

# WIND POWER, SOLAR AND BATTERY STORAGE: INLAND EMPIRE UTILITIES AGENCY

**Southern California**

## PROJECT DESCRIPTION



Inland Empire Utilities Agency (IEUA/Agency) is a regional wastewater treatment agency and wholesale distributor of imported water located in Southern California. Today, the Agency is responsible for serving approximately 875,000 people over 242 square miles in western San Bernardino County. The Agency is focused on providing three key services: (1) treating wastewater, developing recycled water, local water resources, and conservation programs to reduce the region's dependence on imported water supplies and drought-proof the service area; (2) converting biosolids and waste products into a high-quality compost made from recycled materials; and (3) generating electrical energy from renewable sources.

IEUA currently receives over 50 million gallons per day of wastewater from its regional treatment plants. This water is treated to Title 22 regulations and distributed throughout the service area. IEUA delivers the recycled water to be used for agriculture, municipal irrigation, industrial uses, and for groundwater replenishment. To offset operation and maintenance costs and electricity costs, IEUA manages 5 Megawatts (MW) of solar facilities, a 1 MW wind turbine and 4 MW of battery energy storage. Of the 5MW of solar facilities, some are directly owned by IEUA, while some facilities are managed through Power Purchase Agreements (PPAs) and an Energy Management Services Agreement (EMSA). Below is a description of IEUA's renewable energy portfolio:

**Wind Power:** A 1 MW wind turbine is installed at the northern Regional Water Recycling Plant No. 4. The wind turbine stands 180 feet high and has three blades that span 100 feet in length and provides a portion of the electricity needed at the plant. The wind turbine went online in 2011 and the construction time was around 1 year. The wind power project was funded fully by Foundation Windpower. IEUA and Foundation Windpower have a PPA which lays out the terms and conditions for IEUA to purchase the wind power from Foundation Windpower.

**Solar:** IEUA's diverse renewable portfolio also includes 5 MW of solar installed at four IEUA Regional Water Recycling Plants. Of that 5 MW, 3.5 MW of solar are from PPAs with SunPower, 1.5 MW of solar is through an EMSA in conjunction with battery storage, and 82.6 kW of solar is owned by IEUA.

**Battery Energy Storage:** IEUA entered a partnership with Advanced Microgrid Solutions (AMS) to install, operate and maintain 4 MW of battery storage at four IEUA facilities (water recycling plants). The batteries will reduce IEUA's demand for power during peak periods, saving the Agency in electricity costs. The project will charge the batteries when power costs are at their lowest and use the batteries during the day when grid demand is highest and costs are exponentially higher. These battery storage systems will integrate IEUA's renewable installations and give IEUA a greater ability to cost-effectively meet the Agency's demand and optimize the delivery of self-generated electricity. Furthermore, the batteries can potentially act as a resource for the utility to shed grid load during periods of high demand.

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## MAKING THE PROJECT HAPPEN

Consistent with the IEUA Business Plan goals and objectives, IEUA optimizes facility energy use and effectively manages renewable resources to achieve peak power independence, contain future energy costs, achieve statewide goals in renewable energy, distributed generation, and greenhouse gas reduction, as well as to provide for future rate stabilization.

## FINANCES



Energy projects implemented through PPAs or EMSAs were funded by the third-party entities.

Foundation Windpower financed the design and construction of the 1 MW wind power project. Foundation Windpower owns the facilities and sells the renewable energy to IEUA via a PPA. The rate for wind power is pre-established for 20 years and is lower than the imported power rate.

In 2008, 3.5 MW of solar was designed and constructed by SunPower through a PPA. Similar to Foundation of Windpower, SunPower owns the solar arrays and sells the generated power to IEUA. The rates were established in the 20-year agreement.

AMS installed, operated, and maintained the Battery Energy Storage and Solar project. A new operator, Enel X, has since replaced AMS. IEUA pays an annual energy management fee (consistent with the EMSA, which is lower than the annual energy cost savings. AMS received some funding from the Self-Generation Incentive Program (SGIP) offered by California Public Utilities Commission. Both projects were implemented as public-private partnerships.



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## IMPLEMENTATION

Foundation Windpower implemented the wind project in 2011 and a PPA was executed. For the Battery Energy Storage Project, AMS installed, operated, and maintained the batteries (currently there is a combined 4 MW of storage) and 1.5 MW of solar. Enel X replaced AMS and is now operating and maintaining the battery storage system.

In 2008, IEUA installed 3.5 MW of solar power at its water recycling facilities and the Inland Empire Regional Composting Facility. The 3.5 MW of solar energy is enough to power approximately 600 homes for one year.

## CHALLENGES

Despite the good relationship with the electrical utility, Southern California Edison (SCE), interconnection agreements may be challenging and can take years to commission a project. Delays in finalizing the interconnection agreement may affect incentives or funding for energy projects. This process is even more complex if multiple onsite generation projects with different owners are present at the site. As for the energy storage and solar project, there were schedule requirements for project completion in order for AMS to be eligible for SGIP funds.



## ADVICE AND LESSONS LEARNED

Organizations interested in pursuing the above projects should conduct a feasibility study to assess the financial viability of the project and estimate capital cost, payback, and annual savings. If the organization is not willing to take on infrastructure risks, it may enter in a private-public partnership such as a PPA. Once PPA rates are established, savings can be estimated by comparing to the electricity imported rates. The power produced from the wind turbine is less than what was forecasted for IEUA, therefore IEUA is not seeing the expected cost savings for the wind power; however, the PPA rate for the wind turbine is lower than the average grid price so cost savings are occurring. To better predict power production, a high-precision weather production model to forecast wind turbine output should be used when possible. Solar estimates are more accurate in comparison.

## LEARN MORE

For more information about IEUA and this project, contact:

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