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The Sacramento Municipal Utility District: Transmission Activities Connecting to Renewable Resources

Elaine Sison-Lebrilla

Sacramento Municipal Utility District
Sacramento, California USA

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ABSTRACT

The Sacramento Municipal Utility District (SMUD) has a renewable supply goal of 23% by 2011. In 2007, SMUD had a gross renewable supply procurement of 18.4%. With only a 900-square-mile service area, SMUD needs to import renewable energy from throughout California and neighboring states to meet its current and future goals. Transmission is an issue for SMUD and indeed for all of California's major utilities. SMUD is participating in several transmission related activities that may assist in alleviating SMUD's transmission issues.

Sacramento Municipal Utility District

The Sacramento Municipal Utility District is a publicly owned utility serving about 1.4 million people in Sacramento County and parts of Placer County. SMUD is committed to utilizing renewable energy to meet its load. SMUD had a 12% target for renewable energy supply for 2006 and met its target with 13.1% in 2006. Its current goal is to have 23% renewable energy supply by 2011.

In order to grow renewable energy supplies for its customers, SMUD voluntarily created two separate programs: 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.

In 1997, SMUD started the green pricing program, 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 2007, over 43,500 customers partici-

pated in the Greenergy program, including over 30,000 residential customers.

SMUD's RPS program was approved by the SMUD Board one year before the State RPS program was approved by the Legislature and Governor. Although the State's RPS statues do not obligate publicly owned utilities (POUs) such as SMUD with percentage goals or to meet state eligibility rules, SMUD has chosen to establish 23% renewable supply goals by 2011, 20% RPS and 3% Greenergy. In 2007, SMUD's gross procurement of renewable supply was 18.4% with 15.9% in RPS and 2.5% in Greenergy, see Table 1. In addition, SMUD has chosen to base its eligibility requirements predominantly on the State's requirements.

Table 1. SMUD's renewables goals and accomplishments.

Renewables Supply Programs	2007 Supply Goal	2007 Gross Procurement	*2007 Actual (Net) Supply	2011 Supply Goal
RPS	12.0%	15.9%	11.7%	20.0%
Greenergy	2.2%	2.5%	2.5%	3.0%
Total	14.2%	18.4%	14.2%	23.0%

* Accounts for the sale of surplus RECs and carrying forward of surplus procurement.

Although SMUD has met its 2006 renewable supply goals with incremental annual increases in renewable supply, SMUD believes that meeting the goals for 2011 will be challenging. This is primarily due to several renewable energy Power Purchase Agreements that will be ending in the 2008 through 2010 timeframe, overall transmission constraints and the decline of available renewable energy projects and resulting increasing prices for renewable energy projects. Specifically, in 2009 SMUD's geothermal power purchase agreement will end, leaving no geothermal resource in its portfolio. In 2007, SMUD's renewable supply portfolio consisted of 69% baseload resources (biomass and geothermal) and 31% variable resources (wind, small hydro and solar PV), see Figure 1, overleaf.

Furthermore, the Governor is advocating for an extended RPS goal of 33% by 2020. Legislation is currently being proposed to

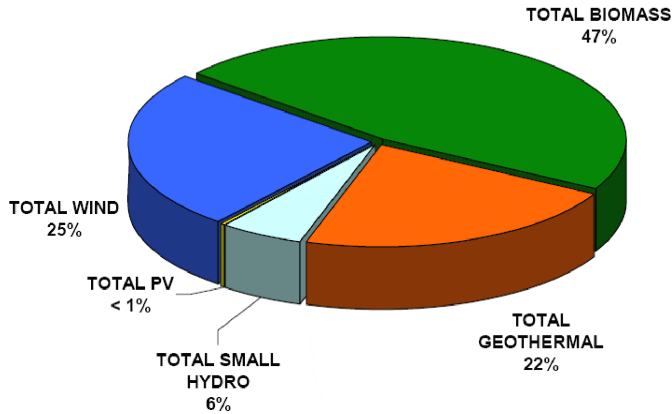


Figure 1. SMUD's 2007 renewables distribution.

enact the 33% goal by 2020. In addition, a ballot initiative is being circulated proposing a 50% by 2025 goal. Thus, SMUD faces a continuing challenge beyond 2010 because it has typically met or exceeded the State's RPS mandates.

Transmission Constraints

The SMUD service territory encompasses 900 square miles, all of Sacramento County and a small portion of Placer County. SMUD relies on renewable energy imported from the rest of CA and neighboring states for a majority of its renewable supply. Transmission is an issue for SMUD and indeed for all of California's major utilities. New transmission takes many years to plan, permit and build. New facilities require high capital costs. Although SMUD's transmission activities will not significantly help achieve its 2011 goals, it will assist in meeting future renewable energy and greenhouse gas reduction goals.

Transmission Activities

SMUD is involved in four transmission related efforts in order to improve load serving capability and address transmission constraints.

Elverta-O'Banion Line

SMUD is participating with the Western Area Power Administration (WAPA) on the Sacramento Area Voltage Support (SAVS) Project. The project is designed to enhance the reliability of the region's transmission service and increase transmission import capacity. WAPA will install approximately 30 miles of new 230kV overhead transmission lines between two existing substations, SMUD's Elverta substation and WAPA's O'Banion substation. In addition to the new 230kV lines, about 5 miles of the existing transmission lines between SMUD's Elverta and Natomas substations will be rebuilt. The exact routing of the transmission lines is still pending. The SAVS project will gain SMUD additional import transmission capacity. WAPA estimated the total project cost to be around \$74 million. SMUD budgeted about \$8.2 million for 2006 and 2007 for this project. The final Supplemental

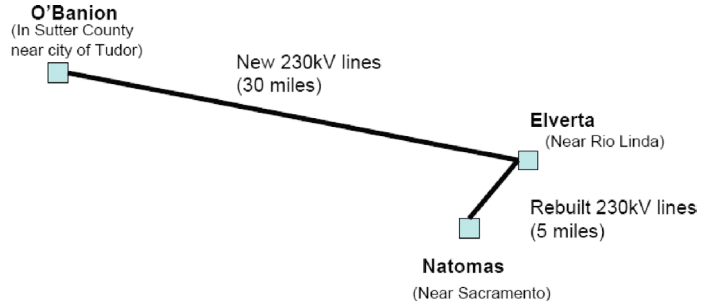


Figure 2. Elverta-O'Banion Line (Distances are approximations).

Environmental Impact Statement and Environmental Impact Report was available March 2008. The project's completion date is expected to be in the 2011 timeframe, see Figure 2.

TANC Zeta Line

SMUD is a member of the Transmission Agency of Northern California (TANC). TANC is a public entity whose members include many northern California municipal utilities. Its mis-

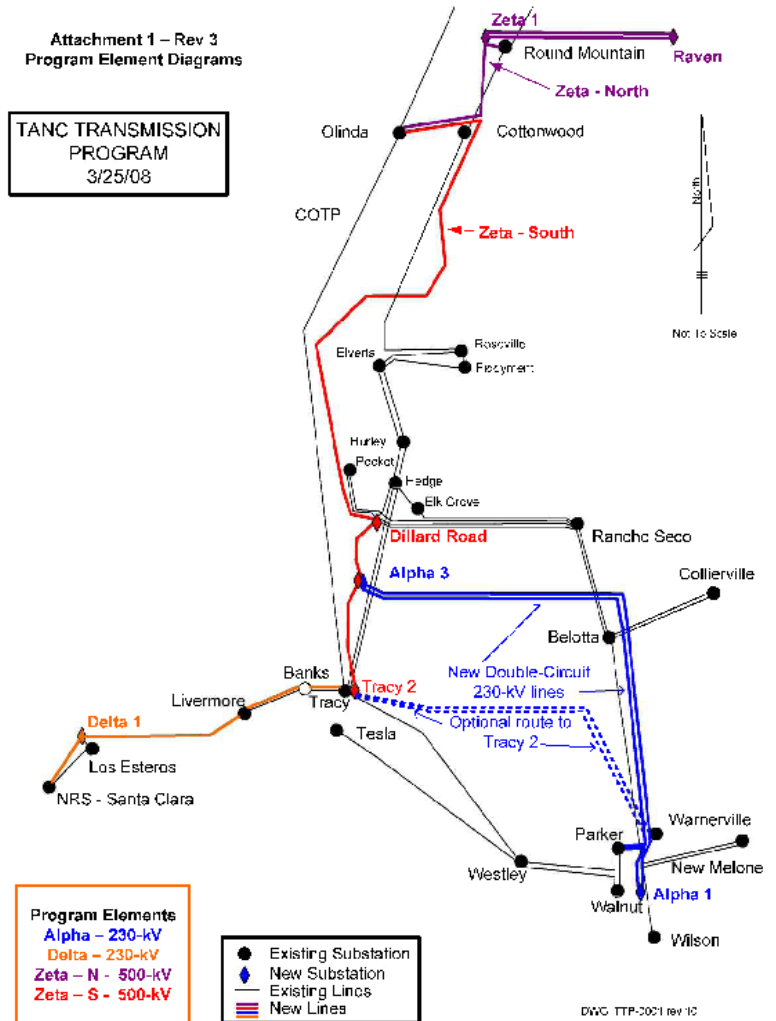


Figure 3. TANC Transmission Program (Presented at RETI Steering Committee Meeting on 4/16/2008).

sion is to assist its publicly owned utility members in providing cost-effective energy supplies to their customers, through long term ownership of essential high-voltage transmission lines with California and the western United States. To this end, TANC developed a Transmission program (TTP). SMUD is interested in the Zeta project, an element of the TTP.

In early 2008, the SMUD Board of Directors authorized a development agreement with TANC. This will allow SMUD to participate in detailed studies, preliminary engineering and possible licensing of a high-voltage transmission project. The development agreement allows but does not obligate SMUD to participate in the construction of the Zeta project. The Zeta project adds or augments transmission lines from Ravendale to Tracy, see Figure 3. The Zeta project has the potential to give SMUD access to more renewable energy located in the Pacific Northwest. SMUD could gain significant additional transmission capacity through the Zeta project.

Northern CA Regional Integration of Renewables

The Northern California Regional Integration of Renewables project (RIR) develops multi-utility transmission planning scenarios that leverage a diverse portfolio of renewable energy generation technologies (wind, geothermal, hydro, biomass and solar) available in northern California to supply projected electricity demand from now to beyond 2020. The RIR received funding from the California Energy Commission's Public Interest Energy Research Program (PIER) and is coordinated by Pacific Gas & Electric (PG&E). The California Energy Commission (PIER), the California Public Utilities Commission and the California Independent System Operator are partners in the effort with participation from northern California transmission owners including the Western Area Power Administration, the Transmission Agency of Northern California and the Sacramento Municipal Utility District. The RIR project kicked off in October 2007. With this project, SMUD hopes to better understand the transmission interactions and implications when more renewable energy is accessed in Northern California.

Renewable Energy Transmission Initiative

SMUD is also participating in the Renewable Energy Transmission Initiative (RETI). It is a statewide initiative to help identify the transmission projects needed to accommodate California's renewable energy goals, facilitate transmission corridor designation and transmission and generation siting and permitting. RETI is a multi-year effort resulting in recommendations that will support future energy policy.

RETI plans to assess all competitive renewable energy zones in California and in neighboring states that can provide significant electricity to California consumers by the year 2020. RETI also plans to identify those zones that can be developed in the most cost effective and environmentally benign manner. Further, RETI will prepare detailed transmission plans for those zones identified for development.

SMUD is a member of RETI's Coordinating and Stakeholder Steering Committees. Though its participation, SMUD hopes to bring in the publicly owned utility perspective to the RETI activities.

Access to Geothermal Resources

There is a significant amount of geothermal resources in Northern California, Northwestern Nevada and Oregon. In Northern California, up to 790 MW of geothermal potential may be developed in The Geysers area, Glass Mountain and Surprise Valley.¹ In Northwestern Nevada, up to 1150 MW of geothermal potential may be developed in the greater Reno area and the Dixie Corridor.² In Oregon, up to 380 MW of geothermal potential may be developed.³

Conclusion

SMUD is committed to utilizing renewable energy to meet its load and help reduce its impact to the environment. It needs renewable, especially geothermal, generation to have a balanced renewable portfolio. Transmission constraints continue to be an issue with respect to developing renewable resources. SMUD wants to work collaboratively with other entities to meet its renewable supply goals and plan for transmission that benefits all of California especially SMUD's customer/owners.

References

C. Klein, J. Lovekin, S. Sanyal, April 2004, "New Geothermal Site Identification and Qualification", GeothermEx Inc. Consultant Report, P500-04-051.

RETI Phase 1A Draft Final Report, April 2008

TANC Transmission Program Overview presentation to the RETI Stakeholder Steering Committee Meeting, April 16, 2008

¹C. Klein, J. Lovekin, S. Sanyal, April 2004, "New Geothermal Site Identification and Qualification", GeothermEx Inc. Consultant Report, P500-04-051.

²C. Klein, J. Lovekin, S. Sanyal, April 2004, "New Geothermal Site Identification and Qualification", GeothermEx Inc. Consultant Report, P500-04-051.

³RETI Phase 1A Draft Final Report, April 2008

