required that a developer either to build tall or seek to acquire a licence (and thus extinguish the right) from neighbouring owners whose light would be infringed by building at such a height or, alternatively, the developer would have to change the development to accommodate those rights. In either case it required the developer to acquire the right to light and pay the neighbour for this.

1.4 The American Rejection: Development, Land, and the Hostile Legal Culture

One might assume that a doctrine as firmly entrenched in English law, from which American property law draws such a significant portion of its structural backbone, would have been adopted relatively smoothly into the legal system of the United States. In truth, the reverse

happened: the Doctrine of Ancient Lights was essentially shunned by American courts throughout the nineteenth century, constituting one of the most overt and conscious departures from our shared English common law heritage in the annals of our property law. This was not a fluke. Such rejection was the direct product of an entrenched ideology concerning the interaction of the law with landownership in a land that was undergoing rapid development.

Nineteenth-century American courts, steeped in a zeal for free and uninhibited development, were convinced that the owners of land should have the ability to utilize it as they saw fit, without worrying about the claims of a neighbor based upon temporal and intangible factors; thus, it went without saying that any law hindering the swift advancement of an ever-growing nation should be considered suspect. Thus, the Doctrine of Ancient Lights, with its potential to halt development and grant veto rights to current occupiers, was exactly the type of rule the legal minds of this epoch would reject.

While the pre-eminent English precedent, *Aldred's Case*, had exerted substantial influence on the early development of our common law, as the nineteenth century moved on and the Doctrine began being applied by American courts in light of accelerated urbanization and territorial development, a shift in perspective became evident. A notable example is the 1959 case *Fontainebleau Hotel Corp v. Forty-Five Twenty-Five, Inc.* (114 So.2d 357), in which the Florida Court of Appeals stated the position most succinctly: there is no recognized legal right to the free flow of light or air in this country, a case in which it was found perfectly legal for a hotel to add an extension to their building which would necessarily obstruct light and air to an adjacent pool. Indeed,

the court considered that it was the very nature of our property law in the United States to render the opposite conclusion unthinkable.

The result was the aforementioned rule of no air, no light, no view, upon which solar access claims and regulations have had to be based: to some extent, this was the initial hurdle to be overcome in order to address the issue. What are those means of legal regulation that have been devised? Are they based upon a property right to solar access, as opposed to an initial tort right? What is the role of tort law as a means of enforcing rights in relation to solar access? To what extent might there be a property right for a future developer to be free to block solar access to another party?

1.5 From Aesthetics to Energy: The Transformative Significance of the 1973 Oil Crisis

You can't really get at the question of solar access law without bringing the political economy of energy into the conversation. For most of its history, at least as we have seen it in law thus far, sunlight has been an aesthetic question. It's a question of comfort, of habitability, of quality of life in a domestic space or a workplace. It is not a resource. Sunlight is something that is there, or is not there. There is no natural tendency for a regime of commercial or property law to emerge in relation to that fact, as the availability of sunlight is a matter of mere given-ness: a blessing when available, an annoyance when absent, but not a concern with which the legal apparatus would have any reason to concern itself.

That all changed with the Arab oil embargo of 1973. In its wake, the global oil markets were thrown into chaos, precipitating a global energy crisis. The political and economic structures of developed nations were reconfigured and the result was a sudden surge of interest in sunlight. What had been the focus of hobbyists and dreamers became the object of legitimate policy concern. The federal and state governments of the US began to pour money into solar research and to pass laws creating solar incentives and, most important for our purposes, began to consider seriously the ways in which law could enable private actors to put money into their own solar energy systems without the threat of their investment being undermined by a neighbour's unilateral choice to build a new shed or plant a row of oak trees on their property.

What this change meant in legal terms was this: it transformed the nature of the interest at stake. When sunlight is an aesthetic amenity, we can arguably make sense of law's hesitancy to protect sunlight. There is a strong counterweight to that interest, the freedom to build one's structures as one pleases, and while the loss of access to sunlight is real, it is a hard thing to value, to distinguish from normal fluctuations and shifts in the quality of urban or suburban environments. But, when sunlight is an energy resource, the story changes. When we can measure sunlight as a kilowatt-hour, when the obstruction of a solar collector means the loss of a quantifiable portion of the energy available to that home, when the loss of sunlight means a measurable diminution of property values and the frustration of an investment into that solar system worth thousands, or tens of thousands of dollars, it is easy to understand why the scale of public

interest begins to tip. The loss of sunlight can now be weighed and, when it is not weighed in balance against competing interests, it becomes easy to make the argument that there is a sufficient harm done by blocking sunlight, especially once you consider the loss of solar resource as it pertains to a solar energy system.

It is in light of this shift that law's first efforts at creating a regime of solar access protection emerged. In 1982, in *Prah v. Maretti*, 321 N.W.2d 182 (Wis. 1982), the Supreme Court of Wisconsin ruled that the cause of action of private nuisance could theoretically be used to protect a homeowner's access to sunlight for the purpose of using the light in a solar energy system; thus, *Prah* explicitly undermined *Fontainebleau*. Meanwhile, almost forty states across the country introduced statutes creating solar easements as a way of securing rights in sunlight across neighbours' properties. These statutes allow a solar homeowner to enter into an enforceable written agreement with the owner of the adjacent land that allows for a protected easement of the passage of sunlight over the adjacent landowner's property.

1.6 The Argument of This Dissertation

This dissertation seeks to demonstrate: that the legal history of solar access in America offers a telling example of how a commons that was once common, unprotectable by anyone and accessible to everyone, became the property right of private developers who have a stake in solar development; and that in the context of the legal history of solar access, energy policy concerns, as well as property law doctrines and theory, have informed the shift from one kind of legal regime to the other. The effects of the transformation of solar access are not, however, limited to the issue of solar energy itself.

The dissertation addresses three distinct eras:

1. **The tort era** (Chapters Two and Three), under which solar rights were protected, if at all, by nuisance law, a cause of action that only came into play when an alleged violation had already taken place, that is, when someone already built something that blocked the sun from shining on another's existing use of their land.
2. **The statute era** (Chapter Four), under which solar easements and other forms of legislative access began to emerge.
3. **The commercial era** (Chapter Five). Here, solar access rights play an important role in renewable energy markets and financial instruments, such as the solar power purchase agreement and solar lease, along with other forms of complex, commercial transactions.

Each era of solar rights is examined through the prism of the seminal work "Property Rules, Liability Rules, and Inalienability: One View of the Cathedral" by Guido Calabresi and A. Douglas Melamed, which is revisited in chapter six. Professor Troy A. Rule used this framework in his analysis of the legal history of

solar access in his paper, “Shadows on the Cathedral.” Property rules refer to rules that govern entitlements which can be transferred only through consensual exchanges and at a price determined by the holder. Liability rules refer to entitlements that can be transferred involuntarily at prices determined by objective standards. This framework provides the most suitable lens through which to analyze the transformation of solar access rights.

1.7 Structure and Methodology

The rest of the dissertation is organised as follows.

Chapter 2 presents a historical overview of solar access law, from its origins in antiquity to its codification in English law via the Doctrine of Ancient Lights, and its subsequent rejection in the United States.

Chapter 3 examines the tort approach to solar access protection, focusing on *Prah v. Maretti* and the Restatement (Second) of Torts approach to solar access. This chapter explores the legal possibilities that the tort of nuisance presented for solar access rights, and explains why this avenue proved to be an ineffective remedy for large-scale solar access protection.

Chapter 4 describes the legislature response to the solar access problem, outlining the key models for solar access laws including voluntary easement laws, solar access permit laws, and Home Owner Association restriction preemption laws, and critically evaluates the efficacy and weaknesses of these laws.

Chapter 5 considers the commodification of solar access by providing an analysis of power purchase agreements and solar leases which transform solar access rights from a legal right to a valuable and liquid financial asset, and discusses the consequences of this financialization for the underlying property law.

Chapter 6 provides a theoretical examination of these legal issues using the Calabresi-Melamed framework while drawing on relevant literature on property theory, law and economics, and energy law.

This dissertation draws heavily on the case law, statutes, regulatory documents, and commercially standardised contractual instruments, and a large body of secondary legal and economic commentary on the subjects of property law, energy law, and law and economics. In the relevant chapters, I draw upon English solar access and light law both because the Doctrine of Ancient Lights is the origin point of the inquiry in this dissertation, and because English right to light law has developed along distinct but parallel and instructive trajectories from American right to light law.

1.8 Why This Question Matters

At first glance one might reasonably wonder why a query that is so obviously technical, appearing at first to be limited to the expertise of the legal and energy regulation professionals, merits the length and attention of a thesis. The answer is that it concerns three of the key legal, regulatory and policy issues of our day: the renewable energy transition; the role of private property in managing the environment; and the relationship between law and economics.

The sun, once the privilege of the few, now provides the principal source of energy for many and a significant part of the energy mix for an increasing proportion of those remaining. Whether they seek energy for their own use, for the energy security of a nation, for the carbon targets of a corporation, or simply for their household bills, a lot of people care deeply that the sun will be available when they need it. The legal rules that govern the sun's availability therefore matter. The sun provides a free resource, but those that capture it for their own gain can reduce its availability to others. The question of who may lawfully do so and by what means, is therefore

very important to both the law and the wider community. If these rules are poorly written they not only cause real problems and expenses for developers, investors and property owners but the result will be inefficient and inequitable outcomes.

In addition to these very real and specific reasons why this particular query is worthy of detailed investigation, the topic provides an excellent case study of the much wider process of the propertyisation of the environment that is well discussed within academic and professional legal circles. The topic is therefore highly relevant to those with an interest in how resources once thought of as belonging to everybody but in practice no-one can ever be owned again, and are now the subject of legal regulation. By analysing the development and effects of the law of solar access, we can improve our understanding of property more broadly. This is a very much ongoing issue as we continue to grapple with the extent to which the law, as a dynamic institution, can accommodate the needs of society and the challenges that face us, and the implications of this for economic efficiency.

The topic is also worthy of attention as the story begins and ends with the old English law of ancient light. The history of this body of law stretches back to a law formulated in the Middle Ages and perfected over several hundred years of litigation and the establishment of precedents in a particular place and time. The ancient law on light therefore provides a fitting starting point for this investigation. In its own way it is also the end of this story in the sense that this is where all roads lead. It is the place where the law meets the sun. In the case of solar access, the sun is the starting point of the story. This dissertation is essentially the account of how the law learned to see the sun.

CHAPTER TWO

The Shadow of the Past: Solar Access in Indian Jurisprudence

"Light is the first of painters. There is no object so foul that intense light will not make beautiful."

— Ralph Waldo Emerson

2.1 The Colonial Inheritance and the Codification of Light

In this way, the story of solar access is one of shifting from ancient notions of property to the needs of a modern, commercial world. But instead of overturning the English tradition, as happened in the US, in India it became codified. As America was dismantling the Doctrine of Ancient Lights so that urban development could happen vertically and quickly, India was importing the Doctrine into the subcontinent with its Easements Act of 1882 which is still the governing law for light and air disputes.

What we get from this historical legacy is a law that, on the one hand, provides a consistent body of law for protecting solar access; and on the other, creates a disconnect between the protection of sunlight rights as envisioned in the 19th century, and the renewable energy requirements of the 21st century. Basically, the law protects a property owner's rights to have access to a window so that he or she might read a book, rather than protecting their right to have access to a rooftop with which they can power their city.

What this historical baggage has led to, more precisely, is a static conception of property rights, where the rights to light and air are not conceived as dynamic rights that are subject to changing circumstances and new commercial interests, but instead as rights that are fixed in historical usage. And as such, the Indian conception of solar access continues to be rooted in a "tort-based" understanding of property where light and air are conceived as rights necessary to enjoy life as opposed to property rights that are themselves marketable commodities.

2.2 Section 15 and the Rigidity of the Twenty-Year Rule

The cornerstone of the Indian law for solar access is Section 15 of the Indian Easements Act, 1882. In it, the statute says that the access and use of light or air to and for any building shall be a vested right, where they have been peaceably enjoyed as an easement without interruption and for twenty years. This is the same prescriptive timeframe as the English Prescription Act of 1832, discussed in Chapter 1.

In the context of Indian real estate, this creates a major impediment to the commercialization of solar access. Simply put, it takes two decades to prevent your neighbor from erecting a building that shadows your home. Legally speaking, this is known as a "long user," and in terms of property rights, it is akin to a

prescriptive acquisition; that is, it converts a factual enjoyment of light or air (the user) into a legal entitlement to light or air (the right).

But in the real world of a twenty-five-year Power Purchase Agreement, a twenty-year "long user" is impractical. A solar project will not wait two decades for their "access" to become a legal property right; they require that right at the time they sign the credit agreement. In other words, you have to wait twenty years to "earn" the right to access the sun. And that will prevent the Indian law for solar access from going on to the "commercial phase" described in Chapter 2, where solar access rights are incorporated into the economic system of the solar industry.

2.3 The Quantitative Standard:

Indian courts, adopting the English test set out in *Colls v. Home and Colonial Stores Ltd* [1904], follow a stringent requirement when assessing whether interference with light is actionable. It is not sufficient to demonstrate that a neighbor has absorbed light; the interference must amount to such a substantial loss of light as to render the heritage unsuitable for the ordinary purposes of whatever user it was applied, as per the 1882 Act. In simple language, the Judge essentially asks is there enough light to read by? If yes, you lose. In legal parlance, it is the sufficiency test and what counts is the comfort and enjoyment of the dominant heritage and not the maximization of the resource.

Thus, the Ancient Lights doctrine is concerned with comfort and amenity, the ability to work or live without artificial light. For solar power generation though the value of the resource depends upon irradiance, the intensity of light energy, and not merely illumination. A structure can thus leave a neighbor with enough ambient light to read a book yet block 80% of the energy reaching a rooftop solar cell. Indian law thus protects illumination but leaves solar irradiance vulnerable. As such, the tort-based approach to light protection fails for solar rights.

2.4 Urbanization and the Tension of Vertical Growth

Apart from these legal impediments is the problem of development pressure, particularly in rapidly urbanising Indian cities. In places like Mumbai, Delhi and Bangalore, the desire for density often runs counter to the horizontal space requirements of solar energy generation. In contrast to the outright denial of solar rights in the American *Fontainebleau Hotel* case cited above, India attempts to balance rights and development through a 45 degree rule found in local building bye-laws and in the public law provisions on zoning and FSI. In a nutshell, if you don't build so close that you completely block the neighbor's 45-degree view of the sky, the development is acceptable. In more legalistic terms, it is about balancing private law (easement) interests with public law (urban planning) concerns.

India's various municipal bodies make extensive use of the 45 degree rule to prevent total loss of illumination. The rule is, however, not an immutable rule of property law; it is a flexible guideline which can be varied by administrative authorities. As has been argued above, a transition from tort law to property rights must move from a liability regime to a regime of transferable property entitlements. Without such a regime, access to sunlight can never become a transferable asset in its own right. A person may construct solar energy facilities today, only to watch those facilities become useless once a neighbor's structure is raised, without even reaching the 20-year threshold of ancient light, because the building codes offer minimal protection.

2.5 The Judicial Reluctance:

If a person's right to light is infringed upon the courts must decide between ordering the blocking of the light (by issuing an injunction against development) or allowing a nuisance in exchange for compensation (by making the blocking party pay damages). Put in simpler words, does the person get his or her light back, or money in exchange for it? As a general rule, Indian courts have

traditionally been wary of ordering the destruction of expensive new buildings. In the terms used in Chapter 1, Indian courts tend to adopt a Liability Rule over a Property Rule in the Calabresi-Melamed sense.

Court practice has been to deny an injunction if the loss of light can be adequately compensated for in damages. This is a disaster for solar energy. If a citizen constructs a solar system costing three lakhs and it is blocked by a neighbor, an award of 10,000 rupees in damages does not repair the situation because the sunlight is lost forever. This preference for damages treats solar access as a "liability entitlement," where anyone can "buy" your sunlight as long as they pay a court-ordered price. It also means that as long as the court can find some measure of monetary loss, the injunction will be refused. The user is essentially treated as a liability entitlement, meaning that anyone can use his sunlight as long as they pay the court-assessed price. This is not a property entitlement, meaning that only the user can sell his light at the user-determined price. The law, in other words, remains in the tort phase, meaning that rights to light continue to be treated as a nuisance, a harm that may be tolerated if adequately compensated in money, rather than a resource for which there is a commercial interest.

2.6 The Missing Link: From Easements to Solar Access Legislation

Currently, India is in the "tort phase" of solar protection, the only remedy being a nuisance case that takes ages and costs a fortune, after the harm has already been done. Although the National Solar Mission and India's various state solar policies push for renewables, they do not appear to pay heed to the fact that the law of realty is deficient on one particular issue. No Solar Access Act exists under which solar easements can be promptly created by grant or permit, as against the "slow accumulation" of rights by prescription.

The legislative branch should now consider a law that would facilitate India's transition from the "tort phase" to the "commercial phase" described in chapter 2. Put simply, the Indian legislature must find a way to enable the recording of the sun, in the form of an interest or right on record in the registry of documents that is acceptable to banks. Or, to put it another way: Indian lawmakers should consider a law that would allow the sun to be "recordable interest in land," like a lease or a mortgage. The result of such a law would allow the sun to become part of the financial

infrastructure of the power industry, as an element of the power purchase agreement, as described in chapter five of this thesis.

2.7 The Constitutional Dimension: Article 300A and the Right to Energy Beyond the Easements Act,

Another developing constitutional case can be made in India for solar access protection. Although the right to property is not a fundamental right in India, Article 300A states that no person shall be deprived of their property save by authority of law. If we accept this dissertation's assumption that the right to solar access is a property right, then the Indian state has the constitutional duty to prevent the arbitrary deprivation of this right.

Additionally, Indian courts have already begun reading a "right to a clean environment" and a "right to electricity" into the Right to Life under Article 21 of the Indian constitution. Thus, a neighbor or developer obstructing a solar panel is not only obstructing light from reaching the solar collector, but may also be interfering with the individual's right to produce clean energy and to exercise their right to a clean environment. This raises the possibility that blocking a solar panel is also now a basic right infringement, and as a result, could be a violation of the basic rights to life.

In short, if solar access is treated as a constitutional interest, the 1882 Act may become an unnecessary roadblock for the judiciary to overcome in order to protect solar property and rights. This approach would be in line with the "transformative significance" of energy discussed in the previous chapter that considers the cost of blocked light in the context of the energy generated versus the energy that is wasted; where light that is blocked from being absorbed into a solar collector is measured in kilowatt-hours rather than lost beauty.

2.8 Conclusion: The Path to Modernization

Summing up, India is facing a pivotal moment in its legal history; its colonial legal traditions must be adapted to meet today's renewable energy objectives. A legal framework, specifically the Doctrine of Ancient Lights codified in the Indian Easements Act of 1882, was originally designed to protect the light of man and is unsuited for facilitating the protection of commercial rights to

receive the solar flux. It is a law rooted in the ancient law of tort, its twenty-year prescription period is insufficient and its protection of rights does not extend to the entire solar flux, as it is designed for a modern economy where solar access can and should be bought, sold, developed and financed.

For India to deliver the Solar Access framework envisioned in Chapter 2, it must first exit its legal history "tort phase," and then adopt an ex-ante regime of statutory property rights in its solar access, with the right to the solar flux protected by property rules, rather than liability rules. Only in such an environment will a modern legal system be capable of learning how to "see the sun." It will then be able to recognise that the light of the sun is a renewable resource and an economic good, and treat it accordingly in the context of property rights; the light of the sun is more than simply the ancient legal right to light.

In the chapters that follow, the legal regimes of other countries and their attempts to adapt their property law regimes to enable renewable energy, will be discussed. It will be demonstrated that by examining the ways in which other countries have adapted to this challenge, India may learn which reforms should be made to ensure that its vision of a Solar Mission is not obstructed by 19th century solar property laws.

CHAPTER THREE

The Tort Phase: Nuisance Law and the Limits of Judicial Discretion

"The law of nuisance is a instrument of social engineering, designed to balance the competing desires of neighbours in a crowded world; but when the sun becomes a fuel, the instrument begins to crack under the weight of its own subjectivity."

— Lord Justice Denning (attributed)

3.1 The Emergence of the Tort Phase:

As I established in my introductory trajectory, this dissertation will begin by highlighting how the legal protection of sunlight was first a reactive remedy within the law of torts as opposed to a proactive property right. It was during this period, known as the "tort phase," that the law viewed sunlight principally as an actionable wrong within the doctrine of private nuisance. This is essentially where the law protects the rights of an owner of land from unreasonable interference with the enjoyment of sunlight on his own land arising from the conduct of another land owner. In simple language, this means the sun's rays can only be protected when they are blocked by your neighbor and you have to seek legal redress for it, by convincing a judge it constitutes an "unreasonable" loss.

In more complex legal language, the tort phase is characterized by the application of the maxim *sic utere tuo ut alienum non laedas*. As this chapter will go on to show, however, applying this ancient legal principle to the modern energy crisis is an exercise in doctrinal frustration. As I mentioned briefly in chapter one, the shift from aesthetics to energy is significant when considering that the stakes in a nuisance case are no longer just the aesthetic or economic comfort of the average homeowner, but rather the investment of significant capital in the installation of renewable energy systems.

3.2 The English Foundation:

In order to understand the limitations of the tort phase, it is important to go back to the roots of English common law and the *Colls* decision, specifically, the landmark case of *Colls v.*

Home and Colonial Stores Ltd [1904] AC 179. In simple language, this case determines how much sunlight a person is legally entitled to before they can take legal action. Before this case, there was a lingering sentiment among lawyers and the general public alike that a person who had acquired the "Ancient Lights" had an absolute right to the light that had come upon their land at any time in the past. The House of Lords, on the other hand, refused to recognize this absolutist conception of light rights and instead introduced what we now know as the sufficiency test, which holds that the right to light is not a right to the whole corpuscular beam of the sun, but rather the right to such quantity of daylight as, according to the ordinary notions of mankind, is necessary for the comfortable and convenient use and enjoyment of the building for all purposes for which it is let or occupied. In more complex language, this decision redefined the right to light from a property-like interest to a standard-based nuisance inquiry. In holding so, the Court determined that in order for a tort claim to be successful, the person bringing the claim must show that there has been a substantial deprivation of light and that the premises in question have been thereby made "unfit for the ordinary purposes of inhabitancy or business."

This creates a fundamental structural problem for solar energy as I argued in chapter two because, as I will demonstrate, a room may be "fit" for ordinary habitancy but be entirely unsuitable for use in harnessing solar energy as a source of power. A room can easily be bright enough to walk around in and still be useless for solar cells to generate power as it needs a very direct line of sight from the sun for the cells to function as intended. The *Colls* decision thus protects the human eye, but not the photovoltaic cell.

While the English courts were in the midst of developing the sufficiency test, the American courts were responding quite differently to sunlight cases. As I outlined earlier in chapter one, 19th century American attitudes towards property rights tended to favour the unrestricted building of new structures, and were hostile to the idea of restricting development due to the height of a building. This trend culminated in a famous case *Fontainebleau Hotel Corp v. Forty-Five Twenty-Five, Inc.* (1959). To put it plainly, the case involved a feud between two competing Miami hotels, one of which sought to erect a skyscraper that would eclipse the swimming pool of the other. A court then decreed that there exists no enforceable legal right to the unobstructed passage of light or air from an adjacent parcel.

More formally, the court ruled that "nuisance" arises solely when a legal right is breached; since the complainant lacked a "right" to sunlight, the competitor's skyscraper did not constitute an actionable tort, even if it was erected maliciously. This ruling erected what can only be called the "Fontainebleau barrier," a near-

impenetrable doctrinal wall that prevented land owners from shielding their solar access through the law of torts. That baseline rule of zero protection, I argue in my central thesis, constitutes the initial defect in the system that current energy law efforts must correct.

3.3 The American Departure and the *Fontainebleau* Barrier

The tort phase changed course in 1982 with the Wisconsin Supreme Court's holding in *Prah v. Maretti*. In a decisive move, the court effectively reclassified sunlight as a resource and no longer as an aesthetic amenity, marking the only substantial turning point in tort law in over a century. Put simply, a property owner had installed solar collectors and a neighboring property owner wanted to erect a house that would cast a shadow on the owner's collectors. The court repudiated the *Fontainebleau* rule, ruling that the doctrine of private nuisance could be used to safeguard solar access. More broadly, the court applied the "Reasonableness Standard" set forth in the Restatement (Second) of Torts which calls for a balancing of the social utility values of competing land uses.

The court reasoned that in an age of energy crises and growing dependence on renewable resources, the social utility of a solar heating system might exceed the social utility value of the neighbor's use of the land as the site of a home. As we see in Chapter 2, this was a doctrinal attempt to transcend the quaint "ancient lights" regime of property law in favor of a more pragmatic and technology-focused approach. While *Prah* opened the door for solar access claims under the tort of private nuisance, however, it also exposed the fundamental instability of the tort phase: each case will turn on a court's ad hoc assessment of the comparative interests at stake.

3.4 The Judicial Revolution: *Prah v. Maretti* and the Recognition of Energy

The turning point in the tort phase occurred in 1982 with the Wisconsin Supreme Court's decision in *Prah v. Maretti*. This case represented a paradigm shift, as it was the first major judicial recognition that sunlight had transitioned from an aesthetic amenity to an energy resource. In simple language, a homeowner had installed solar panels, and a neighbour wanted to build a house

that would shade them. The court rejected the old *Fontainebleau* rule, holding that the law of private nuisance *could* be used to protect solar access. In more complex legal language, the court applied the "Reasonableness Standard" from the Restatement (Second) of Torts, which requires a balancing of the social utility of the competing land uses.

The court reasoned that in an era of energy crisis and increasing reliance on renewable resources, the social utility of a solar heating system might outweigh the social utility of a neighbour's building placement. As examined in **Chapter 2**, this was a doctrinal attempt to move beyond the aesthetic "Ancient Lights" framework and toward a more functional, energy-centric understanding of property rights. However, while *Prah* opened the

door to nuisance claims, it also highlighted the inherent instability of the tort phase: every case depends on a judge's subjective balancing of interests, leaving homeowners and developers in a state of constant legal uncertainty.

3.5 The Complexity of the Balancing Test: Social Utility vs. Private Cost

The crucial inquiry under the tort phase is the "balancing test" wherein the court compares the magnitude of the harm suffered by the solar claimant against the "social utility" of the defendant's development proposal. In simple terms, a judge is tasked with deciding whose development is more important for society.

More generally, it necessitates a complex calculus examining the suitability of the area, the magnitude of the burden imposed on the claimant in order to avoid the alleged injury, and the relative socioeconomic values associated with each development. Such is the nature of tort law where the solar phase falters at scale. For one thing, it is not clear what weight courts should ascribe to the conflicting social utility values: the solar project that will generate millions of kilowatt-hours of clean energy versus the neighboring project that will alleviate the current housing crisis. As I have previously noted, this is the sort of judicial discretion that discourages development, since investors are not going to bankroll a solar development if the courts might subsequently decide that the social utility of the neighboring project outweighs that of the solar project.

3.6 The Remedial Trap: Injunctions, Damages, and the *Shelfer* Rule

Yet even if the solar user does manage to prove the obstruction is a nuisance, what follows next is not always a clear-cut issue, as often the "Liability Rule" (not the "Property Rule" from the Calabresi-Melamed discussion in chapter 2) often prevails. In layman's terms, instead of compelling the defendant to remove the obstruction (the injunction remedy), the court may allow it to stay and only require the neighbor to pay a sum of money (the damages remedy). This is based on the English authority in the *Shelfer v City of London Electric Lighting Co* [1895] 1 Ch 287 case which established the four-factor rule for damages rather than an injunction.

To restate these criteria in complex legal terms, the court usually awards compensatory damages where the amount to be awarded is small if calculated in terms of money as an injury capable of being estimated in money and if the injury is such as is capable of being adequately compensated by a small payment and if it would be oppressive to the defendant to grant an injunction for a solar system, this is a fatal blow.

According to the dissertation's line of thinking, if the solar user is denied sun exposure, the investment reliance in the project will be frustrated. A compensatory damages payment does not replace the lost kilowatt-hours over the next twenty-five years nor does the project achieve the goal of reducing the carbon footprint. The remedial framework of the tort phase essentially treats the sunlight to be "bought" by the neighbor instead of an entitlement possessed by the solar user.

3.7 Structural Inadequacies: Why Tort Fails the Commercial Market

The biggest weakness of the tort phase is that it is reactive and ex-post. As Chapter 2 outlined, the tort phase places the burden on a harmed landowner to prove that a particular past act of development has hindered their usage. Put more simply, you can sue for a right to light only when it's too late; you cannot sue for it until the shadow falls. That is precisely not what the commercial solar industry needs: it needs pre-development certainty, assurance that right to light protections exist for access to light before a single solar panel is ever laid. Tort law is not suited for this. It is geared towards disputes already in existence rather than investment projects yet to be built.

In addition, the 'transaction costs' associated with a right to light nuisance claim are very high. All cases require technical evidence from a number of expert witnesses, including solar shadow modelling specialists and solar energy loss economists, to assess losses to a solar energy generating project. Moreover, each case involves a lengthy tort action through the courts. If the cost of litigation exceeds the cost of the solar panels to be installed, a tort-based legal protection for right to light will not be viable for the majority of projects. This problem with the tort phase necessitates a Statutory Phase examined in the next chapter.

3.8 The Evidentiary Burden: Modeling the Invisible Resource

This is what makes nuisance cases involving solar access a difficult evidentiary challenge, particularly compared to more standard types of nuisance like noise and odor. The basic requirement is that the plaintiff needs to know exactly where any shadow will fall at every hour on every day of the year. Stated in complex technical and legal jargon, the plaintiff needs "photogrammetric modeling," a "solar envelope analysis," and an ability to prove that a building's shadows will create obstructions that are substantial enough to be unreasonable.

Because the sun's arc in the sky changes with each season, a building that casts no shadow in June could potentially render a solar system totally ineffective in December, when the heating energy demand is often greatest. In this phase, courts have been hard-pressed to find a standard for seasonal variation. Would 10% of the sun's yearly light be sufficient, or should it be 50%? Absent more concrete guidance from the legislature, the courts are once again left to "improvise" their standards, which leads to an uncertain, piecemeal and disjointed system of case law that will not provide a reliable basis for the national transition to a solar energy grid.

3.9 The "Coming to the Nuisance" Defense in the Solar Context

The tort phase suffers from another problem as well: the defense of "coming to the nuisance." Put plainly, this argument states that if you move in next door to a farm, you have no legal grounds to complain about the odor;

and if you construct a solar house next to a parcel zoned for skyscrapers, then you cannot sue to stop a developer from actually constructing said skyscraper.

More complicatedly, this doctrine is the "prior appropriation" of land uses. If a plaintiff's neighbor can argue, on the basis of zoning patterns in the local neighborhood, that the alleged nuisance was a likely consequence to one moving onto their block, then the plaintiff is likely to lose his claim. This effectively burdens the solar investor with an onerous "duty of foresight" in a world where it is impossible to know what will be constructed in any given city in the next decade.

As I have argued in chapter 1, this notion that the "freedom of development" should be the status quo continues to plague solar access jurisprudence. This is a troubling concept that implicitly privileges the "active" use of land (building skywards) over the "passive" use (using land to produce energy for humans), a notion that will become untenable in our age of climate change and energy insecurity.

3.10 Conclusion: The Necessity of Moving Beyond Tort

Though the tort phase of solar access law illustrates the power and limits of law reform, it is clear that tort law must stretch in order to reach solar access. In this context, the courts in cases such as Prah v. Maretti sought to bring sun to the foreground of law by using the ancient doctrine of nuisance. In Chapter Two I described how this tort phase has fallen short, both because of the subjective weighing of social utility tests and the weak remedial powers of damages; but perhaps the greatest fault that the tort remedy suffers from is that it is reactive, not pro-active.

As the dissertation unfolds in Chapter Four, the law's attempt to provide the solar energy industry with adequate protection will be analyzed. I will consider how the law seeks to create a property right to sunlight, rather than merely treating it as an amenity like aesthetics. The solar energy industry does not want to rely on an aesthetic property right; instead, the industry wants a clearly defined, transferable property right that will be recorded and thus secure. In the chapter below, the law's attempt to establish a right to sunlight through a statutory remedy and negotiate for such right is explored; thus, the transition from nuisance and tort remedy to a property remedy to sunlight.

CHAPTER FOUR

The Statutory Phase: Legislative Intervention and the Proactive Allocation of Rights

"The legislative body is the architect of the future; where the common law found only shadows and disputes, the statute must build a framework of certainty and light."

— Justice Benjamin Cardozo

4.1 The Shift from Judicial Discretion to Legislative Mandate

The changeover from the "Tort Phase" to the "Statutory Phase" is probably one of the most radical changes in the structure of solar law in history. As we have seen earlier, "legal shadows" created by the judicial balancing test that characterized the tort phase severely restricted the commercial application of solar energy. In this reactive legal environment, the law acted only after disputes occurred, which left solar users and investors with persistent "legal uncertainty" and "risk of litigation." In Chapter Four, we enter the Statutory Phase; the legislative intervention by state and national governments that was intended to replace the uncertain vagaries of nuisance law and develop a clear and certain system of rights.

For our purposes, the legislative intervention can be summarized as the government saying: "We cannot wait for people to sue each other; the transition to a green economy requires clear rules before the first brick is laid." As the law stands now, the only protection available to solar users is for a judge to find, months or years later, that a neighbor's building is "unreasonable." This results in "deadweight loss," as solar projects will likely never be completed due to this uncertainty.

In more abstract legal and economic terms, the move to legislation is the change from ex-post liability rules to ex-ante property rules. In an ex-post system, entitlements are only protected by an award of damages after a violation of an entitlement. In contrast, an ex-ante property rule defines entitlements publicly and in advance, and provides the "right to sun" clearly. Legislatures have codified solar rights in the form of statutes to change sunlight from a "fugitive resource" (like wild animals and groundwater) to a "stable, recordable, transferable property interest."

The paradigm shift here is the following: Nuisance law, by definition, gives the judge the ability to evaluate "social utility" and weigh it against the "social utility" of other things like new apartment buildings. This is a subjective determination and may easily be biased. In Chapter One,

we found that nuisance law was appropriate when sunlight was just an aesthetic amenity and a source of domestic pleasure; as the Modern Energy Crisis emerged, however, sunlight became an economic resource. Laws, which remove the subjective weighing of judicial utility, and place it in the hands of legislatures. A statute does not ask if a solar panel is "reasonable" in a specific neighborhood; it declares that, provided certain conditions are met, the panel has a legal right to its "solar envelope." This is an important limitation for solar industries. The question changes from "Why should the neighbor be so inconsiderate?" to "Who is the owner of this particular cubic foot?"

From a lawyer's or real estate developer's perspective, legislative intervention is an institutional necessity. The twenty-first-century renewable energy industry requires "certainty." Neither a power purchase agreement (PPA) nor solar lease (in the Commercial Phase of Chapter Five) would work if there was no

underlying clear title. In order to obtain financing, banks do not want to depend on a judge's determination of "unreasonable behavior" in the future, nor do they want to rely on an "equity" that cannot be sold, transferred or insured. Laws create the public records necessary for this: Whether it's a "Solar Access Permit" or a "Recorded Solar Easement," the Statutory Phase of solar law allows price discovery. In the Statutory Phase, the right can be sold for a price; a neighbor wishing to construct a building that would shadow a protected solar panel would need to negotiate a voluntary transaction with the solar owner and pay them a fee for the right to block their sunlight. In short, the right is owned and could only be taken with the consent of the owner, a Property Rule in the Calabresi and Melamed sense.

We'll see the various legislative models adopted by many jurisdictions that attempt this.

We will look at:

- Voluntary Easement Laws: allowing neighbors to contract around the sun
- Solar Access Permits: Using administrative law to give a "priority" in access to sunlight to the first solar user in a neighborhood
- Mandatory Construction by-Laws: using the police power to force buildings to become "solar ready," for example, in India.

All of these legislative models try to solve the fundamental problem identified in the "Ancient Lights" doctrine: that the law traditionally viewed light as an aesthetic "commons" that no one could truly own. By moving to a legislative mandate, the state effectively "propriatizes" the sun.

4.2 The Anatomy of Solar Easement Statutes

The passage from the turbulent, case-by-case evolution of nuisance law to the precise architecture of legislative solution was most enduringly marked by the passage of Solar Easement Statutes. As explained in chapter 1, the 1973 oil shock was the impetus for approximately forty U.S. states to write laws that facilitate treating sunlight like a property right.

While it is frequently asserted that such acts confer upon landowners an explicit or inherent right to the sun, such statements are generally misleading. Instead, the statutes essentially provide a framework. In layman's terms, these laws provide a "toolkit" that allows neighbors to sit down and build a binding contract ensuring that one party's solar panels will never be cast into the shadow of the other's future construction. In doctrinal terms, these acts authorize the formation of negative easements either appurtenant to the land or in gross. A negative easement, such as a solar easement, prevents a neighboring land owner from doing something he would otherwise be permitted to do, namely, erect structures and grow plant life that interfere with the defined solar easement.

The critical elements of Solar Easement Statutes involve the formalities for making such agreements valid and the consequences such agreements have for the title chain. To constitute a valid solar easement enforceable in most states, the document must be in writing, recorded with a recorder of deeds in the same manner as a deed or mortgage, thus making it binding on subsequent owners of the land burdened by the easement. Recordation, in human terms, converts a contract into real property and thus gives it a permanence, or at least a permanence beyond that of an ordinary contract. Thus, rather than a private arrangement between John and Mary, the contract is a contract between "the land" of both John and Mary. If Mary sells her house to a third party five years later, that new owner is legally bound by the easement John recorded, even if they never personally met him or agreed to his terms.

The recordable property interest ensures that the bank, mentioned in chapter 2, has something other than the good faith promises of two adjacent land holders who are unlikely to sue one another. Recordation of a property interest that serves as collateral provides security for the bank's investment in the ability of one adjacent land holder to create an electric asset.

While the recordation provision is important and essential to the enforceability of Solar Easement Statutes, many of these statutes contain more anatomical descriptions in an attempt to clarify the nature of the rights at issue. These acts require that a solar easement include a description of the vertical and horizontal angles, in degrees, at which the solar easement extends over the real property subject to the easement. The instrument may also specify the term of the easement, whether the maintenance will be compensated in any monetary terms, and the manner in which the easement may be extinguished or modified. Put plainly, the statutes require the parties to identify the precise slice of the airspace subject to the purchase-and-sale. This specificity of definition stands in marked contrast to the "ordinary notions of mankind" formulation found in the doctrine of Ancient Lights. By establishing a concrete set of criteria, the legislature obviates the need for judicial fact finding; when the statutory language defines the amount of access purchased, there is no need to assess whether a given shadow is "unreasonable." This level of specificity represents a crucial component of the movement from a private tort to an estate in land: the question shifts from the subjective issue of "damage" to the objective issue of a "contractual" term. Moreover, the appurtenant nature of the easement provides an assurance that the benefit of the light will inure to the owner of the parcel that actually enjoys access to the panels. In other words, rather than constituting a personal privilege of the grantee, the right is attached to the dominant tenement, which is the solar house (or office building). On a deeper level, this means that the easement imposes a servitude on the servient tenement and effectively removes part of the "bundle of sticks," which, as previously noted, is the metaphor by which we think of property rights, that once comprised the neighbor's estate and conveys it to the solar user.

In the commercial sense, the ability to transfer sunlight in this manner is important to the renewable-energy industry. It makes possible the sale of rights in sunlight as a bundle. For instance, a solar developer could

record a solar easement across fifty properties within a development and, in effect, create a large “solar protected” area for all of the houses. The fact that a number of homes

will enjoy legal protection against shading makes a solar development considerably more valuable to institutional investors than the alternative: a collection of houses that offer no assurance against future encroachments upon their solar access. As mentioned in chapter 2, this is precisely what a “commercial phase” requires of the law: certainty of property rights and protection of the property rule so as to encourage the movement of capital and complex economic development.

Finally, most statutes addressing solar access contain remedies for enforcement in favor of the grantee of the easement. In recognition of the public policy interest in encouraging renewable energy, most states grant the grantee recovery of court costs and attorney fees if they enforce the easement against a neighbor seeking to violate it. This additional remedy assures that the “property rule” will be respected: the neighbor cannot simply ignore the easement, construct a building, and face only a small penalty. In plain English, this provision means the law has “teeth”: in most jurisdictions, it will be very difficult to violate an easement. In this regard, the statutory easements form an essential link between the tort-based grievances of the “tort phase” and the financial asset-management of the “commercial phase.” The statutes provide early evidence that the law may be willing to offer solar access the same level of security as is traditionally associated with a physical boundary. The statutes essentially “de-risk” the solar resource, making sunlight an acceptable investment for the modern energy economy.

4.3 The English Influence: The Rights of Light Act 1959

During the time when the United States was creating voluntary and contractual solutions, in England, the ancient law was undergoing refinement through The Rights of Light Act 1959, which marks an important stage in the “Statutory Phase”. The 1959 Act represents a major milestone in the “Statutory Phase” because it introduced an innovation to the way rights to light operate. The innovation was the Light Obstruction Notice. A Light Obstruction Notice, simply put, gives developers a way to “freeze” the 20 year clock for light for their neighbour. Prior to the 1959 Act, to defeat a prescriptive claim the landowner had to build something physically such as a “spite wall” or hoarding to obstruct the light. The 1959 Act provided a way for developers to freeze or interrupt the clock by submitting a notice to the land registry as opposed to building a wall that would permanently obstruct the light. Legally the 1959 Act creates an administrative system for preventing the acquisition of a prescriptive easement under the Prescription Act 1832 by creating a fictional obstruction of light which is purely on paper as opposed to a wall that is built on the boundary.

This evolution in the English legal system reflects an attempt to balance the pressures of densifying a city like London by building in the sky while also preserving ancient rights to light. The 1959 Act had a major effect on the legal regime because the 1959 Act modernised the legal regime and turned the Doctrine of Ancient

Lights from a physical barrier into an administrative scheme. In essence the legal regime prior to the 1959 Act involved the acquisition of light by long user occurring almost invisibly on the face of the land. The Rights of Light Act, when it was enacted, opened up this process of acquisition by introducing public registers. The legal mechanism in the Rights of Light Act is the construction of Light Obstruction Notices which is treated by the law as if a physical wall had been built on the boundary for a period of one year. From a social point of view, the 1959 Act removed the warfare between neighbours that had historically occurred in the course of development. Before the 1959 Act, if a landowner wanted to prevent a neighbor from acquiring a legal right to light through twenty years of continuous use, they had to physically construct a giant "spite wall" or a hoarding to block the sun. The 1959 Act, in this regard, made the acquisition of prescriptive rights to light a public administrative process. For the purposes of this dissertation, the 1959 Act will be examined to see how the law is able to transition from the frictional system of long user that the Indian system has been grappling with for over a century, to the modern regime.

The English legal regime is a good example of how law can transition from a physical mechanism to an administrative one. The construction of a fictional wall in the 1959 Act can also be viewed as an attempt to convert light into something that can be owned in a more formal way by converting light into a right that can be registered in the land registry. This concept of converting light into a registrable right can be seen as an early precedent for the modern concept of "recordable rights" in the commercial sector. While the purpose of the Light Obstruction Notice is not to protect an investment in solar panels but rather to preserve the quality of light to a building, the legal regime is still important to the development of a legal system of solar rights. For this reason the 1959 Act will be discussed to see how a legal framework can convert an open access resource into one that can be controlled through a bureaucratic process.

4.4 Solar Access Permits: The Administrative Allocation Model

Where the English model is a kind of timid modernization of traditional rights, the Solar Access Permit system, a model now being implemented to greater or lesser degrees in such American states as Wyoming and Wisconsin, is a radical shift towards the affirmative grant of solar access. Rather than simply enabling and encouraging a voluntary agreement between neighbors, the Permit system is predicated upon a first-in-line concept. Put in more prosaic terms, if you are the first person on the block to file a notice with the city regarding the installation of your solar panels, the city grants you a legal bubble of protection from the encroachment of neighboring property that can be construed to block the sunlight reaching your panels; you own the sun over your roof and no one is permitted to build anything that might interfere with your enjoyment of it.

As more of the legal analysis begins to take over, however, you realize how this model is radically different from traditional real property law as it relates to neighboring rights and interests, and instead harkens to the doctrine of prior appropriation that governs water rights in arid states in the American West: the first person who puts a natural resource to "beneficial use" gains a priority interest over others. The Permit system is a highly

administrative model which is designed to lower the transaction costs that can otherwise impede the development of solar facilities: where in a voluntary system a developer might need to go house by house, spending money and time, negotiating easements from five different neighbors who own land that might block the path of the sun, all for one or even none of them to decide in the last hour to hold-out and reject the deal, under the Permit model the state can issue such an easement over to a solar facility developer in just one step, and once the Permit is recorded against the neighboring titles, the solar envelope becomes a permanent encumbrance on such properties, which thus provides the ultimate in "bankable" certainty. Once the Permit is issued, there is never any question of a neighboring owner refusing to consent to a deal or changing his mind because of a change in ownership or other factors, and this system thus represents an important and potentially powerful tool in the Statutory Phase of the history of solar access rights.

This is, of course, an administrative and legal system for the protection of access rights, and one must therefore ask if there are "takings" of neighboring owners in the first person to secure

such a permit: if the state gives a solar access permit to neighbor A, this effectively strips neighbor B of her rights to build her second story (let's say) as well as plant her beautiful, tall, shade-providing tree, even though Neighbor B had no intention of blocking the sun when she purchased her own home. Put simply, under the permit scheme, you would lose a portion of your property rights because your neighbor installed solar panels before you. The example reveals the profound conflict between the private bundle of rights which define private property and the public interest in transitioning away from fossil fuels and to renewable energy sources. As stated in Chapter 1, this is the point at which law moves from being simply a neutral arbiter to an energy policy player. The permit scheme also creates a technological problem for local government agencies. Under permit systems the state will need the capacity to accurately quantify the "solar envelope," the 3-dimensional plane in the atmosphere through which the sun must travel to illuminate the solar panels, in order to provide a permit that can withstand legal scrutiny. This entails a 3-dimensional simulation of solar geometry that the local government will need to master. If the permit is too expansive it punishes the neighbors unfairly; if the permit is too narrow, the solar panels could be shadowed in the winter months when the sun stays closer to the horizon. "Solar zoning" represents the "Statutory Phase" at its peak, the effort to marry the ancient idea of fairness with modern solar science, moving the conversation from the concept of tort liability for being a bad neighbor, to administering a public utility.

Finally, we must consider the "prior appropriation" of the sun's light in perpetuity in our dense cities. If every solar panel owner applies for a solar permit, it will potentially "freeze" our existing skyline, thereby inhibiting the high density housing we will increasingly need to combat other societal problems. This is the "Statutory Phase"'s hidden downside, that in our haste to protect the sun's energy as a commercial resource we will replicate a "Ancient Lights" doctrine far more restrictive in its consequences than the doctrine originally was. The problem that legislatures must solve in the future will be to craft a permit system for solar energy production that preserves the "investment reliance" of those who use solar energy without foreclosing on the

growth and development of our cities. The permit system is a strong remedy for the "Modern Crisis of Energy," but it requires precise legislation and judicial interpretation to prevent that remedy from becoming an impediment to the very development it was designed to facilitate. As we turn to the "Commercial Phase" of Chapter 5, we will see that a permit is not simply a document granting a privilege to use the sun's light; rather, it is the "DNA" of a new form of property right, created in the laboratory, documented at city hall, and transferred in the energy market of global capital.

4.5 The Conflict with Private Governance: Preempting HOA Restrictions

However, that process met a second significant obstacle: the expansion of homeowners association (HOAs) and deed covenants. In effect, while state legislatures were legislating solar easements, thousands of local communities were also using the power of covenants to legislate against solar. As described in the preceding chapter, aesthetic concerns were a significant obstacle to solar power development in the American suburbs. Often, HOAs would prohibit solar panels because they were "eyesores" or did not meet the design requirements of a neighborhood. It is therefore not uncommon for a homeowner to have the opportunity of purchasing a neighbor's easement in a solar access agreement, but be forbidden by HOA rules to install a solar system on his or her home.

In short, states must inform local HOAs that they must sacrifice aesthetic uniformity for solar development. States have accomplished this objective with Solar Rights Acts, which preempt or void unreasonable solar restrictions in private covenants. In other words, in a state that enacts Solar Rights Act, the legislature will override private contract (i.e., the doctrine of *pacta sunt servanda*) that restricts solar systems, in order to protect a public policy (the right of solar users to develop solar energy). The statute provides that the public policy to support the development of renewable energy outweighs a covenant's aesthetic considerations of a private entity or HOA.

These provisions also address the problem of whether a restriction is unreasonable. The law attempts to balance HOAs interest in maintaining property values through aesthetic control of solar development against the right to generate solar power. For instance, HOAs could require solar panels to be placed on the rear side of a roof rather than on the street-facing portion, but only if the restriction does not significantly increase costs or reduce the energy efficiency of the system. Some statutes go so far as to declare the restriction unreasonable if it reduces the annual solar energy production potential of the system by more than 10% or adds more than \$2,000 in costs, and in that case, declare the restriction void.

This legislation contributes to the "commercialization" of solar by "freeing" millions of rooftops from private governance. This development will benefit solar leasing companies and other private entities by alleviating the risk of investment for those entities, as the legislation would allow homeowners to have a more

consistent ability to develop solar power. Prior to the enactment of the Solar Rights Act, a residential solar developer could not be sure whether HOA would block solar project on the property. Through the Solar Rights Act, the legislature has created a more predictable market to provide investment. The legislature has made it clear that the right to develop solar power outweighs the arbitrary aesthetic concern of a HOA.

4.6 The Indian Context: Building Bye-Laws vs. Property Rights

The Statutory Phase in India has progressed in a significantly different fashion compared to the West, with an apparent lack of comprehensive legal frameworks for individual solar rights. The Indian government has essentially relied on the Model Building Bye-Laws and urban planning regulations (as discussed in Chapter Two, the Indian Easements Act of 1882 has remained dormant) to enforce the installation of solar water heaters and rooftop photovoltaic (RTPV) systems on certain types of buildings (such as large residential buildings, hospitals, commercial hotels, etc.). In simpler terms, the government is trying to mandate a solar revolution by saying, “If you want a building permit, then you must ensure your buildings are ‘solar-ready’ in certain areas”.

In more legally oriented terms, the government has essentially used their police power over the administration, to enforce solar requirements on buildings through the Model Building Bye-Laws (2016). These regulations stipulate that buildings must be designed and built to accommodate these systems as a condition for obtaining a Completion Certificate, and thus require that the physical infrastructure for solar energy to be installed. This is a significant shift from traditional property law, as it attempts to regulate the use of solar energy at the source (the building design) rather than at the point of consumption or ownership.

However, the administration has a “fatal flaw”: it does not regulate the rights to access to sunlight. This is the crucial “missing link” mentioned in chapter 2. If a building is legally required to install high-end solar panels by the Model Building Bye-Laws, then a neighbor who is building a 10 story building 6 months later, is not subject to any regulation or restriction (yet) if his new construction obstructs the sun from reaching the original building’s solar panels. This lack of a solar easement (as mentioned in Chapter Two), means that the legal right of a building to access solar energy will be subject to the Ancient Lights rule (which requires 20 years of usage). Until this time has elapsed, it will be virtually impossible to establish that any particular building has a right to solar access. This creates a paradox where the government is requiring citizens to invest heavily in solar technology, but not providing them with the legal protection to ensure that technology can actually function as intended. This lack of protection makes the adoption of solar energy in India a much riskier proposition, particularly in urban areas where space is limited and competition for sunlight is higher. Without clear and enforceable solar rights, it becomes difficult to justify the investment in rooftop solar panels, as the economic returns may be compromised by neighboring developments that block sunlight. This, in turn, could stifle the growth of the rooftop solar sector in India, as potential investors may be deterred by the lack of legal safeguards.

For India to transition from a “mandated” solar market into a “commercial” one, the model building bye-laws must be accompanied by a legal framework that recognizes and protects solar rights through property. As mentioned in Chapter Two, this will require the creation of a recording system where solar easements are listed against property deeds, thereby giving the user a property right in the form of an interest in the bundle of rights to the building plot (which is not currently present in India as this will need to be established legally). This is an important step, because it will provide a way for property owners to ensure their right to solar energy is legally protected. Additionally, this will provide greater certainty for investors and developers, making it easier to justify investing in solar infrastructure as a bankable asset. By combining these regulations with a system of recorded solar rights, India can create a strong foundation for the commercial adoption of rooftop solar power. In conclusion, while the Indian Model Building Bye-Laws are a significant step forward in promoting the use of renewable energy, there are still several challenges that must be addressed in order to achieve a fully sustainable and equitable solar future. To that end, the Indian government must address these challenges and develop a regulatory framework that protects solar access and ensures that all buildings have access to solar energy. The Indian state must move away from the police power model and move towards a property law model.

4.7 The Valuation of a Statutory Right: Kilowatts as Capital

With the statutory phase, sunlight takes on a different economic quality than before: it becomes a valued financial commodity, no longer an undervalued environmental resource. Valuing sunlight, I believe, is primarily accomplished by the legal system through statutory rights.

In a prior “Tort Phase” of legal history, sunlight was generally of no monetary value. When someone’s sunlight use was impeded and they successfully litigated a property dispute, monetary compensation was awarded as damages to reflect what the value of the sunlight was, but no monetary value was placed on the sunlight until it had already been interfered with.

However, in the “Statutory Phase,” a sunlight use right can exist as a recordable, transferable interest that has a liquid market value (the easiest way to understand this is: a house or office building with a “guaranteed sun right” is worth far more than an identical structure without that right). In more complex terms, statutes create the “property rule” that gives sunlight a value through real-time “price discovery.” So a solar company’s negotiations to purchase sunlight as an easement to a nearby property isn’t a “favor” to the neighboring property, per se, but a “buy” of the neighboring property’s air rights, specifically a portion of them in order to receive sunlight. Because the air rights must be recordable and transferable, they can be appraised, insured by title, and sold/assigned to others by real estate professionals.

This is the mechanic necessity for sunlight to move to the “Commercial Phase.” Without this statute to provide specific boundaries and a duration for the right to sunlight, some would describe it as a ghostly interest to real estate developers. And, more so, to institutional investors. To banks. The valuation that a sunlight use right undergoes has to be “bankable,” and the statute helps do that by giving the project a “fuel supply.”

It is not an overstatement to say that sunlight, protected by a property rule, is a property right that allows the project owner to calculate a twenty five year yield, or at least, the Net Present Value (“NPV”) of a given solar project. Without a statutory protection for sunlight, the risk of the “shading event” would be too substantial to value and thus the project likely would not be financed. The value of the statute, therefore, is that it provides the value of the sunlight, by allowing the “kilowatt” to be a value in a financial context.

4.8 The "Solar Envelope" and Scientific Zoning

Alongside individual rights, “Solar Envelope Zoning” represents a legislative breakthrough of systemic resource distribution, where the “envelope” or the maximum allowable volume of every building is shaped specifically to guarantee a minimum duration of sunlight to all neighboring plots (in more colloquial language, legal origami, or a system in which the law “clips” and “folds” the volume of each building to provide an allocation of the resource for everyone; in more technical architectural and legal language, this is “geometric regulation” derived from the sun’s specific path across the sky at various latitudes).

Unlike the statutory phase, this model shifts from a reactive, neighbor-centric perspective to a proactive, city-wide perspective. Like the Greek model of the ancient city of Olynthus, a system which I described in chapter 1 as a more sophisticated model of the individual rights phase, the modern Solar Envelope zoning model has to be combined with modern requirements to include private property rights in the title of every lot and the additional complications of industrial energy, which were not a concern in ancient Greece, and the problem of density. The solar envelope, therefore, addresses a complex question of density in order to ensure a sufficient solar supply. Solar zoning treats the sunlight as a public resource as opposed to nuisance to a private party in that the solar resource is being considered to be allocated as a city-wide infrastructure resource. While in theory it is possible for the first builder in a city-wide area of undeveloped land to build an arbitrarily large skyscraper that would shade all of its neighbors in the area to a minimum or perhaps zero level of sun, once the land is developed, the last builder to arrive captures all the light, leaving everyone else in a permanent, energy-poor shadow. The solar envelope allows the city to grow as high or dense as necessary, but not to grow as dark as it creates a “predictable skyline.”

In algorithmic terms, the Solar Envelope is the geometric regulation of height and setback so that a certain amount of sunlight is guaranteed to remain for the rest of the neighborhood. It allows a developer to know that they do not have to worry about a potential claim against them later, and to know exactly how far

they can build before they run into another lot from the time they buy the land. It provides, as far as a city is concerned, for an efficient method for “solarizing” all buildings in the city by providing an infrastructure to allow this, rather than requiring every

individual building in the neighborhood to be negotiated as an easement or a potential court ruling. Rather than being just a property law issue, the Solar Envelope represents one of the first steps toward the constitutionalization of the legal framework for the right of the sun, where this law becomes a part of the legal geography of the city.

4.9 Statutory Remedies: Beyond Damages

The last component of the “Statutory Phase” is the implementation of certain, effective remedies. A major weakness of the “Tort Phase” was the “liability rule” conundrum: a rich developer could effectively “purchase” the right to shade another’s home via small monetary damage payments levied against him following a judgment. Statutory laws aim to avoid this by employing “deterrent” remedies.

Many new solar rights acts provide for the collection of “attorneys’ fees” and “treble damages” (which is three times the actual amount of money lost by the injured solar user) from a person who knowingly interfered with a solar user’s solar rights. Simply put, it becomes too expensive to infringe on a neighbor’s solar rights. These laws move the legal discussion from, “How much did the neighbor’s shadow cost you?” to “You didn’t have the right to shade your neighbor’s home in the first place.” In technical terms, this damages regime strengthens the Property Rule as a financially reasonable choice for a developer to contract with a neighbor to buy out their solar rights rather than infringe upon them. This creates an effective deterrent to maintain the “investment reliance” of a home owner who invests, for example, \$30,000 into solar, in the knowledge that a neighbor cannot afford to build a spite fence or add an extra room.

These remedies often include the availability of injunctive relief as a matter of right rather than as an exception. Under tort law, the courts would often decline to issue an injunction to stop a costly project to preserve a few solar panels. Under a rights based law, however, the courts must grant the injunction if a right holder has a recorded claim and the developer is causing the infringement. Again, this helps restore the balance of power to the individual solar user and not the developer who can afford the damages. These penalties raise the price to infringe so much that the statutory phase has turned solar rights into a “hard” rather than “soft” law.

Chapter Four concludes with the final transformation: the “Statutory Phase.” Statutes and regulations have converted vague shadows to a clear legal structure with three parts:

- the ability to value solar rights
- laws governing the use of solar access rights through zoning
- the implementation of remedies for violation of rights

These statutes and regulations provide the final step in the transformation of the sun: to the “Commercial Phase.”

4.10 Conclusion: The Bridge to Commercialization

The end of the Statutory Phase is a decisive turning point in the sun's legal history. It is the stage where the sun stops being viewed as a momentary gift and starts being viewed as a component of modern civilization. The Tort Phase, looking at it in retrospect, was the sun's legal adolescence. During that stage, the right of sunlight was fragile and subject to arbitrary determination by the judges of the time and the ex post facto application of nuisance law rules. At that stage, there was not a right to the light, only the hope that it would not be blocked, and that hope depended largely upon a judge's opinion of the neighbor's motive.

The Statutory Phase was an advancement because it took this determination away from judges and placed it into the hands of the legislatures. At this stage, society at last began to establish the defined, recordable, and transferable entitlements that are required to create a modern energy market. The transformation to the Statutory Phase was significant because the legislature was engaging in a kind of "legal alchemy" by turning a resource that was never properly defined into an entitlement that was. "Propertizing" the sun was not only essential to the development of the solar market, but it was a necessary step to transform a sun user from a state of vulnerability into a state of ownership.

In chapter 2 it was stated that the "mechanical necessity" that underlies the modern energy market is that it can operate only if rights are defined. A legislature that enacts a solar easement act and a solar permitting statute is providing the certainty that the modern energy market needs. That certainty comes from the creation of a public record. The sun has been put into a "paper trail." It can be found by lenders, sellers, buyers, and others that have an interest in the rights of sunlight. As revolutionary as these changes were, they represent only the beginning of the sun's transformation to a commercial commodity. These statutory rights to sunlight must now be

integrated into the financial infrastructure that underlies renewable energy markets. In the next stage, the Commercial Phase, we will see how these statutory rights to sunlight are being integrated and used to create financial instruments. A statute cannot, of course, accomplish that task alone. It can establish the right to sunlight, but it cannot turn that right into a financial instrument. The Commercial Phase involves creating a bridge between a property right to sunlight and a financial asset. This chapter will discuss some of the techniques used to make that transition.

The Commercial Phase involves "bundling" together the easements, permits, zoning envelopes, and tax credits established in the Statutory Phase in a way that allows these instruments to be traded and used to create revenue. In this phase, the work of the solar lawyer moves from the statehouse and the courtroom to the investment banking boardroom. To make solar energy bankable, the statutory right to sunlight must be "standardized." Consequently, when a bank in New York or London lends against the security of solar

access in California or New Delhi, the bank needs to know that the solar easement is as secure and has the same status. The creation of such international consistency is the “missing link” alluded to in Chapter 1 and is the focus of the next decade of legal evolution.

Moreover, the bridge to Commercialization requires the “securitization” of solar access. Once a solar property interest has been recorded and made alienable, then such property interest can be pooled with thousands of others in a Solar Asset-Backed Security (SABS). With the SABS, institutional investors can invest billions of dollars into Solar Access knowing that the “fuel supply” behind such investment will be protected by the statute-based framework. In the absence of such “Property Rule” protection afforded by a statute, this type of high-level finance would be unimaginable. Banks are risk-averse; they will not lend against a “ghostly” interest that could be extinguished by a next-door construction project. By creating a statutory framework, the statute effectively “solidifies” the sun, making it as durable and secure as a plot of land or a barrel of crude oil.

Also crucial to the “Statutory Phase” conclusion is the human component. In essence, the Statutory Phase has democratized the sun. By moving solar access out of the exclusive hands of a landowner who can afford to litigate twenty years of legal proceedings and placing that right within

a simple easement or permitting regime, legislatures have opened the opportunity for renewable energy participation to the average homeowner and the small business owner. The “Solar Access” debate has moved out of the sphere of elite landowners and into the public forum of basic rights. This human “democratization” is what fuels the next, commercial phase. A global, “Commercial” Phase market cannot exist when it can be accessed only by a tiny fraction of the world’s population. The “Statutory Phase” provides the scale necessary for the development of a global commercial market.

As we conclude the Chapter, it is important to remember that the tort-to-property journey is all but complete. We have constructed the legal machinery to define and defend the sun. We have replaced the “legal shadow” of litigation with the “proactive light” of legislative regulation. However, the final leg of our solar property journey, the one that has been the most elusive, is the realization of this property right in the marketplace; the transition of property rights into tradeable, bankable assets. This is the final hurdle in the evolution of solar property. This is the moment where the “right to the sun” meets money and becomes the “capital of the future.” The statutory framework we have built in Chapter Four is the bridge to Commercialization. In Chapter Five, we will see the financial world step across.

Finally, the “Statutory Phase” is an indicator of the law’s ability to react to the changes of the planet. In light of the “Modern Crisis of Energy,” the law did not look back at the status quo of the past; the law instead created a new property category to deal with the issue at hand. The law realized that the sun was no longer just a matter between neighbors; instead, the sun was recognized as a vital public resource. By

establishing the legislative framework necessary for this reality, the Statutory Phase has ensured that the solar revolution is more than a technological one; it is a legal one. The “bridge to commercialization” has been built. As we enter the next chapter, we will see the world rush to cross that bridge, and with it, they bring hope for a greener, more secure, and more sustainable energy future.

CHAPTER FIVE

The Commercial Phase: Sunlight as a Bankable Asset and Global Commodity

“Property is a hub of rights, but commercial property is a hub of expectations. In the energy sector, the most valuable expectation is the uninterrupted flow of the resource.”

— Lord Denning

5.1 The Dawn of the Commercial Phase: From Rights to Assets

The movement into what is, for the purposes of this dissertation, the “Commercial Phase” marks the end and most important part of the long history of solar access. Whereas, until now, I have chronicled the movement of legal thought from the often unpredictable area of the law of torts to the more deliberate and regulated area of statutory law, Chapter Five focuses on how these legal foundations have recently been used to establish a commercial market for solar energy.

This is a highly sophisticated phase, wherein sunlight has taken on an entirely different meaning. No longer is the sun seen merely as an amenity to one’s neighbor or a right protected by statutes. It has been transformed into an investment asset. It is the phase where the right to light is evaluated as a source of cashflow over the next several decades. In a more colloquial sense, this is the moment where the law collides with the banking system. It is the moment where an easement created by a legal professional or a permit granted by a municipality becomes the security for a bank loan for an infrastructure project costing millions. When a bank decides to finance a solar power plant, the decision is not made based on the quality of the solar panels, but on the quality of the legal documentation of the property. In legal and financial terms, this phase can be described as the securitization of irradiance.

As was discussed in chapter 2, if solar is to become a scalable industry capable of reducing greenhouse gas emissions, then the right to light must be standardized and must become a “language” understandable to investors anywhere in the world. Investors in London, Tokyo and New York do not need to know anything about local geography or who lives there, just the return on investment. This chapter discusses the transformation from the right to a view to the internal rate of return (IRR) on the project. A rights-based analysis asks, do I have a right to light? An asset-based

analysis asks, how much is this revenue stream valued at today?

The objective in this context is not fairness or even neighborhood, but the reduction of uncertainty and the creation of a predictable revenue stream. A bankable asset is an asset whose output can be predicted and therefore securitized. This is the function of the law in the Commercial Phase. It has become an instrument for risk mitigation in the interest of producing a predictable source of revenue for a bank. It has brought to bear the right to light on the most basic element of the asset to maximize its value. The sun has been properly-sized like crude oil.

5.2 The Financial Architecture of Solar Projects: Debt, Equity, and Irradiance

To really understand the commercialization of solar access, you have to look at the financial system that runs the renewable industry. Most major solar installations do not get paid for through a developer's internal funds; they are structured with a sophisticated system known as project finance, or Project Finance. This is a form of financing that allows a loan to be constructed and repaid on an assets-only basis rather than a balance-sheet basis. Simply stated, the solar panels must earn enough money to pay off their own loans. If the panels cannot produce power, the loan is never paid back. Therefore, the bank must be 100% confident, not just hopeful, that the sun will shine directly on those panels with no obstacles during the twenty-to twenty-five-year term of the loan.

In legal terms, this means that solar access is considered a form of security interest. If a solar developer, regardless of whether she is in India, the UK, or the US, applies for institutional finance, the lawyer for the bank will conduct an incredibly thorough "Title Search." The bank's lawyer needs to know what is now known as the Solar Title. In other words, if the statutory rights mentioned in the previous chapter are not clean, meaning, are subject to shading, neighbor disputes, or ill-defined municipal codes, the project is unbankable. An unbankable project is a dead project. This implies that the law of solar access now requires even greater precision in property law. A tiny omission in a solar easement filing can kill a one-hundred-million-dollar solar project, by creating a shading risk that a bank's risk-modeling software cannot tolerate.

Perhaps, the degree of solar access's entrenchment in the legal system is most apparent in the drafting of Power Purchase Agreements (PPAs) and Credit Agreements. In these documents, solar access is no longer a natural right but is instead a contractual provision. Lawyers are now very specific in how solar access is treated as a part of "Force Majeure" or "Operating Risk." For example, a neighbor building a tower that partially shades a commercial array does not trigger legal claims by a local magistrate in the Commercial Phase. Instead, it triggers a Default Event in a credit agreement worth several million dollars. A Default Event is significant because it can lead to acceleration of the debt, which means the total amount of the loan is demanded from the borrower immediately. Alternatively, a Default Event can trigger a Liquidated

Damages clause, which means that the neighbor responsible for shading the project must reimburse the project owners a specific rate for every kilowatt-hour of solar energy lost because of the shading.

Moreover, it is worth mentioning that the terms on which a solar project can borrow money, specifically how the debt-to-equity ratio of a project is established, are predicated on the degree of solar access the project will receive. A high-risk equity investor, or equity investor, will demand a higher rate of return if a solar project is only protected by the reactive torts that governed solar access in the early twentieth century. On the other hand, a low-risk equity investor can receive a lower return, which means a cheaper loan, if a solar project is protected by the proactive solar permit system or recorded easements found in most American jurisdictions today. In short, the law of solar access has an economic effect on the overall rate of return on renewable energy, also known as the Weighted Average Cost of Capital, or the WACC. Put another way, the law of solar access has an economic effect on the legal quality of the sky. In other words, the legal quality of the sky in the Commercial Phase is as important as the technical quality of the hardware. Thus, by necessity of the commercialization of the sun, the legal system has become a mechanism for the mobilization of global capital on the ground.

This chapter looks at technical due diligence and its marriage with legal due diligence in the Commercial Phase of solar access. Before a solar project can reach Financial Close, engineers produce so-called P50 and P90 reports. These reports are technical reports that provide statistical probability regarding how much solar radiation the site will receive. Lawyers must wrap their legal advice in the language of these P50 and P90 reports. If the P90 report assumes zero shading, the

lawyer must protect the Solar Envelope. In other words, the lawyer must understand every provision of every local building code and the height limitations of neighboring projects, to ensure, for instance, no air rights transfers from surrounding neighbors occur. Therefore, the lawyer, in the Commercial Phase, becomes, so to speak, a Value Engineer. He/she must shape the legal environment to reflect the legal needs of the sun. We do not simply argue over ancient rights to light; we manage the supply of fuel for a twenty-first-century power plant through the legal regulation of property rights, contract rights, and administrative rights. In this way, in the Commercial Phase, the sun is now capital and it must be legally secured.

5.3 English Case Law and the "Commercial Sufficiency" of Light

To give the present study the broader international perspective and appropriate depth required by the international legal context, it is necessary to review the history of English case law, which forms the basis for property rights in most common law systems.

The "Commercial Phase" can perhaps best be identified by the evolution in English case law, which has been the trend toward abandoning the nebulous, aesthetic concept of light in favor of a "Commercial

Sufficiency." Until relatively recently, the standard for a light entitlement for 105 years was the standard laid out in the House of Lords decision in *Colls v. Home & Colonial Stores Ltd* [1904] AC 179: not "every particle of the light," but a "sufficient" amount of light based on the "ordinary notions of mankind" for the "comfortable enjoyment" and use of a dwelling, or "for the profitable and beneficial use and enjoyment" of a place of business. This standard of "ordinary notions of mankind" was basically a domestic, human-standard test, a test appropriate to a man working in an office lit by oil lamps but not necessarily an adequate test to the modern, technology-intensive needs of the energy market.

In the current "Commercial Phase," however, the ordinary notions of mankind no longer provide sufficient standard of either equity or economic security. As modern English jurisprudence has become more cognizant of the reality that light may have a commercial value as an input of a commercial operation, English cases have shown a surprising readiness to uphold and enforce such light entitlements. For instance, in *HKRUK II (CHC) Ltd v. Heaney* [2010] EWHC 2245 (Ch), English courts recently demonstrated the willingness to grant a mandatory injunction for light,

such that a commercial developer would have had to demolish the top two stories of its 35 million pound office building to avoid infringing on the light of its historic neighbor's building. The Heaney decision was notable for its adherence to the property rule over the liability rule: a commercial developer can no longer simply buy-out a neighboring light holder, paying damages in a suit at the time of development; rather, the light itself is an asset, an input value of commercial benefit which must be preserved. This may be the first time English courts explicitly recognized light as a commercial property interest of value, although, more significantly in this context, the decision suggests that the legal framework necessary to develop and maintain light as a commercial entitlement is now in place, as English courts have shown a willingness to grant an injunction to protect light as a "property" interest, even when such a right would require a "nuisance" to the value of the developer's investment (here, the building itself). From an economics perspective, this case may suggest the changing relative value of commercial light (and, by extension, irradiance) in high density commercial spaces.

In solar projects this "sufficiency" standard is redefined by a scientific revolution in the measurement of value. To a solar developer or financial institution, "sufficient light" cannot be defined by the ability of the average human to read a newspaper in a room without a lamp but only as the P50 and P90 energy outputs projected for a 20-year period based on the irradiance data supplied by solar engineers. These are the numbers upon which a solar project depends for its viability. The reduction of a commercial solar development's available light by a 5 percent reduction in light from a 20 year average will destroy a project's commercial value, and the loan underlying the financing will likely default.

This section advocates that the international legal regime is slowly shifting toward a "Scientific Sufficiency" standard, in which the law will protect the specific expected kilowatt-hour outputs. While the Colls test relied on "sufficiency" and the "ordinary notions of mankind" for the comfort of residents or businesspersons, the modern "Scientific Sufficiency" test relies on scientific precision, or the "reasonable" scientific data point. For a solar development to become a commercially viable industry, and a reliable asset that can be purchased and sold on international markets, the law must adopt such an adequate and specific standard which deems the loss of even a measurably small amount of irradiance, when such loss is detrimental to the financial value of a

solar project, as an injury sufficient to be enjoined or to support a claim for compensation. Adopting this "Scientific Sufficiency" standard in international law will ensure that, once solar projects are legally protected and financially viable, the market will have the requisite security to begin trading solar power. This will transform solar power into a contractually deliverable and commercially viable power source.

5.4 Securitization and the "Solar Asset-Backed Security" (SABS)

In the next phase, the commercialization, we reach another of the most compelling subjects in the world of solar law: the Solar Asset-Backed Security (SABS). While individual easements and permits set the stage on a local level, securitization brings money from all over the world into the solar energy industry.

Put simply, securitization involves the process by which a solar company aggregates numerous solar contracts (the leases, or power-purchase agreements for suburban rooftop solar panels) into a single financial instrument (or package of solar contracts) and sells those to big investors on Wall Street or on the stock markets in the City of London. By using these financial instruments, a solar developer can immediately retrieve their investment, which they can reinvest in ten thousand more roofs instead of waiting twenty years for the monthly payments from homeowner lessees.

Legally, for the securitization of solar energy to work, the solar right must be perfectly fungible. When a big financial institution buys a "portion" of a bundled solar package comprising 5,000 different rooftops, the solar right for each of those 5,000 solar rooftops must be equal in protection and identical in form. This is the last phase mentioned in Chapter One, where the right is converted into the legal status of a commodity or financial instrument.

This final phase poses a significant legal challenge, as there is no standardized solar title. If one solar roof has a permit in Wyoming, the next roof has an easement in California, and the third roof has its protection under the Building Bye-Laws for India's National Capital Territory of Delhi, solar asset-backed securities would never be purchased by a major institutional pension fund on account of the due diligence

that would be required to understand and vet 5,000 different

local property laws. The legal standardization of solar rights is essential to the commercialization of solar energy; without such a standard, a security based on solar rights cannot be a reliable financial instrument. For solar energy to be traded globally as a liquid financial instrument, solar rights must be standardized in a similar fashion to global oil futures, or even carbon credits.

This section represents the moment where the "property right" that was discussed in the statutory phase of Chapter Four is converted into the financial security that will be traded in the commercial phase of Chapter Five. The global solar right becomes something that can be traded on the financial exchanges in the United States and in the United Kingdom, or anywhere around the world that solar energy can be traded in a liquid commodity market. We must move away from local recording of deeds and create global, or at least national, solar registries. In this new system of solar title, every solar array will have a "digital twin" of its solar rights; the global registry records every solar panel in every rooftop or farm array in the world, and the interest in the solar access that goes with it can be recorded on the registry and easily tracked.

This is where the law begins to shift from its "dirt" status to the "paper" of financial security. No longer is the solar access a legal right tied to a physical property or to a local set of neighbors. In the SABS world, the solar access (a right to a certain amount of sunlight at a certain time on a certain day) is something that can be protected by covenants and by law against a shading risk in a standardized fashion. We need to develop a solar industry that is not only built on the "dirt" law that is the property law, but also built on the "paper" law that is the securities law. When the law develops standardized solar rights that are the equivalent in value and legal structure for every solar panel in the world, then the law effectively de-risks the sun as a commodity and can begin to bring it to the center of the financial world. The commercialization of solar rights is the process of building that bridge for solar energy to enter into the financial system.

5.5 Insurance and Risk Mitigation: The Role of Title Insurance

Every viable commercial market with a discernible risk also has a market for insurance. The dawn of the "Commercial Phase" of solar access has brought with it a particularly sophisticated financial instrument: "Solar Title Insurance." Put most simply in human terms, this is the "ultimate insurance policy" for the sun.

If an investor or individual has a nagging concern that at some time in the future a neighbor will erect a high-rise, or even a forest of tall trees, casting their solar collection devices into a permanent shade, they can now pay an "insurance company" to assume the risk of a "shading event." Should such an event take place, the insurance policy pays out. The insurance pays off the bank loan or "makes good" for the loss of income. In "legal and actuarial" terms, this is a "Risk Transfer" tool, the key link between "uncertain" law and "certain" capital.

Insurance companies don't guess at the probability of "shading"; they conduct "Solar Due Diligence," or a "deep" analysis of the "Solar Envelope" around a project. They also conduct a thorough review of local statute to ensure that all "easements" and "permits" are in place and legally defensible. As we discussed in Chapter 2, this is particularly significant in countries like India where property law is still "stagnant" or weak, as the cost of solar insurance in India is simply "too expensive," impeding "economic development" or "commercial growth."

The meat of this section involves understanding "Legal Uncertainty," a feature of the Tort Phase, as converted into Basis Points and Premiums for solar access in the Commercial Phase. Actuarial pricing of solar access "uses the following variables":

- local zoning volatility
- the neighborhood's litigiousness
- the "Air Rights" potential in neighboring properties, among others.
-

As was previously mentioned, when the law is vague, as it was when judges merely balanced "reasonableness," insurers cannot price the risk. In the Commercial Phase, the risk can be priced, for "recordable" rights now exist. The existence of a robust insurance market, particularly a competitive insurance market, for solar access is, perhaps, the "ultimate indicator" of commercialization. In short, this means that the "right to the sun" has been quantified, de-risked and priced, so as to be insurable by the "balance sheets" of "major national and international insurance carriers."

5.6 The Indian Commercial Challenge: Moving Beyond the "Stagnant" Act

Focusing now on the Indian context, however, is to confront a peculiar situation: India has some of the most ambitious renewable targets in the world, yet there is a very wide gap between that potential and the reality of solar access commercialisation. This part of the paper seeks to understand why this 'Commercial Phase' has found itself stuck in India despite the Model Building Bye-Laws (2016) being progressive in some sense.

As has been mentioned above, the present legal position in India essentially regulates the 'hardware' and the 'commercialisation of installation' of the solar revolution, but stops short of 'regulating the harvest' of this revolution. In the most basic, simple language possible, in this case, India is very strongly incentivising the building of factories, rooftop panels, solar power farms, etc. But it is not providing the legal rights for the raw material of those factories, sunlight, so that the factories are not at a risk of shutdown. In legal terms, this means that the present Indian law is unable to provide for the concept of a Marketable Solar Title since the Indian Easements Act of 1882 has not been modernised and is still based on an old definition of light.

In terms of the practical work that is done to assess solar projects or do the due diligence, this concept is known as Terminal Shading Risk. It is in cases where the solar project is perfectly fine to start with (say the site was perfect, the panels installed, infrastructure built etc.) but the developer is not able to legally protect the site against a vertical build from a third party (say a neighbouring plot) and this means that such a project cannot be insured or be banked by external financial institutions.

In a more practical manner, if we are going to achieve a 500GW target in India through solar energy in an efficient manner, we have to be more than administrative mandates which just 'require' panels to be put on roofs. We have to create a legal framework which essentially gives the right of light the legal status it requires. It is my contention that the 'missing link' that the Indian solar revolution is lacking, is a Commercial framework for Commercialization of Solar Access. This in turn suggests that a transition to a Digital Solar Registry has to be done so that the solar property right to the sun for a specific property is 'registered' on a digital land record platform. For instance, if a developer has the legal right to the solar envelope for 10 years, that right could be tagged on a property-specific GPS location on a digital 'blockchain' style land record that the government is developing for the country, such that that digital solar asset is protected to be used for the solar project.

Through this method the developer could 'bank' or 'insure' the commercial viability of the solar project based on a known and quantifiable future stream of income without the possibility of the project being rendered non-viable by a vertical build (or a shading risk in the near term) from a third party. By doing this, the concept of solar rights could be transformed into a viable, tradable right that is capable of being banked by global investors in a manner that is comparable to the way that titles are banked and transferred in the English or American legal systems. For India to make any real strides towards the democratic access to energy, this has to be the path that it takes.

Currently in India, we have a problem in the fact that the state uses its Police Powers under the model building bye-laws to impose the requirement for solar energy in order to 'create' markets, but the same state has not been willing to use its power of legislation to create or protect solar access rights and property rights that the industry needs in order to function over the long term. There is thus an investment gap and we are essentially stuck with the fact that we are creating an environment where we have 'hope' that our neighbours will not build upwards so as to create shading risks in our solar project (and thus a risk that the project will be rendered non-viable in the long term), instead we should have 'knowledge' that our neighbours will not be able to build vertically in order to cause shading risk, so that the project's long term viability can be guaranteed to potential investors and international lenders. Thus if India is going to go from being a country with solar panels to a country that has a Solar Revolution where solar access rights are a commodity with

international currency value, it has to bridge this gap in terms of the investment landscape.

5.7 Conclusion: The Sun as the New Oil

This concludes the synthesis of Chapter 5, the chapter and book's final part. This conclusion reveals the fundamental nature of the history and laws concerning solar access: the transformation of our relationship with one of nature's greatest resources. At the conclusion of our tour of the Commercial Phase, we arrive at the end of an evolutionary arc that began in the Tort Phase through neighbors' conflicts over light, continued through the Statutory Phase's legislative definitions, and now culminates in a solar energy transition that has culminated in a world where the Sun has become the new oil.

As the sun becomes the new oil, the legal rules governing it will no longer be a reaction to past harms, the oil infrastructure that delivers the sun to the world's energy market. Put plainly, the sun has changed. We now consider it as a raw commodity that supplies our buildings and cars and not merely a warm glow in a room or a pleasant sight through a window. To say the sun is the new oil is to understand that it requires the same kind of protection and infrastructure as the oil and gas industry before it: if oil required pipelines, then we now require solar access easements; if oil required title assurance, then solar access requires solar easements; and if oil required property rights, solar access requires the right to receive a constant, uninterrupted flow of sunshine. Put another way, the sun has become an object, just like all other things.

As the discussion in the tort cases of English law and the American statute laws and the Indian administrative court cases illustrate, our legal system is developing the financial architecture to power this world. We have left the era of a solar right, a human comfort, in favor of an era of irradiance as capital. Put another way, this is a transformation. It is not a result of capital's avarice, rather, it is a transformation to a world in which we live in the absence of carbon fuels and must supply our globalized economy with another energy source. We must treat sunlight as the commodity it has become in order for the world to transition out of the era of fossil fuels and into the era of alternative fuels. As a commodity, sunlight has clear rights, clear obligations. And sunlight can be bought and sold just like any other asset.

Finally, as Chapter 1 described, legal institutions develop slowly. The legal system is not an innovation machine; it is a rule-making institution that develops slowly and deliberately. The current need, however, has accelerated the rate of legal development. Today we are witnessing the beginning of the era of solar easements, the beginning of the solar asset, the development of a title that is worth as much as a deed to land. This creates the framework for the "Securitization of the Sky," wherein thousands of individual solar rights are aggregated into a singular, high-value financial instrument. Thus, the transition from "Tort" to "Commodity" reaches its end. When a pension fund on the European continent purchases a solar bond which

is underpinned by rooftops in India or the United States, the trade of sunlight is transnationalized in real-time. And of course,

none of this would be feasible without the "Property Rule" protections laid out thus far.

Our final reflections also reflect on the role of the lawyer as "the guardian of the sun." Within this commercialized landscape, the function of lawyers has altered. We are no longer simply litigators fighting over shadowing; we have become architects of the solar economy. We create the "legal density" that enables sunlight to be valued when drafting solar easements and permits, and negotiating solar Power Purchase Agreements. Chapter 2 identified the "missing link" in the law of several jurisdictions (and especially India) to have been the existence of such robustly commercialized forms of property rights. Without the ability to "tag" and to "protect" sunlight as a commodity, the movement toward solar power remains stuck in its early, localized days. It is my hope that, as I have argued here for the sun to supplant oil, we are beginning to understand it is only via the commercial laws of the West that the light of the sun can be treated as oil.

Additionally, what of the commercialization of the sun, from a humanized perspective? The terms "reification" and "Securitization" are very cold, but the ultimate effect they have is one of democratization. By allowing sunlight to be securitized and therefore, bankable as an asset, the law now provides the homeowner the opportunity to be an energy producer. The law, then, provides the rural poor of a developing country to use the sun's rays as capital to help fund their own development projects. With the ability of the law to provide marketable title to the sun, we allow the average person to challenge and supersede the power structures which governed the fossil fuel era. We must also not forget that "the new oil" is not hidden within the bowels of the earth in a single place, but exists as a global resource, distributed evenly. If sunlight is to be used as the fuel source for a new, renewable global energy system, legal tenure must first exist.

And finally, to review our three phases. The Tortian phase defined what the harm was, that is to say the loss of value caused by shading. The Statutory phase provided the ability to define this loss; the easement and the permit made the solar right a recordable interest. The Commercial Phase, then, created the ability to trade the loss. Recordable interest became a tradeable commodity, and the journey is complete. The solar industry is now capital, the law is the primary guardian of this new commodity. From the view of a neighbor to the view of a banker, the legal history of the solar industry has been made. While we look upon a world that must be defined by

new forms of clean, renewable energy, we can take solace in the fact that while the sun may power the world, it is only with the law that we may harness it. We have been learning to own the light, for the sun is indeed, the new oil.

CHAPTER SIX

The Theoretical Framework: Shadows on the Cathedral

"The primary function of property rights is that of guiding incentives to achieve a greater internalization of externalities."

— *Harold Demset*

6.1 The Jurisprudential Architecture of Solar Entitlements

Chapter 6 of the dissertation provides the theoretical underpinning to the dissertation's history of the "Tort Phase" and its examination of the practicality of the "Commercial Phase". Chapter 6 begins the discussion as to how the law should regulate access to the sun. To answer this, one must turn to questions of legal theory and the Law and Economics school of thought to consider the framework developed by Guido Calabresi and A. Douglas Melamed in the 1972 work *Property Rules, Liability Rules, and Inalienability: One View of the Cathedral*.

Chapter 6 applies Calabresi and Melamed's framework of conflict and entitlement to the issue of solar energy. Conflicting interests for solar energy include the solar user, whether residential or commercial, who would benefit from access to solar radiation and the landowner who would like to exercise the right of ownership through development upward. As discussed in Chapter 2, the state cannot avoid taking a position; to not provide a legal remedy to a solar energy user is for the state to implicitly provide a right for the neighbor to obstruct the solar user.

The central argument advanced is that the legal system has been granting the neighbor's right to develop upward for the past century at the expense of renewable energy development. To provide renewable energy a place as a major power source, we must develop a jurisprudential architecture that prioritizes a solar user's right to harvest energy. This shift requires us to rethink what it means to "own" land. Traditionally, ownership was defined by the *ad coelum* doctrine, which is owning from the center of the earth to the heavens. However, this vertical concept of property is being challenged by a horizontal necessity: the flow of solar radiation across property lines.

When we allocate an entitlement, we are deciding whose interest the law will protect by default. If the law favors the shadower, it places a "tax" on renewable energy in the form of lost production. If the law favors the solar user, it places a constraint on vertical development. This section argues that the "Cathedral" of modern property law must be redesigned to acknowledge that the atmosphere is no longer just empty space; it is a vital corridor for the world's most important "fuel."

6.2 Property Rules vs. Liability Rules: A Choice of Protection

Once we have determined who gets the right, Calabresi and Melamed say we face a second major question: what kind of protection does this right deserve? And this is the Property Rule, Liability Rule distinction that will make or break the solar industry.

An entitlement is protected by a Property Rule only if the holder's consent is required before that entitlement is transferred, at a price determined by the seller of the entitlement. That means if you hold a "Solar Title" protected by a property rule, your neighbor may not block your sun unless he or she talks you into selling your right to light to them. You would have a veto power. The entitlement's value would be the amount you are willing to accept for selling that entitlement. If you thought the value of your solar energy were \$50,000 over a period of twenty years, your neighbor would have to at least bid \$50,000 in order to erect his or her tower.

By contrast, an entitlement is protected by a Liability Rule if the entitlement can be appropriated by another party without the consent of the holder as long as the appropriator pays a value of the entitlement, usually damages, that is determined by the state. This is the Tort Phase. The neighbor constructs first, the court assesses value later. As explained in chapter 2, during the "Tort Phase" property rights of solar were governed by liability rules which naturally and systematically favored the "shadower." The judge's valuation was likely to reflect ordinary notions of mankind (see 5.3) of the lost light, which is not likely to reflect the value of the harvest of irradiance.

This chapter argues that because solar energy is no longer a hobby, but a necessity for the global environment, solar should be moved to property rule regime where irradiance would be treated as an asset rather than a vague concept for courts to balance. Granting the solar user a property rule protection would "internalize the externalities" and thus require that a potential building shadower purchase that light before construction begins. This approach would stop the "efficient theft," the process where a developer takes a neighbor's sunlight because it is cheaper to pay a small court-ordered fine than it is to redesign the building.

This shift to property rules, therefore, requires careful human consideration of the behavior change it is designed to achieve. Liability rules allow a "take first, pay later" mentality that is very risky to solar projects backed by twenty year bank financing. A bank will never lend money to a solar developer if a neighbor could "steal" the fuel supply from that project for a single time damages fee. Property rules, on the other hand, provide investment certainty. They send a signal to the market that the right to sunlight is worth the investment of capital that goes into the solar infrastructure. They provide a framework for neighbors to negotiate a value that they are comfortable with, instead of arguing over a damages fee a court would

determine based on a judge's notion of what irradiance might mean for the value of a property. By going in the direction of property rules, we are doing more than protecting a right, we are protecting the possibility of using the sun as an asset by making the true cost of "shading our future" part of our current economic reality.

6.3 Transaction Costs and the Efficiency of the "Solar Veto"

One of the most common arguments put forward by academics against the application of property rules in a dense, urban setting is that it will generate "holdout" issues. The gist of the argument is that a small-scale, individual solar user may refuse to sell, or demand an extortionate price for his solar right, thereby frustrating some massive housing development that is in the public interest, or for other social good; this argument is sometimes called "Solar Veto."

However, in our analysis of the costs of transaction in the modern commercial phase we find that such costs are much lower than they appear. To put it simply: The problem is not that a solar right is a "veto," but that nobody knows who has a solar right. If a solar right were more clearly "tagged" (e.g., utilizing the block chain style GPS-based coordination proposed in section 5.6), developers would not face any discovery cost. They will not need to hire teams of lawyers to identify their litigation risks, and instead simply need to refer to a map to identify their solar counterparty.

To put it in the parlance of law and economics: Clarity of entitlement is a key determinant in the reduction of transaction costs; under a Liability Rule or Tort Phase of solar rights, parties face a high cost of bargaining over the legal standard of "reasonableness" in courtrooms over many years. The parties face much lower bargaining costs under the property rules phase, and instead negotiate in a boardroom setting over a price within weeks.

The "Solar Veto" does not stop development, but rather leads to "Solar-Compatible" development, and a change in architectural practices such as tiered buildings and step-back design in lieu of high-rise structures that may block all the light from neighboring properties or the extensive use of reflective surfaces that allow for the absorption of irradiance from neighboring solar rights. The veto is not a block, rather it starts a dialogue.

6.4 Professor Troy A. Rule and "Shadows on the Cathedral"

We spend a great deal of this chapter exploring the work of Professor Troy A. Rule and, in particular, his wonderful and powerful idea of "Shadows on the Cathedral." Rule claims that our modern legal regimes are haunted by "shadows" that are far more damaging than the physical darkness cast by a building. These are institutional inefficiencies, legal shadows, where viable solar projects are strangled in their infancy by

regulatory friction and litigation risk. In other words, when the law is too confusing to provide a clear legal path to building solar panels, it will not be profitable enough for a project to be financially viable and investors will opt to invest their money in more familiar energy sources such as fossil fuels.

In more complicated language, we fail as a society to allocate our resources and Professor Rule posits that by failing to provide a "Marketable Solar Title," we are essentially providing an invisible subsidy to the fossil fuel industry. In this sense, the law provides incentives against solar projects while subsidizing the fossil fuel industry. It is easier to fight for traditional property rights than to fight for the rights associated with building a solar panel on your own property. We must consider solar within the larger debate over how common resources such as water, sunlight, and air should be governed in society. In this same vein, we have rules that ensure that a homeowner

does not pollute his neighbor's well water; so why is it that we consider a person's right to sunlight to be of a lower interest? Professor Rule's article reminds us that sunlight is not an infinite "free" resource, but a finite, valuable commodity that requires the same legal dignity we afford to land or minerals.

6.5 The English Context: *Shelfer* and the Discretionary Trap

To bring the international and historic flavor to this regime, we need to look at the English Shelfer Criteria of *Shelfer v City of London Electric Lighting Co* [1895] 1 Ch 287 for more than a hundred years English courts looked at these four criteria in order to determine the final question, which is should the court give you an injunction, a Property Rule solution, or should it make you take damages, a Liability Rule solution. So, the Shelfer original rule was very protective of your rights and basically said you should get an injunction, that is stop the interference, unless your injury was small, and could be compensated by a monetary award. This means your solar interests will have some security that you cannot be bought out by a trespasser who is just very rich.

The modern jurisprudence has however fallen into what we will call the "Discretionary Trap", in cases like *Coventry v Lawrence* [2014] UKSC 13, the UK Supreme Court says instead of having a rigid Shelfer rule, the English courts will look at a much more open, discretionary standard, and the intention was actually to allow more flexible and sensible solutions to some of these problems and urban planning concerns, but the net result is to pull solar rights back into the nebulous and uncertain territory of Liability Rule jurisdiction. We argue that this is what leads to the institutional "shadows" that Professor Rule warns of and if you want to securitize a Solar Asset, if you want banks from London or Mumbai to make a twenty year loan against a solar array on a rooftop, then you don't want any discretion, you want automatic remedy of injunction.

If a judge is told they can let the sun be in exchange for a one-time cash payment then the Solar Title will have little commercial viability. It will cease being a property right, and become more or less a suggestion. So in high-stakes renewable energy financing discretion equals risk and if India and the rest of the world is to move forward into 500GW then we need to get rid of this discretionary trap, ensure the law of the sun is as predictable as the sun itself and provide automatic injunction against an illegal shadow so that we can make the light of the sun, the light of the whole world

6.6 The Inalienability of the Environment

The fourth and, arguably, most radical tenet of the Calabresi and Melamed doctrine is the principle of Inalienability. Throughout this chapter we have championed the idea that sunlight should be protected by property rules to enable market transaction, yet the doctrine of Inalienability challenges the premise that sunlight entitlements should be marketable at all. Inalienable entitlements are those that law forbids transfer even for money, such as the right to vote, the sale of body organs, or even personal freedom. These entitlements, which are not to be traded at all for any price, suggest the necessity of "Solar Corridors" and "Solar Sanctuaries" where the right to harvest photon flux would be a legally inalienable entitlement.

On a very elementary, colloquial level, what I am arguing is whether we want some portion of our urban landscape where it is illegal, no matter what the developer's bid, to cast a shadow over a certain area? If we are to acknowledge sunlight as the "new oil", and acknowledge the harvesting of solar power as the lifeblood of a sustainable urban future, it should stand to reason there are parts of our city where certain sunlight must remain unshaded because it is too important to market exchange. In other words, if the "public trust" doctrine is to apply to water in the river of our cities, it should apply to the rivers of light we allow into our city. In other words, should it be possible for a private actor to dam "rivers of light" with a tall skyscraper?

In more sophisticated academic terms, I am taking the doctrine of inalienability (the "Statutory Phase") to its final conclusion. Moving from a liability rule (paying to cast shadows) to a property rule (buying out neighbors to block sunlight) still relies on market dynamics. In other words, we would just be paying to "turn off the tap" at a very early stage, before that tap is connected to a building, but the tap would still be "turned off." However, when a right is protected by an inalienable rule, we move to the realm of trust or command and control, where the right cannot be traded for cash at all. This is the point to acknowledge in the context of climate change: that certain rights are not only to be paid for, but must be "commanded" and protected in order to protect the public and global welfare.

In 2026, the climate has changed. We face unprecedented heat waves. We experience increasingly unstable power grids. It has become a requirement to generate electricity as close to the source of consumption as possible in order to avoid the losses associated with long-distance transmission. As we noted in Chapter 1, we live in a post-Carbon era where we cannot afford to trade off any sunlight that is capable of harvesting energy. In other words, sunlight in certain areas of our cities can be thought of as a necessity rather than a luxury, such that society has to mandate in order to maintain the global economy and a functioning power grid. In 2026, the law has to recognize that the atmosphere is no longer an entity which can be carved up into discrete parcels of private property in the same way it was at the time Calabresi and Melamed penned their article.

The case for "inherent inalienability" in solar access is based on a similar principle: the public trust doctrine. Under the public trust doctrine, certain natural resources, like navigable waters, shorelines, and wildlife, are reserved for public use, and the government has a legal obligation to preserve these resources for the public, acting as a "trustee." Thus, the public's right to sunlight has the same claim as a property owner's right to sunlight when the public right is more highly prioritized. Under this theory, the Solar Envelope over an existing high-density solar zone in a given area could be viewed by the government as a non-negotiable public easement. No developer could purchase a building permit to build a skyscraper that would shade a solar facility, regardless of the developer's ability to pay. If all neighbors consented to the sale, the state might still veto it in order to protect the public's interest in a green grid; the reduction of renewable power from a property is thus seen as an affront to a larger public. Here we are confronting the problems of Holdout and Transaction Cost identified above; by making the right inalienable, we preclude the possibility of predatory development purchasing out one house at a time, and one neighborhood at a time.

This level of protection is needed because, unlike other transactions, of which there may be remedies, a building is a permanent, physical obstruction. The potential loss of solar energy in a Solar Corridor is thus a loss that will persist for the lifetime of the building, between 50 and 80 years. In the time of Climate Change, there simply is no room for a loss of eighty years of energy in the name of commercial development. We thus have to conceive of Fixed Assets of Light. As mentioned in chapter two, property in its current form remains largely static; this law needs to be inalienable, for it must take the most important Solar Corridors off the table of negotiation.

Implementation of the inalienability approach, however, must be accompanied by some Solar Mapping. We are not proposing that every square meter of sun in a city be made inalienable, since that may result in the very outcome that advocates of solar law fear. Instead, we should create Strategic Solar Zones where such inalienability will be applied; these could be areas of high solar density, where communities have set up solar panels or community grids, or other forms of solar energy collection. Within those zones, the

right to light becomes a public, rather than a private good. We are thus painting a picture of a new urban landscape, in which Solar Sanctuaries are preserved for much the same reasons as our parks or historic monuments. In these areas, we are preserving an asset which we are too often treating as disposable, and in so doing, ensuring the sun itself will remain a common good.

Ultimately, this framework is the first logical step towards the legal reform we seek; we have moved beyond the liability rules of yesteryear, which allowed the wealthy to purchase the right to block sunlight; we have adopted the property rules of the present, and are now in search of the inalienability that allows for certainty and investment in a new energy model. We are moving beyond viewing the sun as merely the “new oil” of commercial development; the sun is not just a source of capital, the sun is the “new air”, a shared, public resource for our future and current generations alike. We are moving beyond the notion that the sun is a mere common resource by enacting legal rules which prevent us from selling off a resource essential to the environment. Sunlight is a commodity, certainly, but it is a resource which must be protected. Our legal Cathedral is not truly built until the sky itself is no longer a resource to be sold off.

6.7 Synthesis: The Guardian of the Resource

This concluding synthesis of the framework has brought us a critical understanding to the soul of property law in general: The legal system itself needs to evolve in its role. For centuries, the legal system has played the role of a “referee of disputes”; it has intervened when a fence was built too close to the neighbor’s house and the neighbor wanted it removed, or when a second story was constructed blocking the sunlight from a neighbor’s window. While this system is adequate for the minimal maintenance of some basic social order, it will clearly fail if left in place for 2026 and the challenges it poses for the energy landscape as a whole.

In this chapter’s final synthesis, I argue that it is necessary to move beyond this referee role and become a “guardian of the resource”: that is, a system that not only considers the importance of the natural resources to our environment, but to our very economy itself, in a much more direct and primary fashion. The synthesis here suggests a blueprint for such a system: that by utilizing property rules in conjunction with the removal of the “shadows on the Cathedral,” as well as the marketability of the solar rights, we essentially move away from this referee of disputes role and into that of an energy and environment guardian. In other words, in this legal system, sunlight finally stands as an asset equal to or greater than other assets such as oil and gas in that there is a market for and a legal environment conducive to its exchange.

While fossil fuel has enjoyed an extensive and easily marketable set of property rights to the resource and an established regulatory pipeline for the transport and delivery of fossil fuel to market, solar has suffered from vague nuisance laws and open-ended discretion on behalf of judges and juries. What I argue for

in the synthesis of this chapter is a “Cathedral” of solar law where the sun is protected as a primary commodity for the 21st century, in that the windows are never in the shadow of another. To assume this guardian role, the law must embrace the “Property Rule” that was discussed in the analysis in section 6.2.

In assuming this guardian role, the legal system does not consider whether or not the shadow cast by an adjacent building is reasonable as measured against 19th century values. Instead, by recognizing that every lost photon represents a lost unit of value for the energy system, as demonstrated in chapter 2 where the current system’s “stagnant” approach to regulation does not allow for the protection of investment reliance on solar power in a sufficient way, the law will essentially take on the responsibility of protecting solar rights from any and all shading by erecting a “Protective Shield” around the rights of the solar user. This will protect any loss of irradiance by establishing a Property Rule that requires, in essence, the rights of any solar user to harvest sun cannot be taken without consent, ensuring the recognition of sun’s real worth in the marketplace. This move makes the lawyer a guarantor of energy security rather than just an adjudicator of disputes.

It also means that the lawyer, as a “Guardian of the Resource”, is now expected to remove the “Shadows on the Cathedral” that Troy A. Rule identified. Those shadows, the murky rules, the overlapping jurisdictions and the ambiguity in the title, are part of what has slowed down the shift to green energy. Seen through the lens of the solar developer, those shadows appear every time a project falls away on account of its legal risks. The role of a guardian law, therefore, is to light up those dark corners in the name of absolute clarity, through what is known as the “Marketability of Solar Titles” in our commercial paper. A solar right should be as identifiable and tradeable as any other property, for that is when the legal shadows will fade. The law will then become an instrument of progress, a clear, well-trodden route that will enable capital to move in an energy-efficient, environmentally sound manner.

The synthesis we have proposed here also requires us to revisit the “Discretionary Trap” that exists in contemporary English and Commonwealth case-law (Shelfer, *Coventry v Lawrence*, see above). We have argued that when judges are allowed too much latitude to trade injunction for damages, they are failing to fulfil the role of the legal guardian. Should the law be the true protector of the resource to be harvested, any legal infringement against it should automatically carry an injunction. In other words, the guardian of the resource cannot just be paid off into turning a blind eye to an alleged infringement. Making solar energy bankable means making the law as predictable and inflexible as the sun. We can also ensure that the solar title has a high level of integrity that enables its leverage, securitisation and tradability throughout global markets.

Finally, in a more philosophical context, this synthesis also enables us to place the law of solar energy as part of the wider question of the global governance of “Common Resources”, specifically those resources deemed to be “Public Trust”, such as the atmosphere and its light, which are the focus of our inalienability argument. The law is once again put to its most fundamental role of being a guardian of the

common resource. Even though private interests are the ones that have access to that resource and are the ones benefiting from its use, the ultimate ownership remains in trust with society as a whole and for future generations. That, in effect, is the real synthesis of the Law & Economics and Environmental Ethics schools: we are not just seeking to better the market for the betterment of our society, but also to protect the long-term existence of this very society. Chapter 1 demonstrated that moving from "Tort" to "Property" is a mechanical requirement to achieve that more moral aspiration of the real world.

How about this in actuality? In actuality, it looks like a small homeowner in a developing nation can install a solar roof with the guarantee that his/her investment will not be obliterated by a neighbor's building. In reality, the "Solar Sanctuaries" are defended as much as our "National Parks" by law. In actuality, "Solar Bonds" are as secure investments as state paper. Such is the "Cathedral" of the law to which our discussions point us. We have created a law system of transparency, durability, and protection of the most basic asset of life.

The path from "Tort Phase" to "Synthesis" is both a growing understanding and an increasing value. In the beginning, we had the "Ancient Lights." Slow, passive, and weak rules of ancient times came to us. We were taken through the "Commercial Phase," where we became aware of converting photons to the "thing" and turning them into an object of property rights and trade. Here, in the "Theoretical Framework," we have proved the need for this process. The Sun is the new oil. This oil does not need to be pumped, but rather caught. The law provides the net. If the net leaks because of the lack of property law and the intrusion of liability law and judicial arbitrariness, the resource will inevitably be lost. Finally, we have reached the "Guardian of the Resource." Law achieves its loftiest aspiration during the era of the energy transition. We are left with a reality where the Sun serves not only as a source of illumination but as a source of power and life as well. The theoretical "Cathedral" of the law is complete. The feature I am looking for here, and the most important one, is not its height or grandeur but the windows. They are open. They are safe. They are filled with light. Sunlight is a kind of capital, and in the "Synthesis" of property law and the strategic inalienability of property, the law is the most conscientious, unyielding, and capable protector of sunlight. It is the last step from "Tort" to "Property" to "Public Trust," in order to make the sky an energy resource of our world.