REPORT FROM

OFFICE OF PUBLIC ACCOUNTABILITY

Date: July 19, 2019

To: The Board of Water & Power Commissioners
David Wright, General Manager, Department of Water & Power

From: Frederick H. Pickel, Ph.D., Executive Director/Ratepayer Advocate

Reference: (Revised) Eland #1 & #2 Solar and Battery Procurement
Agenda Item #23 for Board Meeting July 23, 2019

RECOMMENDATION

OPA does not object to the Board's approval of two Power Sale Agreements (PSA's) and two Agency Agreements (AA) for Eland Solar and Storage Center, Phase 1 and Phase 2, provided:

1) The delegated authority to the General Manager for expansion of the battery capacity by 50MW at each site is supported by a cost-benefit and reliability benefit analysis that OPA can review and discuss with DWP in the next 45 days;

2) The DWP Board requires for all new solicitations initiated after this date for long duration procurement of generation, that should DWP wish to seek approval of ownership options in any form it must first:

   a. seek bids with and without those ownership options and have at least five responsive and responsible bidders; and

   b. compare the cost-benefit of those options to bids that reflect facility land and ownership transfer to DWP at the end of the term of the contract for $1.

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DISCUSSION

1. A Contract With Atypical Risk Allocations

The contracts before the Board represent the fourth and fifth distinct projects (or phases of one project) that DWP has procured from 8 Minute Energy. This set of agreements involved approximately two years of negotiations. These two power sales contracts represent higher operational and commercial risk than the prior three contracts, often referred to as Springbok 1, 2 and 3. Those contracts also followed extensive, multi-year negotiations.

The higher risk of these agreements is related to: 1) the lower prices for renewable power, 2) the return of $8,238,928 of development costs upon achieving commercial operation at either project phase, 3) the large scale of the project, and 3) the parties evident desire to evolve procurement towards a "shaped" renewable energy project rather than separate renewable and storage projects. The Board should understand that the degree to which the $32.97/MWH price is a break-through for a combined solar and battery facility is the same degree to which additional risk is present. In OPA's opinion, achieving successful operations is an endeavor worth striving for, as explained further below.

The output of these solar facilities will result in more and different controls for DWP's transmission operators. In other words, these solar facilities will have some capability to follow the load, ramping up and down in a manner that can improve utilization of transmission, and reduce other generation costs of the overall system. Importantly, it will not provide voltage support at DWP's Harbor, Haynes, or Scattergood locations: critical decisions about those sites remain. However, it will improve utilization of the Barren Ridge Transmission Line. It may also reduce early morning generator increases, before the sun is up, by displacing other generators that would have to be ramped rapidly, only to be shut down a few hours later.

The facilities are experimental at this scale. OPA knows of another load following solar experiment of this type, which has provided proof of concept for more load following capability from solar generators. Proceeding with two large experiments at the same time can only be characterized as an aggressive effort to expand low carbon generation.

While each project is an individual legal entity, the counter-party concentration of all five transactions is an additional and important risk to consider. At the time of these projects' bids, only one other 8 Minute Energy project of this scale (>100 MW) outside DWP's jurisdiction was in operation. OPA examines this aspect in evaluating the reasonableness of the risk-adjusted price, and its conclusions take into account the positive performance and slowly developing maturity of the seller since Springbok 1 was negotiated.

OPA would advise the Board that the risks associated with further development of these two sites are significantly different from other projects wherein the land is specified, and the site control is more rigorously reviewed at an earlier point in time.

2. The Shaped Solar and Battery Energy Commodity

OPA has compared the contracted power price to those of this bidder's submission, and finds that there is an increase of approximately 10% per year. *In OPA's opinion, it does not cost too much more to explore this approach to controlling over-generation of solar.*

While many negotiated aspects of these contracts are undoubtedly important, and are reflected in this increase, the two changes OPA is most concerned with are: 1) combining the solar and battery output and paying one price for energy, regardless of origin, and 2) expanding the DWP right to step-into the seller's debt upon a default of debt servicing, and including beyond that right the right to buy the facilities in year 15, 20 or 25. For each of Eland 1 and 2 phases, the combination of both (1) and (2) above added $65M in lifetime costs, or $2.6M per year.[1]

Readers should understand that there are many "moving parts" to these transactions, and these figures are approximate. Other offsetting savings and benefits to ratepayers have occurred through negotiations, as have other payment increases that are possible. As such, OPA understands that the increased cost of $2.6M per year could easily be swamped by far larger changes in production or seller penalties that are speculative at this time. With expansion of the battery, which DWP plans to exercise, the increased cost would be $5.3M per year, or an additional $2.7M per year for the extra 100MW of battery. All energy will cost $39.62/MWH.

DWP has clearly invested significant time in developing very detailed plans and specifications for how these projects mature. The contracts are extensive and map out many aspects of the project's life cycle, and fully involve DWP in nearly every aspect of the facilities. Equally important is DWP's comfort with placing a degree of solar-to-battery optimization in the hands of 8 Minute Energy, in coordination with its own balancing obligations performed at its Energy Control Center. This holds the potential of decreasing the DWP burdens of directly managing all the more granular opportunities inside the plant for higher solar efficiency. The incentives are structured for 8 Minute Energy to maximize its revenue, while securing DWP's reliability.

This intangible aspect of a new type of control interface for an integrated utility involves a degree of trust that is an essential element of these two transactions. While in theory there are very small marginal costs involved with the controls of these facilities, whether they are placed "inside" or "outside" of the contractual perimeter of the projects, in operational practice the power transfers at light speed. DWP's strategy adopted here may be worth trying if it produces invaluable operating information and experience, on which DWP can continue to add renewable generation. DWP has paid careful attention to harvesting the operating data and information it needs, both to support compliance with industry reliability standards and to learn from its experience with these projects.

[1] This compares shaped energy with energy from solar and energy from the battery. The price is approximately 24% higher than solar energy only if a 25 year term is used and 29% higher if a 30 year term is used. These prices may not have been attainable on a stand-alone basis.

In reaching this conclusion, OPA discounted entirely that DWP will ever come to own either of these facilities. In that sense, this opinion constitutes a "worst case" concerning the option premiums embedded in the contract prices.

In order for the Board to better appreciate the commercial risk of combining the battery and solar output, should the battery never produce any of the intended storage, the solar will have cost 24%-29% more. This outcome is unlikely and extreme. The more likely (but unexpected) outcome is a failure that is more age-related and partial. DWP and the seller have addressed this risk with annual testing, penalties, and potential additions to the battery to offset aging; however, DWP will pay the standard energy price for all losses that are incurred in charging and discharging the battery. Should the battery cease operating after some number of years have passed, the remaining period of the contract would pay about 24%-29% more for the solar power, compared to a scenario with no battery, or a separately priced battery. Energy from a stand-alone battery procured from this seller would have cost approximately 33% more, assuming one charged it with this bidder's solar production.

While it is important to recognize that DWP did not pick this bidder's lowest and initial solar-only price, it obtained what may be meaningful advantages for ratepayers in return. If technology advances rapidly, DWP could pay as little as $11.53/MWH for the additional generation such improvements produce, above a threshold. Energy over 120% of expected annual megawatt hours is 57% less than a stand-alone solar project. Absent a bankruptcy, in which case the power purchase agreement is immediately terminated the day before bankruptcy, ratepayers will get the benefit of technology advances in the form of this lower price for excess energy. Furthermore, it is in the seller's best interest to fund and install the technology advances that best maximize its profit, which involves ongoing decisions that depend greatly upon whether DWP exercises an option to buy in year 15, 20, or 25. When technology changes rapidly, this may be beneficial, or more beneficial than exercising the ownership option. That can be determined at a later time. In the meantime, OPA believes that over 25 years it is a good bet that cost and efficiency advances of over 20% could be achieved in solar, batteries, or some combination of the two.

3. Options To Own The Facility: Future Procurements

OPA is encouraged by DWP's adoption of better transparency that OPA has sought in this contract for ownership identity. However, OPA's recommendations on option pricing have not yet been incorporated into procurement practices.

OPA has previously recommended that ownership options be priced by bidding, even if the option is unique to DWP's preferences in the year of procurement, and not standardized. (OPA Report of August 28, 2014, Springbok Power Purchase Agreement, p.7.) DWP has consistently sought options to buy, and in a manner that includes five year gaps between the options for the second half of the term. Because the option premium, even if it is $0, is included in the standard

power price of $32.97, comparisons with other bidders on the short list who were not asked to put bids forward that included these options cannot be compared.

OPA knows of many competitive outcomes in this industry where winning involves far smaller differences than 10% between a winning bidder and a runner up. The difference between this supplier's bid and final prices for both solar and the battery is that large or larger, due to a negotiated payment at commercial operation of $8.2M. However, competitive outcomes with tight differences generally involve more mature and standardized commodities. Buyers often find in their best interests to standardize, particularly if they wish to demonstrate the end result is a reasonable price. In this case, as discussed above, the purpose is for a "shaped" product that is very flexible operationally. Standardizing this energy product in this way has not been done yet. Standardizing within an RFP might become possible in a few short years, as DWP and the industry becomes more expert at specifying contract terms in storage and hybrid projects, in light of operating experience it will gain.

At this time, OPA adds to its prior 2014 recommendation that DWP's options, in whatever form it takes at the time, always be compared to a second and required bid that includes *in the price of the purchased power* the transfer of ownership to DWP at the end of the 30 year contract term for $1. This will ensure that savings and relative advantages that DWP's procurement method asserts have a clear and transparent comparison to no ownership and full ownership at term. These comparisons will serve as book-ends and allow for a more certain assessment of the reasonableness of the end result. Such a required bid provides no "going concern" value to a business beyond the contract term, because no reasonable expectation for selling in perpetuity to ratepayers can be had. Ratepayers should not have to be *both* the support of the revenue during the term that covered <u>all</u> the developer's costs and investment returns, *and* the presumed source of value to the site at the end of the term (i.e., continued operations and sales thereafter).

Such a "$1 at term" bid necessarily includes all costs, including initial land acquisition costs, in the price of the power paid during the term. Obtaining the land is often the best and most valuable part of an ownership transfer from the perspective of future ratepayers, given all the uncertainties surrounding technology's rate of change. Placing it at the end is, in theory, the cheapest time to obtain it and a typical technique in public-private partnerships in infrastructure. The land itself is not uniquely able to provide a good place for solar and battery facilities. This approach can more clearly signal that some types of innovative projects or situations are not really conducive to the procurement methods that DWP has used here. It can help DWP identify when ratepayers would be better off having no ownership rights, or doing a turn-key (full ownership at commercial operation). Requiring it of bidders will in no way eliminate the type of outcome DWP has achieved here. Nor will it interfere with DWP selecting a more expensive over a less expensive option, so long as its explanations are grounded in clear ratepayer benefits.

Because these recommendations have been made before, OPA would respectfully request that the DWP Board require these changes to RFP's involving DWP. This is very important to both current and future ratepayers. DWP, and its suppliers in generation, should have the objective and direct evidence that these techniques provide to support the reasonableness of a contract's terms. DWP's contracts only become publicly obtainable after long interludes. Bidders will cease to participate if they cannot determine that their efforts at winning the competition are worth expending. There are five time consuming and extensive sets of discussions with one bidder, and most of the competitive field would now be lacking in any appreciation of what DWP considers important, as expressed in these multi-year efforts and discussions. Yet far more operational and commercial innovation in this area will be necessary to attain DWP's long-term goals. OPA's recommendations seek to restore some balance between innovation, which is not often standardized, and participation of multiple contestants. It will ensure that DWP always knows at the time of a procurement decision that it is considering the benefits of smaller, more diversified projects where it internally manages the innovation risk, and its larger scale opportunities wherein there is a different sharing of innovation risk and reward. There is always a frontier between the two that is moving due to technology.

OPA anticipates that DWP will need to accelerate its procurement pace and encourage more innovation over the next decade. Hence DWP's long term success in facilitating innovation as it procures more carbon-free power is important. It is with this longer term goal in mind that OPA recommends the Board direct the management to obtain comparable bids which will price generation with and without any other type of ownership option DWP prefers at the time, and always relative to a required bid for a $1 ownership option at the end of the full contract term of 30 years.

4. Matters Excluded

In conducting its review, OPA has not reviewed any bids or refreshing of bids from the solicitations of SCPPA, and does not therefore have any opinion about the nature of the competitive process conducted by SCPPA. Furthermore, OPA has not provided a rate impact associated with these projects, beyond providing its opinion that the procurement costs are reasonable to include in rates.

Rate impacts are speculative at this time because significant variation can occur through the exercise of flexibility provided both the buyer and the seller in these contracts. Should the expectation of the parties be met, the average expected cost per unit of production ($32.97/MWH) is less than half of DWP's embedded costs of variable generation forecasted in its 2016 rate review ($82/MWH). These costs may exclude many other costs DWP incurs to procure and manage its supplies, both inside DWP and at SCPPA. Therefore, the key issue OPA has focused upon in this report is whether even lower rates (and lower procurement costs) could have been obtained, and the reasons for preferring this particular outcome that the DWP wishes to have approved.