Title

Presenting status updates on three recommendations from the *Strategic Policy for Electrical Energy Resources* and the *Distributed Energy Resources and Rate Structures* documents, addressing the feasibility of a community solar garden, dispatchable loads, energy storage, and generation assets.

Recommended Action

No Action anticipated, for discussion

Staff Recommendation

No recommendation, however staff welcomes feedback from Utility Board members on the plan and schedule

Body

This agenda item addresses three recommendations from the *Strategic Policy for Electrical Energy Resources*, and the *Distributed Energy Resources and Rate Structures* documents, adopted by the Board of Public Utilities on January 2016:

1. "Evaluate the feasibility, including market interest, of a community solar garden if bandwidth or other limits are not being approached by individual installations.
2. "For large customers, require or encourage (via rates) that at least large loads be dispatchable. County government and the Department of Public Utilities can and should lead by example.
3. "For large DER [Distributed Energy Resource] producers, require or encourage (via rates) dispatchable storage and generation and Phase 2 or 3 inverters as they become available. The County government and the Department of Public Utilities can and should lead by example.

Community Solar Garden

In 2010, DPU began a demonstration project with the Japanese government to test the amount of PV (photovoltaic) solar penetration that could be added to a residential feeder while maintaining power quality using a battery system. A 1 MW (megawatt) PV array was installed at the closed landfill adjacent to Tech Area 3, with second 1 MW array planned for future installation.

In 2013 flooding damaged the landfill cap, allowing water to enter the underlying waste, and causing a significant increase in methane production. Installation of the second 1 MW array was necessarily delayed. Repairs to the cap were completed in 2017, and a gas extraction system to deal with the methane is planned to be installed in summer 2018. Installation of the second 1 MW array could begin as early as summer 2019. The landfill site is a preferred location for new solar because it already has an interconnection to the grid and is unsuitable for commercial or residential use.

Under the current Electric Coordination Agreement (ECA) between LAC and DOE-LANL, neither party can add generation resources to serve their individual load. The ECA, commonly referred to as the power pool, meets the power demands of both parties using approved resources as required by the ECA and the costs are shared equitably based on energy and demand. Any resources connected behind the meter for either party will shift the demand cost to the other party, violating the agreement.

If DPU actively promotes or coordinates a solar project behind the meter, staff recommends that it becomes a Pool asset whereby DOE-LANL takes a pro-rata ownership share, leaving DPU's share available to our customers under some predetermined model for a solar garden.

Adding the second MW at the landfill site as a pool asset could give the County approximately 400 kW (kilowatt) of capacity available to our customers to actively participate in a solar garden. The result of our 2016 solar garden survey showed an interest of approximately 300 kW depending on the final terms and condition of the project. Following the survey, the Chamber of Commerce informed DPU that there was some interest in the business community that was not captured in the survey.

Staff recommends pursuing the landfill site option for a community solar garden in accordance with the terms and condition of the ECA. Staff will continue to investigate alternate sites under the same terms and conditions.

Distributed Energy Resource Management System

The second and third recommendations being considered revolve around dispatchable loads, generation resources and storage. Staff proposed a Distributed Energy Resource Management System (DERMS) to accomplish this goal and to lead by example.

The initial primary driver for a DERM system was to replace the Micro EMS (prototype) used for the operation and management of the PV solar array and battery system constructed with the NEDO demonstration project. Being a prototype, support services are unavailable for continued operation and maintenance, which doesn't allow for future expansion.

With the implementation of DERMS software and the corresponding rate structures, DPU could also take advantage of the dispatchable loads and Energy Storage Systems (ESS) of our customers. Large loads and distributed ESS can be used as virtual power plants by shedding load as needed without disrupting business or building comfort levels giving our Power System Operators more flexibility when matching the generation resources to the demand.

Time of use rates may influence our customer's behavior on when to use electricity or DPU could have an incentive program for ESS being dispatched at the utility discretion based on some predetermined requirements. A good example of this could be the state of charge of an electric vehicle that could potentially be dispatched at the utility discretion or even the customer discretion in the future.

DPU attempted to partner on two different occasions with OATI for a grant from the DOE for implementation of a DERMS and Building Energy Management System (BEMS). DPU and OATI were given an opportunity to present to the selection committee in Washington DC with the Department of Energy for the funding opportunity.

DPU's goal with this demonstration project was to have the implementation fees covered by the grant money and also give an opportunity for the County facilities staff along with DPU's Power System Operators to gain some experience with these proposed systems.

Both grant applications were rejected, leaving the cost of implementation with DPU and facilities.

Alternatives

Alternatives for Community Solar Garden

1. Alternative sites are being considered which would support a pool asset:
    - DP Road A-16 land transfer cleaned up for commercial zoning
    - DOE-LANL property identified in the NREL report

2. Other smaller sites that may be considered for a standalone community solar garden:
   - DP Road A-9 Affordable Housing with covered parking considered in the design may accommodate roof top solar if located on the south side of the apartments.
   - Neighborhood Association sites (e.g. Pajarito Acres in White Rock)
   - Public Schools property
3. In support of the strategic policies adopted by the BPU, "the County and the Department of Public Utilities can and should lead by example."
   - Staff proposes that DPU consider supporting a demonstration project using covered parking solar panels located at the Municipal building. This site will be very visible to the community and it's estimated that we could reduce the Municipal building demand by 25%.
   - Public Property centrally located downtown doubling as a Demonstration

Alternatives for Distributed Energy Resource Management System

One alternative is to move forward with the implementation now with the County Facilities commitment to participate through the learning curving period, giving ample time for Operators to become familiar with the system prior to rolling it out to our customers.

Fiscal and Staff Impact

Fiscal and Staff Impact for Community Solar Garden

1. With a Pool-approved resource and the size of the project being considered the fiscal impacts would be relatively minor and blended with the other generation resources.
2. Developing a solar garden for the community, the cost could be fully recovered from the participants depending on the terms and condition of the agreements.
3. A demonstration project could apply for grant money to help subsidize the structure with the remaining cost borne by the customer.

Staff Impacts for the strategic Policy initiatives have been included in staff regular work hours.

Fiscal and Staff Impact for Distributed Energy Resource Management System

The following table is an estimate for the implementation of a DERM system along with monthly and annual recurring costs. The table also shows the potential savings the first year of operation.

	Implementation Cost	Monthly-Recurring	Annual Fee-Recurring
DERMS BASE	$ 95,000.00	$ 5,000.00	$ 60,000.00
GRID Control Base	$ 20,000.00	$ 1,500.00	$ 18,000.00
GridPort- with Celluar	$ 1,250.00	$ 7.00	$ 84.00
GridPort-BEMS	$ 250.00		$ -
Intergration Service 125 hours	$ 25,000.00		$ -
Trane	$ 86,290.00		$ -
	$ 227,790.00	$ 6,507.00	$ 78,084.00
Voltage Saving	**Total System**	**WR Share**	**Potential Savings-Annual**
Conservation Voltage Reductio	111,136	0.3333	$ 37,041.63
BEMS Savings Potential	**Demand- MW**	**Demand $/MW**	**Potential Savings-Annual**
Peak-55 Kw Minimum Range	0.055	$ 15,512.50	$ 10,238.25
Peak-110 KW Maximum Range	0.11	$ 15,512.50	$ 20,476.50

Note that the two rows stating savings potential represent a range from a low of $10,238 to a high of $20,476. Current estimated net operating cost is approximately $30k per year with an initial implementation cost of $227,790.00. Based on these estimates, staff recommends waiting at least two years then evaluating the community's uptake of electric vehicles and distributed roof-top PV systems.

Based on lessons learned from the NEDO demonstration project, it is anticipated that a significant amount of time will be required for operations and maintenance personnel to train and develop proficiency with the DERM software interface and the building hardware and software necessary for controlling the air-conditioning units.

Attachments

The following is a link to the DERMS that was used to develop the economic analysis above:

https://www.oati.com/Solution/Smart-Energy/distributed-energy-resource-management