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Letting Solar Shine: An Argument to Temper the Over-the-Fence Rule

Tim Lindl[*]

> "If we fail to make timely and necessary changes to our current regulatory framework, we may find ourselves in a situation where technological advancements cannot be implemented because of existing regulatory barriers. Such an outcome is not desirable."
>
> —California Public Utilities Commission[1]

California's over-the-fence rule prevents the distribution of excess power from a solar energy producer to more than two nearby properties or to any neighboring property that is not adjacent to the property where the electricity is generated. This investment-choking regulation stunts the growth of renewable and distributed electricity.

The over-the-fence rule's purpose is to protect utilities from competition, guard consumers from unfair practices, and promote grid reliability. However, each of these justifications is insufficient to warrant the existence of a rule that restricts investment in California's distributed generation potential. The over-the-fence rule protects a regulatory consensus that no longer exists, is redundant in its prevention of consumer abuses, and makes grid reliability worse instead of better.

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1. Re Distrib. Generation & Competition in Elec. Distrib. Serv., Decision 99-10-065, 1999 WL 1138447, at *5 (Cal. Pub. Utils. Comm'n Oct. 21, 1999).

California should ease the over-the-fence rule's grip on electricity generators to a point that neither allows investor-owned utilities to escape regulation nor limits essential investments in distributed generation.

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INTRODUCTION

California's over-the-fence rule regulates the distribution of excess power from a solar energy producer. The rule prevents a solar electricity producer from distributing its excess power to more than two nearby properties or to any neighboring property that is not adjacent to—that is, over the fence from—the property where the electricity is generated.

This Note will discuss the regulatory context in which the over-the-fence rule operates. It will also analyze the mid-1980s origins of the over-the-fence rule and its recent application in California Assembly Bill 2863 (AB 2863). It

will then consider three potential reasons for the over-the-fence rule, including that it justifiably protects utilities from competition, is necessary for consumer protection, and promotes grid reliability. Finally, the Note will conclude that each of these justifications is insufficient to warrant the existence of a rule that restricts investment in California's distributed generation potential. Specifically, it will demonstrate that the over-the-fence rule protects a regulatory consensus that no longer exists, is redundant in its prevention of consumer abuses, and makes grid reliability worse instead of better.

Distributed generation encompasses small-scale electricity generating technologies, such as solar photovoltaic panels, microturbines, wind turbines, and fuel cells.[2] These generation technologies locate the devices that generate the electricity near the systems that use the electricity. Distributed *solar* generation is simply the solar-powered version of distributed generation, where solar panels—the generators—are located near the end user. A house with solar panels on its roof is the quintessential example of distributed solar generation. In contrast, today's common electricity production scheme includes a large, fossil-fuel based electricity plant connected to a hub-and-spoke electricity grid. The large plant is the hub, and the power lines going to the end users of the electricity are the spokes.

California's over-the-fence rule unnecessarily restricts investment in distributed solar generation. It deters property owners and independent solar generators from installing solar generation beyond what is necessary to power on-site electricity demand. Thus, thousands of large properties in California with little electricity demand but large generating potential will not install the type of distributed solar generation that could help California achieve its climate and generation goals. This Note argues that California should ease the over-the-fence rule's grip on generators to a point that neither allows investor-owned utilities to escape regulation nor restricts essential investments in distributed generation.

I. THE POLICY AND OPPORTUNITY OF DISTRIBUTED SOLAR GENERATION

In the near future, fully realized distributed generation has the potential to weave a decentralized web of electricity generators and users resembling the Internet. This web would be more impervious to blackouts, fuel price spikes, and terrorist attacks. Within such a decentralized network, citizens could employ smart technologies to monitor how much power they use, where their electricity comes from, and the degree of their energy efficiency. They could connect with neighbors to realize greater power supply reliability through a

2. *Id.* at 7.

diversity of generators, power storage, and localized generation.[3] "To these customer-producers, the [electricity] grid, and all the competitive transactions occurring on it, could become irrelevant."[4]

While not yet realizing this potential, distributed generation is currently a pragmatic and valuable investment. Today, distributed generation increases electricity's reliability,[5] relieves constraint on electricity distribution systems,[6] makes upgrades to such distribution systems more infrequent,[7] meets peak electricity demand in areas experiencing growth in population or commerce,[8] and creates numerous other system-level benefits.[9]

Distributed generation also plays a significant role in achieving greenhouse gas reduction goals. Assembly Bill 32 (AB 32) mandates that California reduce its emissions to 1990 levels by 2020.[10] The California Air Resources Board's Scoping Plan indicates that such reductions require California to decrease its greenhouse gas emissions by 174 million metric tons of carbon dioxide equivalent.[11] To achieve this lofty goal, the Scoping Plan requires the state to replace 90,000 gigawatt-hours (GWh) of electricity demand with renewable generation or demand reduction.[12] Under the Plan, distributed solar generation must account for 4500 GWh of those 90,000 GWh.[13] 4500 GWh is not a small amount of electricity: it is equivalent to the amount of electricity consumed by 640,000 California homes in one year.[14]

3. *See* Mike M. He et al., *An Architecture for Local Energy Generation, Distribution, and Sharing*, INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS ENERGY2030 CONFERENCE PROCEEDINGS (Nov. 16, 2008).

4. ROBERT F. HIRSH, POWER LOSS 16 (1999). Thus, distributed generation follows the "soft energy path" suggested by Amory Lovins, a path that relies on non-depletable, diverse, and flexible energy capital that is matched in scale and quality to society's energy needs. Amory B. Lovins, *Energy Strategy: The Road Not Taken?*, 55 FOREIGN AFFAIRS 65, 77–78 (1976).

5. *See* Re Instituting Rulemaking into Distrib. Generation, Rulemaking 99-10-025, 2003 WL 1235580, at *6 (Cal. Pub. Utils. Comm'n Feb. 27, 2003); *Re Distrib. Generation & Competition*, 1999 WL 1138447, at *8.

6. *See Re Distrib. Generation & Competition*, 1999 WL 1138447, at *8.

7. *See* Re Procedures & Incentives for Distrib. Generation & Distrib. Energy Res., Rulemaking 04-03-017, 2004 WL 614598, at *7 (Cal. Pub. Utils. Comm'n Mar. 16, 2004); *Re Instituting Rulemaking into Distrib. Generation*, 2003 WL 1235580, at *2.

8. *See Re Procedures & Incentives for Distrib. Generation*, 2004 WL 614598, at *8; *Re Instituting Rulemaking into Distrib. Generation*, 2003 WL 1235580, at *4.

9. *See Re Instituting Rulemaking into Distrib. Generation*, 2003 WL 1235580, at *2–5; *Re Distrib. Generation & Competition*, 1999 WL 1138447, at *8.

10. CAL. HEALTH & SAFETY CODE § 38550 (Deering 2009).

11. CAL. AIR RES. BD., CLIMATE CHANGE PROPOSED SCOPING PLAN 17 tbl.2 (Oct. 2008).

12. CAL. AIR RES. BD., CLIMATE CHANGE DRAFT PROPOSED SCOPING PLAN 58 tbl.23, n.1 (June 2008).

13. *Id.*

14. Average annual residential electricity consumption in California is approximately 7000 kWh/year. CAL. PUB. UTILS. COMM'N, CALIFORNIA SOLAR INITIATIVE PROGRAM HANDBOOK 18 (Jan. 2008) [hereinafter HANDBOOK]. 4500 GWh / 7000 kWh per home per year = 642,857 homes per year.

The California Solar Initiative (CSI) is California's major policy tool to promote distributed solar generation.[15] It is a $2.2 billion project to fund the installation and operation of solar photovoltaic projects over 10 years.[16] Governor Arnold Schwarzenegger launched the CSI on January 1, 2007, with the goal of installing 3 gigawatts (GW) of production capacity[17] by 2017.[18]

The CSI uses power purchase agreements (PPAs) as the major vehicle for funding solar generation in residential and commercial settings.[19] A PPA is a contract for the purchase of electricity between an electricity generator and a buyer.[20] The contracts are normally long-term, with prescribed rate structures[21] that ensure a constant and steady stream of revenue.[22] With distributed solar generation, the electricity generator owns and maintains the equipment, which it installs on the buyer's private real property, home, or business.[23] The generator then sells electricity to the buyer under the PPA.[24]

Through the CSI, the owner of the equipment—the independent solar producer—receives the CSI rebates and any federal investment tax credits.[25] Generally stated, the transaction would follow the framework in Figure 1.[26]

15. *See id.* at 1.

16. *See id.*

17. Production capacity is the amount of electricity that would be produced if the electricity generator was producing at 100 percent of is potential.

18. *See* HANDBOOK, *supra* note 14, at 2.

19. PPAs account for 70 percent of all rebate applications for commercial properties under the California Solar Initiative. ASSEM. COMM. ON UTILS. & COMMERCE, ELECTRIC CORPORATIONS: EXCLUSIONS AB 2863 ANALYSIS, 2007–2008 Sess., at 2 (Cal. Apr. 11, 2008). In addition, while PPAs accounted for only 2.59 percent of the residential, commercial, government, and non-profit projects that applied for CSI rebates through October 2008, they accounted for 42.4 percent of the generation capacity from such projects. As of that time, there had been 14,735 total applications for California Solar Initiative Projects, of which 381 projects had a host customer that was a different person than the system owner. CAL. PUB. UTILS. COMM'N, CALIFORNIA SOLAR INITIATIVE STAFF PROGRESS REPORT 14 tbl.6 (Oct. 2008). 381/14,735 ≈ 2.59%. As of October 2008, there had been 269 MW worth of applications for California Solar Initiative Projects, of which 114 MW had a host customer that is a different person than the system owner. *Id.* 114/269 ≈ 42.4%.

20. *See* AB 2863 ASSEM. FLOOR B. ANALYSIS, 2007–2008 Sess., at 3 (Cal. Aug. 28, 2008).

21. Rate structures are simply the name given to the system of rates that electricity users pay to generators.

22. S. ENERGY, UTILS. & COMMC'NS COMM., AB 2863 ANALYSIS, 2007–2008 Sess. (Cal. June 18, 2008). The revenue is constant and steady as the generators know the likely minimum of revenues they will receive each month based on the negotiated rates and estimates of the electricity used by the customer.

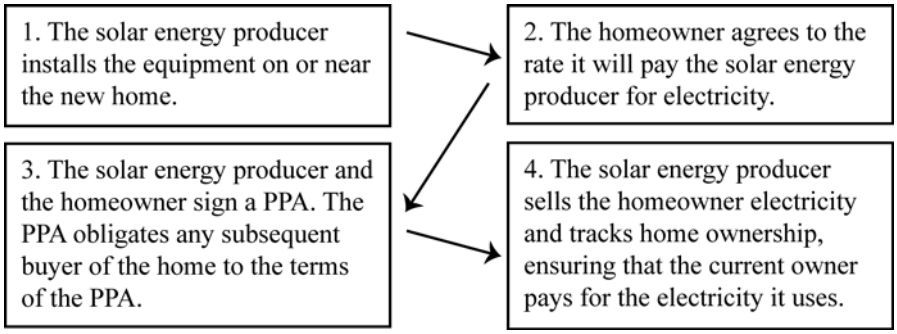
23. *See* AB 2863 ASSEM. FLOOR B. ANALYSIS, *supra* note 20, at 3.

24. *See* S. ENERGY, UTILS. & COMMC'NS COMM., *supra* note 22.

25. *See* HANDBOOK, *supra* note 14, at 11, 59–60.

26. S. ENERGY, UTILS. & COMMC'NS COMM., *supra* note 22.

Figure 1. Framework of a typical power purchase agreement



With independent solar operators combining maintenance and construction economies of scale, solar technology that would be unprofitable over its lifetime for a single homeowner can be profitable for an independent operator with a series of generators.[27] The contract also benefits the property owner as he or she may negotiate a price at or below the utility price for electricity.[28]

To facilitate PPAs, the California Legislature passed AB 2863, which Governor Schwarzenegger signed into law on September 28, 2008.[29] AB 2863 created an independent solar energy producer exception to the definition of an electrical corporation.[30] The bill's purpose was to increase investment in solar by clarifying that companies offering solar PPAs are not public utilities.[31] This distinction, and AB 2863, is discussed in detail below.

The CSI has already encouraged many distributed solar generation projects. From its inception on January 1, 2007, through September 30, 2009, the CSI program installed 21,259 projects, totaling 257 MW of rooftop solar

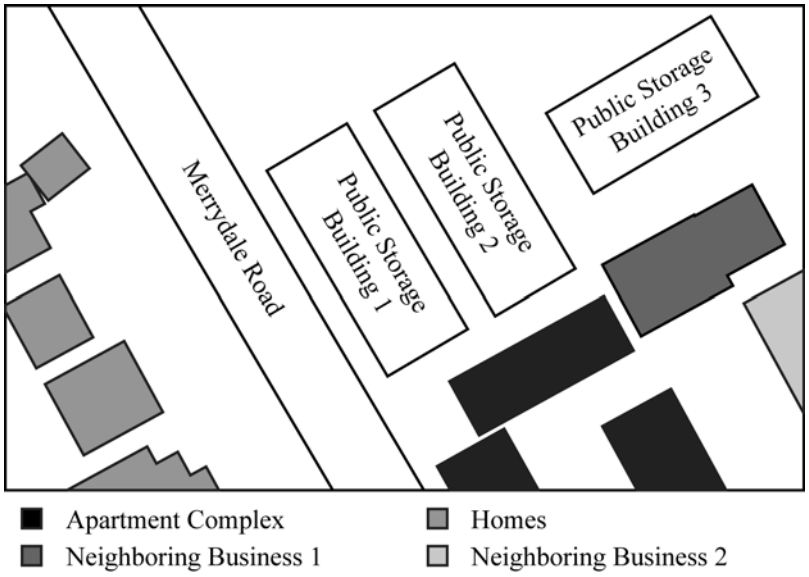
27. *See id.*
28. *Id.*
29. 2008 Cal. Adv. Legis. Serv. 535 (Deering).
30. *Id.*; ASSEM. COMM. ON UTILS. & COMMERCE, ELECTRIC CORPORATIONS: EXCLUSIONS AB 2863 ANALYSIS, *supra* note 19, at 2.
31. *See* AB 2863 ASSEM. FLOOR B. ANALYSIS, *supra* note 20, at 3.

power.[32] In fact, the CSI Program received over 2100 applications in August 2009, a record high.[33]

The success of the CSI to date is good news, but the attributes of distributed solar generation—increased reliability, decreased greenhouse gas emissions, and decreased peak loads—warrant more than just CSI success; they warrant complete investment in California's solar potential. Yet, the over-the-fence rule, an unnecessary limitation in the California Public Utilities Code, prevents the state from fully harnessing its solar potential.

Consider the hypothetical example of a self-storage unit in San Rafael, California, shown in Figure 2.

Figure 2. Public Storage and surrounding buildings in San Rafael, CA



This picture shows buildings one, two, and three of Public Storage on 380 Merrydale Road in San Rafael, California.[34] A self-storage unit is one example of a property where mid-day electricity demand ("load") is small and large-rooftop electricity generating potential is high. Other examples of such properties include inventory warehouses, vacant vacation homes, or any large-roofed structure that is unoccupied during the middle of the day. Notice that the storage units above are bordered by apartments to the south, homes to the west,

32. CAL. PUB. UTILS. COMM'N, CALIFORNIA SOLAR INITIATIVE STAFF PROGRESS REPORT 7 (Oct. 2009).

33. *Id.*

34. *See* Google Maps, http://maps.google.com (search 380 Merrydale Road in San Rafael, CA) (last visited Oct. 19, 2009).

and neighboring businesses to the east and southeast. The over-the-fence rule essentially prohibits a solar energy producer from installing solar panels on Public Storage's roof and selling its excess electricity to its neighbors because of the potential for regulation as a public utility.[35]

What is the impact of such restrictions? From this Public Storage unit in San Rafael alone, the state of California misses out on 174.8 kilowatt-hours (kWh) of electricity for every hour of strong sunlight,[36] enough electricity to power 218 typical California homes for that one hour.[37] Thousands of such properties with small mid-day load and large generating potential exist in neighborhoods and industrial parks throughout the state.

II. ASSEMBLY BILL 2863 AND THE OVER-THE-FENCE RULE

The over-the-fence rule states that an electricity producer may distribute its power only if the producer distributes it to two or less properties and only if such properties are located immediately adjacent to the property where the power is produced.[38] That is, the generator cannot distribute its power to three other properties or distribute its electricity more than one property away.[39] If the generator violates either requirement, it qualifies as an "electrical corporation" and is regulated as a public utility.[40] Regulation as a public utility results in extensive and invasive government intervention in the rates a generator may charge, which negatively impacts a project's viability.[41]

35. Part II *infra* discusses this concept in detail.

36. For these calculations, see Appendix A *infra*.

37. ((1 year / 7,000 kWh) / home) * (365 days / 1 year) * (174.8 kWh) * (24 hours / day) = 218 homes / hour. This number is likely an underestimation since homes are usually unoccupied in the middle of the day and therefore demand less electricity at that time.

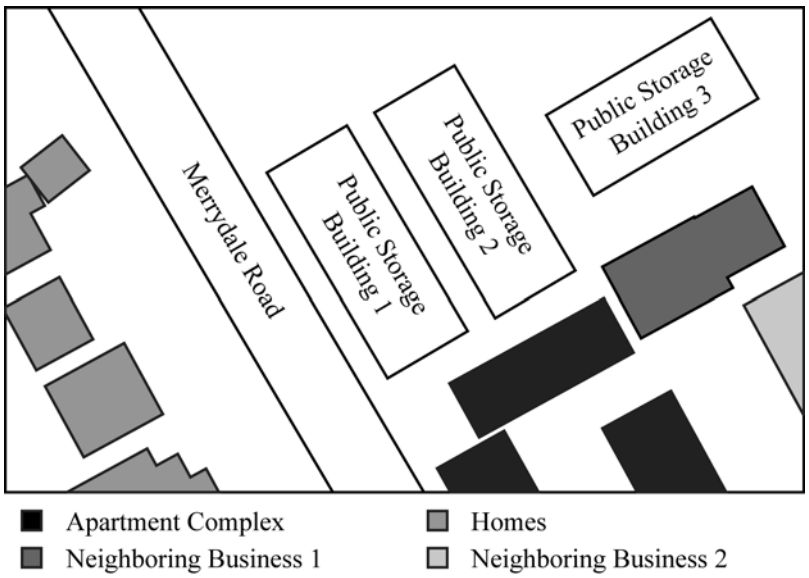
38. CAL. PUB. UTIL. CODE §§ 218(b), 2868(b) (Deering 2009). In this context, the word "distributes" denotes sending electricity to another entity for free or for a fee. Of course, in almost all such instances, the power would be sent for a fee.

39. *Id.* It should be noted that for the purposes of sections 218(b) and 2868(b), a road is considered a property. Therefore, two properties separated by a road are not considered adjacent. *See id*.

40. *Id.* The analysis of whether an entity is a public utility is not quite as simple as the cited sentence makes it seem. First, the generator must satisfy the definition of an electrical corporation. Second, the generator must not qualify for any exceptions to that definition. Third, the entity must have dedicated its property to public use. See *supra* note 123 for a full analysis.

41. *See, e.g.*, Richfield Oil Corp. v. Cal. Pub. Utils. Comm'n, 354 P.2d 4, 11 (Cal. 1960); CAL. PUB. UTIL. CODE §§ 313, 314 (Deering 2009). Under Direct Access provisions created during deregulation, a generator that sells retail electricity may be an "electric service provider" instead of a "public utility." *Id.* §§ 218.3(a), 365(b)(1). However, status as an electric service provider also subjects an entity to CPUC regulations, albeit less regulation than public utilities. *See id.* §§ 394(b), 394.2(a)–(d), 394.25(a)–(e). Furthermore, Assembly Bill 1X suspended Direct Access in 2001. Interim Opinion Suspending Direct Access, Decision 01-09-060, 2001 WL 1288525, at *1 (Cal. Pub. Utils. Comm'n Sep. 20, 2001). Not until the recent Senate Bill 695 in 2009 did new transactions between electric service providers and retail electric customers begin to return to legal status. *See* CAL. PUB. UTIL. CODE § 365.1(a)–(b) (Deering 2009). The uncertainty of recent legislation coupled with CPUC regulatory jurisdiction makes status as an electric service provider resemble status as a public utility in terms of restricting investment in distributed generation.

Figure 3. Public Storage and surrounding buildings in San Rafael, CA (Figure 2 reproduced)



Using the Public Storage example, show in Figure 3, what happens if a solar electricity producer installs photovoltaic panels on buildings one, two, and three? The over-the-fence rule would deter electricity distribution:

1. To more than two apartment buildings in the Apartment Complex if the buildings are on separate properties.
2. To Neighboring Business 1 and the Apartment Complex if such entities in total are located on more than two pieces of property.
3. To Neighboring Business 2 because its property and the Public Storage property are not adjacent.
4. To any of the homes because the homes are separated from Public Storage by a road and therefore not considered adjacent.

As this example demonstrates, the over-the-fence rule is a stiff restriction, offering little flexibility or opportunity for generation on prime solar generation properties.

A. A Caffeinated Version of 150 Years of Public Utility Regulation

To fully understand the roots of the over-the-fence rule one must understand the history of electric utility law. Professor Robert Hirsh's *Power Loss* is a useful lens through which to view such a history. Hirsh follows the transformation of the electric industry from (1) a closed, monopolistic system that I will call the regulatory consensus to (2) a semi-open market for electricity

generation created by the Public Utilities Regulatory Policies Act (PURPA) to (3) California's fateful experiment in deregulation.[42] The following section will highlight themes from Hirsh's conclusions, fill in the post-deregulation gap, and provide a snapshot of the industry's current regulatory structure.

1. Utilities as Monopolies Clothed in the Public Interest

Electricity is a unique commodity that demands special treatment because it cannot be stored efficiently in high volumes. The lack of efficient storage is an unfortunate characteristic since electricity is the working fluid of society's system. Without electricity, the gears of commerce, technology, and communication would seize. Even in 1932, President Franklin D. Roosevelt pronounced it vital:

> Electricity is no longer a luxury. It is a definite necessity. It lights our homes, our places of work and our streets. It turns the wheels of most of our transportation and our factories. In our homes it serves not only for light, but it can become the willing servant of the family in countless ways. It can relieve the drudgery of the housewife and lift a great burden off the shoulders of the hardworking farmer.[43]

Housewives and farmers aside, electricity today carries a heavy burden. A sudden and complete loss of today's electricity would likely result in catastrophic scenarios of intense conflict and de-civilization. Perhaps only water, food, and atmosphere carry burdens that outweigh electricity's awesome responsibilities.

The importance of electricity evolved from the experiments of Thomas Edison and his small direct-current grid into the supply chains of large, vertically integrated, investor-owned utilities endowed with an obligation to serve the public.[44] This "obligation to serve" is derived from the English notion of a "common business": in exchange for government-sanctioned monopoly power, a company that did business in a publicly vital industry would charge government-enforced, reasonable rates and provide non-discriminatory, quality service.[45] With monopoly power and revenue guaranteed by government regulation, a common business enjoyed limited risk and easy access to credit and investment.[46] Common businesses included entities such as ferry boats, wharves, port town crane operators, highway constructors and maintainers,

42. HIRSH, *supra* note 4.

43. Franklin D Roosevelt, A National Yardstick to Prevent Extortion against the Public and to Encourage the Wider Use of That Servant of the People—Electric Power—A Campaign Address on Public Utilities and Development of Hydro-Electric Power (The Portland Speech) *in* THE PUBLIC PAPERS AND ADDRESSES OF FRANKLIN D. ROOSEVELT, Vol. 1, 727, 733–734 (Russell & Russell 1938).

44. *See* HIRSH, *supra* note 4, at 12–13.

45. *Id.* at 16.

46. *Id.*

bakers, brewers, innkeepers, and milling businesses.[47] Lord Chief Justice Matthew Hale famously justified the regulation of these exclusive franchises on the principle that they were "affected with a public interest."[48]

In the United States, an electric industry "affected with a public interest" mandated the creation of a regulatory consensus, a regulation-for-monopoly pact between governments and electric utilities.[49] The regulatory consensus evolved from the case of *Munn v. Illinois* and the efforts of Governor Robert "Fighting Bob" La Follette of Wisconsin.

The Supreme Court first endorsed the regulatory consensus in the United States in *Munn v. Illinois*.[50] In 1870, the Illinois Legislature passed a law declaring grain elevators in Chicago vital to the public interest, thereby permitting regulation of their rates.[51] The issue in the case was whether the government could regulate the natural monopoly caused by routing all of the grain produced in eight states through Chicago to the market on the East Coast.[52] The Court ruled that the Illinois Legislature had the right to declare what constituted "reasonable compensation" for a company in a publicly vital industry.[53] As Chief Justice Morrison Waite stated:

> Property does become clothed with a public interest when used in a manner to make it of public consequence, and affect the community at large. When, therefore, one devotes his property to a use in which the public has an interest, he, in effect, grants to the public an interest in that use, and must submit to be controlled by the public for the common good . . . .[54]

If the Illinois Legislature deemed grain elevators a natural monopoly "clothed with a public interest," the Legislature had the right to set reasonable grain storage prices without violating the Due Process Clause of the Fourteenth Amendment.[55] *Munn* stands for the proposition that if any industry lends itself to monopoly characteristics and is a necessity for the function of society, the government can regulate it to ensure its prices are reasonable. In exchange for this regulation, the state will endorse the business owner's monopoly.[56]

Thirty years after *Munn*, the "Wisconsin Idea"—a series of Progressive reforms that relied on experts employing scientific approaches to managing government—institutionalized the regulatory consensus within state government.[57] In 1905, Governor Robert "Fighting Bob" La Follette passed

47. *Id.*
48. *Id.*
49. *Id.* at 11.
50. 94 U.S. 113 (1877).
51. *Id.* at 132.
52. *Id.* at 131.
53. *Id.* at 133.
54. *Id.* at 126.
55. *Id.* at 133, 135.
56. *Id.* at 133.
57. HIRSH, *supra* note 4, at 20.

legislation that established the Wisconsin Railroad Commission.[58] The Commission embodied, for the first time, a regulatory body with deep oversight powers.[59] Two years later, Fighting Bob helped craft legislation that gave the Railroad Commission jurisdiction over public utilities, including electric utilities, and the first public utilities commission emerged.[60] The law gave regulators broad and invasive powers to ensure good service at a fair price, including the ability to "investigate a company's books, approve sales of stock and bonds, and dictate uniform methods of keeping accounts."[61] Although the Wisconsin electric industry had the means to fight the creation of such a commission, utility managers nationwide viewed such regulation as the lesser of two evils.[62] The benefits of the regulation-for-monopoly consensus outweighed the more extreme alternative of government takeover and the conversion of investor-owned private utilities to city-owned municipal utilities.[63] Wisconsin's strong public utility law bulldozed a path "'for continuous, positive, expert government control of public utility rates and services on a statewide basis.'"[64] In fact, by 1914, forty-five states had enacted laws creating state regulatory commissions to control electric utilities.[65] Eighteen years later, Roosevelt made his seminal speech declaring electricity a necessity to which all Americans should have access.[66]

As the century progressed, the regulatory consensus deeply entrenched itself as the backbone of economic growth in the United States. Americans became obsessed with products powered by electricity.[67] They associated electricity and the economic growth it provided with the "good life."[68] Despite setbacks during the Great Depression, Americans' acceptance of electricity usage as a manifestation of that growth "provided the justification for utility managers to control an important infrastructural element of modern society."[69] In addition, improvements in generation technology kept electricity prices low despite large growth in electricity demand.[70] Because of these factors, consumers, utility managers, and regulatory commissioners all endorsed the utility companies' obligations and rights under the consensus.[71] Through the

58. *Id.*
59. *Id.*
60. *Id.* at 21.
61. *Id.* at 22.
62. *Id.* at 24.
63. *Id.*
64. *Id.* at 23 (quoting Ben W. Lewis, *Public Utilities*, *in* GOV. AND ECON. LIFE: DEV. AND CURRENT ISSUES OF AM. PUBL. POLICY 638 (1940)).
65. *Id.* at 26.
66. Roosevelt, *supra* note 43, at 733–734.
67. HIRSH, *supra* note 4, at 50–51.
68. *Id.* at 51.
69. *Id.*
70. *Id.* at 55.
71. *Id.* at 51–52.

first half of the century and well into the second half, utility managers enjoyed a "closed system" that guaranteed returns, limited competition, produced benefits for everyone in society, and established utility companies as large, vertically integrated monopolies.[72]

2. PURPA and EPAct Chip Away at the Vertical Monopoly

The blissful age of the early regulatory consensus continued until the late 1970s when the regulation-for-monopoly pact unraveled. Three events sobered the country's electricity binge and ended utilities' monopoly on electricity generation. First, electricity increased in demand while the pace of technological gains in generation efficiency slowed, resulting in price increases for electricity.[73] Second, as America reached peak oil production for traditional petroleum, demand for oil continued to barrel upwards, and OPEC cut its exports, creating an energy crisis in 1973 that shook the country.[74] Third, the modern environmental movement created demand for cleaner-burning generation fuels.[75] In response, Congress passed PURPA in 1978.[76]

PURPA ended the utilities' monopoly on electricity generation by requiring investor-owned utilities to buy all power produced by Qualifying Facilities (QFs).[77] QFs were non-utility electricity generators, known as independent power producers, that satisfied certain requirements based on size and quality of operations.[78] PURPA created a competitive power supply market that pitted QFs against the utilities.[79] Moreover, because of PURPA's price structures and bidding schemes, independent power producers and utility generators "had incentives to drive down their costs as they vied against each other to win contracts."[80] The competition that ensued mandated a departure from traditional rate structures, under which regulated utilities had profited on the cost of their capital investments "regardless of their economic or energy efficiency."[81] "QFs earned money only when they sold electricity, and no regulatory body would make them financially whole if they floundered."[82] By the late 1990s, PURPA had created a wholesale electricity generation market in California where QFs provided 9,412 MW of the state's approximately 56,000

72. *Id.*
73. *Id.* at 68.
74. *Id.* at 60–61.
75. *Id.* at 69.
76. 16 U.S.C. § 2601–2645 (2006); *see also* Kamine/Besicorp Allegany L.P. v. Rochester Gas & Elec. Corp., 908 F. Supp. 1194, 1204 (W.D.N.Y. 1995) ("PURPA was created as a vehicle to reduce the nation's dependency on foreign oil and to conserve energy.").
77. 16 U.S.C. § 824a-3 (2006).
78. *Id.*
79. HIRSH, *supra* note 4, at 129.
80. *Id.*
81. *Id.*
82. *Id.*

MW capacity,[83] leading Hirsh to conclude that PURPA "found a true home in California."[84]

The Energy Policy Act of 1992 (EPAct) further chipped away at the utility's generation monopoly. Under EPAct, Federal Energy Regulatory Commission Order 888 required utilities to functionally unbundle their transmission, generation, and ancillary services businesses.[85] That is, utility generators and independent power producers had to bid the electricity they produced into the same market. The utility then would choose the least-cost generation, regardless of whether the energy was produced by the utility's generators or an independent power producer. Further, EPAct also required that independent power producers be given access to the utilities' transmission grid on rates and terms comparable to those that the utility would charge itself.[86] EPAct disallowed a utility transmission company from discriminating against independent power producers by charging them more to use the utility's transmission system than the utility transmission company would charge the utility's own generators.[87] Thus, EPAct made utilities functionally separate their generation and transmission businesses, and then barred price discrimination between those companies and independent power producers. Dividing these businesses and making utility generators compete meant the end of monopoly-protected, vertically integrated electric utility companies.

The combination of PURPA and EPAct also resulted in the birth of the exempt wholesale generator—a power plant that sold its electricity to the utility through a market rather than through a long-term contract (although such contracts still existed).[88] In California, hundreds of exempt wholesale generators sprung up throughout the state strutting the latest in low-cost, environmentally friendlier power generation: the combined-cycle gas turbine.[89] These producers pushed down the price of electricity and saturated the California electricity market with non-utility generators.

83. *Id.* at 93

84. *Id.*

85. Promoting Wholesale Competition Through Open Access, 62 Fed. Reg. 12,274, 12,275 (Mar. 14, 1997) (to be codified at 18 C.F.R. pt. 35). "Ancillary services businesses" are utility-owned entities and equipment that provide generation and services that maintain the voltage necessary for the electricity grid to operate properly. *See* CAL. INDEP. SYS. OPERATOR, CURRENTLY EFFECTIVE CAISO CONFORMED TARIFF, Appendix A, Sheet No. 483 (Feb. 5, 2009).

86. HIRSH, *supra* note 4, at 244.

87. 16 U.S.C. § 824d(a)–(b) (2006).

88. HIRSH, *supra* note 4, at 243.

89. *See id* at 247–48. Combined-cycle gas turbines, unlike traditional generation systems, recycle the hot gas used to turn one turbine by transporting the heat given off from the first turbine to a second turbine, where the heat turns water into steam to push the blades of the second turbine. Both turbines spin a magnet inside of a bundle of copper wires, creating electricity. This recycling of waste heat increases the efficiencies of the turbines, thereby requiring less natural gas to produce more electricity and reducing the cost of electricity.

In the end, PURPA and EPAct helped destroy the rationale for the old regulatory consensus by "stimulating development of small-scale technologies that produced cheap power," "show[ing] that barriers to entry were not so formidable," "empower[ing] a host of old and new actors" in the regulatory sphere, and introducing "market-based principles that challenged the sanctity of rate-of-return regulation."[90]

3. Deregulation

Deregulation of the electricity industry challenged these principles even further. As exempt wholesale generators took off, capitalism won the Cold War, and an era of "market triumphalism" spawned calls for deregulation.[91] The era was marked by a general acceptance of the notion that "markets were the answer, government was the problem, and anybody who thought otherwise was either Rip Van Winkle or a card-carrying liberal clinging to the past."[92] Assembly Bill 1890 (AB 1890) ushered in California's disastrous experiment in deregulation on September 23, 1996.[93] When the measure passed, Governor Pete Wilson

> proudly pointed to the California legislation as another successful example of a market-oriented approach breathing new life into a stale, regulated industry that suffered from too much "command-and-control" oversight. "We've pulled the plug on another outdated monopoly," proclaimed Wilson, "and replaced it with the promise of a new era of competition."[94]

AB 1890 rested on the premise that more competition meant more efficiency, and more efficiency meant lower prices for electricity.[95] The unanimously approved bill was designed to dismantle the investor-owned, government-regulated utility model and create a deregulated market in which price would be established by competition.[96] AB 1890 completely abandoned the notion that utilities were natural monopolies with which only regulatory commissions could deal.[97] "The theory was that power generation, which ostensibly no longer had natural monopoly characteristics, would be separated from transmission, which still had natural monopoly characteristics."[98] Hirsh concluded in 1999 that deregulation

90. *Id.* at 131.
91. Timothy P. Duane, *Regulation's Rationale: Learning from the California Energy Crisis*, 19 YALE J. ON REG. 471, 491 (2002).
92. *Id.*
93. *Id.* at 497.
94. *Id.*
95. *Id.* at 498.
96. *Id.* at 498–99.
97. *See* HIRSH, *supra* note 4, at 260.
98. Duane, *supra* note 91, at 498.

> constituted the final blow to utility managers' status as dominant elites. It did so by depriving power companies of the privileges they obtained nine decades earlier as part of the utility consensus. No longer viewed as natural monopolies, the firms surrendered their exclusive franchises and began competing against market-savvy entrepreneurs for customers they previously took for granted. And in the absence of traditional regulation, utilities could not depend on assurances anymore that they would receive sufficient income to pay dividends and interest payments to investors. In short, the emergence of competition signified that power company managers had conclusively lost control over a once-closed utility system.[99]

Of course, Hirsh did not know then that deregulation would be a spectacular failure, the causes of which will not be addressed in this Note. Yet it is a fact that the wholesale price of electricity skyrocketed from May 2000 to May 2001.[100] Independent power producers earned enormous profits[101] while Pacific Gas & Electric (PG&E) declared bankruptcy on April 6, 2001, and Southern California Edison narrowly avoided doing so.[102] The California Department of Water Resources bought power on the utilities' behalf and entered into $6 to $9 billion of electricity contracts at double the market value of electricity.[103]

Regardless of deregulation's failure, the idea of protecting utility-owned electricity generators from competition had passed. PURPA, EPAct, and deregulation combined to obliterate such notions.

4. The Regulatory Structure Today: Cost-of-Service Regulation and the ERAM

While California's electric utilities are no longer vertically integrated monopolies, their transmission and distribution companies are still monopolies with exclusive territories that link electricity generation to its end user. The California Public Utilities Commission (CPUC) determines the rates a utility may charge for such services through a rate order. Commission-approved rate orders are based on the cost of service, or the cost of providing electricity to end users with an opportunity for the utility to earn a negotiated return in addition to the cost.[104] Rate orders must reasonably balance the private utility's interest in maintaining the utility's financial integrity and access to capital

99. HIRSH, *supra* note 4, at 260.
100. *See* Duane, *supra* note 91, at 509–10.
101. *Id.* at 510.
102. *Id.* at 520.
103. *Id.*
104. Cost-of-service rates are discussed in detail in Appendix A *infra*.

markets with the consumer's interest in being charged "non-exploitive rates."[105]

Further, the rate structures that the CPUC approves are not based on the amount of electricity the utility actually sells because of the Electric Revenue Adjustment Mechanism (ERAM). In the late 1970s, utility managers craved financial stability after high construction costs and escalating fuel prices damaged their financial positions.[106] In 1981, responding to the pleas of PG&E, the CPUC adopted the ERAM.[107] The ERAM's purpose was to reduce financial risk for utilities by depositing into a balancing account the difference between the revenue the utility actually earned and the revenue the CPUC forecasted it would earn.[108] If the CPUC overestimated or underestimated sales, the interest-earning account compensated for the difference.[109] The ERAM effectively decoupled sales from revenues, as it guaranteed the utility a certain level of revenue from electricity sales each year.[110] More importantly, the ERAM, which is still in place, eliminated the utilities' incentives to sell more kWh of electricity. Utilities earn the same revenues from the sale of electricity regardless of how many kWh they actually sell. Since utility profits equal guaranteed revenues for a year minus costs for that year, utilities earn returns by meeting or beating their cost expectations.[111]

5. Summary of the History and Current State of Electricity Regulation

California's electric utilities started as vertically integrated natural monopolies that generated, transmitted, and distributed electricity to customers in exclusive service areas under the regulatory consensus. PURPA, EPAct, and deregulation collectively ended the utility's monopoly in electricity generation, so that utilities now purchase power from the lowest bidder, whether that bidder is a merchant power plant, a non-merchant QF, or the utility's unbundled generation company. However, investor-owned utilities still hold monopoly power over transmission and distribution services that deliver electricity to end users. Because of this monopoly power, the regulatory consensus still subjects utilities to cost-of-service rate structures that must be approved by the CPUC. These rate structures, under the ERAM, guarantee that utilities earn the same revenues from the sale of electricity regardless of how

105. *See* Fed. Power Comm'n v. Hope Natural Gas Co., 320 U.S. 591, 603 (1944); Jersey Cent. Power & Light Co. v. Fed. Energy Regulatory Comm'n, 810 F.2d 1168, 1178 (D.C. Cir. 1987).

106. *See* HIRSH, *supra* note 4, at 179.

107. *See id.* at 182.

108. *See id.*

109. *Id.*

110. *Id.* at 183. On the other hand, this decoupling removed the incentive for utilities to generate more power and effectively "eliminated utilities' disincentives to promote conservation." *Id.*

111. How utilities earn their profits is discussed in detail in Appendix A *infra*.

many kWh of electricity they actually sell that year. Thus, the utilities make money by meeting or beating their projected costs of service.[112]

To fully understand the motivations behind the over-the-fence rule, it is important to know the difference between utilities' rights and obligations under the regulatory consensus at the time of formation and their rights and obligations today. As this Note demonstrates, utility obligations under state and federal laws remain the same today as during the regulatory consensus. These obligations included: (1) charging reasonable rates,[113] (2) the obligation to serve all customers who desired service,[114] (3) "faithful and consistent service,"[115] and (4) no unjust discrimination against any potential customers.[116] However, the rights of utility companies have changed. Under the regulatory consensus, they included: (1) exclusive service areas with a government sanction that competition was not in the public interest,[117] (2) eminent domain authority, enforced by courts, to compel property owners to sell to utilities,[118] and (3) sufficient revenues to recoup costs on their capital expenditures, maintain their financial integrity, and promote their access to capital markets.[119] It is the first of these rights—protection of utilities from competition in the public interest—that state and federal law most altered between the previous regulatory consensus and now. More importantly here, protecting utilities from competition was a key reason for the creation of the over-the-fence rule.

The following Parts of the Note will apply the rationale behind the electricity regulatory structure to the creation of the over-the-fence rule in 1984 and to the justifications for the rule's continued existence.

B. Why Did California Write the Over-the-Fence Rule?

California's stated purpose for writing the law that created the over-the-fence rule was to encourage investment in cogeneration technology. Cogeneration includes any facility that uses waste heat to produce electricity or steam, including large factories that use waste heat from industrial processes to generate electricity.[120] However, analysis of the winners and losers under the

112. *Id.*

113. *See, e.g.*, Fed. Power Comm'n v. Hope Natural Gas Co., 320 U.S. 591, 603 (1944); Munn v. Illinois, 94 U.S. 113, 133 (1877); Jersey Cent. Power & Light Co. v. Fed. Energy Regulatory Comm'n, 810 F.2d 1168, 1178 (D.C. Cir. 1987).

114. HIRSH, *supra* note 4, at 26.

115. *Id.*

116. *Id.*

117. *Id.* at 27.

118. *See id.*; Cantu v. Pac. Gas & Elec. Co., 234 Cal. Rptr. 365, 367 (Cal. Ct. App. 1987).

119. *See* Jersey Cent. Power & Light Co. v. Fed. Energy Regulatory Comm'n, 810 F.2d 1168, 1178 (D.C. Cir. 1987).

120. *See* CAL. PUB. UTIL. CODE § 216.6 (Deering 2009).

rule and analysis of the electricity industry's paradigm at the time both demonstrate that the over-the-fence rule itself was written to protect utility-owned generators from competition.

1. Encouraging Investment in Cogeneration One Day

Section 218(a) of the California Public Utilities Code defines an "electrical corporation" as "every corporation or person owning, controlling, operating, or managing any electric plant for compensation."[121] The definition is significant because section 216 of the Public Utilities Code defines an "electrical corporation" as a "public utility," "subject to the jurisdiction, control, and regulation" of the CPUC.[122] Thus, once an electricity generator qualifies as an electrical corporation, that generator is subject to CPUC regulation.[123] Under such regulation, the CPUC has intimate and invasive control over the price the generator may charge for its power, what types of customer service programs the generator may implement and how much must be spent on such programs, and what measures the generator must take to ensure public safety.[124] Such heavy regulation deters investment since the CPUC has great influence over the generator's revenues and expenses.[125]

Recognizing that subjecting a company to such regulation would restrict investment in technologies it deemed beneficial, the California Legislature carved out exceptions to the "electrical corporation" definition.[126] Currently, exemptions exist for (1) cogenerators,[127] (2) producers that generate electricity from "other than a conventional power source,"[128] (3) landfill gas producers,[129] (4) digester gas generators,[130] and (5) independent solar producers.[131]

121. *Id.* § 218(a).

122. *Id.* § 216(a)–(b).

123. The analysis of whether an entity is subject to CPUC jurisdiction is simplified here. First, the generator must satisfy the definition of an electrical corporation. Second, the generator must not qualify for any exceptions to that definition, which are addressed in the next paragraph. A third requirement may also exist where the entity must have dedicated its property to public use, a complex factual question. *See* Thayer v. Cal. Dev. Co, 128 P. 21 (Cal. 1912); Richfield Oil Corp. v. Cal. Pub. Utils. Comm'n, 354 P.2d 4, 11 (Cal. 1960); Van Hoosear v. R,R. Comm'n, 194 P. 1003 (Cal. 1920). *But see* Pacific Gas & Elec. v. Dow Chem. Co., Decision 94-07-063, 1994 WL 478596, at *9 (Cal. Pub. Utils. Comm'n July 22, 1994) ("The dedication doctrine has survived but only narrowly."). Relying on a factual question as complex as the public dedication doctrine to avoid regulation is a risky proposition and unlikely to provide a foundation from which investment in distributed generation can grow.

124. *See* AB 2863 ASSEM. FLOOR B. ANALYSIS, *supra* note 20, at 4.

125. *See, e.g.*, Richfield Oil Corp. v. Cal. Pub. Utils. Comm'n, 354 P.2d 4, 11 (Cal. 1960).

126. *See id.*; AB 2863 ASSEM. FLOOR B. ANALYSIS, *supra* note 20, at 3.

127. CAL. PUB. UTIL. CODE § 218(b) (Deering 2009).

128. *Id.*

129. *Id.* § 218(c).

130. *Id.* § 218(d).

131. *Id.* §§ 218(e), 2868(b).

To qualify for the exemption, however, sections 218(b) and (e) dictate that cogenerators and solar producers must sell surplus power beyond their property lines in accordance with the over-the-fence rule.[132] As explained above, the over-the-fence rule limits the exemption to generators that produce electricity for their own use, the use of their tenants, or the sale to no more than two other entities "for use on the real property on which the electricity is generated, or on real property immediately adjacent thereto."[133] More simply stated, the over-the-fence rule exempts a generator from regulation only if it sells power to two or less entities and only if such entities are located on a property immediately adjacent to the property where the power is produced.[134]

Governor George Deukmejian created the over-the-fence rule on August 21, 1984, when he signed Senate Bill 1773 (SB 1773).[135] On paper, SB 1773 sought to clear up confusion over the status of cogenerators. Under the law in 1984, the only exemption that existed from the definition of "electrical corporation" was a generator that produced power by "other than a conventional method for personal use, use by a tenant or for sale to a utility."[136] In 1978, the passage of PURPA left some uncertainty as to whether cogeneration facilities—and the banks that funded them—were utilities or not.[137] The regulatory uncertainty over the status of cogeneration facilities restricted investment as potential investors in renewable energy became nervous that they would be subject to CPUC regulation as public utilities.[138] More specifically, investment counsel with First Boston Corporation requested a law such as SB 1773 "to clarify an ambiguity in California law. The bill [made] clear that the exemption from public utilities regulation . . . for alternative energy projects [extended] to the financing entity which [paid] for

132. *Id.* §§ 218(b), (e); 2868(b).

133. *Id.* § 2868(b). Further, "real property" is defined as "a single parcel of land" and "solar energy system" is defined as "any configuration of solar energy devices that collects and distributes solar energy for the purpose of generating electricity and that has a single interconnection with the electric utility transmission or distribution network." *Id.* § 2868(c)–(d).

134. The over-the-fence rule applies also applies to cogenerators and electricity producers that generate from "other than conventional power sources." *Id.* §§ 218(b), 2868(b). Further, landfill gas and digester gas generators will qualify for the exemption only if the power produced is used by the generators themselves, by not more than two of the generators' tenants, or by not more than two other corporations or persons *and* it is used on the real property on which it is generated. *Id.* § 218 (c)–(d). Thus, the regulatory leash is even shorter for landfill gas and digester gas generators.

135. Letter from Herschel Rosenthal, Chairman, California Senate Committee on Energy and Public Utilities, to George Deukmejian, Governor of California (Aug. 13, 1984), *microformed on* Governor's Chaptered Bill Files Chapter 699-Senate Bill 1773 in the Univ. of Cal., Berkeley Law Sch. Library.

136. S. B. 1773 B. ANALYSIS, 1983–1984 Session (Cal. Aug. 14, 1984), *microformed on* Governor's Chaptered Bill Files Chapter 699-Senate Bill 1773 in the Univ. of Cal., Berkeley Law Sch. Library.

137. *See* Letter from Herschel Rosenthal to George Deukmejian, *supra* note 135.

138. *See id.*

the project."[139] In other words, the bill explained that third-party development of cogeneration equipment would not subject the third party to CPUC regulation.[140] The Legislature concluded that allowing third-party development of cogeneration equipment would "encourage development of alternative energy sources at sites or facilities where cogeneration potential exists," but where facility owners are unwilling or unable to develop it themselves.[141] Thus, SB 1773's stated purpose was to encourage cogeneration.

2. Stifling Cogeneration the Next Day

However, while SB 1773 encouraged investment with its right hand, it wrote the over-the-fence rule with its left.[142] The bill encouraged third-party investment through the cogeneration exemption, but then limited such investment by mandating that cogenerating facilities keep their power to themselves, send it to less than two neighbors, or sell it back to the utility. Why did the Legislature limit power sales with such an arbitrary and paradoxically investment-restricting boundary? The answer is that the over-the-fence rule was written to protect utility-owned generators from competition.

Although this Note is too narrow in focus to examine the effect of energy industry lobbyists in crafting the 1984 over-the-fence rule, two points can still be made: (1) utility generators benefited the most from the 1984 over-the-fence rule as the rule limited competition from cogenerators, the utilities' only competition at the time; and (2) the monopoly-protection attitudes and beliefs of the pre-PURPA regulatory consensus still existed when the Legislature enacted the 1984 over-the-fence rule.

At the time of enactment, the main effect of SB 1773's over-the-fence rule was to limit competition for already established generators—that is, utility-owned generators. After all, the measure passed only six years after PURPA opened the generation market to competition, only two years after the Supreme Court finally declared PURPA constitutional,[143] only three years after the ERAM decoupled electricity revenues from power sales, and before any meaningful generation existed beyond investor-owned utilities.[144]

Further, the California Legislature passed SB 1773 to encourage investment in cogeneration, a non-traditional way of creating electricity. Yet, instead of allowing large cogenerators with reliable electricity production to sell power directly to neighboring industrial plants, businesses or communities, the Legislature restricted the generation so that it could only be sold to two

139. *Id.*
140. *See* S. B. 1773 B. ANALYSIS, *supra* note 136.
141. *Id.*
142. *See* Letter from Herschel Rosenthal to George Deukmejian, *supra* note 135.
143. *See* Fed. Energy Regulatory Comm'n v. Mississippi, 456 U.S. 742, 745 (1982).
144. *See* HIRSH, *supra* note 4, at 96.

neighboring properties or back to the utility. The major economic effect of such a restriction was to limit competition for the existing generators that supplied power to such communities and businesses. The only other generators existing at the time of SB 1773's enactment were utility-owned generators.[145] Thus, utility generators benefited the most from the restrictions imposed by the 1984 over-the-fence rule. I do not mean to imply that consumer protection from unscrupulous and unregulated entities was not part of the motivation behind the over-the-fence rule. However, the tight grasp of the over-the-fence rule, drawing the regulatory line at two or less adjacent properties, clearly and financially benefited utility generators.

But why would utility generators care about how much electricity they sold if the ERAM decoupled utility revenues from kWh sold? The answer is that the utilities still had profit incentives to limit distributed generation despite the ERAM. While the ERAM removed the direct relationship between kWh sold and utility profits, utility profits still depended on the number of customers the utilities served. Unlike traditional companies, utilities make their profits in two ways: (1) they beat the forecasted cost of operating their assets, or (2) they increase their investments in capital projects, such as generating plants, transmission lines, or distribution lines.[146] This latter profit source explains the utilities' interest in limiting distributed generation. If a group of customers taps into distributed generation, the electricity load demanded by those customers disappears. These missing customers thereby decrease the amount of electricity the utility must procure. If the utility procures less electricity, it builds less generation and less transmission infrastructure to connect to new generation. Thus, a reduction in procurement represents a decrease in capital investment and a resulting decrease in utility profits.[147] In summary:

> The more customers a utility has, the more opportunity the utility has to build capital assets.
> ⇓

145. *Id.*

146. *See* Appendix B *infra*.

147. The rate structure in Appendix B is simplified, as today there are other utility costs and revenues that are not included. One prominent example of a revenue that adds an incentive for utilities to maintain or increase their customer base is energy efficiency. Under a CPUC program, utilities earn a small return for each dollar invested in energy efficiency. An example of such an investment is giving customers rebates for reducing the energy used during a particular month in consecutive years. The customer earns a rebate for each kWh of reduction in electricity the customer makes. For the utility, the rebate represents an investment in energy efficiency, upon which the utility earns back every dollar it pays out, plus a small percentage—say 2 percent—of each dollar. The fewer customers a utility has, the fewer dollars it can invest in efficiency programs such as the energy-reduction rebates, the less gross returns it earns each year from energy efficiency programs, and the lower its profits will be. Thus, the utility has an incentive in energy efficiency programs to maintain or increase its customer base.

The more opportunity the utility has to build capital assets, the more opportunity the utility has to earn a profit.

⇓

Because of this profit incentive, maintaining or increasing its customer base is a priority for the utility.

⇓

Distributed generation, such as cogeneration or solar power, limits the number of utility-served customers, thereby limiting the utility's opportunity to make a profit.

⇓

A utility has an incentive to constrict distributed generation.

Thus, despite the ERAM, California's endorsement of cogeneration represented competition over customers that provided returns for investor-owned utilities. If the California Legislature opened investment opportunities for cogeneration to take utility customers, the utilities had a profit incentive to limit that competition as much as possible. Restricting sales to adjacent properties and two buyers would help achieve that goal.

In addition, utility managers had a history of tying themselves to sales of electricity even when those sales did not mean more revenue for investors. In the 1970s, during the onslaught of conservation efforts by state governments,

> experience had taught [utility managers] that selling more electricity was a good thing. Increased consumption enabled customers to enjoy higher material standards of living, and it drove utility companies to build bigger and more efficient plants. To promote reduced consumption—to unsell electricity—did not fit into the traditional paradigm of the growth-oriented electric utility industry. It clearly militated against managers' history and value system.[148]

The "value system" of utility managers made them "hesitant to abandon cherished beliefs" that growth in power sales is necessary.[149] Further, the monopoly-protection attitudes and beliefs of the pre-PURPA regulatory consensus still existed when the Legislature enacted the 1984 over-the-fence rule. After all, the rule was enacted only six years after PURPA. Thus, it is likely that utilities argued fiercely to maintain protectionist attitudes and beliefs through the enactment of the over-the-fence rule.

Such resistance to change continued into the late 1990s. In the midst of deregulation, utilities' reluctance to change caused CPUC Commissioner Jessie J. Knight, Jr., to remark in a dissent:

148. HIRSH, *supra* note 4, at 156.
149. *Id.* at 154.

> The provision of over-the-fence generation [and other measures] all begin to chip away at the façade of natural monopoly which the utility distribution companies argue and claim exists. The industry was slow to see the advent of competition in generation and retail provision of electricity. Now it is starting to grasp the eventual reality that competition in transmission services is coming and will become a forgone conclusion as part of the evolution of competitive energy markets. Soon they will have to come to grips with competition within the bastion of distribution. It is only a matter of time.[150]

Commissioner Knight's remarks demonstrate the stubborn attitude utilities had towards competition in electricity generation even after the ERAM decoupled sales from profits.

The over-the-fence rule was an industry attempt to protect "the façade of natural monopoly."[151] The reason the rule's boundaries were drawn so tightly was to protect utility-owned generation assets from competition, and the current electricity industry paradigm endorsed such protection. Thus, while Governor Deukmejian signed SB 1773 to encourage investment in cogeneration, the over-the-fence rule choked such generation's actual potential.

C. There is No Reasonable Justification to Maintain the Over-the-Fence Rule

Utilities still have incentives to protect themselves from competition and still benefit from the over-the-fence rule's tight grip on investment in distributed generation. The following Part will use the most recent incarnation of the over-the-fence rule—AB 2863—to demonstrate how the current regulatory structure does not justify a rule that protects utilities from competition in electricity generation. Further, it will examine two other potential justifications for the over-the-fence rule: consumer protection and grid reliability. The Part will conclude that none of the three justifications are valid for a rule that draws the line between regulated entities and unregulated entities at two or less adjacent properties.

1. Under the Current Regulatory Structure, Utilities Do Not Warrant Any Protection from Competition in Generation

In 2008, the California Legislature made the same mistake as the Legislature in 1984. It attempted to encourage investment in distributed generation with one hand while using the over-the-fence rule to discourage investment with the other. Today, as in 1984, utilities have incentives to use the over-the-fence rule to block the advancement of distributed solar generation.

150. Re Line Extension Rules of Elec. and Gas Utils., Decision 97-12-099, 1997 WL 1938745, at *7 (Cal. Pub. Utils. Comm'n Dec. 16, 1997).

151. *Id.*

After PURPA, the ERAM, EPAct, and deregulation, however, today's regulatory consensus certainly does not justify the over-the-fence rule's restrictions on competition in generation. If competition is the justification, the Legislature should temper the over-the-fence rule.

Sponsored by the Solar Alliance, a group of independent solar producers, AB 2863 created the "independent solar energy producer" exception to the definition of an electrical corporation in September of 2008.[152] As SB 1773 clarified the status of cogenerator financiers, AB 2863 attempted to clarify that companies offering solar power purchase agreements (PPAs) are not electrical corporations subject to the same level of regulation as public utilities.[153]

AB 2863 arose out of uncertainty over the status of PPAs within the regulatory context.[154] Although the CPUC had determined that PPAs between one homeowner and one generator did not trigger regulatory oversight, solar producers were fearful that the CPUC might eventually determine that companies holding PPAs would constitute electrical corporations.[155] "That determination would put existing contracts at risk as the PUC would have the authority to set rates and terms that differ from the agreed upon terms."[156] Further, "the largest benefit of the PPA to the owner of the generation is the guaranteed revenue stream, and if the PPA were subject to rate regulation, the certainty of the revenue would be lost."[157] As this uncertainty over the future treatment of the PPAs restricted investment, the Solar Alliance sought to clarify the status of third-party solar producers just as First Boston sought to clarify the status of third-party cogenerators.[158] The Legislature created an exception from CPUC regulation for independent solar producers that was likely to spark investment. The Legislature quickly doused the spark, however, by simultaneously failing to knock down the over-the-fence rule.

The Public Storage example illuminates this failure in Figure 4.

152. 2008 Cal. Adv. Legis. Serv. 535 (Deering); AB 2863 S. FLOOR B. ANALYSIS, 2007–2008 Sess. (Cal. Aug. 9, 2008).

153. *See* AB 2863 ASSEM. FLOOR B. ANALYSIS, *supra* note 20, at 3.

154. *See* ASSEM. COMM. ON UTILS. & COMMERCE, ELECTRIC CORPORATIONS: EXCLUSIONS AB 2863 ANALYSIS, *supra* note 19, at 2.

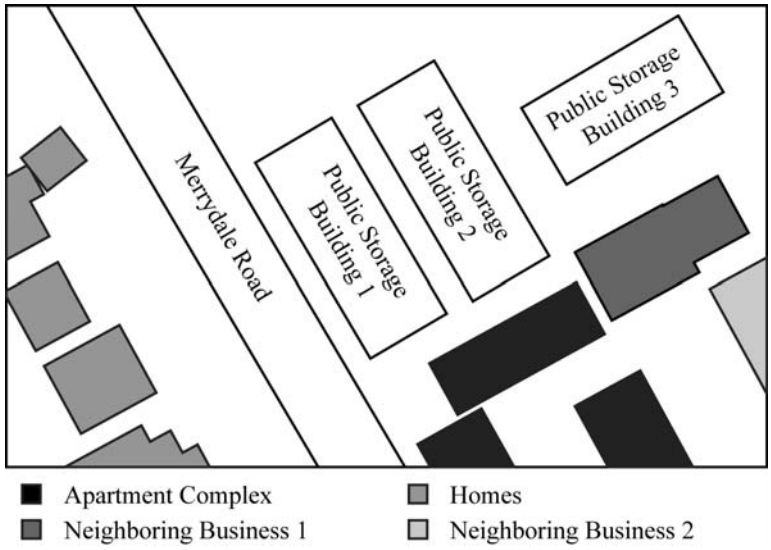
155. *See id.* at 3. Note that solar companies always limited the sale of electricity to one property owner. This was to ensure that the PPAs were not treated as electrical corporations under the over-the-fence rule. *See* S. ENERGY, UTILS. & COMMC'NS COMM., AB 2863 ANALYSIS, *supra* note 22.

156. ASSEM. COMM. ON UTILS. & COMMERCE, ELECTRIC CORPORATIONS: EXCLUSIONS AB 2863 ANALYSIS, *supra* note 19, at 3.

157. *Id.* at 4.

158. *Id.* at 2.

Figure 4. Public Storage and surrounding buildings in San Rafael, CA (Figure 2 reproduced)



To avoid regulation under the over-the-fence rule, the Public Storage unit's solar energy producer can only use its 174.8 kWh of rooftop capacity for the unit's own use, sell it to two neighbors, or sell it back to the utility.

Taking each of these in turn, one can see that the over-the-fence rule will limit the incentives for the Public Storage to fully invest in solar. First, assuming that the unit's electricity demand in buildings one, two, and three is comprised solely of light bulbs, electricity demand is very low.[159] To power its on-site load, it only needs to fill a fraction of its rooftop with solar panels, a failure to realize the unit's full generating potential.

Second, the Public Storage unit produces enough electricity to power 218 homes.[160] However, under the over-the-fence rule it can only power two adjacent properties, whether those properties are two apartment complex buildings or one apartment complex building and Neighboring Business 1. Regardless of which two properties it chooses to sell power to, the energy demand of those two properties is only a fraction of its 218-property generating potential. Again, the Public Storage owner will be encouraged to fill only a fraction of the rooftops with solar panels.

159. *See* Appendix A *infra*.
160. *Id.*

Third, selling electricity back to a utility in California involves either net metering or a feed-in tariff.[161] Under net metering agreements, the generator would "sell" electricity to the utility by running her meter backwards when she is producing more electricity than she is using from the grid.[162] However, if the site owner produces more electricity than she consumes in a given billing cycle, the utility will not pay her for the surplus electricity she generated.[163] Since the Public Storage facility demands only minimal electricity, the owner will not be paid for the excess electricity the facility would produce if she filled its rooftop with panels.

Under a feed-in tariff, on the other hand, the utility would compensate the Public Storage generator per surplus kWh the generator produces.[164] The ratemaking authority (in most cases the CPUC) would determine the rate at which the utility compensates the generator.[165] The creation of the tariff, enacted October 11, 2009, in two separate bills,[166] is welcome news as it creates a market in which a potential generator like Public Storage may sell its power. However, there are two aspects of the tariff that continue to curb investment in potential solar generation facilities. First, as the CPUC would set the compensation rate, Public Storage would be subject to a rate that it did not negotiate. It remains to be seen whether the CPUC-determined rate would be sufficient to garner full investment in distributed solar. If the CPUC rate is not sufficient to pay off the initial investment in a timely manner, such an investment would not be made. Second, the two laws that created the feed-in tariff have express caps on the amount of electricity utilities must purchase. One law expressly caps feed-in tariff generators at 750 MW statewide[167] and another caps the program at "2.5 percent of the electric utility's aggregate customer peak demand."[168] These caps may prevent Public Storage from building its generation if other projects have filled the caps.

Therefore, under all three scenarios—on-site load service, sale to two neighbors, and sale to the utility—Public Storage has limited incentives to fully utilize its 174.8 kWh of rooftop capacity.[169] Multiply this scenario by the thousands of vacation homes, warehouses, and self-storage units in the state,

161. *See* CHRIS COOPER & JAMES ROSE, NETWORK FOR NEW ENERGY CHOICES, REPORT NO. 01-06, FREEING THE GRID: HOW EFFECTIVE STATE NET METERING LAWS CAN REVOLUTIONALIZE U.S. POLICY 32 (2006).

162. *See id.* at 8; HANDBOOK, *supra* note 14, at 11.

163. *See* COOPER & ROSE, *supra* note 161, at 13.

164. CAL. PUB. UTIL. CODE §§ 2827(h)(4)(A), 387.6(c), (f) (Deering 2009).

165. *Id.*

166. A.B. 920, 2008–2009 Sess. (Cal. Oct. 11, 2009); S.B. 32, 2008-2009 Sess. (Cal. Oct. 11, 2009).

167. CAL. PUB. UTIL. CODE § 387.6(e) (Deering 2009).

168. *Id.* § 2827(c)(1).

169. Appendix A *infra*.

and it is easy to see how the over-the-fence rule constricts the state's ability to realize its full solar potential.

Public utilities benefit from this constriction, public utilities have incentives to foment this constriction, and public utilities have supported this constriction. California still abides by cost-of-service regulation.[170] Recall that under cost-of-service regulation, the more customer load a utility must serve, the more opportunity the utility has to earn a profit. Thus, utility profits benefit from constricting distributed solar generation at the Public Storage units. Recall further that because of this profit incentive, a utility has a strong incentive to constrict distributed generation. Though concrete evidence is difficult to find, utilities likely bargained hard to maintain the over-the-fence rule in 2008. Finally, utilities respond negatively to proposals for electricity generation that displace utility-owned electricity generation in other contexts.[171] For example, PG&E still consistently opposes any political measure that would increase generation assets owned by others that would decrease power purchased from PG&E.[172]

Utilities also have other incentives to limit distributed solar generation. Distributed solar generation is one component of a paradigm shift that marginalizes electric utility companies. That is, distributed solar generation threatens the century-old paradigm that keeps utilities in business: utilities are necessary to supply the electricity that keeps our society functioning. Preserving this paradigm means maintaining dependence on utility companies. By limiting the number of customers served by distributed solar generation, utilities increase the number of customers still wholly dependent on utilities for electricity. This dependence drives the paradigm that generating utilities are vital. Distributed generation, however, introduces the idea of non-utility generation at a residential, per property level. Distributed generation is the first step toward a society that relies less on centralized generation and its utility-owned grid. Thus, any distributed generation—whether it is cogeneration or residential solar—represents the continuing marginalization of electric utilities.

In a related way, political power offers another incentive for utilities to promote their current dominance. The less utility-supplied load, the less leverage utility managers will have in promoting policy and making system-wide demands. Since the passage of PURPA, the last thirty years have seen utility managers become increasingly marginalized in terms of return, growth,

170. *See, e.g.*, S. Cal. Edison v. Peevey, 74 P.3d 795, 801 (Cal. 2003); Toward Util. Rate Normalization v. Pub. Utils. Comm'n, 750 P.2d 787 (Cal. 1988); S. Cal. Edison v. Pub. Utils. Comm'n, 125 Cal. Rptr. 2d 211, 219 (Cal. Ct. App. 2002).

171. *See, e.g.*, Re Instituting Rulemaking into Distrib. Generation, Rulemaking 99-10-025, 2003 WL 1235580, at *3 (Cal. Pub. Utils. Comm'n Feb. 27, 2003) (Pacific Gas & Electric, San Diego Gas & Electric, and Southern California Edison all express staunch opposition to distributed generation throughout the Rulemaking Proceeding).

172. *See, e.g.*, *id.* at 12.

and influence.[173] Their political power is slowly eroding away. For utilities, the fight to provide electricity and limit distributed generation is a fight for the preservation of their current political prestige.

Utilities still have incentives—whether caused by profits, paradigm shifts, or the preservation of political power—to use the over-the-fence rule to block California from installing a full complement of distributed solar generation. However, the regulatory consensus that once supported the limitation of generation competition for utilities has crumbled, undermining the purpose of a law as strict as the over-the-fence rule. The over-the-fence rules in SB 1773 and AB 2863 are from two very different eras in California's regulatory law. The 1984 over-the-fence rule was written before PURPA allowed California to open the electricity generation market to QFs.[174] It was written before the EPAct required utilities to give exempt wholesale generators access to transmission lines on rates and terms comparable to those that the utility would charge itself.[175] It was written before AB 1890 caused Governor Pete Wilson to remark that California deregulation law had "pulled the plug on another outdated monopoly" and "replaced it with the promise of a new era of competition."[176] It was written before the CPUC stated there is no utility-owned monopoly in electricity generation.[177] The 1984 over-the-fence rule was written before "[t]echnological change, competitive pressures, and emerging market forces" eroded away the utility's monopoly position in electricity generation.[178] The monopoly-preserving regulatory consensus that should not have justified the over-the-fence rule's restrictions on competition in 1984 certainly did not justify the over-the-fence rule's restrictions on competition in 2008. When AB 2863 put independent solar energy producers on the same level as cogenerators, it unjustifiably preserved a fossil of a regulatory consensus that no longer existed.

2. A Tempered Over-the-Fence Rule Would Protect Consumers as Well as the Current Over-the-Fence Rule

The current over-the-fence rule limits the number of customers that can purchase electricity from distributed generators to two adjacent properties, meaning more people must buy their power solely from public utilities. The CPUC regulates all public utilities to pursue reasonable costs, thereby protecting consumers from unscrupulous practices.[179] The over-the-fence rule

173. HIRSH, *supra* note 4, at 260.
174. *Id.* at 129.
175. *Id.* at 243; *see* 16 U.S.C. § 824d(a)–(b) (2006).
176. Duane, *supra* note 91, at 497.
177. *See id.*
178. *See* HIRSH, *supra* note 4, at 249.
179. *See, e.g.*, CAL. PUB. UTIL. CODE § 738.6 (Deering 2009).

thus protects consumers by increasing the number of customers that purchase electricity solely from CPUC-regulated utilities. Or so the argument goes.

This Part fleshes out the dangers from which the California Legislature wants to protect consumers in the context of PPAs. It then discusses how the Legislature implemented notice requirements, inspections-upon-demand, and rate caps on PPAs despite the current over-the-fence rule. The Part concludes that consumer protection is a hollow justification to maintain the current over-the-fence rule. A softened over-the-fence rule would protect customers from unfair practices as well as the current rule, and it would provide the ancillary benefits of encouraging solar generation and achieving the state's climate goals.

The debate over Common Interest Developments (CIDs) in AB 2863, and their eventual exclusion, highlights the Legislature's major consumer protection concerns in using PPAs to sell electricity. CIDs were one of the main reasons solar producers sought the exemption.[180] CIDs are essentially traditional condominiums, where each property owner has an "exclusive interest in a unit or lot and a shared . . . interest in common area property."[181] In California, however, CIDs include much more than condominiums, branching out to include planned unit developments, stock cooperatives, community apartments, and some resident-owned mobile home parks.[182] Currently, 41,000 CIDs exist in California, ranging in size from 3 to 27,000 homeowners and totaling approximately four million housing units—one quarter of the state's entire housing stock.[183] In CIDs, solar producers saw a gigantic customer pool and an opportunity to achieve significant gains in solar generation.

However, the Senate deleted CIDs from AB 2863 between the June 16th, June 26th, and August 4th drafts.[184] The Legislative Bill Analyses between June 16 and August 4 did not mention the reasons for the deletion.[185] In fact, the Analyses did not mention the elimination of CIDs at all until the final Bill Analysis on August 28 where it was simply noted that the Senate "delete[d] the provision that allowed independent solar energy producers to install solar energy systems on property owned by common interested developments (CIDs) and sell the electricity directly to the residents of the CID."[186]

180. S. ENERGY, UTILS. & COMMC'NS COMM., *supra* note 22.

181. *Id.*

182. *See id.*

183. *See id.*

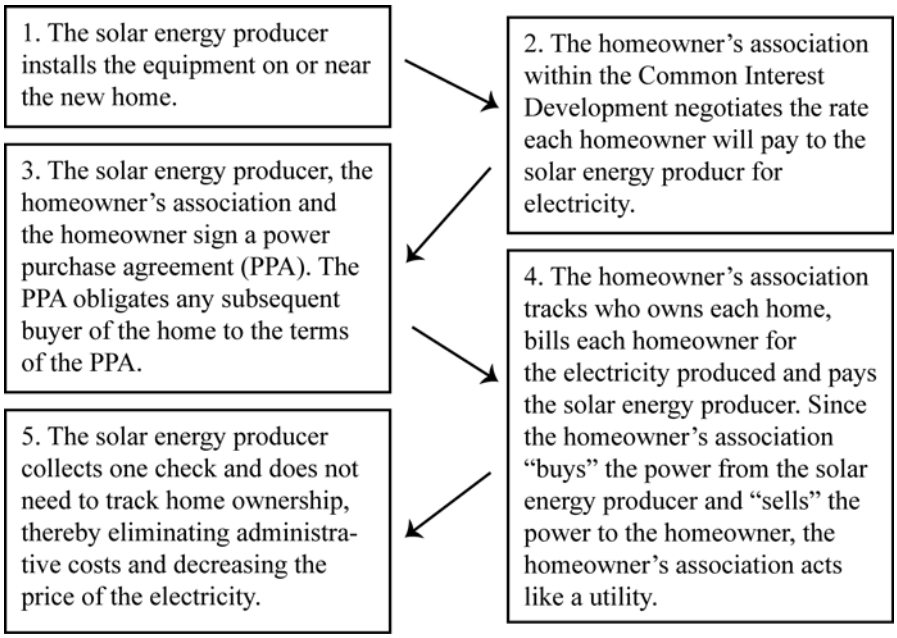
184. *Compare* A.B. 2863, 2007–2008 Sess. (Cal. June 16, 2008), *with* A.B. 2863, 2007–2008 Sess. (Cal. June 26, 2008), *and* A.B. 2863, 2007–2008 Sess. (Cal. Aug. 4, 2008).

185. *See* S. ENERGY, UTILS. & COMMC'NS COMM., AB 2863 ANALYSIS, *supra* note 22; AB 2863 S. FLOOR B. ANALYSIS, 2007–2008 Sess. (Cal. Aug. 6, 2008).

186. AB 2863 ASSEM. FLOOR B. ANALYSIS, *supra* note 20, at 2.

While the Analyses lack an express rationale, the Senate's implied reason for deleting CIDs was to protect consumers from dangers associated with selling electricity through PPAs.[187] Generally stated, a PPA transaction would follow the framework shown in Figure 5.[188]

Figure 5. Framework of a power purchase agreement within a CID



The Senate, responding to this framework, said that "[t]he fundamental issue before the [Senate Energy, Utilities and Communications Committee was] whether a CID, person, solar producer, landlord or other corporation should be permitted to lease solar generation systems or sell electricity generated by solar power *completely unregulated*."[189] The phrase "completely unregulated" belied the Senate's consumer-protection motivation for deleting CIDs from AB 2863.

187. Again, I refrain from analyzing the influence of electric utility lobbyists in the creation of AB 2863. However, as shown in the previous Part of the Note, utilities have the incentive to limit consumer access to distributed solar generation. Thus, with such massive market potential for solar generation, one can assume that utility influence was almost certainly a major factor in the elimination of CIDs from AB 2863. However, the reasons for the deletion of CIDs in AB 2863, as gleaned from the Senate Bill Analyses, are only offered in this Part to disprove consumer protection—not utility influence—as a justification for the over-the-fence rule. Utility influence as an improper justification for the rule is discussed in the previous Part, albeit without discussion of the deletion of CIDs.

188. S. ENERGY, UTILS. & COMMC'NS COMM., AB 2863 ANALYSIS, *supra* note 22 (diagram derived from language within analysis).

189. *Id.* (emphasis added).

The PPAs would be "private documents not subject to regulation," with no restrictions on their terms, and potentially resulting "in hidden costs or obligations to the consumer whose only recourse would be litigation since no regulatory body would have oversight."[190] In addition, the Senate Committee worried that "a homebuyer would be subject to a long-term PPA even though they were not a party to the original negotiation."[191] Finally, the Senate Committee expressed distaste over the idea of already controversial homeowners associations acting as utilities.[192] In fact, the Analysis goes on to call a CID's homeowner's association an "unregulated utility."[193] The Senate thus eliminated CIDs from the bill.[194]

Even with the elimination of CIDs from AB 2863, many of the consumer protection issues associated with CIDs still existed with respect to individual homeowners and master-meter landlords.[195] PPAs would still be private documents, with unrestricted terms, potentially resulting in hidden costs or obligations. Further, the PPAs would still provide recourse only through civil litigation, and would potentially subject a homebuyer, renter, or landlord to a long-term PPA even though they were not a party to the original negotiation.[196]

It is important to note that all of these consumer protection issues existed despite the over-the-fence rule. That is, even with the over-the-fence rule and the deletion of CIDs, the Legislature still had to contend with the dangers of unfair practices from electricity providers. To counteract such dangers, the Senate Committee created provisions to protect individual homeowners, renters, and master-meter landlords. Under AB 2863, a solar PPA must include these consumer protection measures:

1. An estimate of the kilowatt hours to be delivered;
2. An estimate of how the pricing will be calculated over the life of the contract and an estimate of the price per kilowatt hour;
3. An explanation of operations and maintenance responsibilities of the contract parties;
4. An explanation of the disposition of the generation system at the end of the contract; and

190. *Id.*
191. *Id.*
192. *See id.*
193. *Id.*
194. Today, to provide solar energy to a new CID the size of the 27,000-homeowner CID mentioned above, the solar energy provider must negotiate 27,000 different contracts with 27,000 different homeowners—and then keep track of each contract as each homeowner sells his home to a new buyer. Making profitable the administrative juggernaut required to pursue such a venture would likely require impossibly high electricity prices.
195. 2008 Cal. Adv. Legis. Serv. 535 (Deering). A "master-meter landlord" is a landlord that pays the electricity bill for the entire building or property and then bills the individual tenants separately. *See* CAL. PUB. UTIL. CODE § 777 (Deering 2009).
196. S. ENERGY, UTILS. & COMMC'NS COMM., *supra* note 22.

5. An explanation of provisions regulating the disposition or transfer of the contract in the event of a transfer of ownership of the residence.[197]

In addition, the final version of the bill included additional measures to protect consumers:

1. **Notice Requirements:** An independent solar energy producer must record the PPA against the title to the real property where the electricity is generated and against the title to any adjacent property using the energy.
2. **Inspection-upon-Demand:** All contracts for the sale of electricity between an independent solar energy producer and a person for use in a residence must be made available to the CPUC upon its request.
3. **Rate Caps:** Any master-meter landlord providing sub-metered service to tenants of a residential complex must charge tenants the lesser of the independent solar energy producer's rate or the electric utility's rate for an equivalent amount of electricity.[198]

In passing AB 2863, the Senate concluded that the above protections were sufficient to protect consumers in a PPA transaction where a solar producer generates power on equipment the homeowner/landlord does not own, in close proximity to the homeowner/landlord's residence, and then sells the power to the homeowner/landlord.

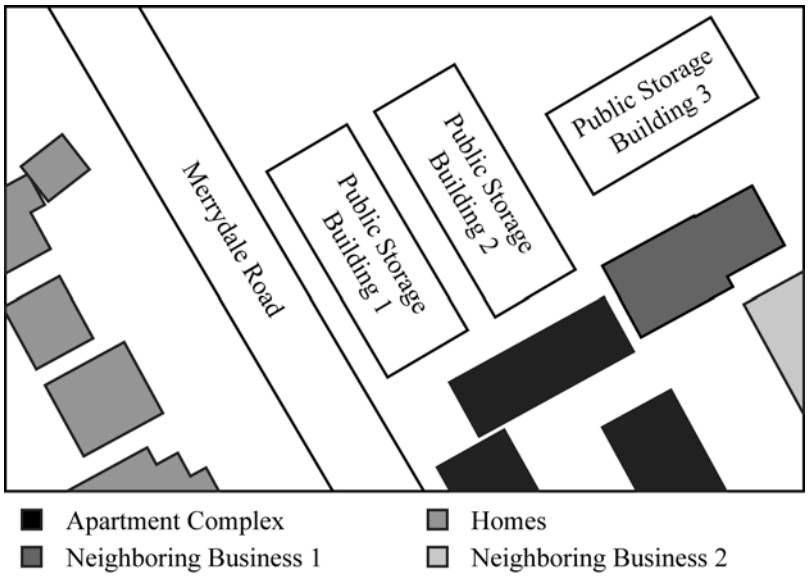
These same consumer protection issues exist for power sent within a person's property, from a neighboring property in compliance with the over-the-fence rule, or from a property three lots away in violation of the over-the-fence rule. In all of these transactions, a solar producer generates power on equipment the electricity buyer does not own, in proximity to the buyer's property, and then sells the power to the buyer through a PPA. In terms of potential consumer exploitation, all PPA sales are identical to the homeowner and master-meter sales approved by the Senate. Tempering the over-the-fence rule to give homes access to power generated three properties away would not decrease the level of consumer protection any more than permitting power to be sent from one property away. The PPAs do not become more private, the terms more unrestricted, or the obligations more hidden if the generator is three properties away instead of one property away. Thus, there is no consumer protection justification for the Legislature to maintain the current over-the-fence rule if it believes that notice requirements, inspection-upon-demand, and rate caps are sufficient to protect consumers in PPA transactions.

The Public Storage example demonstrates the superiority of a tempered over-the-fence rule with notice requirements, inspection-upon-demand, and rate

197. *Id.*; 2008 Cal. Adv. Legis. Serv. 535 (Deering).
198. 2008 Cal. Adv. Legis. Serv. 535 (Deering).

caps over the current over-the-fence rule with such provisions, as shown in Figure 6:

Figure 6. Public Storage and surrounding buildings in San Rafael, CA (Figure 2 reproduced)



A solar producer wants to install solar panels and generate power on the roofs of buildings one, two, and three of the Public Storage property. Under the over-the-fence rule, the solar producer can only sell its power to two of the neighboring properties, such as two of the apartment complex buildings. Second, it must comply with AB 2863 and therefore can only sell to the landlord if the buildings are master-meter buildings. It cannot sell its power to the neighboring businesses, because those businesses are neither residential nor master-meter. Third, it cannot sell to the homes because a street separates them from buildings one, two, and three. Finally, in order to sell to the two apartment complex buildings, the solar energy producer must also comply with the AB 2863 consumer protection measures set out above. It is easy to see how the combination of AB 2863 and the over-the-fence rule will regulate the solar producer's plan out of viability.

Consider instead a world with a softened over-the-fence rule. Under protective measures similar to those in AB 2863, the solar producer can sell its electricity to any and all of the nearby businesses, homes, and apartment complexes regardless of the number of properties involved or the adjacency of those properties. To protect the business owners, homeowners, landlords, and renters—and to protect the future occupants of those properties—the solar producer must provide the owners with estimates of the electricity to be delivered and its cost over the life of the contract, explanations of which party

has operations and maintenance responsibility, how the generation system will be disposed of at the end of the contract, and how to dispose of or transfer the contract. The solar operator must also record the PPA against the real property's title. Further, the contracts for the sale of electricity between Public Storage and its customers must be made available to the CPUC upon its request. Finally, the solar operator must abide by a rate cap equal to the utility rate for comparable electricity.[199] These provisions would provide consumer protection, while still allowing the sale of solar-generated electricity to homes and businesses.

With a tempered over-the-fence rule, notice requirements, inspection-upon-demand, and rate caps can protect consumers without stifling investment in distributed solar generation. The Public Storage example demonstrates that there is no need for an over-the-fence rule to set arbitrary boundaries at adjacent properties and at two buyers in the name of consumer protection.

3. The Over-the-Fence Rule Restricts Grid Reliability

A third argument used to justify the over-the-fence rule is that the rule enhances grid reliability by managing the number of generators that introduce electricity onto transmission lines. This justification responds to a concern that inserting electricity into the grid requires technical compatibility to match the generated electricity to the electricity in the grid, which in turn must match the electricity demanded by consumers.[200] For example, if the Public Storage unit was located near a section of the electricity grid that was severely congested, and that unit still sent power into the congested node, the grid could be damaged by the overload.[201]

However, interconnection standards, smart meters, and grid management programs can manage such dangers. There is no need to resort to the over-the-fence rule. First, standards and smart meters currently exist that ensure that independent generator power complies with interconnection standards, thus matching distributed generation to grid generation.[202] Second, the California Independent System Operator has the power to shut down or reduce power on

199. While AB 2863 only included this provision for landlord master-meter situations, the provision could be expanded to all consumers. Rate caps are just an example of a provision that could be included in a new law. Other provisions, such as a requirement for all PPA contracts to have opt-out clauses if the price of electricity rises above the market price, could also be included.

200. *See* Re Instituting Rulemaking into Distrib. Generation, Rulemaking 99-10-025, 2003 WL 1235580, at *6 (Cal. Pub. Utils. Comm'n Feb. 27, 2003); Re Pac. Gas & Elec. Co., 190 P.U.R.4th 184, at 3–6 (Cal. Pub. Utils. Comm'n Dec. 17, 1998).

201. *See* ISO NEW ENGLAND, LOCATIONAL MARGINAL PRICING UNDER STANDARD MARKET DESIGN, 4 (2003). Grid congestion occurs when more electricity is demanded or supplied in a location than the distribution system at that location can handle.

202. *See Re Instituting Rulemaking into Distrib. Generation*, 2003 WL 1235580, at *6; *Re Pac. Gas & Elec. Co.*, 190 P.U.R.4th 184, at 3.

distribution lines that are being supplemented by distributed generation.[203] Since distributed generators must register with the CPUC, the California Independent System Operator would know which properties are generating electricity.[204] Third, congested distribution nodes are due to a lack of transmission capability in an area of high demand.[205] Distributed generation can actually relieve congestion by reducing the amount of electricity that utilities must transmit across congested lines. Finally, distributed generation increases the quality and reliability of electricity in general,[206] relieves constrained electricity distribution systems,[207] makes upgrades to such distribution systems more infrequent,[208] meets peak electricity demand in areas experiencing growth,[209] and creates numerous other "system-level" benefits.[210] The over-the-fence rule does not maintain grid reliability; instead it actually damages grid reliability by limiting distributed generation.

CONCLUSION

The analysis above leads to two conclusions: one, third-party sales of electricity to properties beyond those adjacent to the generating property should be allowed; and two, while current over-the-fence limitations on such sales are too restrictive, some limitations should exist.

First, the justifications for the existence of the current over-the-fence rule are inadequate, while the benefits from over-the-fence sales are dramatic. The current regulatory structure of the electricity industry does not warrant the protection of utilities from competition in electricity generation. Further, a tempered over-the-fence rule protects consumers as well as the current over-the-fence rule. Finally, distributed generation enhances grid reliability while the over-the-fence rule restricts it. Without the over-the-fence rule, the thousands of properties in California similar to San Rafael Public Storage could become

203. *See Re Instituting Rulemaking into Distrib. Generation*, 2003 WL 1235580, at *17; California ISO, http://www.caiso.com (last visited Oct. 11, 2009) ("The California ISO is a non-profit public benefit corporation charged with operating the majority of California's high-voltage wholesale power grid. Balancing the demand for electricity with an equal supply of megawatts, the ISO is the impartial link between power plants and the utilities that serve more than 30 million consumers.").

204. *See Re Instituting Rulemaking into Distrib. Generation*, 2003 WL 1235580, at *17–18.

205. *See* ISO NEW ENGLAND, *supra* note 201, at 1–2.

206. *See Re Instituting Rulemaking into Distrib. Generation*, 2003 WL 1235580, at *2; Re Distrib. Generation & Competition in Elec. Distrib. Serv., Decision 99-10-065, 1999 WL 1138447, at *8 (Cal. Pub. Utils. Comm'n Oct. 21, 1999).

207. *See Re Distrib. Generation & Competition*, 1999 WL 1138447, at *8.

208. *See* Re Procedures & Incentives for Distrib. Generation & Distrib. Energy Res., Rulemaking 04-03-017, 2004 WL 614598, at *7 (Cal. Pub. Utils. Comm'n Mar. 16, 2004); *Re Instituting Rulemaking into Distrib. Generation*, 2003 WL 1235580, at *2.

209. *See Re Procedures & Incentives for Distrib. Generation*, 2004 WL 614598, at *8; *Re Instituting Rulemaking into Distrib. Generation*, 2003 WL 1235580, at *4.

210. *See Re Instituting Rulemaking into Distrib. Generation*, 2003 WL 1235580, at *2–5; *Re Distrib. Generation & Competition*, 1999 WL 1138447, at *8.

sources of clean, renewable electricity—sources that would help California achieve its ambitious climate goals.

Second, this Note argues for a more flexible, tempered over-the-fence rule, not the abolition of restrictions on the sale of retail electricity. The over-the-fence rule does serve the purpose of ensuring that public utilities clothed in the public interest do not escape regulation. However, this necessary restriction can easily be enforced in a way that does not inadvertently constrict distributed solar generation. An example of a less restrictive over-the-fence rule appears in the Energy Independence and Security Act of 2007.[211] In that Act, a state may choose to give a combined heat and power plant[212] a series of incentives to produce electricity and sell it back into the grid.[213] One such incentive is to waive or modify state laws to permit a combined heat and power plant to transport electricity over private transmission lines "to up to 3 purchasers within a 3-mile radius of the project, allowing the wires to use or cross public rights-of-way, without subjecting the project to regulation as a public utility."[214] The federal law builds its regulatory fence at three customers within three miles of the generator; California, on the other hand, builds it fence at two customers adjacent to the generator. While the federal over-the-fence rule is superior to California's, an even better solution would expand the fence further, pushing the boundary to one mile and 50 properties. The purpose of this Note is not to claim where such a line should be drawn, but to propose that the lines be pushed out to a point that neither allows utilities from escaping regulation nor constricts essential investments in distributed solar generation.

Given these two conclusions, the elephant in this Note must finally be addressed. An argument against expansion of the over-the-fence rule is that it will not actually increase investment in solar generation. Properties like San Rafael Public Storage will not find the investment profitable. Because of this barrier, the status quo should be maintained.[215]

However, situations exist where solar producers already find distributed solar generation profitable. After all, AB 2863 grew out of a situation where

211. *See* 42 U.S.C. § 6344(c)(3) (2006).

212. A combined heat and power plant is the same as a cogeneration plant, both of which produce thermal energy and electricity in an integrated system. *See* CAL. AIR RES. BD., *supra* note 11, at 43.

213. 42 U.S.C. § 6344(b), (c)(1)–(4) (2006).

214. *Id.* § 6344(c)(3).

215. This argument is especially effective when considering the nature of the sale of electricity from the Public Storage unit to its neighbors. Since electricity cannot be tracked, the neighbors would have no idea if the power they are using is from the utility or from the Public Storage unit. However, electricity sales are essentially a legal fiction. That is, the unit would pump its electricity into the grid, the consumers would use the grid's generic electricity, and the consumer would pay Public Storage the negotiated price instead of paying the utility—regardless of whether it actually used electricity produced from the Public Storage unit or utility-purchased electricity. Or, in the alternative, the solar producer would string power lines from the Public Storage facility to its neighbors, although the profitability of such a venture is questionable because of the expense of building power lines.

developers sought to power large housing developments with solar energy, but could not do so because of the over-the-fence rule.[216] Further, the Public Storage example demonstrates that excess generation potential exists throughout the state. It is hardly the job of the California Legislature to assess the profitability of each of those situations. There is no need for electric regulatory law to protect against unprofitable investments. It is the purpose of regulatory law to foment such investment whenever it is possible without needlessly restricting it in the name of outdated legislation, consumer protection, or grid reliability. In other words, the over-the-fence rule unnecessarily restricts even the possibility of the profitability of these ventures. Further, when it comes to renewable energy, the law should be forward looking. As government and private investment in solar technology increases, the price of electricity from small-scale solar will go down, increasing the number of profitable investment opportunities.

In the end, only with a tempered over-the-fence rule will California be able to achieve its distributed solar generation potential and truly let solar power shine.

216. *See, e.g.*, S. ENERGY, UTILS. & COMMC'NS COMM., AB 2863 ANALYSIS, *supra* note 22.

APPENDIX A: GENERATING CAPACITY OF THE PUBLIC STORAGE FACILITY IN SAN RAFAEL, CA

Assumptions:

- The three buildings in the picture are single story and contain only storage.
- The map scale is approximately 20 m per .75 in.[217]
- The measurements are from a clear, sunny September 1, between 1 p.m. and 2 p.m., with a temperature of 25°C (77°F).
- Solar panel specifications: 205-Watt Sharp Solar Module, Model ND-205U1, Maximum Power: 205W (+10%, -5%) at Standard Test Conditions of 25°C, 1kW/m^2 and AM 1.5. Module Efficiency Maximum Power 12.6%. Size: 1640mm x 994mm.[218]
- Solar panels are installed properly and laid next to each other, with no space between each panel.
- Storage units are 5 ft. by 5 ft., or 3.32 m^2.
- Each unit contains a 23W compact fluorescent light bulb that is never turned off.
- There are no hallways and the storage units consume the entire building. This assumption is made to overestimate the amount of electricity that the storage units use. Also, it is unlikely that hallways versus storage units would change the calculations significantly, especially because of the assumption that none of the lights are ever turned off.

Area of Buildings' Roofs:

Building 1:
Length = 1 11/32 in. * (20 m / .75 in.) = 35.83 m
Width = 5/8 in. * (20 m / .75 in.) = 16.67 m
Total Roof Area = 597.2 m^2
Building 2:
Length = 1 9/32 in. * (20 m / .75 in.) = 34.17 m
Width = 9/16 in. * (2 0m / .75 in.) = 15 m
Total Roof Area = 512.5 m^2
Building 3:
Length = 1 5/32 in. * (20 m / .75 in.) = 30.83 m
Width = 9/16 in. * (20 m / .75 in.) = 15 m
Total Roof Area = 462.5 m^2

217. *See* Google Maps, http://maps.google.com (last visited Oct. 19, 2009).

218. SHARP ELECTRONICS CORPORATION, ND-205U1 SPECIFICATIONS SHEET 1–2 (2005), http://www.dcshop.com.au/images1/sol_dow_205watt_SS.pdf (last visited Oct. 19, 2009).

Total Power Generation Capacity:
Building 1:
Number of panels lengthwise = 34.17 m / 1.64 m ≈ 20 panels
Number of panels widthwise = 15 m / .99 m ≈ 15 panels
20*15 = 300 panels
Building 2:
Number of panels lengthwise = 35.83 m / 1.64 m ≈ 21 panels
Number of panels widthwise = 16.67 / .99 m ≈ 16 panels
21*16 = 336 panels
Building 3:
Number of panels lengthwise = 30.83 m / 1.64 m ≈ 18 panels
Number of panels widthwise = 15 m / .99 m ≈ 15 panels
18*15 = 270 panels
Total Panels = 300 + 336 + 270 = 906 panels
Total Power Capacity = 906 panels * (205W/panel) * 1 hour = 185730 Wh = 185.7 kWh

Total Load of all Three Buildings between 1 p.m. and 2 p.m.:
Total units per building:
Building 1: 597.2 m^2 / 3.32 m^2 ≈ 179 units
Building 2: 512.5 m^2 / 3.32 m^2 ≈ 154 units
Building 3: 462.5 m^2 / 3.323 m^2 ≈ 139 units
Total Units = 179 + 154 + 139 = 472 total units
Total Load of all three buildings: (472 * 23W) * 1 hour = 10856 Wh = 10.86 kWh

Net Capacity of Generation that Could Be Sold Elsewhere or Sent into the Grid between 1 p.m. and 2 p.m.:
185.7 kW - 10.86 kW = **174.8 kWh**

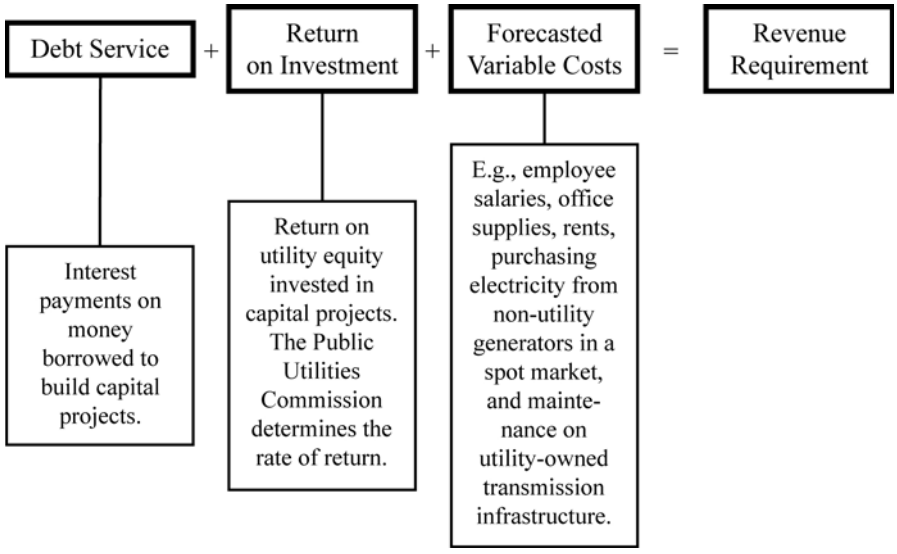
APPENDIX B: UNDERSTANDING REVENUE REQUIREMENTS AND THE UTILITY PROFIT STRUCTURE

Currently, a utility earns revenue from customers through the rates the customers pay per kWh of electricity used. However, the rate that a customer pays has been pre-calculated to achieve the utility's revenue requirement: what the CPUC and the utility agree the utility should earn in a given year.

Recall that under the ERAM, if the total revenue from customer rates is greater than the revenue requirement, the difference is put into an interest-earning account. In contrast, if the total revenue from customer rates is less than the revenue requirement, the money in that same account is used to make up the difference. Thus, no matter how many kWh of electricity customers actually use, the revenue the utility earns from those kWh will be the same. Actual revenues from kWh sold have no effect on how much profit the utility makes. Instead, the revenue requirement determines a utility's profit.

The revenue requirement has three parts, as shown in Figure 7.

Figure 7. Components of a public utility's revenue requirement



The first two parts are derived from the rate base. The rate base consists of all of the capital investments a utility will make over the course of the following year. Capital investments are investments in capital construction projects, such as building new power plants, new transmission lines, new distribution lines, or new step-down stations. These capital projects are built using equity or debt or both. The CPUC determines what a reasonable return should be on the utility's equity invested in capital projects; that is, the CPUC determines how much the

utility should profit on the use of its own money (although the utility is not required to actually pay a dividend to its investors on the equity). This is called the return on investment (ROI) and essentially represents the utility's profit. The bank that finances the capital projects determines what the cost of the utility's debt will be on the project. This is called the "debt service." In the end, the first part of the revenue requirement incorporates both the ROI and the debt service necessary to build the new assets.

The third part of the revenue requirement is a forecast of the utility's variable costs for the year. The variable costs include, for example, employee salaries, office supplies, rents, purchasing electricity from non-utility generators in a spot market, and maintenance on utility-owned transmission infrastructure.

Both the debt service and the variable costs are calculated on a pass-through basis. The CPUC estimates what the cost of both will be and sets the revenue requirement to exactly offset those estimated costs. The ROI, on the other hand, represents the utility's profit on top of their equity investment. The CPUC sets the revenue requirement to include the ROI, but anticipates that none of the ROI will be used to cover costs. The ROI will simply be the utility's profit at the end of the year.

Over the course of the year, a utility uses the revenue from the revenue requirement to service its debt and pay its variable costs. If the variable costs and debt service equal their forecasted amounts, then the utility will have an amount of money left over in its accounts that equals the ROI. If the variable costs turn out to be less than forecasted, the utility will increase its ROI and its profits. However, if variable costs exceed their forecast, the ROI acts as a cushion against the utility losing money during the year. If such costs greatly exceed their forecast, the utility will record a net loss for the year. During the California energy crisis in 2000 to 2001, the variable cost of electricity from non-utility owned generators skyrocketed. These high prices quickly ate up the utilities' ROI cushion and actually bankrupted PG&E.

Thus, a utility can earn money two ways. The first way is to keep its actual variable costs below its forecasted variable costs. The second way is to increase its annual ROI by investing in and constructing more capital assets. The more assets a utility builds, the higher the gross amount of money represented by the ROI, and the more opportunity for utilities to earn a profit by keeping the difference between their forecasted and actual variable costs below the ROI.[219]

219. I am indebted to former California Public Utility Administrative Law Judge Steve Weissman for patiently explaining this process to me.

We welcome responses to this Article. If you are interested in submitting a response for our online companion journal, *Ecology Law Currents*, please contact ecologylawcurrents@boalt.org. Responses to articles may be viewed at our website, http://www.boalt.org/elq.