



City of Saint Paul
2022 Load Forecast

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2022 Load Forecast

Summary of Changes

<i>Revision Number</i>	<i>Revision Date</i>	<i>Revision Description</i>
1	2022-12-07	Initial Release

1 Executive Summary

Electric Power Systems (EPS) was retained to provide the City of Saint Paul (CSP) with a load forecast as part of the 2022 RUS Loan Application. In preparing the 2022 load forecast, the historical information from 1997 to 2022 submitted to the State of Alaska was used as our bases and we have extrapolated the expected trend and added possible new customers based on discussions with the City Manager. The forecast utilized recent population and economic trends for the CSP to create the projected 2032 load .

1.1 Forecasting Methodology

The data submitted to the State of Alaska has peak demand (kWd) information listed by month from 2012 to 2022. See “Monthly Peak Demand” in Section 3. The same data submitted to the State of Alaska has additional information that presents the energy sold (kWh) from 1997 to 2022. See “Monthly Energy Sold” in Section 3. We have used the energy sold to confirm the trends that we are seeing with the peak demand values since CSP has a smaller window of data for the peak demand.

EPS developed a simple annual load reduction factor based upon trends and research regarding population growth, economic forecasting, and climate considerations. In addition to the base reduction factor, EPS has developed estimated loads for three potential areas of growth that could happen over the next 10 years.

Reduction factors include a population reduction, economic reduction as the crab industry is presently on hold, and energy consumption reduction as residents continue to increase their usage of LED lighting. Possible Increases to load over the next ten years include four duplex houses, a community indoor greenhouse, and adding the Trident processing plant off-season load. EPS developed load estimates and/or growth factors for these, and combined them with the overall system growth factor to develop a projected system peak loading for the CSP system in 2032.

1.2 Results

EPS projected a relatively flat trend based on the existing load. If the proposed load additions happen over the next 10 years, the City of Saint Paul load could double.

2 Trends

1.

2.1 Population

The recent trend for the City of Saint Paul population shows a steady reduction over the past ten years. This trend is not expected to change as the younger generations continue to move to larger cities.

The following table indicates the statistics for the City of Saint Paul.

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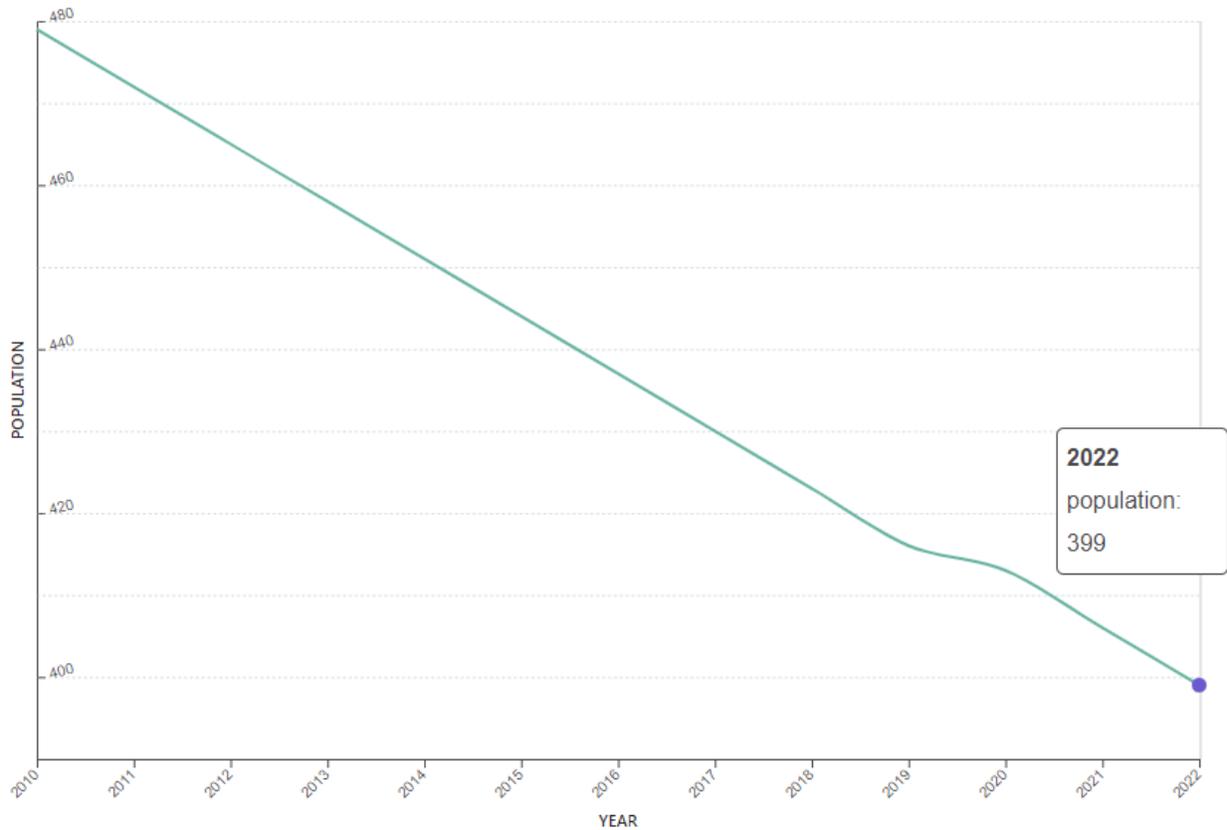
Table 1, City of Saint Paul Statistics

State	Alaska
Land Area (mi²)	42.6 sq mi
Population Density (mi²)	9.40/sq mi
Population Growth Rate	-1.72% (-7)
Population Growth Since 2020	-3.39% (-14)

The following graph shows the population trend.

St. Paul, Alaska Population 2022

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2.2 Economy

The recent economic climate of the City of Saint Paul is relatively stagnant. Since the Snow & King Crab harvest has been canceled for the 2022/2023 season with a prediction to stay closed for four years. The economic climate is not expected to change until the crab harvest has resumed.

2.3 Energy Efficiency Upgrades

Reducing the lighting load with LED luminaires is a substantial reduction in electrical consumption. Over the past 10 years, there has been a significant increase in the use of LED fixtures and new construction. As the prices of LED luminaires have become very competitive with existing technology, we expect an even larger replacement over the next ten years.

- The City of Saint Paul has already converted their outdoor and street lighting to LED.
- Future reductions in lighting load will be by residential customers embracing LED technology by replacing incandescent and fluorescent lighting.

2.4 Electric Vehicles

Presently, there are two electric vehicles on the island. Personal purchases of electric vehicles are not expected since there is no maintenance available on the island.

- The TDX corporation has a Chevy Volt and a Ford Transit.
- A recent study determined electric public transportation was not economically feasible..

We do not anticipate substantial load growth based on electric vehicles.

2.5 Renewable Energy

Although photovoltaic and wind are desirable to reduce dependency on diesel fuel, there is no change planned in the next ten years.

- Since there are no grants or funding for adding photovoltaic power, no substantial increase in photovoltaic power is expected.
- The existing wind power being generated by TDX has been difficult to integrate with the small City of Saint Paul power grid. Increases in wind generation are not expected.

2.6 Potential New Customers

The only substantial change in the system will be the addition of new customer load. There are a few projects worth noting.

- A proposed development of four duplexes would be added near the health clinic for an assumed demand increase of 50kW.
- The City Manager plans to contact Trident to investigate the possibility of adding Trident as an offseason client. This would benefit the City with a new customer and Trident by eliminating their inefficient large-scale generation to maintain off-season heating and freeze-protection. The estimated load is about 250kW.
- The city would also like to add a large-scale community greenhouse. No plans exist, but we assume a rough order of magnitude is approximately 250kW.

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3 Forecast Results

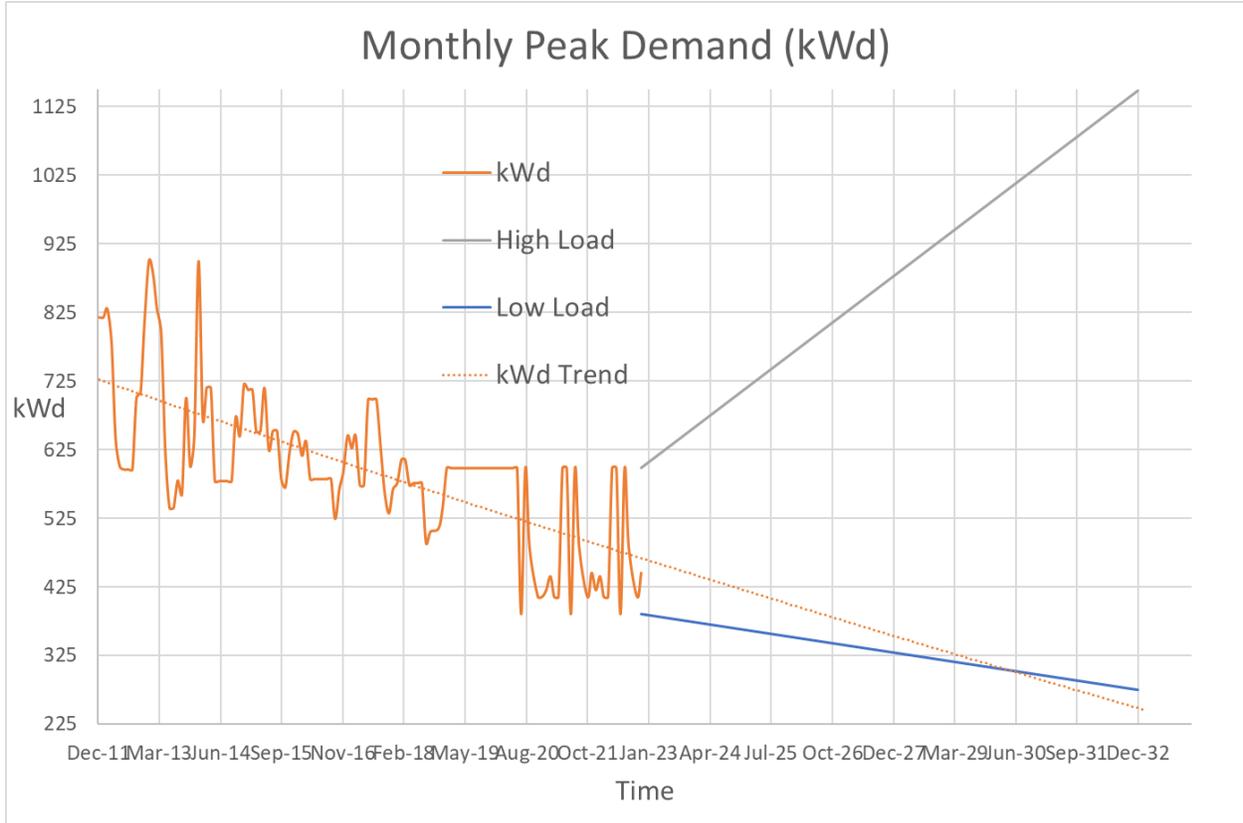
Based on an average CSP load of 465kW in 2022, we are expecting a Low Load case of 275kW in 2032, a reduction of 69%. The reduction would be driven by energy efficiency and population decline.

If all of the proposed new customers are added to the system, we expect the High Load case to reach a peak demand of 825kW, an increase of 77%. The major drivers for the increase would be adding Trident as an off-season customer and adding a large-scale community greenhouse.

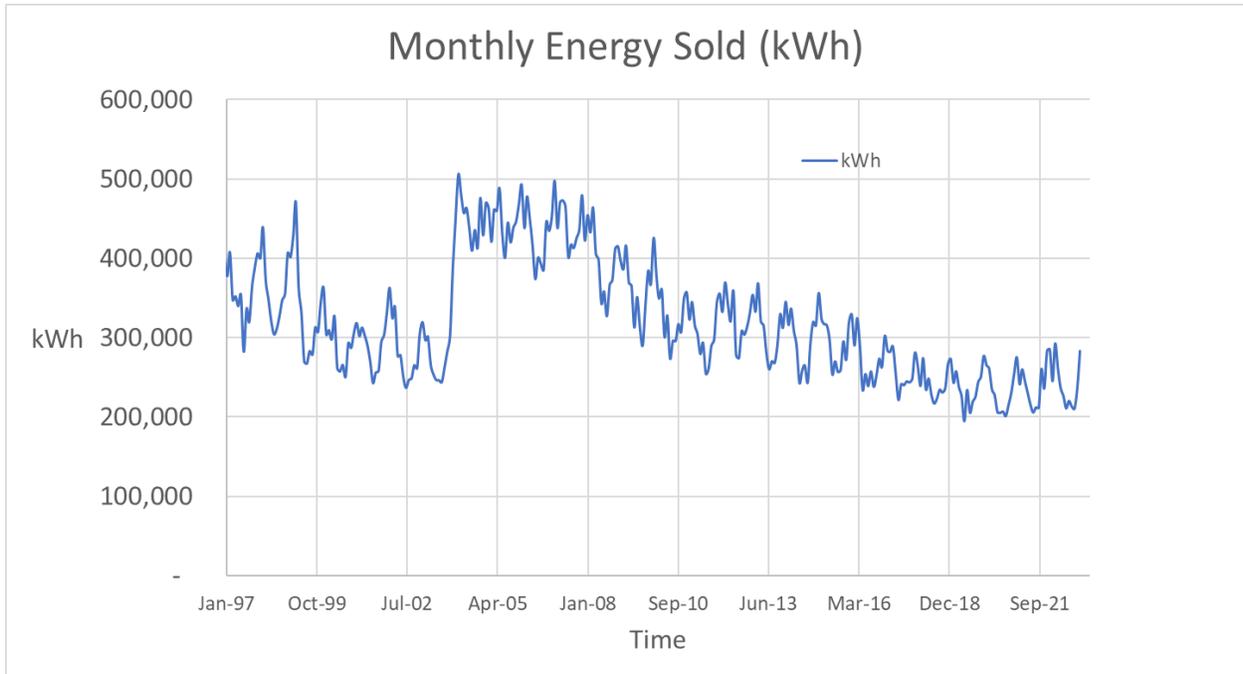
Table 2, 2022 CSP Peak Load Forecast Summary

Load Description	Low Load Case Based on 2021-2022 CSP Peak	High Load Case Based on 2021-2022 CSP Peak
2021-2022 Peak Load	385 kW	598 kW
Population or Economic Reduction	- 110 kW	- 110 kW
Potential New customers	+0 MW	+ 550 kW
2028 Peak Load Summary	275 kW	1,148 kW

Based upon the growth factors and load projections an updated graph of historical and projected load growth to 2032 was developed.



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