

**2007 STATUS REPORT ON RENEWABLE  
ENERGY AT SMUD**

May 10, 2007

This paper summarizes the 2007 status of SMUD’s efforts to increase its supply of renewable energy. It includes a description of SMUD’s renewable energy supply goals, a brief assessment of renewable energy supply programs, a description of key issues faced by the District in the near future, and an assessment of long-term prospects.

**SMUD Programs Supporting the Growth of Renewable Energy**

SMUD has created two separate programs to grow renewable energy supplies for its customers: 1) A Green Pricing Program called Greenergy, and; 2) A Renewables Portfolio Standard (RPS) Program. Both programs were begun by SMUD before the State created its RPS program. Accounting for SMUD's renewable energy supply is done separately for these two programs and aggregated as SMUD's total, non-large hydro renewable energy supply.

SMUD has had a green pricing program since 1997 called “Greenergy,” which allows customer choice in selecting renewable energy supply for 100% or 50% of their electricity based on a simple monthly fee of \$6 or \$3, respectively. Commercial Greenergy customers pay 1¢/kWh for 100% renewables and 0.5¢/kWh for 50% renewable energy. In 2006, there were about 36,000 participating customers in the Greenergy program, including about 34,000 residential customers. In addition, SMUD has an RPS program that was approved by SMUD’s elected Board one year before the State RPS program was approved by the Legislature and Governor.

**SMUD Renewable Energy Growth Targets and Status**

To meet its annual renewables goals, SMUD both contracts for renewable electricity from independent power producers and builds and owns renewable energy power plants. SMUD has renewable energy supply goals of 12% for 2006 and 23% for 2011 (10% RPS + 2.2% Greenergy in 2006 and 20% RPS +3% Greenergy in 2011, see Table 1 below). The final supply numbers compiled for 2006 show that SMUD provided about 13% of retail sales of eligible, non-large hydro renewable electricity supply.

Table 1. SMUD’s renewables goals and accomplishments.

Renewables Supply Programs	2006 Supply Goal	2006 Actual Supply	2011 Supply Goal
RPS	10%	10.90%	20%
Greenergy	2.20%	2.20%	3%
<b>Total</b>	<b>12.2%</b>	<b>13.1%</b>	<b>23%</b>

Figure 1 shows SMUD's 2006 renewable energy supply by type of renewable energy resource. It shows a good utility mix of baseload renewable energy supplies (geothermal, biomass) and intermittent renewables (wind, small hydro, and solar).

Figure 1. SMUD's 2006 renewables distribution.

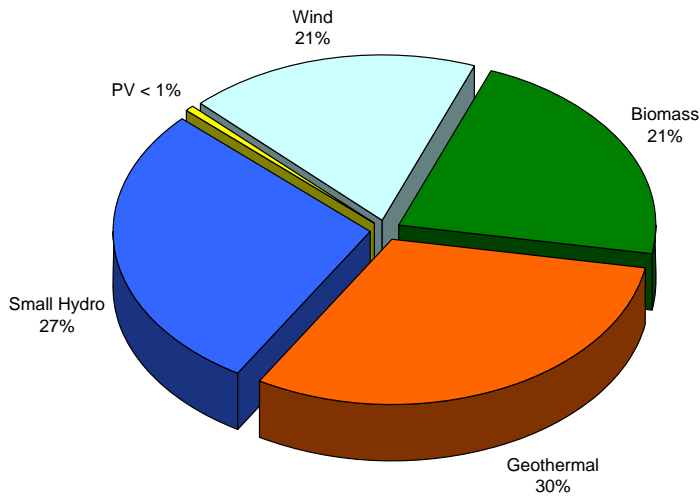
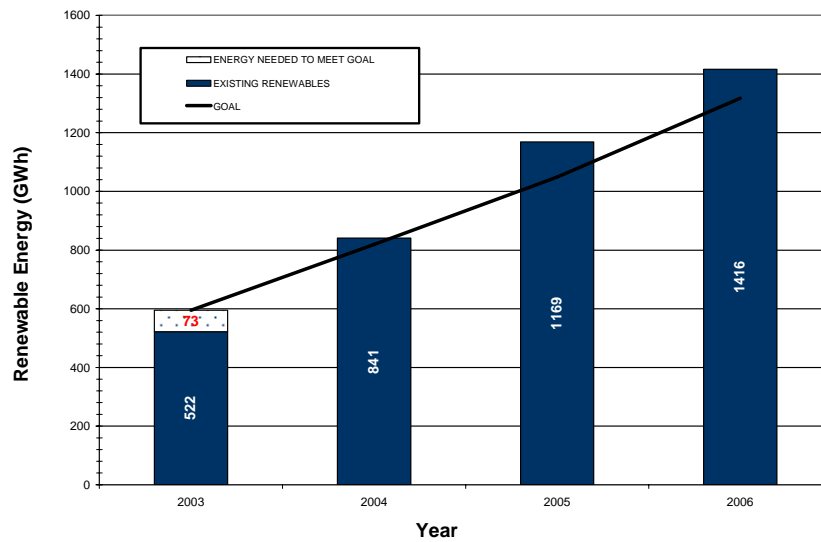


Figure 2 displays the growth in renewable energy supply for SMUD from 2003 to 2006. It shows almost a tripling of renewable energy supply in three years. While SMUD is very pleased with our current status of renewable energy supply, SMUD will be seriously challenged to meet the 23% supply target for 2011.

Figure 2. SMUD's renewables growth, 2003 - 2006



### NEW Power Plants Supplying Renewable Energy to SMUD Customers

SMUD has supported several new renewables projects that have begun providing electricity to the grid since 2002. The SMUD-owned Solano wind project has installed 39 MWs since 2002,

and an additional 63 MWs is being installed in 2007. This wind project is expected to have over 200 MWs installed by 2011. SMUD also recently signed a Power Purchase Agreement (PPA) contract for the second phase of the Kiefer landfill gas-to-electricity project for 5.7 MW, which is now online. Further, SMUD also signed a PPA several years ago for a California wind project that came online in phases from 2003 to 2007, and it now totals 75 MW.

In addition, SMUD has programs to provide local benefits and to solve local environmental problems, such as our solar PV program and our local biomass program to convert problem organic wastes to green electricity (e.g., dairy digesters, grease waste to electricity, and food waste to electricity). SMUD also expects a number of new local projects in the near future, including two or three dairy digesters to begin generating electricity this year, hopefully some food & grease waste-to-energy projects in the next several years, and significantly more solar projects to come online based on SB 1 and the California Solar Initiative.

SMUD also conducts annual solicitations to procure renewable power from independent power producers, and builds and operates renewable energy facilities. SMUD continuously is in negotiations, based on earlier solicitations, for additional new wind, biomass and solar thermal electric renewable energy resources that are proposed to come online by 2011.

### **What are the Challenges Facing SMUD in Growing Renewable Energy?**

Four primary problems affect SMUD's ability to meet its 23% renewable energy supply target for 2011: 1) lack of transmission; 2) the supply of renewable energy projects is small and declining, while price is increasing; 3) eligibility rules are stringent, complex, and restraining; 4) incentives are needed for "emerging" technologies such as solar thermal electric, advanced biomass technologies, etc. so that the "next generation" of lower cost renewables become market-ready, mitigating transmission issues.

**Transmission.** There are plenty of renewable energy resources in the West, but transmission is not available to access these resources. While there has been some progress on transmission construction beginning in Southern California, there has been very little progress expanding transmission access to renewable energy resources in Northern California. Transmission takes many years to plan, permit, and build, and new facilities require high capital expenses.

**Renewable Project Supply/Price.** SMUD has seen the available supply of renewable energy projects from independent power producers decline significantly in the past two years, and prices of renewable energy have increased. As an example for comparison purposes, SMUD conducted a solicitation for renewables projects in 2004 and in 2006. SMUD received 42 proposals in 2004, and received only 8 proposals in 2006. This is an 83% decline in the number of proposals received by SMUD in only two years. Further, the average price quoted for the renewable energy proposals received has increased by 15% in SMUD's 2006 solicitation. As a subset of proposals received, wind projects alone increased prices by an average of 17%.

**RPS Eligibility Rules.** Publicly-owned utilities currently are not required to follow the detailed and complex renewable energy eligibility rules for investor-owned utilities. However, for publicly-owned utilities that require close compliance with California's RPS eligibility rules such as SMUD, it is a complex maze of requirements that is daunting to most small, publicly-owned utilities. As examples, what are the definitions and requirements for the important terms "baseline" and "bundling" (e.g., does the energy and the REC need to be bundled only in the same contract, or from the same facility? Are there hourly, daily, weekly, monthly or annual bundling requirements?)? In addition, Renewable Energy Credits (RECs), sometimes called "Green Tags," alone are not eligible for the RPS according to the basic bundling requirement. If

RECs were eligible for the RPS as now allowed by SB 107 and pending CPUC rules, important transmission issues may be mitigated to promote further California renewable energy growth. Also, the eligibility rules include inequities in the treatment of Publicly Owned Utilities (POU) vs. "Retail Sellers." As an example, a small hydro facility that meets the eligibility criteria of SB 107 can get full CEC certification for RPS eligibility if it sold electricity to an investor-owned utility on 12/31/05, but if the same facility instead served only a Publicly Owned Utility on 12/31/05, the facility cannot get full certification for RPS eligibility. This is clearly unfair. (Note: the RPS statute defines eligible small hydro using the term "retail seller" and defining this latter term to not include POUs. Thus, the CEC has determined that, while they strongly encourage POUs to meet their renewables targets from CEC "Certified" renewables facilities, they cannot according to the statute fully certify small hydro for POUs)

***Emerging Technologies.*** SMUD believes that California should be planning for renewables growth beyond 2010 and that a better structure of incentives should be developed for "emerging technologies." These are technologies that are moving out of Research, Development, and Demonstration and into the marketplace, and they face difficult market barriers to entry. Incentives are needed to bridge what is sometimes called the "valley of death" for new technologies. These technologies will be the next generation of renewable energy supply for CA. Bridging this R&D-to-market gap will open up other diverse renewable resources for electricity generation. Solar and biomass gasification technologies, as examples, rely on energy resources that are more widespread and available throughout California, in comparison to wind, geothermal and small hydro resources that are confined to specific locations. Thus, the development of these emerging technologies will help address transmission barriers to renewables market growth in the state. Emerging renewable energy technologies include solar thermal electric, concentrating photovoltaics, biomass anaerobic digestion, biomass thermochemical conversion, fuel cells supplied with biogas, ocean & tidal energy, and others. Solar photovoltaics overall (not just concentrating PV) would be listed as an "emerging technology," but SB-1 approval last year provides special incentives that address the "valley of death" for this technology. All of these technologies NEED to be market-ready for California to meet a 33% Renewable energy supply target for 2020.

### **Future Prospects For Renewable Energy Growth**

The long-term prospects for SMUD renewable energy growth looks promising. SMUD has rights to develop two new renewable energy resource sites (primarily wind, but some geothermal possible also) in CA and Oregon, and is evaluating these sites to determine the potential for future development. Resource assessments, environmental evaluations, and transmission studies are underway that SMUD staff expects will lead to promising future development. However, transmission likely will need to be built to access these renewable resources. New transmission lines require many years to plan, permit and to build so these new renewable resources will not supply electricity to SMUD customers until after 2011. Another new, emerging renewable energy resource that SMUD is evaluating is solar thermal electric. SMUD is negotiating in partnership with other utilities for one or more large solar thermal power plants in the southwest desert. In addition, SMUD is evaluating possible solar thermal sites in the Sacramento region.

While the long-term is promising for new renewable energy for SMUD, the period between 2008 and 2011 poses major challenges to the District. Figure 3 shows that existing SMUD renewable resources meet or exceed our annual supply targets through 2008. However, SMUD has several renewable energy PPAs that end from 2008 through 2010 that reduce supply and results in a significant and growing gap beginning in 2009 compared to our growing renewable energy

supply targets. Figure 3 shows a worst-case scenario for SMUD renewable energy supply (it only includes existing projects) since it does not include projects currently in negotiation, and does not include current procurement plans. SMUD is hopeful that that the supply gap will be closed by signing additional PPAs for new renewable energy projects and/or from new SMUD-built and owned renewables facilities.

Figure 3. SMUD’s actual and estimated renewables growth, 2003 - 2011

