

CalPERS AIM Clean Energy & Technology Program

2007 Environmental Measurement Results

November 2008



CalPERS has established a pioneering role as one of the most sophisticated global investors in the clean energy and technology sector.

Under the direction of the Investment Committee, the CalPERS AIM program launched the Clean Energy and Technology program in 2004. The program now has \$600 million in commitments. The primary objective of the program is to generate attractive, risk adjusted financial returns, either meeting or exceeding PE benchmarks. As an ancillary benefit the program seeks to catalyze the adoption of environmental and clean technologies in the broader market place manifesting itself in a cleaner, more energy efficient environment, the generation of new industries and a subsequent increase in employment.

Overview

This report examines one aspect of the ancillary benefits derived from the Clean Energy & technology Program. It is designed to measure the extent to which the program is meeting its goal of investing in companies and technologies that are less polluting and more energy efficient.

CalPERS has taken the lead in measuring and reporting the actual net environmental benefits created by its investments. The 11 private equity funds invested in 79 portfolio companies (as of the end of 2007) have produced meaningful and growing environmental benefits, even though the Program is at an early stage of development. These benefits include reducing fossil-based electricity usage by the amount consumed annually by 100,000 US households and reducing the emissions of greenhouse gases (CO₂) by the amount produced annually by 39,000 people in the US.

Processes Used

In partnership with PCG Asset Management and the 11 private equity firms, Environmental Capital Group (ECG) has developed an innovative method for measuring and quantifying the environmental benefits of underlying companies' portfolios.

Pre-investment Environmental Due Diligence

Before CalPERS invests in the private equity firms, ECG conducts detailed environmental due diligence to determine whether an investment is likely to yield material net environmental benefits. This evaluation is conducted in tandem with the financial due diligence evaluation.

Post-investment Analysis of the Program's Environmental Impact

After investment, ECG works with the fund managers to establish an analytical framework that relates business results to the associated environmental result. For example, product units sold or material volume processed is converted to metric tons of emissions avoided or gallons of water saved. ECG assesses improvement or net environmental benefits by comparing the positive and negative environmental impacts of the "new" technology to the baseline technology in common use. Business results are collected annually and used to quantify actual environmental benefits. ECG issues an annual report that aggregates environmental benefits at the Program level.

2007 Environmental Results

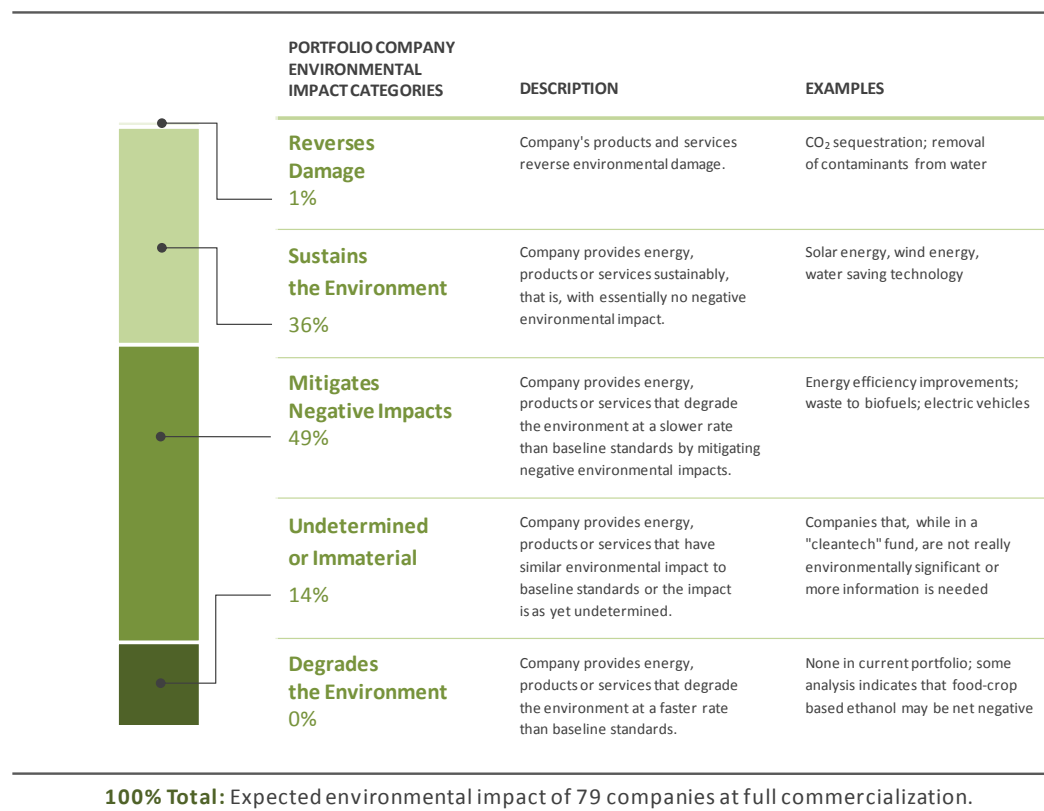
The 79 portfolio companies evaluated as of December 31, 2007 fall into a broad group of clean energy and technology business sectors, including:

- Renewable power generation
(e.g., solar, geothermal, biomass, and wind)
- Energy efficiency technologies
(e.g., building, transportation, and energy and power generation)
- Renewable fuels
- Advanced materials
- Water

We classify the potential environmental impact of each company using the categories in Figure 1.

Even though more than half of the companies are pre-commercial (see Figure 2), over 85% of all the companies are expected to improve the environmental conditions around the globe.

FIGURE 1: CLASSIFICATION OF ENVIRONMENTAL IMPACT



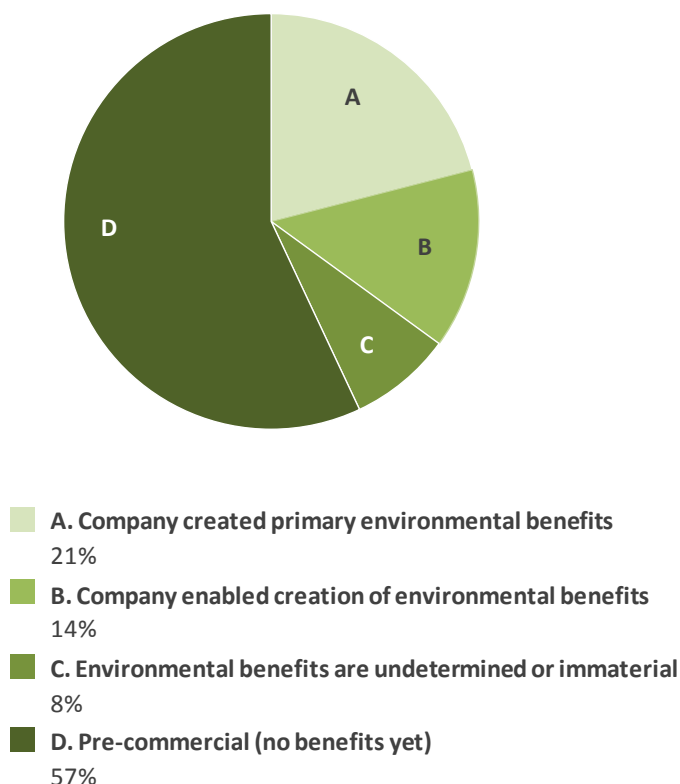
Portfolio Diversification

The portfolio is diversified across the value chain. Companies whose products directly result in an environmental benefit are termed “primary,” and companies that have a more indirect role in creating the environmental benefit are termed “enabling.”

Primary benefits are usually fairly straightforward to calculate and accurate in magnitude. The technology of an enabling company may be used in a variety of applications, so calculating these benefits requires more assumptions and should be considered an estimate. Other companies in the portfolio are commercially active, but their environmental impact is either still being determined or is relatively immaterial.

The current role of the 79 companies in creating environmental benefits is shown in Figure 2.

FIGURE 2: ENVIRONMENTAL BENEFIT CREATION OF MEASURABLE AGGREGATE PORTFOLIO AS OF 2007



Resource Savings and Emission & Waste Reductions

The environmental benefits that the portfolio companies create are quantified in two major categories: resource savings and emission and waste reductions.

The portfolio's most important resource savings is the reduced use of fossil-based energy through improved efficiencies or replacement by renewable sources. Reduced use of fossil energy is directly linked to reduced emissions of greenhouse gases, so portfolio companies that produce energy savings or clean energy will also produce emission reduction benefits. These emission reductions are calculated using standard analyses. Water savings come both from companies that directly save water (smart irrigation, etc.) and as a result of reduced electricity production (which requires significant amounts of water). Environmental benefits were quantified for all the commercially active companies in a primary role, about half of the companies in an enabling role, and for two companies producing biofuels. Current research is highlighting how the land use changes that result from diverting crops grown on arable land to produce biofuels indirectly causes greenhouse gas release via conversion of forests and grasslands to cropland elsewhere. Pending further research in this area, the biofuel companies are classified as "undetermined".

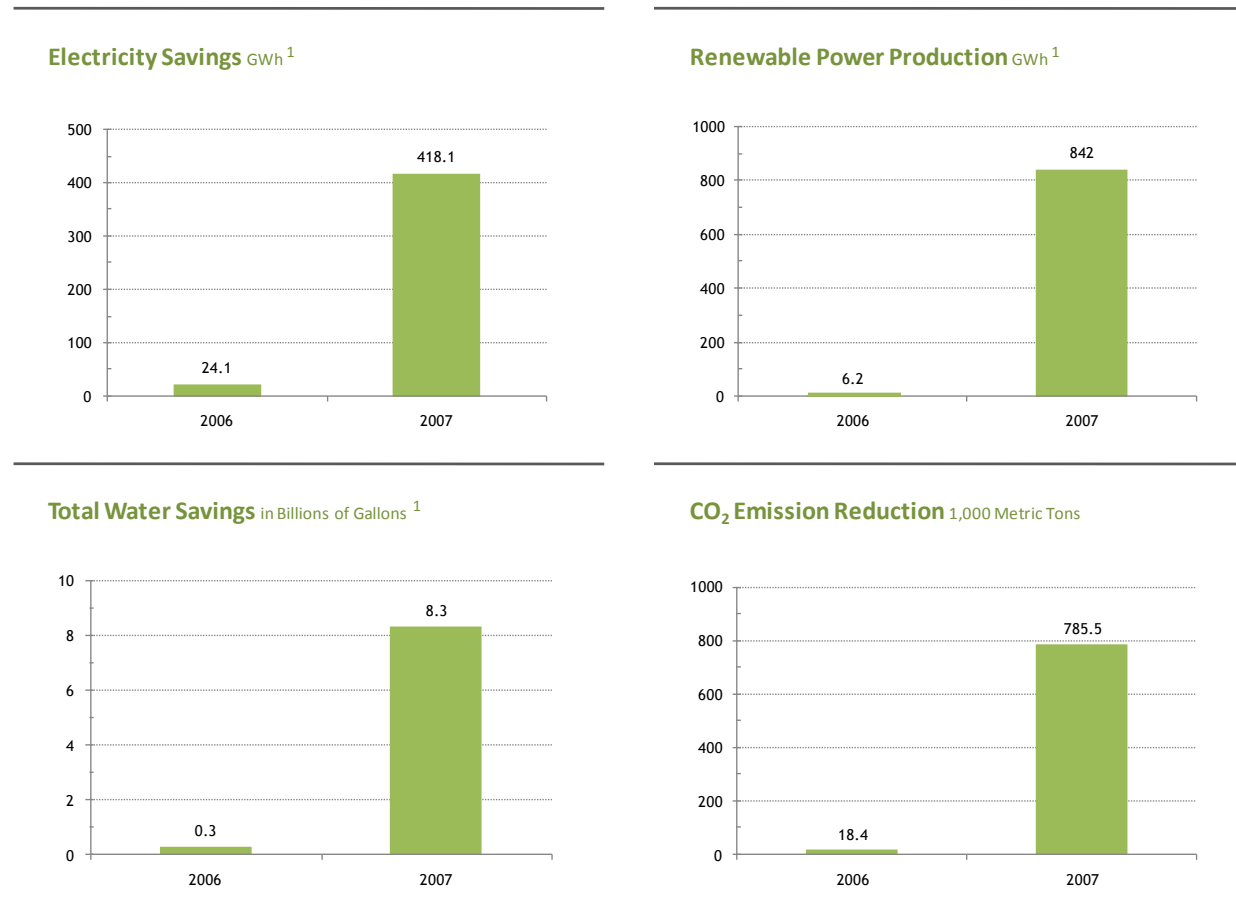
Figure 3 shows the total quantified environmental impact in 2007. The portfolio either replaced or reduced the use of approximately 1,260 GWh of fossil-based electricity—enough energy to meet the annual electricity requirements of about 100,000 US households. Total water savings of 8.3 billion gallons meets the annual needs of about 225,000 people in the US. The reduction of 785 thousand metric tons of CO₂ emissions is equivalent to what may be attributed to about 39,000 people, using a US annual average of 20 metric tons per capita.

FIGURE 3: AGGREGATE ENVIRONMENTAL IMPACT IN 2007 (23 COMPANIES)

| RESOURCE SAVINGS | EMISSION AND WASTE REDUCTIONS |
|--|---|
| Energy Savings 418 GWh | Water 132 metric tons avoided contaminants |
| Renewable Electrical Energy Production 842 GWh | Air 6,000 metric tons of other gases |
| Renewable Fuel Production 17 million gallons of biofuel | Land 27,000 m ³ future landfill diversion |
| Water Savings 8.3 billion gallons | Carbon 785,000 metric tons CO ₂ |

The Program portfolio is still immature, yet meaningful environmental benefits are already being generated. These benefits should continue to grow as the Program expands over the next several years. The dramatic growth in environmental benefits from 2006 to 2007 is shown in Figure 4.

FIGURE 4: GROWTH IN ENVIRONMENTAL BENEFITS, 2006 TO 2007



¹ 2006 & 2007 calendar year totals

Conclusion

CalPERS has funded a diverse portfolio of important technologies that have already created material and quantifiable environmental benefits. Over the next several years, environmental benefits will be multiplied as companies transition into production, current production quantities scale up, and technology break-throughs are licensed or otherwise transferred throughout the industry.

The Program is truly unique with respect to its environmental benefit measurement system. This pioneering effort helps CalPERS and the General Partners:

- Develop a quantitative understanding of the environmental implications of a technology and its possible applications
- Consider further investment in technologies with especially promising environmental benefits, and
- Provide data on environmental results that will help lead other institutional investors to make similar investments in this sector.