# RENEWABLE ENERGY CONSUMER EDUCATION
# MARKETING PLAN

**February 1999**

**Renewable Technology Program**
**CALIFORNIA ENERGY COMMISSION**

**P500-99-018**

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## Summary

This document presents a general marketing approach for the California Energy Commission's (Commission) Renewable Energy Consumer Education (RECE) campaign, a four-year, $5.4 million education program mandated by Assembly Bill 1890[1] (AB 1890) and Senate Bill 90 (SB 90)[2] as part of electricity industry restructuring. The RECE program seeks to raise consumer awareness of renewable electricity generation options and their benefits, to increase purchases of both renewable energy from the grid and small-scale "emerging renewables" installed on customer premises, and to mobilize a self-sustaining education effort that will continue beyond the four-year term of the Commission's program.

Aided by select advisory consultants, Commission staff, under the direction of the Renewables Program Committee (Committee), will manage the program, which will be administered by non-profit organizations representing the interests of both the renewable energy and emerging technology sectors of the renewables industry. In view of the different promotional needs of grid power and distributed generation systems, the RECE campaign establishes separate action plans and program administrators for these elements, with coordinated educational and promotional activities as practical. Promotion will include grassroots outreach, public relations, targeted media, and, in the later years, mass media. Initial efforts will focus on reaching "early adopters"—those audiences most likely to purchase renewables—who can, in turn, help spread the word to a wider market.

Efforts will be made to leverage and match program funds by at least 4:1 by private and public co-funding and in-kind assistance by the end of the program. Funds will be allocated and disbursed in 15- to 18-month intervals based upon the results of formal performance evaluations, market developments, and procurement of co-funding.

## I. Background

In restructuring California's electric utility industry, AB 1890 provided $540 million to be collected from ratepayers of the major investor-owned utilities (IOUs) to foster the competitiveness of a renewable energy market during the initial transition years from 1998 to 2001. SB 90 placed these funds in a Renewable Resource Trust Fund, to be administered by the Commission, with explicit allocation of these monies.

One-fourth of the funds has been reserved for customer-side price supports during the transition years. The Customer Credit program provides up to 1.5¢/kWh for purchases of qualifying renewable energy from the grid, while the Emerging Renewables Buydown program subsidizes the purchase and installation of

renewable energy technologies on the customer site. SB 90 earmarked 1% of the renewables funds—or $5.4 million—for consumer education. As established by SB 90, the purpose of such education is to "promote renewable energy and to disseminate information on renewable energy technologies, including emerging renewable technologies, and to help develop a consumer market for renewable energy and for small-scale emerging renewable energy technologies."[3]

As defined in AB 1890, renewables include the following technologies:

- Biomass
- Digester gas
- Geothermal
- Hydroelectric (30 MW or less)
- Landfill gas
- Municipal solid waste
- Photovoltaic (PV)
- Solar thermal
- Waste tire
- Wind

"Emerging renewables" are defined as:

- Fuel cells that convert renewable fuels into electricity
- Photovoltaic systems
- Solar thermal electric systems
- Wind turbines ≤ 10 kW

To be eligible for the Commission's Buydown program, these emerging distributed technologies must also be on grid-connected customer sites in IOU service areas.

The authorizing legislation is clear that the education effort shall address both larger-scale renewables and smaller-scale emerging technologies; however, there is no specific guidance on allocating the $5.4 million in terms of specific technologies to be promoted, the customer class or geographic region to be targeted, or the type of educational activity (brochures, presentations, media buys, etc.) to be conducted. This proposed marketing plan provides that guidance, sufficient for project administrators to develop detailed implementation plans.

# II. Goals of Education Campaign

In light of the mandate set forth by SB 90, the RECE campaign seeks to raise consumer awareness of renewable energy options so as to increase purchases of both renewable energy from the grid and "emerging renewables" that are installed on customer premises. To these twin goals of raising awareness and changing behavior, we add a third: leveraging the value of the education campaign itself. Thus, the RECE campaign has three principal goals, as elaborated below:

## Goal 1. Increase consumer awareness of renewables

### *Objectives*

- Make California "early adopters" aware of consumer energy choice, renewable energy options, the environmental benefits of renewables, and how to purchase renewables
- Expand this awareness to wider audiences

The aim is to provide the knowledge necessary to make an informed purchase, rather than detailed technical knowledge of how different renewables operate. RECE materials will therefore focus on defining renewable energy and discussing its environmental, energy security, and economic development benefits, emphasizing the availability of consumer choice and renewable options, and directing consumers toward detailed assistance with signing up to purchase renewable energy or purchasing and installing their own renewable system.

## Goal 2. Increase purchases of renewables

### *Objectives*

- Reach full subscription of funds allocated for Customer Credit rebates effectively by end of program
- Expend all funds allocated for Emerging Renewable Technology systems effectively by end of program
- Create an ongoing, sustainable demand base

Beyond raising awareness, the program aspires to "grow" the renewables marketplace by increasing consumer demand. Accordingly, our prime objectives are to expend all funds allocated to Customer Credit for renewable energy purchases ($75.6 million) and all funds allocated to emerging renewable technology buydowns ($54 million) by the end of the program. Although it would seem easy to give away money, these are ambitious objectives. Meeting these objectives will depend upon (1) the ability of the RECE campaign and other stakeholders' efforts to

ignite consumer demand for qualifying renewable products and (2) the willingness of the electric service providers (ESPs) to offer qualifying products. Similarly, expenditure of buydown subsidies sets a high bar for emerging renewables, requiring purchase of at least 32 MW of grid-connected capacity (total capacity, not specified as to distribution among the qualifying technologies).[4]

Because not all "renewables" purchases (as advertised by ESPs and perceived by consumers) qualify for these two programs, activity in these programs will underestimate overall market activity. Nonetheless, we have selected these subsidy programs as our yardstick of consumer demand for several reasons:

- Activity in these programs is readily measurable. Indeed, subscription to these programs may be the simplest and most realistic measure available to the Commission. (Each month ESPs must report the number of direct access switches to the California Public Utilities Commission [CPUC], but do not divulge how many consumers signed up for a particular product.)
- The education effort should support the co-mandated programs in the Renewable Resource Trust Fund.
- Because these subsidies largely exclude out-of-state generation, they serve as fairly reliable indicators of net environmental and energy resource benefits for the state.

## Goal 3. Leverage the value of the education campaign

### *Objectives*

- Achieve match of SB 90 funds by at least 4:1 by the end of program
- Seed an ongoing education campaign that will carry on after the four-year transition period

The Commission's budget of $5.4 million by itself is not sufficient to conduct an effective, multi-year, statewide campaign. Accordingly, the limited RECE funds can best be used as seed money to mobilize organizations that have a long-term interest in renewable energy. By working through knowledgeable existing groups with established networks and funding, the Commission can greatly leverage its outreach—and in a way that creates an ongoing legacy of expanded educational efforts even after SB 90 monies are spent. From this perspective, the Commission prefers to conduct the campaign directly through a network of renewables stakeholders and public interest groups with assistance from marketing/communications experts as necessary.

# III. Two Action Paths: Renewable Energy Market and Emerging Renewable Technologies

Both grid-managed (marketed) renewable energy and distributed generation (emerging renewable technologies) options offer similar environmental and energy security benefits. From a consumer perspective, however, they are markedly different, as illustrated in Table 1.

**Table 1. Comparison of Renewable Energy Market and Emerging Renewable Technologies as Consumer Products**

| RENEWABLE ENERGY MARKET | EMERGING RENEWABLE TECHNOLOGIES |
|---|---|
| Electricity from grid | Small-scale distributed generation on customer side of meter |
| **DIFFERENT PRODUCTS** | |
| Familiar "meter" service from an ESP | Distributed generation systems owned and operated by customer |
| Costs about $10/month extra for average household (minimal investment risk) | High capital investment with 20+ year payback (high investment risk) |
| Invisible electrons; indistinguishable from current electrical service (except for receiving a separate bill in some cases) | Obvious "green" power with pride appeal |
| "Switch" effort similar to switching phone companies | Implementation requires more extensive planning (sizing, vendors, contractors, permits, financing, etc.) |
| **DIFFERENT MARKETS** | |
| Both property owners and renters | Property owners with long-term interest |
| Need to raise only monthly surcharge; not locked into a decision for more than a few years, if any | Able to raise significant capital (thousands or tens of thousands of dollars) |
| Interested in clean, sustainable energy or perceive PR benefits from supporting clean renewable energy | Interested not only in environmental benefits, but also in perceived reliability of on-site generation |
| **DIFFERENT MARKETING STRATEGIES** | |
| Any grid-connected location | Some geographic restrictions (resource availability, zoning laws) |
| Grassroots, public relations (PR), and mass media | Grassroots, PR, and highly targeted media |

As evident from Table 1, purchased renewable energy appeals to a wider market, while emerging renewable technologies appeal to a more limited, specialized market, necessitating different messages and dissemination tools. Although some basic educational and marketing efforts will overlap and complement, these two options are different enough to warrant separate analysis and action plans. A detailed situation analysis for the renewable energy and emerging technology markets is provided in Appendix A to this report.

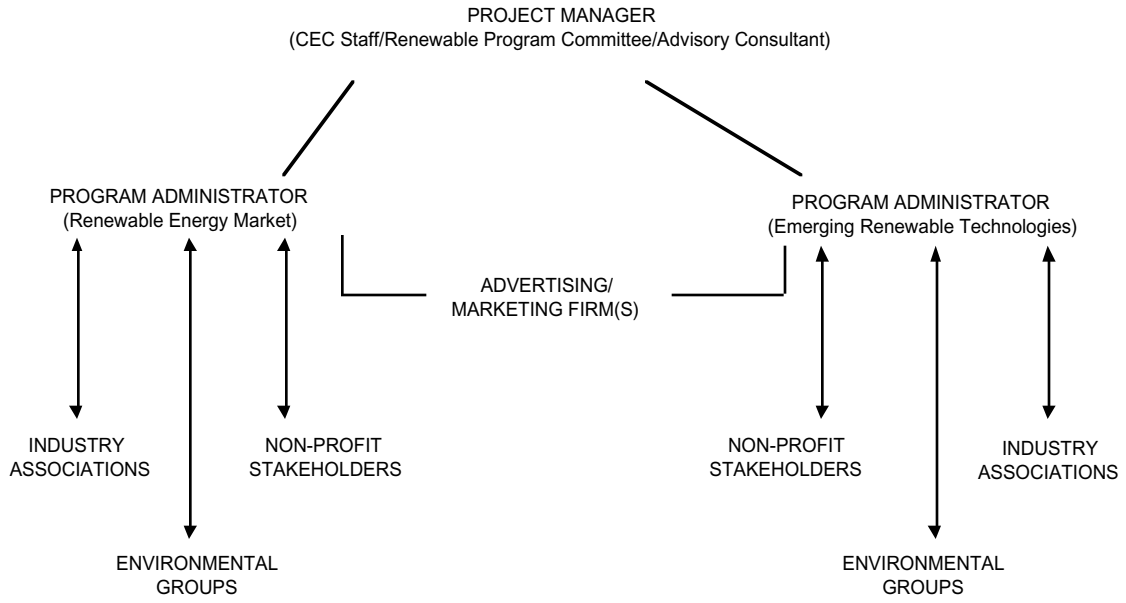
# IV. Program Management

The Commission plans to administer the RECE program through existing renewable industry stakeholders and public interest groups—preferably through a coalition of nonprofit organizations representing the interests of the renewable energy and emerging technology markets. This strategy lends several important advantages:

- Leverage of the Commission's expertise and reputation with additional knowledge, networks, and resources
- Mobilization of committed organizations that will carry on the education effort after the SB 90 funds are spent

The RECE Program will be managed in a coordinated manner as outlined in Figure 1.

### Figure 1: RECE Program Management



## Role of the Energy Commission, Staff and Consultants

As indicated in Figure 1, the Commission, through the direction of the Renewables Program Committee and staff project manager, will oversee the program, assisted by advisory consultants with expertise in renewable technologies and marketing. Ensuring coordination with the other Renewable Resource Trust Fund programs, the CPUC energy education and other local, state and federal renewable energy education programs, the Commission will affirm basic program direction and review all the educational and promotional strategies, activities, and collateral developed by the RECE program administrators. The Commission staff will also oversee program evaluation and recommend to the Renewables Program Committee the allocation of funds based on results.

## Role of the RECE Program Administrators

The RECE program administrators will conceive promotional strategies, produce collateral, and direct daily operations. In addition, the administrators will be responsible for leveraging the state's $5.4 million by at least 4:1 by the end of the program. Matching funds can include in-kind support (labor, office space, etc.) as well as private and public cofunding. The program administrators will report regularly to the Commission project manager, and assist with program evaluation conducted by the Commission staff and an outside contractor.

Although the renewable energy market and emerging renewables industry call for different promotional strategies, there are advantages to coordinating outreach activities, such as:

- Common message development when practical (e.g., education on environmental impacts)
- Use of same public relations specialist
- Enhanced opportunity to join forces between market sectors to strengthen market introduction of renewables in general

Given the differing promotional strategies required, the Renewables Program Committee has recommended two program administrators, each demonstrating the following attributes:

- Non-profit organization supported and trusted by the renewables industry, but free from the appearance of serving any particular industry segment
- Expertise and ongoing interest in the renewable energy and emerging renewable technologies markets
- Ability to bring together and work with a broad base of stakeholders and public interest groups representing renewable energy and emerging renewable technology markets and consumers
- Demonstrated marketing expertise and success (grassroots, targeted outreach and paid media campaigns) incorporating consumer education and energy marketing principles

- Skill and ability to obtain cofunding and potential to achieve 2:1 matching funds through first year of program

The Committee recognizes that the disparate interests of renewable energy market and emerging renewables sectors of the industry require primarily separate education and promotion campaigns. At the same time, the Committee believes that obtaining close cooperation or buy-in from the respective groups and coordinating messages and costs of mutual benefit is essential to effectively leverage limited resources.

## V. Allocation and Distribution of Funds

In contrast to other Renewable Resource Trust Fund accounts, SB 90 is silent on specific allocation and distribution mechanism guidelines for the Consumer Education Subaccount funds.
The Committee recommends an initial disbursement up to $1.5 million for the first 15 months of funded program activities. This initial fund distribution will be allocated approximately 80/20 percent between the renewable energy market and emerging technologies campaigns, respectively. This allocation is based on preliminary projections of relative costs of campaign products and activities and also takes into account costs and effort for coordination of shared message development materials and other activities serving the two campaigns' common or overlapping educational and marketing goals. Subsequent disbursement and allocation of funds will be determined by the Renewables Program Committee based on program evaluation criteria developed with the assistance of independent contractors and ongoing assessment of market conditions and unforeseen developments.

The Committee has set targets for the leveraging of program funds that the program administrators will be responsible for achieving. A 2:1 matching of funds, through private and public co-funding and in-kind assistance, is expected to augment the initial disbursement of funds. After the initial phase of implementation activities, funds will allocated in 15- to 18-month intervals based upon the results of program evaluation (including success at procurement of co-funding) and ongoing assessment of market developments. By the end of the program, matching fund levels of 4:1 are expected.

## VI. Marketing Mix

The marketing mix defines the essential elements of the campaign effort. The four basic elements of the RECE marketing mix are product, price, distribution, and promotion.

## Product

Note that the Commission's product in this campaign is not the renewable energy product offerings or the emerging renewables technologies themselves. Rather, the Commission's product is information: information about renewable energy and technologies, and information that breaks down barriers to purchase—and thereby increases sales—of renewable energy offerings and emerging renewable technologies. It is imperative that this information be accurate, unbiased, and trustworthy, and that it address the concerns of the targeted markets consistent with the direction of SB 90. It should also complement related educational efforts by the CPUC, other government agencies, nonprofit groups, and industry.

To help consumers recognize and become familiar with the state's renewable energy program, the various information products identified with the Commission should maintain a standard graphic look. However, not all information needs to be directly linked with the Commission, as some target audiences have reported distrust of information from government, and some of the work can be effectively implemented by third-party organizations through their existing program materials (e.g., environmental newsletters).

## Price

All RECE information products will be free of charge to the consumer. This means the Commission and other partners will carry all costs related to the education campaign. These include reasonable costs for developing and maintaining information products (hotlines, websites, brochures, fact sheets, media kits, videos, advertising), salaries of outreach and PR coordinators, rents, and other direct charges.

## Distribution

The RECE campaign will strengthen and link the existing information networks to economically expand consumer access to reliable information. Distribution points to be considered include:

- Toll-free hotlines
- Websites
- Personal presentations to targeted groups; informational booths at fairs and conferences
- Targeted media and public relations: press, TV, radio, signage
- Trade and association journals, newsletters of targeted organizations
- Possibly direct mail (a potentially cost-effective way to reach specific markets, if carefully managed)
- Utility bill inserts

## Promotion

In keeping with the different promotional needs of renewable energy markets and emerging renewables, the RECE campaign entails separate action plans for promoting these options. Both promotions take a phased approach, starting with the most receptive audiences ("early adopters" and "innovators") in limited geographic areas in each IOU territory. The promotion will gradually expand the campaign to early adopters in broader geographic areas, and finally, to broader, mass audiences.

In both action plans, the initial phases will employ targeted grassroots outreach, public relations, and targeted placement of articles/advertising. By building a foundation before committing significant funds to mass marketing, RECE gains several advantages:

- Mass audiences will have gained better awareness of choice and renewable energy options through the public relations and statewide educational campaigns
- Messages will have been tested and refined with the early adopters
- Early adopters can reinforce marketing messages
- ESPs will have had a chance to modify product offerings to qualify for Customer Credit and gain better public relations

Ongoing informal assessment will allow RECE efforts to be adjusted mid-course, while formal program evaluations at 15- to 18-month intervals will determine the effectiveness of program activities.

Action plans for both promotions are outlined below. The RECE program administrators will be charged with developing more detailed activity schedules and budgets based on final action plans and actual costs for labor, materials, production, ad placement, and other direct charges. Action plans must be flexible to accommodate field experience and unforeseen events or opportunities.

### *Renewable Energy Market Action Plan*

**Phase 1: Focus on early adopters (15 to 18 months)**
This effort will build on previous work by existing organizations (e.g., REMB, CEERT, NRDC, EDF, Global Greens, CRS, etc.) to create momentum among audiences most likely to purchase renewable energy. Activities would include:

- Prepare RECE campaign infrastructure (coordinating with existing hotline, website, branding programs, etc.)
- Conduct public relations campaign (media outreach, communications coordination)
- Conduct targeted outreach (presentations, articles, mailings, etc.) to likely "early adopters"—e.g., environmentalists, interested local governments, progressive business groups, cooperatives, educational institutions

**Phase 2: Expand to broader audience (remainder of campaign)**
Based on the field experience of Phase 1, the RECE efforts will branch out to a wider audience using mass media, both unpaid (PR and public service announcements [PSAs]) and paid advertising.

- Continue PR campaign
- Continue outreach to receptive audiences
- Launch mass media campaign of PSAs and ads (radio, TV, and signage; start with a pilot program in each IOU area, then refine and extend based on results)
- Conduct other activities identified through field experience (perhaps helping small businesses and other groups form aggregation pools)

## *Emerging Renewables Action Plan*

Market information for emerging renewables is incomplete, necessitating preliminary market research in Phase 1. The next phases will focus on getting information out to innovators, who we anticipate to be environmentalists, technophiles and architect/engineers, and housing developers. A final, third phase of the campaign will identify the next tier ("early adopters") and extend outreach to this audience; depending on the market situation, this phase could also entail geographically limited mass marketing. Activities may include:

**Phase 1: Market Research and Infrastructure Development (initial 6 months)**

- Design and conduct market research; determine best target markets
- Create consumer support tools
- Educate distribution channel
- Conduct early PR as newsworthy opportunities arise

**Phase 2: Conduct Outreach to Innovators (summer 1999)**

- Operate and maintain hotline and website
- Create print ads for trade and environmental publications and other collateral (detailed pamphlets on technologies, brochures, giveaways, etc.)
- Create traveling PV exhibit; attend fairs
- Hold media-public relations events (one per year, same event as for renewable energy)
- Continue PR: identify and place stories; track and "correct" media coverage
- Run print ads in targeted publications
- Make presentations to target audiences as determined by market research in Phase I (speeches, papers, participation at trade association meetings). Anticipated target groups of innovators and "early adopters" could be:
  - Environmentalists, technophiles
  - Architect/engineers
  - New residential and office building developers, real estate firms and cooperatives

- Consumers seeking secure, uninterruptible power supply
- Assist efforts by others (no product-specific)

**Phase 3: Expanded Early Adopters Outreach (start around Oct/00)**

- Continue PR efforts and outreach
- Adjust activities, messages, and collateral based on prior results
- Consider very targeted PSAs and paid advertising

# VII. Program Evaluation

Ongoing evaluation of the effectiveness of the RECE campaign will allow the Commission and project managers to assess progress toward program goals and determine whether the goals and program design are realistic. By providing a measure of the success of the RECE strategies and messages, evaluation also sheds light on the need to refine these elements to maximize future success, and offers an objective basis for allocating funding to greatest advantage. Finally, evaluation findings give the Legislature and public a quantifiable measure of not only the success of the campaign, but also ultimately, the environmental and resource conservation benefits of the RECE campaign to the State of California.

## Measuring Progress Toward Goals

Like the rest of the marketing plan, the evaluation program must be grounded in the overall goals of the RECE campaign:

- Increased awareness of renewable energy offerings and emerging renewable technologies as purchase options
- Increased purchases of renewable energy offerings and emerging renewable technologies (expend all Customer Credit and Buydown funds)
- Seeding of a self-sustaining education campaign on renewable energy purchase and emerging renewable technology options

Table 2 below recommends ways to measure progress toward achieving these goals:

**Table 2. Suggested Measurements of Success**

| Goal | Measurement Technique |
|---|---|
| Increased awareness of renewable energy/emerging renewables as a purchase option | • Pre-and post-surveys (phone or written)<br>• Increased traffic on selected hotlines and web pages<br>• Increased PR coverage<br>• Message dissemination |
| Increased purchases of renewable energy and emerging renewables | • Full subscription of all Customer Credit and Emerging Buydown funds by end of program |
| Mobilize network of committed organizations that will assume financial and management responsibility for ongoing promotion | • CEC observation of activity level of key players, quantifying cofunding and in-kind support<br>• Match SB 90 funds by 4:1 by end of program<br>• Ongoing financial reports from Consumer Education program administrators |

As the action plans are both finalized and refined, the Commission and project managers may further define indicators for determining how well the program goals are being met. Other quantifiable factors to examine include:

- The amount and type of unpaid publicity or media outlets
- The increase in the number of hits to the websites and hotlines
- Growth in expenditure of Customer Credit and Emerging Buydown funds
- The amount of matched funding and the number and types of organizations providing co-funding
- Number of customers (residential, business, large commercial/industrial, institutions) switching to "green" power sources

It is recommended that the evaluation focus on measuring a change in awareness and consumer behavior, rather than the degree to which the RECE campaign alone affected that change. Quantifying the exact amount of market change attributable to a promotion is simply impossible. The most cost- and time-effective means to deal with this uncertainty is to focus evaluations on awareness and behavior change, hypothesize that the RECE efforts played a role in the overall behavior change. Where appropriate, survey questions can be included to determine whether the consumer was influenced by the campaign.

Baseline surveys measuring consumer awareness of renewable energy and emerging renewables will be conducted by an independent contractor. These are already in the design stages, and staff are reviewing the survey tools and content to ensure that the RECE's campaign's effectiveness can be evaluated. The baseline evaluation work for the Customer Credit and Emerging Buydown programs will be designed so as to assess related issues affecting the market: stakeholder actions to improve the market; customer awareness of the products and technologies, relative benefits and costs, purchase incentives, distribution channels; and efficiency of the Commission's incentive programs and ways to improve those incentives. Subsequent surveys will measure changes from these baseline "snapshots" of the market.

Program evaluation activities will be synchronized with the major phases of the respective action plans. Funding for the evaluation effort will not come out of the RECE budget, but rather from separate Commission technical support contract funds.

# Appendix A

# I. Situation Analysis: Renewable Energy Market

## Market Climate

### *Window of Opportunity in an Uncertain Market*

California leads the nation in renewable energy production, accounting for about a third of the nation's renewable generation. Electricity industry restructuring has both hurt and helped the state's renewable supply. After a construction boom spurred by the Public Utilities Regulatory Policies Act of 1978[5] (PURPA) and integrated resource planning requirements, California's renewable generation has declined since 1993, while the industry awaited the outcome of deregulation rulings. With open markets now a reality and natural gas prices so low, even existing renewables face a steep competitive challenge. Construction of new generation facilities is risky business in this uncertain market.

On the other hand, with the provision of special operation and construction subsidies, AB 1890 is responsible for a renaissance in renewables construction. To date, 55 projects representing 510 MW of new renewable capacity have been bid and conditionally awarded subsidies pursuant to the Commission's New Renewable Resources Account auction. Potentially, this represents an increase of nearly 8% over the state's existing renewable capacity of some 6,600 MW. [6]

Moreover, restructuring has opened the possibility of a competitive renewable energy market. Given AB 1890's mandated 10% rate cut for residential customers of the IOUs over the next few years, "green-ness" is virtually the only distinguishing product variable affording ESPs an entrée to the residential market. With price restrictions, renewable generator subsidies, and offsets for renewable price premiums, AB 1890 has created a special window of opportunity for renewables through 2002. It is upon this opportunity that the RECE campaign must capitalize.

### *Renewables Advocates Already Primed*

Fortunately, the RECE program does not start in a vacuum. Environmental and marketing groups have already launched their own educational and marketing campaigns to persuade the public to vote for clean energy with their electricity dollars. The state-mandated power content label as well as the Green-e logo can help answer consumer questions about energy content and alleviate the type of confusion encountered in the New England and retail market pilots in other states.

### *Renewable Energy Marketers Waiting for Public Demand*

Ironically, one of the greatest difficulties in gaining market momentum may be the ESPs themselves, who have been slow to commit to full-scale marketing efforts. There are plenty of players: 15 providers (not counting Sacramento Municipal Utility District) are active, offering more than two dozen products. To date, however, most products represent sale of existing renewable resources that were already part of California's generation mix. Without greater emphasis on new construction that will result in net environmental benefits, there is danger that even the most environmentally committed customers may become disillusioned and revert to their utility distribution company. Yet renewable energy marketers remain understandably cautious, waiting for proven consumer demand to "pull" the market for renewable energy.

### *Public Slow to Switch*

Most renewable ESPs are focusing on the residential market. To date, 69,000 residential consumers—less than 1% of those eligible to switch—have changed their electric service provider; it is not known how many of these are "green" switches. By contrast, the industrial sector is healthily exercising its newfound choice; as of September, almost 16% had switched providers.

The low initial response should not be mistaken for disinterest in renewable energy. New products naturally have a slow initial diffusion rate; further, most Californians are only vaguely aware of their "choice" and how to exercise it, much less the availability of renewable energy products.

Numerous surveys confirm widespread public interest in renewable energy.[7] Nevertheless, renewable energy faces a number of market barriers—some specific to renewable energy itself, some endemic to "switching" service providers. Such hurdles include:

- Lack of awareness about choice and how to switch
- Fear of switching—losing reliability
- Automatic rate reduction and competitive transition charge
- Price premium for renewable energy
- Indistinguishable electrons: paying for a public good, not private good
- Inertia / effort to research renewable energy alternatives
- Lack of knowledge regarding the environmental impacts of electric generation and the benefits of renewables
- Distrust of power companies; wariness of "greenwashing"
- Cynicism about making a difference

The RECE campaign is well positioned to address these barriers. The challenge will be to create enough momentum during the transition window of opportunity to establish an ongoing renewable energy market. Market barriers aside, clean renewable energy is appealing to many Californians.

## Market Potential

All grid-connected customers—industrial, commercial, agricultural, and residential—are potential purchasers of renewable energy. In theory, the only limits on the renewable energy market are the constraints inherent in renewable technologies themselves—resource availability, dispatchability, and cost—and marketing effectiveness. In reality, of course, the renewable energy market is in its infancy and will take many years to reach its potential. Which electricity customers, then, are the best target markets in these early years?

### *Geography*

Pursuant to AB 1890 and SB 90, only customers in the IOU service territories currently have complete freedom to choose their electricity supplier and are the only customers that may apply for Customer Credit rebates. Accordingly, the RECE campaign will focus on these areas.

However, outreach should not be limited to these areas. Various municipal utilities are voluntarily opening to competition and/or offering their customers renewable energy products (e.g., Sacramento, Alameda, and Los Angeles). There may be a useful role for RECE in selected communities, particularly where local governments have expressed interest in renewable energy contracts (e.g., Santa Monica, San Jose, and Palm Springs). Outreach efforts should be coordinated with organizations already established to meet the needs of local and regional governments, such as the Local Government Commission.

### *Customer Class*

**Industrial and Large Commercial (I/C).** These high-volume accounts are very important to the survival of renewable energy marketers and crucial to creating demand for new renewable capacity. The potential gains are significant; however, it may not be as productive for the RECE campaign to directly target individual accounts, as these customers are individually courted by ESPs offering custom-negotiated contracts. It is appropriate, however, for the Commission to encourage corporations to follow the lead example of Patagonia or Toyota, which are offering their employees a discount if they sign up for renewable energy at home, and to follow up with large I/C accounts in terms of education among their employees.

**Small Commercial.** Strapped for cash, time, and resources, most small businesses are less likely to be "early adopters" of renewable energy. However, businesses with an environmental, health, or "outdoorsy" image, or who cater to a progressive clientele, may be inclined to choose renewable energy as a public relations (PR) tool. And because many small businesses don't use that many kilowatt-hours, they may be willing to accept a surcharge for the sake of personal beliefs.

**Institutional.** As highly visible organizations with automatic PR value, government, schools, and churches are attractive accounts. Local government and churches have already expressed interest and are promising initial markets.

**Agricultural.** The agricultural sector account for less than 4% of the IOUs' load, and about only 1% of direct access activity through September.[8] Apart from organic farmers (who will likely make their decisions regardless of RECE) and cooperatives (see aggregators below), this sector is not promising as an initial market.

**Residential.** Accounting for a third of the state's electrical load—more than 50 billion kWh in the IOU territories—residential customers are anticipated by ESPs to provide the majority of renewable energy sales. Of all customer classes, residential consumers report the highest interest in renewable energy, with upwards of 60% surveyed stating willingness to pay a premium for renewable energy.[9] Although good intentions on a survey are quite different from taking action, such market research is valid in terms of assessing general receptiveness. Moreover, the financial risks are lower for the residential sector: energy bills are not a high percentage of the monthly budget, and households needn't worry about competition or shareholders. Accordingly, many households, if convinced of the benefits, are likely to consider renewable energy as long as adoption costs (price and hassle) are low.

**Aggregators/Cooperatives.** Aggregation schemes to bring down costs could be one way to address the small commercial and residential sectors. Agricultural, housing, and food cooperatives naturally lend themselves to cost-saving aggregation schemes, and could provide significant return on a limited level of outreach.

## Target Audiences for RECE Campaign

To effect the greatest market transformation possible, the RECE campaign should focus first on the consumers most likely to purchase renewable energy.

- Residential consumers (starting with environmentalists)
- Institutional sector (primarily local and regional governments, as the religious sector is already organizing)
- Selected businesses (including large industrial and commercial consumers), trade groups, cooperatives

Most efforts will focus on IOU territories, with selected outreach to non-IOU areas that have expressed interest in renewable energy .

The Commission efforts should complement the CPUC and the Electric Education Trust activities and other government programs to inform the public and promote renewable energy. In the first 15 to 18 months the campaign will focus on reaching "early adopter" citizens and organizations, who can themselves help spread the word about renewables. Having built a solid base of success, and tested messages with these audiences, RECE can then reach out to broader masses of residential customers.

# II. Situation Analysis: Emerging Renewable Technologies

## Market Climate

### *High Consumer Interest*

The "emerging" distributed generation (DG) technologies eligible for the Commission's Buydown Program—PV, solar thermal, small wind turbines, and fuel cells—enjoy better name recognition and popularity than some of the renewable central station technologies such as biomass and landfill gas. Unlike grid-based renewable energy, an on-site renewable system is visible and captures the imagination. It is demonstrably "green"—consumers are assured they are receiving "clean" electrons while their system is operating. And, while customer-owned-and-operated systems help society at large, they also offer private benefits, including the appeal of displaying environmental commitment in a way that wins the admiration of friends and customers.

### *Cost Still a Formidable Hurdle*

Because production volume for these fledgling technologies is low, system costs are still prohibitively high without extensive subsidies. For example, a 3-kW rooftop PV system (sized for a typical home) requires a net capital outlay of from $9,000 to $20,000—*after* the maximum rebate offered by the Commission's Buydown Program. Even with California's relatively high electricity prices, net metering, and passage of AB 1755[10] to renew the property tax exemption, emerging technology systems typically have long payback periods.

Emerging renewables cannot yet be sold on the basis of cost-effectiveness over time. Nor can they yet compete with renewable energy in terms of environmental benefits per dollar. Without significant help in bringing down costs, customers for these systems will be limited to highly motivated pioneers who are interested not only in cleaner power but also in promoting the specific renewable technology.

### *Market Research Required*

On-site generation makes economic sense for customers in remote locations who would otherwise have to pay for connection to the grid; naturally, these customers have accounted for the majority of system sales. The economics are completely reversed for the target audience of the Buydown program--customers who are already connected to the grid. The Commission will be contracting for market research (under separate funding) to determine promising initial audiences for grid-connected emerging renewables technologies.

### *Larger Systems More Popular Than Residential-Size Systems*

To date, most of the calls to the Buydown program's information hotline have come from residential customers. However, actual sign-ups have been dominated by the commercial sector. Buydown funds for systems larger than 10 kW have been

rapidly committed, while funds for residential-sized systems—the mandated priority of the Buydown program—are undersubscribed.

It is probable that economics were better for the larger projects, which may have been co-subsidized by federal TEAM-UP[11] (Building Technology Experience to Accelerate Markets in Utility Photovoltaics) funds. And unlike residential customers, the commercial class is subject to demand charges that can be reduced by solar systems which generate during peak hours.

Participation in all the Buydown's size categories could be improved with greater education and publicity. But it is clear that the smaller systems will require significant support if the allocated funds are to be used as designated by SB 90.

#### *Supply Side Not Yet Coordinated*

Solar and wind technologies benefit from strong industry associations that can provide sound assistance to consumers. Yet stakeholders have expressed concern that increased consumer demand could rapidly overwhelm existing supply channels. Channel ties are weak, with little manufacturer support for local retailers. Moreover, grid-connected installations require the participation of the local electric utility. Some customers have had difficulty locating the right utility department to arrange the hook-up, and waits for grid connection have been long. Net metering also requires updated training of building inspectors.

It is imperative that the supply side be fully prepared, as it is crucial during market introduction that early customers have a positive experience free of frustration.

## Commercial Status of Qualifying Technologies

#### *Photovoltaics (PVs)*

To date, California has 132 kW of grid-connected PV capacity. PV systems to date run from $8-$18/W, but with volume orders, can attain $6/W (before the Buydown). The advent of microinverters allows for modularity, whereby customers can build a PV system in 100-W increments, one panel at a time as they can afford. While such an approach does not make PV more cost-effective as an energy source, it does alleviate the need to raise as much capital, enabling more consumers to "do their part" to support a PV market.

Building-Integrated PV (BIPV) holds the potential for greater cost-effectiveness than retrofit PV units. With BIPV, solar panels are integrated into the original roof construction, avoiding the need for other roofing materials. This strategy also mitigates concerns about aesthetics, which can be a barrier to PV installations. BIPV panels are currently less efficient than other solar cells, but their overall cost-effectiveness may be greater. Commercial buildings designed by architect/engineers who are accustomed to using attractive and more expensive materials would be a potential application for this technology.

#### *Small Wind Turbines (<10 kW)*

California has very little grid-connected small wind capacity. Per-kW costs vary with system size, generally ranging from $2,500–$4,000/kW. Systems as small as 300 W are now available for $1,000–$1,500. Though not as cost-effective as larger systems, such turbines enable more consumers to contribute to developing a market for small wind power.

#### *Solar Thermal Electric*

To date, California boasts almost 360 MW of central-station, grid-connected solar thermal power. As yet, no solar thermal application has qualified for the Buydown program. Power tower designs are at the demonstration stage only; as these systems will be much larger than 100 kW, the market will be industrial, agricultural, and possibly large commercial. A parabolic trough system was available in the 1980s, but the manufacturer went bankrupt. A parabolic dish design connected to a Stirling engine is now completing research and development from Science Applications International Corporation. This hybrid system would help industrial/commercial/ agricultural customers reduce their demand charges, yet still be useful during non-peak hours. But like all solar thermal systems, it requires direct normal insolation, and so the market will be geographically limited.

#### *Fuel Cells*

The installed capacity of grid-connected fuel cells in California is approximately 1,600 kW. Thus far, only one fuel cell model--a 200 kW phosphoric acid cell by ONSI--qualifies for the Buydown program. Reservations for this model account for 1,000 kW in new capacity.

## Target Audiences for RECE Campaign

In support of the Buydown program, the campaign will focus on the very small, residential-scale systems under 10 kW, which will require significant promotion if Buydown subsidies are to be used as designated by SB 90. This decision effectively centers the program on PV and wind systems, as opposed to solar thermal and fuel cell systems, which are available only at larger scale.

The campaign will seek to remedy weaknesses on the supply side of the market, while targeting promising audiences on the demand side. These audiences will be determined based on market research findings. However, we anticipate that for PV, early markets will be both urban and rural, including:

- Homes of well-off environmentalists/technophiles
- New office buildings (high-tech look, reduced demand charges)
- New housing developments (volume purchase and installation brings down costs), real estate and housing cooperatives
- Consumers concerned about interruptions of grid-supplied power

For wind power, zoning restrictions on height and potential concerns over noise and aesthetics will restrict applications to rural areas; thus we anticipate the primary audience for wind to be rural environmentalists and technophiles.

## Notes

[1] Chapter 854, Statutes of 1996.
[2] Chapter 905, Statutes of 1997.
[3] Ibid., ,Section 4, SB 90; codified at Public Utilities Code Section 383.5(e)(2).
[4] *Guidebook: Renewable Technology Program, Volume 3: Emerging Renewable Resources Account*, California Energy Commission, January 1998, Table 2, p. 5.
[5] pub. L. 95-617, Title II, Section 210, November 9, 1978, 92 Stat. 3144.
[6] *Policy Report on AB 1890 Renewables Funding*, California Energy Commission, March 1997, Figure 1-1,
p. 4.
[7] Market studies include the following:

- Baugh et al., "Research Fuels Public Service Co. of Colorado's Development of a Customer-Driven Renewable Energy Program," *Quirk's Marketing Research Review*, May 1994.
- Farhar and Houston, "Willingness to Pay for Electricity from Renewable Energy," *Proc. 1996 ACEEE Summer Study on Energy Efficiency in Buildings*, Pacific Grove, CA, 1996.
- Nakarado, "A Marketing Orientation Is the Key to a Sustainable Energy Future," *Energy Policy*, 1996, 24 (2), 187-193.
- Ottman, *Green Marketing: Challenges and Opportunities for the New Marketing Age*, NTC Business Books, IL, 1993.
- EPRI, *Green Pricing: Experience and Technology Options Assessment*, TR-109204, December 1997, p. E-2.
- Peter Asmus, "Customers Across the Country Choose Green Power," *Clean Power Journal*, CEERT, 1997.
- B. Farhar, *Trends in Public Perceptions and Preferences on Energy and Environmental Policy: Executive Summary*, NREL, March 1993 (as quoted by Ed Holt, *Green Pricing Resource Guide*, February 1997, chapter 3, page 1.

[8] Data from CPUC memo, October 20, 1998.
[9] See studies cited in (6).
[10] Chapter 855, Statutes of 1998.
[11] TEAM-UP is a partnership of the utility industry and the U.S. Department of Energy that helps develop commercial markets for a wide range of solar photovoltaic technologies through cost-sharing for selected PV business ventures in the United States.