



## ALAMEDA COUNTY SANTA RITA JAIL Achievements In Energy and Water Efficiency

**Project Overview:** Santa Rita Jail, the fifth largest county prison in the nation with a capacity of 4,000 inmates, requires a lot of energy, 3 MW of secure, reliable power 24 hours a day, seven days a week, with an annual utility bill of about \$3 Million. Alameda County has spent the last decade making Santa Rita Jail's power system more self-sufficient, starting with solar panels, adding a fuel cell and wind turbines, and now four giant batteries so the jail can automatically disconnect itself from the grid if a power disruption occurs and operate independently until local utility power is restored. Additional steps have been taken by the jail and the General Services Agency (GSA) to cut its electricity and water usage.

**Smart Grid:** Also known as a Micro Grid, is powered by a cluster of on-site generators that is able to harness the energy from varied energy producing sources described above. With advanced electrical metering and switching technology, the Smart Grid is able to utilize two-way communications, so that Santa Rita Jail can operate in parallel with PG& E's power distribution grid or independent of it.

### Santa Rita Jail Smart Grid Project

**Total Project Cost: \$11,700,000**

#### **Funding:**

★ DOE Grant:	\$ 6,900,000
★ CEC Grant:	\$ 2,000,000
★ PG&E Incentive	\$ 2,000,000
★ PG&E Incentive CSI Solar Thermal	\$ 500,000
★ 3 <sup>rd</sup> Party Funding (CEV):	\$ 200,000
★ County Energy Funding	\$ 100,000

### GOALS

- Reduce peak electrical load and monthly demand charges
- Store renewable and fuel cell energy overproduction
- Shift electrical loads to off-peak electrical hours
- Improve grid reliability and reduce electrical voltage surges and spikes
- Enable the jail to be a net-zero electrical facility during the most expensive summer peak electrical hours
- Expand the Jail's onsite generation capacity to include three renewable energy sources: Solar Photovoltaic Power, Wind Turbines, and Hot Water Solar Collectors

### Water and Energy Efficiency Projects Results since 1993

**\$1.9M in yearly electrical cost saving (70% reduction)**

**\$285K in natural gas cost savings (40% reduction)**

**\$540K in water/sewage cost savings (50% reduction)**

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### What We Have Achieved Over the Past Decade

Smart Grid at Santa Rita Jail: Integrating Solar Power, Fuel Cells, Wind Turbines, Advanced Energy Storage, and Backup Generators



### 2012: Santa Rita Jail Solar Power Tracking System

275 Kilowatts - 52 Solar Power Trackers - 1100 Solar Panels  
\$75K in Annual Electrical Cost Savings: 5% Reduction

### 2011: Outdoor Induction Light Retrofit:

Retrofit 600 lighting fixtures with \$300K Federal Block Grant; \$200K County Funds;  
Savings: \$115K/annually; 1.3year payback; 1.1MkWh in annual energy reduction

2010: Day Room Induction Lighting Retrofit: 822 fixtures with \$289K capital cost; \$183K annual savings

2009: Integrated Energy & Water Efficiency Project: \$4M capital cost, \$360K energy efficiency incentives; \$353K annual savings

2008: Water Efficiency Retrofit: replaced and retrofitted toilets, urinals, showerheads and valves

2002: Solar Power Project: Completed largest rooftop solar power system on a Government Facility, 1.2 Mega Watts, 9000 solar Panels, \$200,000 in Annual Electrical Cost Savings: 5% Reduction



2001: Cool Roof application and chilled Water Plant Retrofit  
1990's: Energy Efficient Lighting and Fan Motor Retrofits