



City and Borough of Juneau
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DATE: February 19, 2019
TO: Chair Michelle Hale
Assembly Public Works & Facilities Committee
FROM: Rorie Watt
City Manager
RE: Cruise Ship Shore Power

In the FY20 budget I am recommending the allocation of \$250,000 of passenger fees for the study and analysis of additional shore power infrastructure. However, I do raise caution on the potential complexities of the issues. Developing information on this topic is one of the Assembly's goals for the year (*Assembly Goal 5.C. Investigate what it would take to plug in cruise ships.*).

Below, are a couple of preliminary FAQ's, most of the information was provided by AEL&P.

How many megawatts does a typical ship use?

Ship power usage ranges quite a bit. The Princess ships that are currently served can range from 7.5MW to 11MW while docked. The average Princess loads are higher than the average Holland America ship loads by a few MW. Some of the newer, larger ships would use on the order of 14MW while in port. In 2000 when the shore connection was designed for the South Franklin Dock, the average ship was 5MW.

Currently, how much is shore power as a percentage of system load?

About 15%. But on a warm Saturday morning in July, a large ship might be 25% of the total load. On a cold day in mid-September with Greens Creek connected, a small ship could be less than 10% of the total load. However, because the ships aren't connected all day, their energy consumption overall is not that high. For example, last July, the cruise ships used 1.5 million kWh, the mine used 6 million kWh, residential customers used 8.6 million kWh, and the rest of the customers used 14 million kWh. For 2018 total, the cruise ships used 6 million out of 391 million total kWh, or 1.5% of total kWh sold.

How often do ships plug in at the South Franklin Dock?

AEL&P plans on 105 connections in 2019.

How often is there insufficient power to allow usage of shore power?

The existing Princess contract has priority over Greens Creek, so the only interruptions in recent memory were during maintenance events. In low water years it is possible that we could see an interruption of non-firm customers such as the cruise ships. If the low water year that we are currently experiencing extends into May, it could cause a few ship connections to be dropped.

Is there existing power generation to supply more shore power?

AEL&P generally has enough capacity, but there are significant technical challenges associated with managing the transfer of load. However, energy is different than capacity, and in a normal water

year there wouldn't be enough energy for more ship connections. On a wetter than normal year, there may be enough energy to serve more ships with the existing generation facilities, but of course wetter years can't be reliably predicted.

What about Year Round Loads?

Ships would only use shore power for up to ~130 days, around 8-10 hours a day. Therefore paying for the infrastructure without unduly burdening the other Juneau customers could be challenging.

Hydroelectric projects are typically high capital cost, provide a relatively low power cost, and have a very long life. If the ships were guaranteed to be here 24/7 for 50 years, one could more easily make a business case.

Is shore power possible in other Southeast ports?

The smaller electrical grids in other ports, such as Hoonah or Skagway cannot support ship connections. Because of low water, Ketchikan has been burning diesel this year to generate power for the town. Shore power doesn't appear to be a solution for the overall region.

A study from several years ago is attached. Further work on this topic would begin with this source document.