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California Renewable Energy Policy and Implementation Issues — An Overview of Recent Regulatory and Legislative Action

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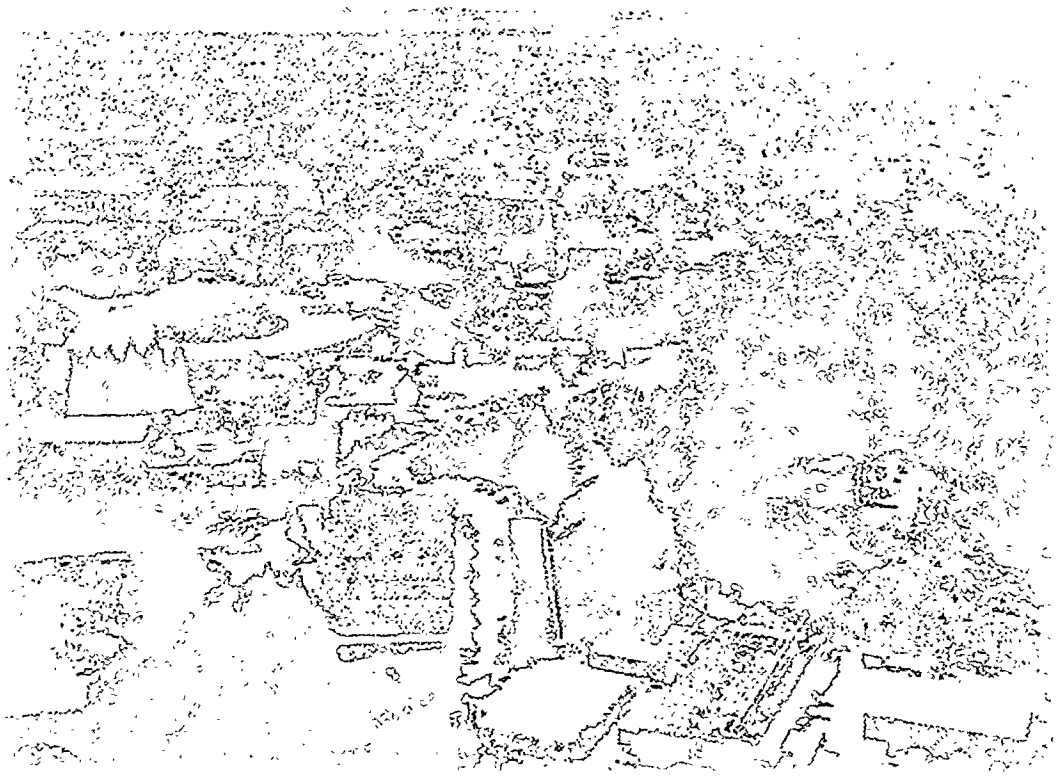
Energy and Environment Division

September 1996



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California Renewable Energy Policy and Implementation Issues

-- An Overview of Recent Regulatory and Legislative Action --

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Contents

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Acronyms and Abbreviations

AWEA	American Wind Energy Association
BRPU	Biennial Resources Plan Update
BWG	Biogas Working Group
CalSEIA	California Solar Energy Industries Society
CEC/ETD	California Energy Commission, Energy Technology Development Division
CPUC	California Public Utilities Commission
CTC	Competition transition charge
EDF	Environmental Defense Fund
IEP	Independent Energy Producers Association
IOU	Investor-owned utility
LBNL	Ernest Orlando Lawrence Berkeley National Laboratory
MRPR	Minimum renewables purchase requirement
NCPA	Northern California Power Authority
NRDC	Natural Resources Defense Council
PBR	Performance-based ratemaking
PG&E	Pacific Gas and Electric Company
PURPA	U.S. Public Utilities Regulatory Policies Act
QF	Qualifying Facility
RD&D	Research, development and demonstration
REC	Renewable energy credit
RPS	Renewables Portfolio Standard
RWG	Renewables Working Group
SBC	Systems-benefit charge
SCE	Southern California Edison Company
SDG&E	San Diego Gas and Electric Company
SEIA	Solar Energy Industries Association
SMUD	Sacramento Municipal Utility District
SO4	Standard Offer #4 contracts
UDC	Utility distribution company

1 Introduction

Compared to fossil-fired generation, renewable energy benefits society by reducing pollution (Chupka and Howarth 1992) and mitigating electricity price risks (Hoff and Herig 1996). Despite these, and other benefits, high costs and institutional barriers have prevented the large-scale deployment of renewable energy (National Regulatory Research Institute 1994; Jackson 1992). To overcome some of these barriers, policies have been developed at the state and federal levels to support renewables.

Electricity restructuring may threaten the viability of both existing and new renewable energy projects. Many of the existing policies used to encourage renewables will not be appropriate in a restructured industry, and new policies may be required if a domestic market for these technologies is to be supported. California has been a leader in both electricity restructuring and, historically, in renewables policy. Therefore, California's recent renewables policy experience provides an interesting case study of the development of renewables support mechanisms within the restructuring process. A number of the key implementation issues raised in California's evolving policy debate are likely to arise in other states as legislators and/or regulators consider the role and rationale for renewables, and the various approaches to meeting "public purpose" objectives in an era of deregulation and restructuring.

Since the release of the California Public Utilities Commission's (CPUC) "Blue Book" on electric industry restructuring (CPUC 1994), there has been a vigorous debate in California about the desirability of supporting renewable energy and the appropriate mechanisms with which to promote these technologies in a restructured industry. Three primary approaches have been advocated in California: (1) mandated renewables purchase requirements; (2) programs funded by a systems-benefit charge; and, (3) voluntary renewable energy purchases through green marketing.

As part of its December 20, 1995 decision on electricity restructuring, the CPUC supported a "minimum renewables purchase requirement" (MRPR) policy (CPUC 1995). The CPUC directed the affected parties to form a Renewables Working Group (RWG) to help resolve many of the implementation details associated with the MRPR and provide consensus positions and implementation options on the policy, often called a "Renewables Portfolio Standard" (RPS). Within ten days after the completion of the RWG report, the California State Legislature, as part of a larger restructuring bill, overhauled the CPUC's proposed MRPR renewables policy. The restructuring bill, AB 1890, passed the legislature on August 31, 1996 and was signed by the Governor on September 23, 1996, and will establish a distribution surcharge-funded renewables program to partially support existing and new renewables in the state. Many of the implementation details of the policy have been left to the California Energy Commission (CEC), which is to provide options and recommendations to the legislature.

This paper has three primary goals: (1) to provide a brief account of recent events in California renewables policy; (2) to outline the California State Legislature's ultimate decision

on renewable energy policy; and, (3) to aid other states in their efforts with renewables policy by summarizing some of the key implementation issues and political conflicts that may occur when crafting renewables support mechanisms within the restructuring process. We begin by describing some of the potential threats and opportunities that electricity restructuring presents to the development of renewable energy. We then outline the renewables policy debate in California since the CPUC's "Blue Book," including both regulatory and legislative developments. We also provide some insight into the MRPR vs. surcharge-based renewables policy debate in California. Finally, we identify and discuss key renewables policy implementation issues that have driven the dialogue and recent decisions in California's renewables policy.

2 Renewables and Restructuring: Threat or Opportunity?

Electric industry restructuring and retail competition may threaten the viability of existing and new renewable energy projects for several reasons. First, a number of policies to support renewables, previously provided by regulated utilities under the direction of state and federal regulatory agencies may—at worst—be dismantled, and—at best—require significant changes in design and implementation. As currently designed, some of these policies will not be appropriate in a restructured industry due, in part, to competitive neutrality concerns.[1] Second, investment decisions currently made within a public regulatory framework will be increasingly decided in the private marketplace. This is likely to lead to shorter investment horizons and increased investment risk, both of which may disadvantage high capital-cost technologies such as renewables. Finally, as restructuring proceeds, new "rules of the game" will be developed. These include rules for transmission access and pricing, ancillary service requirements and costs, and new bidding and pooling schemes. If these new rules are developed without adequate attention to the diverse needs of different generation technologies, renewables may be disadvantaged.[2]

While restructuring does threaten the future viability of renewables, it also provides opportunities for these clean energy sources. First, there is some evidence that in a world of customer choice, individual customers will be willing to voluntarily pay a premium for renewable energy, therefore stimulating a market for renewables without a specific public policy (Farhar and Houston 1996). Although there is no way to predict the ultimate size of this green pricing market, and green pricing does not fundamentally address the market

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1 Competitive neutrality requires that a renewables program apply equally to all retail electric suppliers. Many existing state policies will not meet this requirement post-restructuring, for example, resource-specific set-asides applied only to regulated utilities (not power marketers and other unregulated power suppliers).

2 For example, some bidding arrangements might require advance power supply scheduling. Windpower and solar energy are intermittent and non-dispatchable, and therefore cannot be precisely scheduled in advance. If penalties are imposed on generators that do not meet the scheduled arrangements, solar and wind would be disadvantaged.

failures that have helped thwart the increased use of renewables, a voluntary green power market could prove significant. Second, increased access to the transmission grid at a reasonable cost should provide access to new electricity markets that are remote from the primary renewable resources. Finally, the electricity restructuring process itself provides a forum in which to discuss the future role of renewables and renewable energy policies at the state level. Within regulatory and legislative restructuring processes, we expect that a re-evaluation of state policies to support renewables is likely, and that many states will search for new mechanisms to support these technologies.

3 History of Renewables Policy within the California Restructuring Debate

3.1 Regulatory Proceedings

In 1994, the California Public Utilities Commission's "Blue Book" initiated the electricity restructuring process in California. This initial proposal relied heavily on green pricing as the primary method of renewables support (CPUC 1994). Environmental and renewable energy organizations criticized the proposed policy on several fronts, stressing that green marketing does not address fundamental market failures such as environmental externalities and that the size of the voluntary green power market is not known (Fang and Galen 1996). In order to obtain a more complete set of policy options for the continuation of "public purpose" programs, including renewables policy, the CPUC created a broad stakeholder-driven working group. This working group submitted its report to the CPUC in February 1995 (Working Group 1995). After a comment period, two broad renewables policy approaches appeared as the dominant contenders: a renewables purchase requirement and a non-bypassable surcharge-funded renewables program with an administrative distribution mechanism (an auction, for example).

To meet existing legislative mandates[3] and secure the benefits provided by renewable energy, the California Public Utilities Commission, in its December 20, 1995 decision, chose to pursue the minimum renewables purchase requirement. Specifically, the Commission states, "Establishing a surcharge to fund new renewables development would require some sort of prescribed allocation mechanism or bidding procedure to disperse the funds. We could use

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[3] Under California Public Utilities Code Section 701.1(a), "a principal goal of electric... utility resource planning and investment shall be to... improve the environment and to encourage the diversity of energy sources through... development of renewable energy resources, such as wind, solar, biomass, and geothermal energy." In calculating the cost-effectiveness of energy resources, the CPUC is directed under Section 701.1(c) to include environmental externalities. Section 701.4 makes it state policy for electric resource acquisition programs to recognize and include a value for resource diversity benefits. Under Section 701.3, the CPUC is further directed to set aside a portion of electric capacity additions for renewable resources.

an administrative approach to ensure compliance, but after our experience with the BRPU we are hesitant to do so (CPUC 1995)."

The minimum renewables purchase requirement allows regulators and/or legislators to require that a certain percentage of a state's annual electric use (or capacity) comes from renewable energy (which we refer to as the "physical" standard). To implement the policy, a renewables purchase requirement (as a percent of energy or capacity sales) would be applied and enforced upon retail electric suppliers.[4] Individual obligations would be tradeable through a system of renewable energy credits (RECs), which is intended to add flexibility in meeting the standard. The MRPR would therefore require, as a condition for doing business in the state, that each retail electric supplier obtain RECs equivalent to some defined percentage of its total annual energy sales or electric capacity. These RECs would be created when a renewable facility generates a kWh (or a kW if the standard is based on capacity) of electricity that is contracted for sale into the state. To meet the purchase requirement, a retail electric supplier could: (1) own and use their own renewable energy facilities; (2) purchase RECs bundled with renewable power purchases from independent renewable energy facilities; and/or, (3) purchase RECs from a private REC market without the associated renewable energy. The REC and renewable power sales markets are therefore partially separated. Although the state-wide physical renewables standard (as a percent of total energy or capacity) would still be met in aggregate, credit trading would give individual retail electric suppliers flexibility in meeting the purchase requirement. For example, some retail electric suppliers may decide not to own or purchase any renewable energy but instead meet the requirement entirely through option (3) described above. The overall state-wide physical renewables standard would still be met because the creation and sale of a REC requires that renewable energy is sold to in-state customers. Although some retail electric suppliers may choose not to purchase renewable energy, their purchase of RECs implies that another in-state entity is purchasing the renewable energy. This flexibility is expected to allow the renewables target to be met in the most cost-effective way. Government involvement includes: (1) setting the percentage standard and market ground-rules; (2) certifying RECs; and, (3) monitoring and enforcing compliance with the purchase requirement. For a more detailed description of a particular type of MRPR, see Rader and Norgaard (1996).

The CPUC directed affected parties to form a Renewables Working Group to help resolve many of the implementation details associated with the MRPR. The RWG met bi-weekly from January to August 1996, and completed its final report on August 23, 1996 (Renewables Working Group 1996).

Because of the diverse range of interests among the parties, the RWG was unable to reach consensus on many policy implementation issues. The Working Group decided to allow participants to offer their own renewables policy implementation strategies for inclusion in the final report. As part of the report, each party or group of parties submitting a separate

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[4] It would also be possible, although perhaps not desirable, to apply the requirement on electricity generators.

policy proposal was required to answer a number of questions drafted by the RWG. The intent of these questions was to define the scope of each policy proposal and provide comparability across proposals. The bulk of the RWG report consists of these implementation strategies and question responses. The RWG received six comprehensive proposals and two adjunct proposals. The two adjunct proposals did not address the full range of implementation issues covered by the comprehensive proposals, but rather were designed to be used as possible add-ons to the RWG's comprehensive program proposals. The first of these adjunct proposals was submitted by the Biogas Working Group (BWG)[5] and would have provided additional funding to biogas generation via a renewable energy credit multiplier (whereas other renewables would have received one REC per kWh in the MRPR, biogas technologies would have effectively received two RECs per kWh). The second adjunct proposal, submitted by CalSEIA, SEIA, the CEC/ETD, and NRDC, described several mechanisms that could be used to provide additional funding to emerging renewable energy technologies, including photovoltaics, dish/stirling solar thermal electric power, and advanced biogas technologies, which are not cost-competitive at present with the lower-cost, non-hydro renewables (wind and geothermal).

Table 1 summarizes some of the key differences among the comprehensive options presented to the RWG. For a more complete delineation of the differences among RWG proposals, see the table included in Appendix A.

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5 The Biogas Working Group includes Sacramento County, Yolo County, Monterey County, International Power Technology, Royal Farms, Institute for Environmental Management, and EMCON.

Table 1. Summary of California Renewables Working Group Policy Proposals

Proposal Sponsors*	Type	Eligible Renewables Projects	Technology Bands to Support Intra-Renewables Diversity	Policy Obligation	Cost Containment Mechanisms
AWEA, et al.	MRPR	All but hydro	One for solid-fuel biomass (in form of biomass energy credit, BEC, purchase requirement)	Uniform purchase requirement on all retail electric suppliers or, if no legislation, on CPUC-jurisdictional entities	2.75¢/kWh REC cap 3.75¢/kWh BEC cap
IEP	MRPR	All except large-hydro; hydro size limit of 30 MW	One for solid-fuel biomass	Non-uniform purchase requirement on utility distribution companies (UDCs) for their customers and those direct access customers not choosing to voluntarily purchase renewables	Penalties for non-compliance and incentives to reduce compliance costs are to be imposed through PBR
NCPA	MRPR	All, including hydro	None	Uniform purchase requirement on all retail electric suppliers	Implicit cap through non-compliance penalty of 1 mill/retail kWh
SCE/PG&E	MRPR	All but hydro	None	If legislation is not enacted to make the standard uniform on all retail electric suppliers by 2000, program is terminated	2¢/kWh REC cap
SMUD	MRPR	All, including hydro; only new hydro can trade RECs, however	None	Uniform purchase requirement on all retail electric suppliers	Not specified
EDF, et al.	Auctioned renewable energy production credit	New only; all but hydro can bid	Designed to bid without technology bands or tiers	Uniform state-wide surcharge and auction of funds as 10-year production credits or, if no legislation, surcharge on CPUC-jurisdictional end-users	Funding level set at approximately $100 million/year

*** Full Sponsor List:**

AWEA, et al. - American Wind Energy Association (AWEA), California Biomass Energy Alliance, Geothermal Energy Association, Solar Thermal Energy Association, Union of Concerned Scientists, California Integrated Waste Management Board
IEP - Independent Energy Producers Association
NCPA - Northern California Power Authority
SCE/PG&E - Southern California Edison (SCE), Pacific Gas and Electric (PG&E)
SMUD - Sacramento Municipal Utility District
EDF, et al. - Environmental Defense Fund (EDF), San Diego Gas and Electric, Pacific Gas and Electric, Southern California Edison, Cambrian Energy, Genesis Energy Systems, Laidlaw Gas Recovery Systems, Los Angeles Sanitation Districts, City of Sacramento, Orange County, Sonoma County, NEO Corp., Solid Waste Association of North America, Landfill Energy Systems

Five of the six comprehensive proposals submitted to the RWG were MRPR programs and therefore responded directly to the CPUC's direction. The sixth proposal was for a surcharge-funded production credit, which we describe more fully here because a surcharge-funded approach was ultimately selected by the California State Legislature. The surcharge-funded production credit proposal in the RWG report recommends the implementation of a state-administered auction of funds distributed as 10-year cash production incentives ($/kWh) for the development of new renewables generation (not existing facilities). Funding for this program would come from a non-bypassable systems-benefit charge (SBC) collected from all electricity end-users in the state. Renewables projects would compete for the funds on the basis of the incremental above-market cents-per-kilowatt-hour level of support they require. Renewable generators would be required to arrange for their own power sales (through the spot market or a negotiated bilateral contract), and renewables requiring the least additional support would be expected to win the production credit bidding process. The production credit level would be set up-front, and would be fixed for a 10-year period.

3.2 Legislative Process

The CPUC initiated electric industry restructuring in California, but the California State Legislature has chosen to take a pro-active role in shaping how and in what form restructuring proceeds. After weeks of debate, the 1996 legislative electricity restructuring process culminated with the passage of AB 1890 on August 31, 1996. The Governor signed the bill on September 23, 1996. This bill provides the legislative foundation for transforming the regulatory framework of California's electric industry and significantly redirects the CPUC's restructuring process in several key areas, including renewables policy. The final legislation reflects weeks of intense negotiation among many of the key players in the electric restructuring process. Renewable energy interests were involved in this negotiation were, ultimately, part of the resulting "deal." We focus on the renewables components of the bill in the following discussion.

AB 1890 will establish a surcharge-funded renewables program to partially support existing, new, and emerging renewables in the state between January 1998 and December 2001. The policy will sunset on December 31, 2001, and no long-term renewables policy is proposed. Although the legislation itself is somewhat vague, total renewables funding over this four year period will apparently equal $540 million. These funds are to be collected by the three largest investor-owned utilities (IOUs) through distribution surcharges. Publicly-owned utilities in the state will also create surcharge-funded public purpose programs, but are given more flexibility in the allocation of funds among energy efficiency, research, development and demonstration (RD&D), renewables, and low-income ratepayer assistance programs. AB 1890 also contains several provisions to support green marketing, which are described later.

In the legislature, one of the key renewables policy issues has been how and in what proportion to distribute funds among existing and new renewable energy facilities. AB 1890 would allocate funds to (1) existing renewable facilities, and (2) new and emerging

renewables, provided that no less than 40% of the funds are allocated to either category. Ultimately, the California Energy Commission is to administer the renewable energy funds. AB 1890 does not provide the specifics on how to allocate the funds to existing, new, and emerging renewables, and requires that the CEC provide a report to the legislature by March 31, 1997 detailing options and recommendations on market-based distribution mechanisms. The distribution of funds is to be based on market principles and include options and implementation mechanisms which: (1) reward the most cost-effective renewables generation (existing biomass and solar-thermal facilities, which are not as cost-effective as other renewables, are also targeted for support); (2) implement a process for certifying eligible renewable resource providers; (3) allow customers to receive a rebate from the renewables fund if they voluntarily purchase renewable energy; (4) allocate funds between existing and new and emerging technologies; and, (5) utilize financing and other mechanisms to maximize the effectiveness of available funds.

In addition to the CEC Report, the California Environmental Protection Agency is required to evaluate and recommend to the legislature public policy strategies that address the feasibility of shifting the costs of the public purpose programs from electric utility ratepayers to other classes of beneficiaries. The evaluation will also address the quantification of benefits attributable to the solid-fuel biomass industry (landfill reduction, fire protection, etc.) and identify alternative ways to retain the benefits that the biomass industry provides to the state.

4 "MRPR" vs. "Surcharge-Funded" Policies in California

Perhaps the most contentious debate in California has been between the MRPR-based and surcharge-funded renewable energy policy proposals. MRPR and surcharge-based policies were both pursued in the RWG and in the California State Legislature. Although the legislature ultimately settled this issue in favor of a surcharge approach, it also considered the MRPR in its deliberations.[6]

MRPR supporters in California included most of the renewable energy trade associations and a limited number of environmental organizations and electric utilities. Surcharge-based policies were supported by a number of environmental organizations and, to the extent that they supported any renewables policy, by electric utilities, industrial customers, and power marketers.

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6 AB 1202, one of the bills introduced early in the legislative process, sought an MRPR approach similar to the AWEA, et al. proposal included in CPUC's RWG final report. This bill passed the California State Assembly, but was eliminated from consideration in a joint Assembly-Senate Conference Committee.

Table 2 characterizes some of the key differences between the MRPR and surcharge-based approaches considered in California, and identifies some of the principal issues that have been raised in the debate among MRPR and surcharge policy proponents.[7]

Table 2. Key Issues Matrix for MRPR and Surcharge-Based Policies

Issue	MRPR Policy	Surcharge-Based Policy
renewables support level	depends on standard level, but high in most California proposals	depends on cost cap and renewable energy cost, but expected to be lower than MRPR for policies considered in California
administration of funds	limited; renewables support depends on REC sales occurring in private market	through central state agency, perhaps by competitive auction
cost containment	possible	explicit
ability to achieve renewables production targets (and associated public benefits)	explicit in standard level	ultimate benefits are a function of cost cap level and incremental cost of renewables
obligation on retail electric suppliers	renewables purchase requirement	solely fund collection responsibility
competitive neutrality	standard applies equally to all retail suppliers, but, in the short-term, could be perceived to favor those with higher existing levels of renewables	can be applied equally via distribution surcharge
interaction with competitive power market	forces all electric suppliers to consider renewables for policy compliance	may marginalize renewables within competitive power market
track record	little, but precedents in cap and trade pollution markets	various precedents

Arguments advanced against the surcharge-funded policy approach, as conceived of in California, have included the following:[8] First, many MRPR proponents contend that the

7 While we have sought to separate and distinguish the MRPR and surcharge-based policy approaches, it should be noted that an MRPR/surcharge policy hybrid could be created. For example, a number of parties have suggested the use of the MRPR for less-costly renewable energy technologies, with a surcharge-based program for the higher cost technologies such as photovoltaics. It might also be possible to craft an MRPR-type policy that was funded through a distribution surcharge.

8 The arguments presented against the MRPR and surcharge-based policies have been advanced by participants to the RWG and the legislative process. The arguments do not, necessarily, reflect the views of the authors.

surcharge-funded programs considered in California would not provide sufficient support to increase renewable energy supply in the state and that, even with the policy, resource diversity may decrease as existing projects are forced off-line at the end of their 10-year, fixed price contracts. Furthermore, because the surcharge-funded policy has an explicit cost cap, not a renewables generation target, it is impossible to determine the exact size of the renewables market (and associated environmental and risk reduction benefits) that would be created by the policy. Second, many MRPR proponents assert that centralized fund allocation mechanisms (such as renewable energy auctions) have not fared well in California, are administratively complex, and invite gaming. Finally, a surcharge-funded program is perceived by MRPR supporters to marginalize renewables in the competitive power market. In contrast, the MRPR would force all electricity providers to actively consider renewables as a compliance option, thereby making renewables an important component of the power market for all retail electric suppliers.

Arguments advanced against an MRPR approach have included the following: First, the MRPR, as proposed in California, was a relatively ambitious program that would have likely supported more renewables than the surcharge proposals. Some organizations and interest groups that have been active in the restructuring debate question whether the public benefits provided by renewables are sufficient to merit extensive financial support. Second, as originally conceived, the cost of the MRPR was to be set by the market based on the renewables purchase requirement level and renewable energy credit costs. Although it is possible to design an MRPR with a cost cap, initial proposals did not contain explicit cost containment, a factor deemed key in making the policy palatable to the legislature and to a diverse array of interests. Third, the MRPR was perceived by some to be overly burdensome to retail electric suppliers, who would be required to actively participate in the renewables (or at least the REC) market. Fourth, the incremental effect of the MRPR on electricity rates would differ by retail electric supplier. Although most MRPR proposals would have required all retail electric suppliers to meet the same standard, the MRPR (as contemplated in California) would have lower incremental rate impacts for those utilities with a higher pre-existing level of renewables. Finally, the MRPR is a new and untested policy, and many parties feared that unexpected and undesirable outcomes might result from its implementation (gaming, higher than expected costs, etc.).

5 Key Renewables Policy Implementation Issues

The Renewables Working Group addressed a large number of specific policy implementation questions left unresolved by the CPUC in its December 20, 1995 decision. Although the California State Legislature opted for a surcharge-based policy, and the RWG proposals are therefore effectively dead, many of the issues confronted by the RWG will continue to be of importance in the design and implementation of the legislature's policy and in the development of workable renewables policies more broadly. The following discussion emphasizes some of the most critical implementation issues that were raised in both the legislative and regulatory proceedings in California. The issues can be loosely grouped into

two categories: (1) who pays for the renewables policy and how much should they pay? and, (2) which renewables should receive support and how should the support be distributed?

5.1 Who Pays for the Renewables Policy and How Much Should They Pay?

Renewables Support Level

Of obvious importance in renewable energy policy is determining what level of support (in terms of incremental expenditures or renewables development) is appropriate. To ascertain the socially optimal level of renewables development or expenditure would require detailed information on renewable energy costs and the societal benefits of renewables. The benefits of renewables (environmental, risk reduction, employment, etc.) are difficult to quantify, however, and the ultimate trade-off between costs and benefits depends critically on public preferences. Much of the debate surrounding the surcharge-funded and MRPR policies hinged on differing perceptions of the need and rationale for continuing support of renewables. Many of the MRPR opponents in California questioned whether the public benefits provided by renewable energy are sufficient to merit additional financial support, whereas MRPR proponents and others argued that the incremental benefits of renewable energy far exceed the costs.

For the MRPR policy, higher initial purchase requirements and/or standards that increase over time would result in more renewables generation than standards set at lower levels. For surcharge proposals, renewables generation will increase as the fund size increases and/or the incremental cost of renewables decreases. However, it is not possible to precisely estimate how a given funding level will impact renewable energy production.

Most of the RWG's MRPR proposals set the initial percent standard level based on renewables production in the state during the 1990s, and only the AWEA, et al. proposal included yearly increases in the standard.[9] Instead of setting renewables production or capacity targets, both the RWG's surcharge-funded production credit proposal and the California State Legislature's surcharge-based policy set a fixed funding level. Of the specific policies considered in California, the MRPR proposals would have likely resulted in more funding for renewable energy, and therefore lead to more renewables production than the surcharge-based proposals (at their proposed funding levels). The RWG's surcharge-funded production credit proposal would not have provided additional support to existing facilities, for example. Although AB 1890 includes mechanisms to support existing and new renewables, the level of funding provided by the bill is thought by many in the renewables industry to be insufficient to meet the full needs of existing facilities.

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9 California is the U.S. leader in renewable energy capacity and production. In 1994, total renewable energy generation for California use, including hydropower (but excluding hydro imports from the Northwest), equaled approximately 54,000 GWh/year, or roughly 25% of all California retail sales. Absent hydropower, the level of renewables generation for California use was approximately 28,400 GWh/year, or roughly 13% of total retail sales (Renewables Working Group 1996).

Policy Obligations and Competitive Neutrality

Competitive neutrality requires that a renewables program apply equally to all retail electric suppliers, and is especially important when these entities are competing for retail customers. Concern over competitive neutrality was one of the key issues that led to the MRPR's demise in the California State Legislature.

A central issue for the MRPR in California was whether all retail electric suppliers should be obligated to comply with the purchase requirement or whether the mandate should apply only to CPUC-jurisdictional entities (which include investor-owned but not publicly-owned utilities). Most RWG proposals suggested that the renewables program be uniformly applied to all retail electric suppliers in the state. Regardless of whether it is applied to all or a subset of retail electric suppliers, a legitimate debate exists as to whether the MRPR is a competitively neutral policy when existing renewables are considered. Although most of the RWG's MRPR proposals would have required all retail electric suppliers to meet the same renewables purchase requirement, those utilities with a higher pre-existing level of renewables would be less severely impacted (on the basis of incremental rate increases) by the requirement than other retail electric suppliers. In fact, under an MRPR, utilities with excess RECs (i.e., utilities with high pre-existing levels of renewables) may see incremental rate reductions as they sell their excess credits to other retail electric suppliers, whose rates would therefore increase. While this outcome is considered discriminatory by those retail electric suppliers without a significant existing renewable energy base, it can also be argued that such an approach more fairly distributes the cost of renewable energy supply across the state. Utilities (and their ratepayers) with higher existing levels of renewables are currently paying a more-than-proportionate share of the state's renewable energy policies, effectively subsidizing utilities with little renewable energy. An MRPR might therefore more equitably allocate the total costs of renewable energy across all retail electric sellers.

Competitive neutrality is often less of a concern for surcharge-based renewables programs. For the specific surcharge-funded proposals considered in California, retail electricity suppliers would not have explicit compliance obligations, but would only be compelled to collect funds for a state-administered renewables program. With distribution surcharge-based funding, incremental program costs could be spread evenly across the state by setting equal surcharge levels (as a percent of revenue) for all retail electric suppliers. Although AB 1890 provides publicly-owned utilities more flexibility in the allocation of surcharge-collected funds, it does require that publicly-owned utilities create surcharge-funded public purpose programs that are comparable (on a percent of total revenue basis) to IOU-based programs. Competitive neutrality was sacrificed slightly in AB 1890, however, because the three large California IOUs will all be faced with slightly different surcharge levels.

Cost Containment Mechanisms

Cost containment was one of the most critical issues discussed in the RWG and in the legislature. Industrial customers, utilities, and power marketers were particularly concerned about limiting the costs of public purpose programs. The explicit cost cap contained in a

surcharge-based policy was critical in attracting broad-based support for the inclusion of a renewables policy within AB 1890.

As noted previously, one of the key stumbling blocks for the MRPR policy in the California State Legislature was the lack of explicit cost containment contemplated by some of the MRPR proposers. A cost cap was claimed to be sub-optimal because it would reduce the effectiveness of the MRPR policy.[10] Responding to political desirability and practical necessity, most of the RWG's MRPR proposals contained some sort of cost containment mechanism. Many of the proposals used caps on REC prices, for example, to effectively set a program cost cap.

Green Marketing Synergies

Green marketing attempts to take advantage of some electric customers' willingness to pay for products that provide environmental, health, or other public benefits. Market research indicates that a relatively large number of electric utility customers state a willingness to pay a premium, if given the chance, to buy "green" electric service (Holt 1996). Providing customers with a choice in electric service, as is expected after restructuring, would therefore create a potentially new market for renewables.

Renewables policies can be designed such that green marketing will either: (1) lead to an incremental addition of renewables over that which would have existed under the policy itself; or, (2) offset the policy requirements and therefore not result in any incremental additions to renewables production. A concern about the synergy between green marketing and renewables policy is the possibility that green marketers may be able to "double-dip" by collecting subsidies associated with public policies that support renewables and still charging end users a premium for green electricity. In addition, unless utility bills provide for full disclosure of all generation sources, consumers will have little basis on which to compare green power alternatives.

Most RWG proposals suggested that green marketing should result in the addition of renewable resources greater than that which would have been required to fulfill the state's collective mandated MRPR obligation, effectively disallowing double-dipping. In general, the creation of a REC market in the MRPR proposals would have facilitated green marketing because RECs would already be certified to come from "green" energy sources, reducing additional certification or disclosure requirements.

AB 1890 contains several provisions to support green marketing, including a requirement that electric corporations allow customers to make voluntary contributions through their utility bill payments to support the surcharge-based renewables program established by the bill. The specific language in AB 1890 is vague on whether money collected in this manner will add

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10 MRPR proponents initially claimed that a poorly designed cost cap might weaken the REC trading market and would require administration of the collected funds, a situation the CPUC indicated a desire to avoid.

to the total renewables funding level or offset the surcharge-based funding requirements. The legislature also seeks guidance from the CEC on certification procedures for eligible renewable resource providers, and on the possibility of providing rebates to those customers that voluntarily purchase renewable power. Finally, customers who have at least one-half of their load served by renewables can bypass the direct access phase-in schedule and begin direct access on January 1, 1998.

5.2 Which Renewables Should Receive Support and How Should the Support Be Distributed?

Distribution Mechanisms

The mechanisms used to distribute policy support will affect the administrative simplicity of a renewables program and will, in part, determine the effectiveness of the policy. The careful design of these mechanisms is therefore crucial.

Within the MRPR, incremental funding for renewables comes from REC sales. Because these transactions would occur in a competitive market-place, no specific, centralized distribution mechanism is required.

Surcharge-funded policies will require a means of distributing funds among competing projects. Funds could be allocated in many ways, including: (1) competitive auctions of production incentives, power sales contracts, or grants; (2) first-come first-served production incentives, power sales contracts, or grants; and/or, (3) through the discretion of the administrator. A large number of other approaches are also possible. Many MRPR proponents in California fear the administrative complexity of some types of fund allocation methods (i.e., auctions), and have contended that these mechanisms often invite gaming. The key to structuring these systems will be to keep complexity and participation costs low and the rules fair and transparent.

The surcharge-funded production credit would have distributed 10-year production incentives through a relatively simple state-wide auction. AB 1890 gives the CEC responsibility for providing options and recommendations to the legislature on specific approaches to fund allocation.

Duration and Stability of the Renewables Policy: Financing Issues

The renewable energy industry, much like the non-utility generator industry as a whole, has relied extensively on private ownership and project financing as the primary form of project development in recent years. With project finance, long-term commitments that guarantee a revenue stream are essential, especially for high capital-cost technologies such as renewables. Therefore, policy stability and duration have important impacts on financing costs for new renewable energy facilities. Renewables policies that do not provide a fixed or

determinate revenue stream will increase financing costs for new renewables facilities and will not be as effective as policies that provide stability.

The RWG's surcharge-funded production credit proposal would have established a 10-year, fixed-price production payment, and thus would have provided partial revenue certainty to the winners of the bidding process. The policy would not itself provide full revenue certainty because the renewables developer would still be responsible for power sales negotiations (through bilateral contracts or spot market sales). The renewables developer would presumably either: (1) require certainty in the power sales revenue stream through long-term power sales agreements; or, (2) demand higher production incentives to offset uncertainty in the value of the power market. Therefore, if a long-term forward contract market for power sales did not materialize, renewables developers might require higher production incentive payments.

Policy stability and duration are particularly important for MRPR policies, especially as they relate to new renewable energy projects. As in the production credit proposal, two forms of revenue would accrue to a project owner under an MRPR: (1) power sales revenue; and, (2) renewable energy credit revenue. Power sales would, again, be the responsibility of the project owner. If the MRPR standard is predictable over a long time horizon, REC buyers and sellers would be more likely to enter into longer-term REC contracts, decreasing lender and equity risk, and reducing finance costs for new renewables projects. If, on the other hand, legislative action could change or eliminate the policy at any time, long-term REC markets would be unlikely to form and the increased risk of policy instability would likely contribute to shortened debt terms, higher debt interest rates, more restrictive debt contracts, and higher equity costs (Wiser 1996b). Most of the RWG MRPR proposals attempted to solve the financing problem by offering programs which had no sunset date (except to the extent that renewables became cost competitive, in which case RECs would have no value) and urging policy stability. The specific regulatory and/or legislative mechanisms required to provide this stability were not fully addressed by most proposals.

Financing issues will also be of importance in the implementation of AB 1890. The bill requires that the CEC provide a report to the legislature on options and recommendations for the allocation of the renewables program funds. We expect that financing issues will be an important consideration in structuring allocation mechanisms to support new renewable energy projects within AB 1890.

Program Funding Alternatives

Traditionally, the costs of renewables policies applied at the regulatory level have been bundled and recovered through electricity rates, but not disclosed explicitly through a distribution surcharge. Funding for state renewables programs can also come from the general fund, earmarked taxes, state bonds, or non-bypassable distribution surcharges.

In most of the RWG MRPR proposals, retail electric suppliers were expected to bundle the compliance costs of the program into their rates. These costs might have been explicitly

identified in bills or bundled into a generation cost category. Funding for the auctioned production credit program in the RWG report would have come from a non-bypassable systems-benefit charge. Although this policy could also have been funded through the state general fund or other tax mechanisms, the wires charge has shown itself to be the most politically viable funding approach. In AB 1890, the legislature also calls for the use of a non-bypassable distribution surcharge funding mechanism.

Eligible Resource Types

The determination of which generation technologies are included as part of public policies can be contentious. Generation technologies often classified as renewable include biomass (solid-fuel, biogas, and solid waste-to-energy), wind, solar electric (photovoltaic and solar-thermal), geothermal, and hydropower. Two issues arise with respect to the eligibility of particular resources within a renewables policy.

First, some non-renewable technologies may have attributes that make them as deserving of support as the renewable technologies. Fuel cells, for example, may provide many of the benefits that are currently supplied by renewables.[11] Although renewables policies could be expanded to support other, non-renewable technologies, it is important to explicitly consider the specific goals of the policy before deciding which technologies or technology attributes to promote.

Second, it may not be necessary or appropriate to provide public policy support to some renewable technologies. For example, although hydro is, undoubtably, a renewable resource, the inclusion of new and/or existing hydro generation in the California's renewables policy was a matter of contention among participants in the RWG. RWG participants that did not believe it was appropriate to include hydropower generally cited three reasons: (1) hydro is already commercial and cost-competitive and therefore does not require additional support; (2) inclusion of hydro in the MRPR would cause a number of practical problems including concerns about market power by large hydro owners, yearly production variability, and out-of-state hydro squeezing out non-hydro renewables in the REC market (Wiser 1996a); and, (3) hydro does not provide the wide range of public benefits as do other renewables (i.e., large hydro often has significant local environmental impacts). The three RWG proposals that did include at least some forms of hydro generally contended that hydro does provide many public benefits and that not all hydro is competitive in today's electric market.

AB 1890 provides guidance on which technologies are to be targeted for additional public support, referring indirectly to biomass, wind, solar, geothermal, and small hydro-electric power facilities under 30 megawatts in size. In addition, any power project that has more than a 25% fossil fuel component is not considered by the legislature to be renewable under AB 1890.

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[11] In the New England states, MRPR proposals offered by the Union of Concerned Scientists include fuel cells, whereas they are not included in the CPUC's RWG proposals.

Support of New and/or Existing Facilities

California has a large number of existing renewable energy generators that currently operate under PURPA contracts. Many of these contracts provide ten years of fixed, pre-specified avoided energy payments which, in year eleven change to payments based on short-term avoided energy costs. Based on forecasts from the mid-1980s, avoided energy payments are quite high during first ten years, but are expected to decrease dramatically after the fixed payment period, creating the so called payment "cliff." Some renewable facilities operating under these contracts will be forced off-line at the end of the 10-year fixed price period because variable operating costs and O&M will exceed the power sales revenue.

The necessity and desirability of supporting both existing and new renewable energy facilities has been a key policy questions in California. Proponents for the support of existing projects claim that the incremental cost of keeping existing facilities operating may be lower than the support requirements for new facilities, therefore providing environmental and diversity benefits at lower cost. Furthermore, they contend that support for existing facilities may be a more effective and rapid way of sustaining existing renewable energy companies. Those that lean toward the support of new projects generally claim that technology innovation and cost reductions will occur only with new development.

MRPR-based policies generally allow new and existing facilities to compete for RECs. Therefore, without additional mechanisms for the promotion of less commercial and/or more costly renewable technologies, the lowest cost renewables, whether new or existing, would likely obtain the most support through an MRPR. Surcharge-based proposals can be designed to support existing and/or new renewable energy projects. AB 1890 provides mechanisms to support both categories of renewables in roughly a 50/50 split of funds.

Out-of-State Renewables Eligibility

The goal of a state renewables policy is typically to provide benefits to the local region, whether environmental, economic, or diversity related. AB 1890 specifically restricts renewables support to power projects operated in-state, and RWG participants generally agreed that allowing only in-state renewable generators to participate in California's renewables policy would be desirable. Yet, despite the desirability of limiting participation to in-state facilities, federal Commerce Clause requirements forced most of the RWG proposals to place no restrictions on the participation of renewable generators that are located outside of California as long as they have contracted to sell their power to California customers. The RWG proposals that did seek to limit renewables generation to in-state facilities generally argued that the unique benefits of these facilities provide sufficient in-state interest to allow the in-state restriction to withstand legal challenge.

Promotion of Less-Commercial and/or More Costly Renewable Technologies

Renewable generation sources are a disparate collection of technologies, each of which has its own combination of attributes and financial support requirements. Specifically, some

technologies are less mature and more expensive than others. For example, some of the solar technologies are currently more costly than wind and geothermal. In addition, renewable technologies do not each provide the same mix of environmental, diversity, and economic benefits.

The RWG proposals differed in their mechanisms for the support of less-commercial and/or more costly renewable energy technologies. Two of the proposals included an additional solid-fuel biomass technology band so that retail electric suppliers would be required to purchase RECs from solid-fuel biomass, therefore supporting existing biomass projects that would not be able to compete with wind or geothermal in a single REC market. Although more costly, these existing biomass facilities were claimed to provide the additional benefits of local landfill relief, local air quality improvements due to reductions in the open-burning of agricultural wastes, and local forest fire risk reduction resulting from the fuel collection activities of the biomass plants.

None of the comprehensive RWG proposals identified *specific* mechanisms and offered *specific* proposals to support less-commercial, emerging technologies, such as photovoltaics. The two RWG adjunct proposals offered specific mechanisms to support emerging technologies. One of these proposals, supported by the Biogas Working Group, targeted biogas generation for supplementary support; the rationale for this increased funding was that Biogas technologies provide more greenhouse gas reduction benefits (i.e., reduction in methane emissions) than other renewables. The CalSEIA, et al. adjunct proposal described four different mechanisms that could be used to support emerging technologies: (1) inclusion of an additional band within the MRPR for these technologies; (2) modification of the surcharge-funded production credit proposal to set-aside a fraction of the funds for emerging technologies; (3) including additional funds in RD&D budgets to target commercialization of emerging technologies; and/or, (4) using energy efficiency funds to buy-down the cost of distributed renewables.

While AB 1890 clearly calls for surcharge funds to be used to support emerging renewable energy technologies, it asks that the CEC provide guidance on which technologies to target and to what degree these technologies should be supported. The bill also explicitly identifies existing biomass and solar-thermal facilities as targets for policy support.

6 Conclusion

Ultimately, California's State Legislators had to select among several alternative renewable energy policy proposals including—most importantly—MRPR and surcharge-based policies. We believe that the MRPR's luke-warm reception in the legislature was, in large part, due to the lack of wide-spread support for the policy among the diverse interests represented in the restructuring proceedings. Large industrial customers, power marketers, and a number of utilities lobbied against the MRPR bill within the California State Legislature. Their primary concerns included the MRPR's initial lack of cost containment, competitive neutrality, and

an underlying conception that the benefits of renewable energy may not be worth the costs embodied within the MRPR. Due to disagreement over policy objectives and political strategies, even renewable energy and environmental organizations differed in their level of support for the MRPR. Within these communities, tensions exist over the fundamental goal of a renewables policy, for example, whether and in what proportion to support existing, new, or emerging technologies. Even more critically, many of these organizations have differing perceptions of the need and rationale for continued support of renewables. Environmental organizations primarily concerned with air and water pollution might be more inclined to use limited public funds on the lowest cost pollution mitigation options, which frequently do not include renewable energy supply. Renewable energy interests, on the other hand, point to the additional benefits associated with renewables, including risk mitigation, employment, and projected long-term cost reductions.

To be heard within the electricity restructuring process, it is essential that renewable energy proponents work together and present a clear rationale for continuing support of renewables. Moreover, a more clearly defined set of public policy objectives could help resolve some of the key renewables policy implementation issues, including whether and in what proportion to support existing, new, and/or emerging renewable applications.

The CPUC Renewables Working Group process and the legislative debate on renewable energy policy in California illustrate issues that will arise in translating general public policy goals in support of renewable energy to specific mechanisms that are workable in a restructured electricity industry. Although the California State Legislature opted for a different strategy than that proposed by the CPUC, many of the same issues and conflicts that arose in the RWG process will have to be resolved by the CEC and legislature during the design and implementation of AB 1890's fund allocation mechanisms. These issues and conflicts are also likely to recur in other states' electric restructuring processes. We hope that California's experience with these issues will help inform other stakeholders and states as they struggle with the provision of "public purpose" programs in an era of electric industry restructuring.

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Appendix A: Comparison of the California Renewables Working Group Policy Proposals

Table A-1. Summary of California Renewables Working Group Policy Proposals

Proposal Sponsors	Type	Basis for Standard (Energy or Capacity)	Market Participants Responsible for the Renewables Target	Renewables Included	Technology Bands to Support Intra-Renewables Diversity	Standard Level
AWEA, et al.	MRPR	Energy	Uniform requirement on all retail electric suppliers or, if no legislation, on CPUC-jurisdictional entities	All but hydro	One for solid-fuel biomass	90% of 1993 renewables level (approx. 11.5%), increasing at 0.2%/year
IEP	MRPR	Energy	Non-uniform requirement on utility distribution companies (UDCs) for their customers and those direct access customers not choosing to voluntarily purchase renewables; the direct access customers would be charged for the renewables purchase services of the UDCs through a distribution charge	All except large-hydro; hydro size limit of 30 MW	One for solid-fuel biomass	The UDC purchase requirement equals the standard less the voluntary green power market; standard set for each utility at the 1994 renewables level plus the BRPU winners, not increasing
NCPA	MRPR	Capacity with capacity factor targets	Uniform requirement on all retail electric suppliers	All, including hydro	None	18% of annual average coincidental peak demand (from ER 94), with no increase until 2000
SCE/PG&E	MRPR	Energy	If legislation is not enacted to make the standard uniform on all retail electric suppliers by 2000, program is terminated	All but hydro	None	Approximately 10%, not increasing
SMUD	MRPR	Energy	Uniform requirement on all electric suppliers	All, including hydro; only new hydro can trade renewable energy credits (RECs), however	None	Approximately 21% (based on 1994 data on California renewables generation)
EDF, et al.	Auctioned renewable energy production credit	Energy	Uniform state-wide surcharge and auction of funds as a 10-year production credit or, if no legislation, surcharge on CPUC-jurisdictional end-users	All but hydro can bid	Designed to bid without technology bands or tiers	Funding level set at approximately $100 million/year

Table A-1 (continued). Summary of California Renewables Working Group Policy Proposals

Proposal Sponsors	Funding Source	Program Lifetime	Treatment of Existing QF Renewable Energy Credits (RECs)	Compliance Penalties/Fees and Cost Caps	Which Generators Can Obtain Credits
AWEA, et al.	Bundled in market price of electricity	No sunset	During fixed-price period of interim SO4, RECs go to utility to reduce the CTC; otherwise given to QFs	6 ¢/kWh for REC shortfall acts as a penalty; if REC prices are high in the private market, state agency will sell proxy RECs for 2.75 ¢/kWh for non-biomass and 3.75 ¢/kWh for solid-fuel biomass; acts as a cost cap; funds collected by state agency proxy REC sales are used to purchase RECs in private credit market	All non-biomass renewable generators selling into California (hydro excluded); biomass limited to in-state facilities
IEP	All costs required of UDC customers (to meet the standard net of the green power market) are funded through a public goods distribution charge	No sunset	During fixed-price period of interim SO4, RECs go to utility to reduce the CTC; otherwise given to QFs	Penalties for non-compliance and incentives to reduce compliance costs are to be imposed through PBR	All renewable generators selling into California (except large hydro)
NCPA	Bundled in market price of electricity	No sunset	Negotiated among parties	$1/MWH for *all* retail sales if in non-compliance with the minimum renewables purchase requirement; acts as a cost cap	Limited to renewable generators located in-state
SCE/PG&E	Bundled in market price of electricity	Canceled in 2000 if not legislated state-wide; reviewed every 5 years	RECs default to the holder of the contract (i.e., the utility); revenue from utility REC sales is used to reduce the CTC	2 ¢/kWh for REC shortfall; acts as a cost cap and funds collected could be used to support renewables through an auction	All non-hydro renewable generators selling into California
SMUD	Bundled in market price of electricity	No sunset	RECs default to the holder of the contract (i.e., the utility)	Instead of purchasing RECs, retail electric suppliers could pay into a state administered fund for renewable energy	All renewables except existing hydro (which could be used to meet the standard, but not for credit sales); out-of-state non-hydro renewables selling into California are eligible
EDF, et al.	Funding comes from a non-bypassable public goods distribution charge	Yearly auction for 5 years, but projects will receive 10 years of production credit funding if they are a winning bidder in the auction	n/a	Funding level set at approximately $100 million/year; acts as a strict cost cap	All non-hydro renewable generators selling into California