



**COMMISSION
AGENDA MEMORANDUM**

Item No. 7d

BRIEFING ITEM

Date of Meeting October 24, 2017

DATE: September 25, 2017

TO: Dave Soike, Interim Executive Director

FROM: Elizabeth Leavitt, Senior Director, Environment & Sustainability

SUBJECT: Evaluating Solar Energy at the Port of Seattle

EXECUTIVE SUMMARY

The Environmental Center of Expertise (COE) staff in collaboration with Aviation Facilities and Infrastructure staff will brief Commission on the findings of several studies of the costs and benefits of generating solar energy at aviation and maritime facilities. The results of these studies are compared to other energy strategies currently being implemented or considered by the Port to meet Century Agenda goals. Staff will present recommendations to Commission on developing solar projects that could generate electricity for the Port.

Key Information:

Port staff has developed a number of renewable and energy efficiency strategies in order to meet two Century Agenda goals:

- Reduce port-owned carbon emissions by 50% and
- Meet all increased energy needs through conservation and/or renewables.

These strategies include a range of energy efficiency projects, renewable fuels, green fleet, wind energy and other initiatives, including solar energy. Port staff recently completed several studies of solar energy, one at Sea-Tac Airport and two at the Maritime Division, evaluating eight and nine locations, respectively.

Staff evaluated solar arrays at all locations for total cost of ownership, the net present value of the investment, and the cost per ton of carbon reduced. Findings varied due to a number of factors including: issues related to the specific utility serving the location (e.g., cost of electricity, renewable energy in the existing portfolio, the potential for grants and other incentives), and other constraints such as regulations that limit the orientation of an array.

Costs for the solar projects ranged from \$250,000 to \$19 million, with net present values ranging from negative \$280,000 to negative \$18 million over a 30-year lifetime. All of the solar projects evaluated for the airport generate less than 1% of the total airport electricity needs. Solar projects for the maritime locations generated 3% to 15% of the electricity needs for the individual buildings they would serve.

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Similarly, costs per ton of carbon reduced ranged between a low of \$5,000/ton to a high of \$10,000/ton. The low end of the range reflects a project that has a \$317,000 grant that reduces the cost of the project by approximately half.

Staff compared these costs to the carbon reduction estimates from other initiatives currently underway at the Port. The low end of the cost per ton for solar arrays is comparable to some energy efficiency projects such as replacing light fixtures at Shilshole Bay Marina with LED.

However, a number of Port initiatives provide carbon reduction at significantly lower cost per ton than solar arrays. For example, Puget Sound Energy's Green Direct program provides access to wind-powered electricity for approximately \$60/ton, significantly less than the lowest estimate (\$1,800/ton) for carbon reduction from solar. Similarly, projects such as converting natural gas buses to electric, and purchasing renewable natural gas for Sea-Tac's boiler fuel reduce carbon for approximately \$350 to \$900/ton, significantly less expensive than solar.

Lastly, staff considered the impact of renewable energy and conservation strategies on other community benefits embedded in the Century Agenda goals including small business growth and workforce development. Our analyses suggest that because Washington produces solar panels and has a workforce committed to installing solar arrays, solar projects could contribute to these values as well. Alternatively, other carbon reduction strategies such as converting fleet buses to run on electricity may not.

In light of these considerations, staff recommends that the Port:

1. Continue to pursue the solar project for Pier 69
2. Research solar or wind projects in eastern Washington to obtain the benefits of solar at lower costs
3. Continue to pursue cost-effective carbon reduction strategies across Port facilities.

We look forward to sharing this information with the Commission and obtaining their feedback on the analyses and staff recommendations.

ATTACHMENTS TO THIS BRIEFING

- (1) Presentation slides