

USING THE INTERNET TO PROMOTE PV AND OTHER CLEAN TECHNOLOGIES

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ABSTRACT

Clean Power Estimator is an Internet-based economic evaluation software program for customer-owned clean energy systems (PV, wind, solar thermal, and energy efficiency). Since the tool's introduction in late 1998, it has grown substantially in terms of the amount of usage as well as the types of usage. This paper describes the ways that the tool is currently being used.

1 INTRODUCTION

Clean Power Estimator is an economic evaluation software program for customer-owned clean energy systems (PV or photovoltaics, wind, solar thermal, and energy efficiency). The internet-based program gives a personalized estimate of the costs and benefits of clean energy systems. The program takes into account the characteristics of the specific customer purchasing the system in order to provide the most relevant analysis.

These characteristics include the system being purchased, location, electric rate structure, economic incentives, solar resource, environmental effects, and other customer information (1).

When the tool was first introduced in late 1998, it provided information for a few cities in California. Since that time, the tool has grown substantially:

- It now includes more than 1,000 rate structures and has been extended to work for residential and commercial consumers in 16,000 cities throughout the United States (see Figure 1)
- It is being extended to work for customers in other countries
- It is used by more than a dozen PV manufacturing firms, system integrators, electric utilities, and state agencies



Figure 1. U.S. locations where Clean Power Estimator applies.

2 CLEAN POWER ESTIMATOR USES

This paper describes eleven different ways in which the Clean Power Estimator tool is being used.

2.1 Educate Consumers

State agencies and electric utilities use the tool to inform consumers about the costs and benefits of PV and wind technologies. These agencies either have an economic incentive program or part of their mission is to educate the public on the benefits of renewable energy.

2.2 Enable Customers to Self-Select

Some manufacturers and system integrators use the tool to inform potential customers about the economics of solar prior to investing time with them. This enables them to focus their marketing and sales efforts on customers most likely to make a purchase. It can result in a cost savings by moving the process of educating consumers from a person-to-person process to an Internet-based process. This allows consumers to screen themselves prior to talking with a salesperson.

2.3 Prepare Bids

Some companies use the Clean Power Estimator to prepare bids they present to customers. The tool is particularly useful when the analysis involves multiple technologies (e.g., PV and efficiency). The analysis can be transferred to Microsoft Excel and then combined with other information.

2.4 Support Contractors

A growing number of electric utilities with incentive programs are making the tool available on their websites to support contractors. Only the utility-approved equipment is included in the program. This provides the contractors with a marketing and sales tool for use with the utility's customers.

2.5 Identify Location-Specific Consumer Interest

Information recorded about program usage can be used to identify areas of consumer interest. For example, the residential version on the California Energy Commission's (CEC's) website had 3,500 Full Program Runs¹ from March 2000 through January 2001.² Figure 2

¹ Information is kept on the number of Full Program Runs. The Clean Power Estimator downloads to the user's computer in order to protect consumer privacy. As a result, the user can perform an unlimited number of evaluations until the browser session is ended or another data set is required. One program download is counted as one Full Program Run.

illustrates that interest was concentrated in the San Diego, Los Angeles, San Francisco, and Sacramento areas.

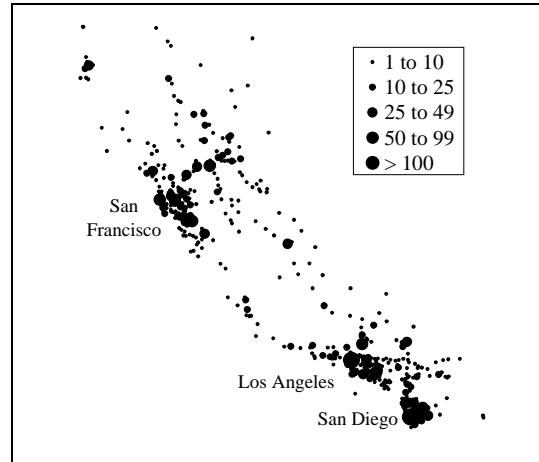


Figure 2. Full Program Runs by location (CEC website).

2.6 Analyze Market Trends

Information recorded about program usage can also be used to evaluate trends in consumer interest over time. Figure 3 presents the number of Full Program Runs by month on the California Energy Commission's website from March 2000 through January 2001. The figure suggests that the California energy crisis generated a substantial increase in interest during the times of high publicity. According to Sandy Miller (CEC), there has not only been an increase in Clean Power Estimator activity, but this interest corresponds to an increase in customer requests for buy down reservations.

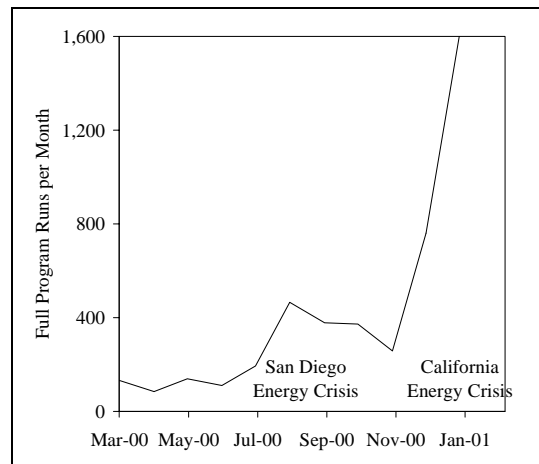


Figure 3. Full Program Runs by month (CEC website)

² Results for January, 2001 are scaled based on data through January 10, 2001.

2.7 Support Rebate Processing

The program is also being used as a support tool for rebate processing. Critical information necessary to calculate rebates and determine program effects for specific equipment is contained in the Clean Power Estimator. Rebate processing personnel run the program to obtain this information.

2.8 Integrate Into Broader Educational Effort

Some organizations are integrating the tool into a broader educational effort. As such, they are developing Internet content and integrating the tool into the website. In addition, they are developing tools that are complementary to the Clean Power Estimator.

2.9 Offer Targeted Incentives

Some companies offer targeted incentives using the tool. These incentives are in addition to state buy down programs, utility rebates, and tax credits. They are incentives that are only available if the customer purchases products through a particular website. This enables resellers and manufacturers to include rebates in the analysis that are only available through their site.

2.10 Perform Research Projects

While the focus of the tool is to provide consumers with accurate information, it is also used to perform marketing and research studies. For example, critical components of the analysis performed in "The Market for Photovoltaics in New Homes Using Micro-Grids" was done using the Clean Power Estimator (2). That is, while the tool can be configured to be simple enough for consumers to use, it can also be configured to perform detailed market analyses and research projects.

2.11 Evaluate System Performance

The tool can also be used for quick comparisons between predicted system performance (predicted using long-term weather data) and actual system performance. For example, measured electricity output data were obtained for three different PV systems (51.3 kW_{AC} Solarex system in Pittsburgh, PA, 26.4 kW_{AC} Siemens system in Austin, TX, and a 27.5 kW_{AC} ASE Americas system in Ann

Arbor, MI) from the Solar Electric Power Association's website (www.upvg.org/upvg). These results were compared to results predicted by the Clean Power Estimator for the given system configurations. Results ranged from a 9 percent overestimation by the Clean Power Estimator to a 5 percent underestimation. These values are within the tolerances specified by manufacturers.

2.12 Other Potential Uses

Other uses of the tool are being investigated. These include: further integrating the tool into rebate processing and program analysis; evaluating the effect of alternative rate structures and incentive programs from the customer's perspective for a regulatory analysis; and incorporating more technologies to assess the economic consequences (e.g., this might be useful in evaluating zero energy buildings).

3 CONCLUSIONS

The Clean Power Estimator was initially developed to make research results and analysis more accessible to a broader audience. The tool has grown from one that worked for a limited number of cities in California in late 1998 to one that works throughout the U.S. as well as several other countries. This paper identified more than ten different ways that the tool is currently being used.

4 ACKNOWLEDGEMENTS

Many people have contributed to the development and expansion of the Clean Power Estimator. Clients and individual users have provided useful feedback, found new uses, and provided direction for expansion. Dr. Richard Perez and Ben Norris are responsible for substantial enhancements.

5 REFERENCES

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- (2) Thomas E. Hoff and Christy Herig. The Market for Photovoltaics in New Homes Using Micro-Grids. Proceedings of the 2000 ASES Annual Conference, Madison, Wisconsin.