

TARENTUM LONG-TERM LOAD FORECAST

July 2025

FORECAST RESULTS

Table 1. Tarentum Load Average Annual Growth Rates

Period	Total Energy	Summer Peak Demand	Winter Peak Demand
2014 - 2023	0.6%	-0.7%	-1.2%
2025 - 2034	-0.1%	-0.3%	-0.3%

Table 1 above contains average annual growth rates for the most recent 10 years of historical data, along with the first 10 years of projections for comparison. System total energy is expected to grow at an average of -0.1% per year through the forecast horizon, driven by change in number of households within Allegheny County. This compares to historical total energy growth over 2014 - 2023 averaging 0.6%. Due to data availability, January through December 2018 historical load data was excluded from the model during the training process. Figure 1 below reflects the historical and projected total energy through the forecast horizon. Additionally, Figure 1 includes AMP’s 2025 forecast for Tarentum total energy, which is 0.5% above the model projections.

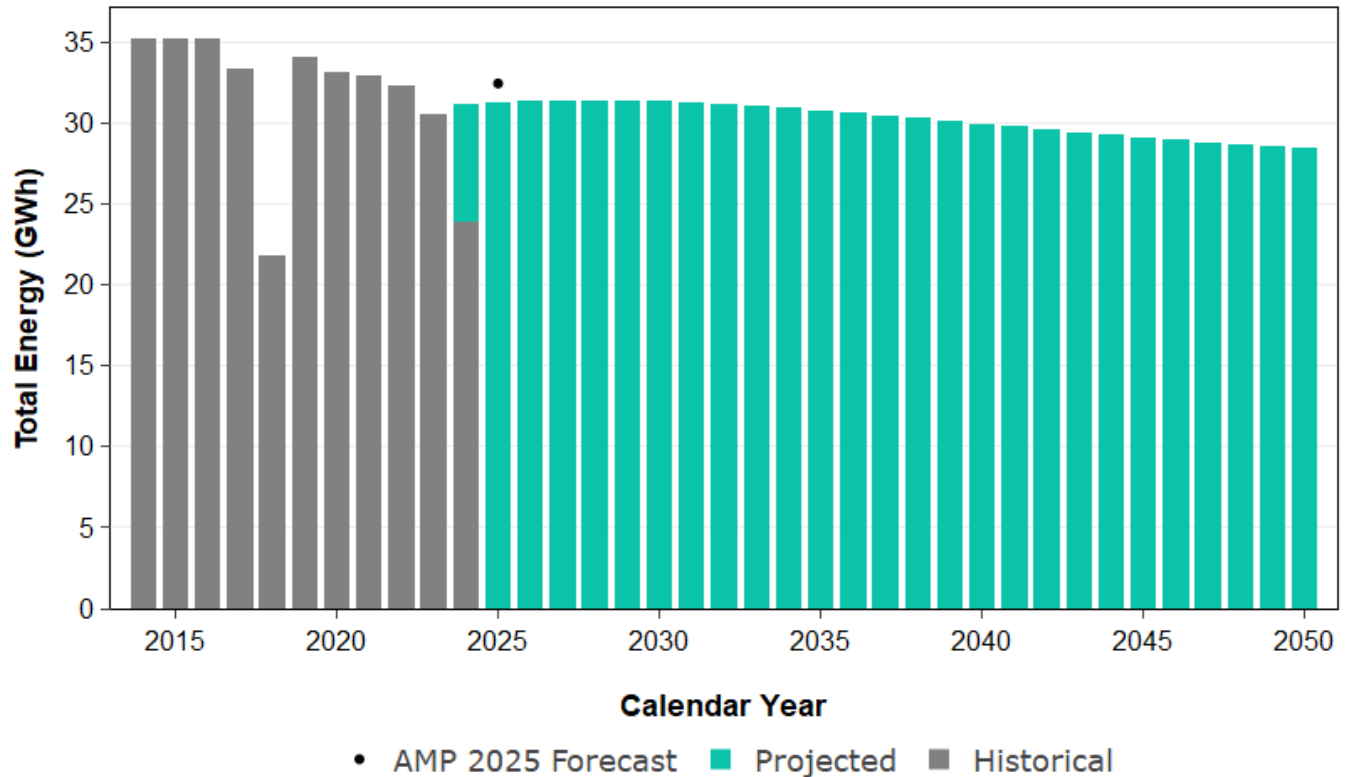


Figure 1. Historical & Projected Total Energy

Future growth in peak demand shown in Table 1 is expected to average -0.3% per year during summer and -0.3% during winter over the next 10 years, driven by change in number of households within Allegheny County. This compares to historical peak demand growth over 2014 - 2023 averaging -0.7% during the summer season and -1.2% during winter. Figure 2 compares the historical and projected seasonal peak demand through the forecast horizon, for reference.

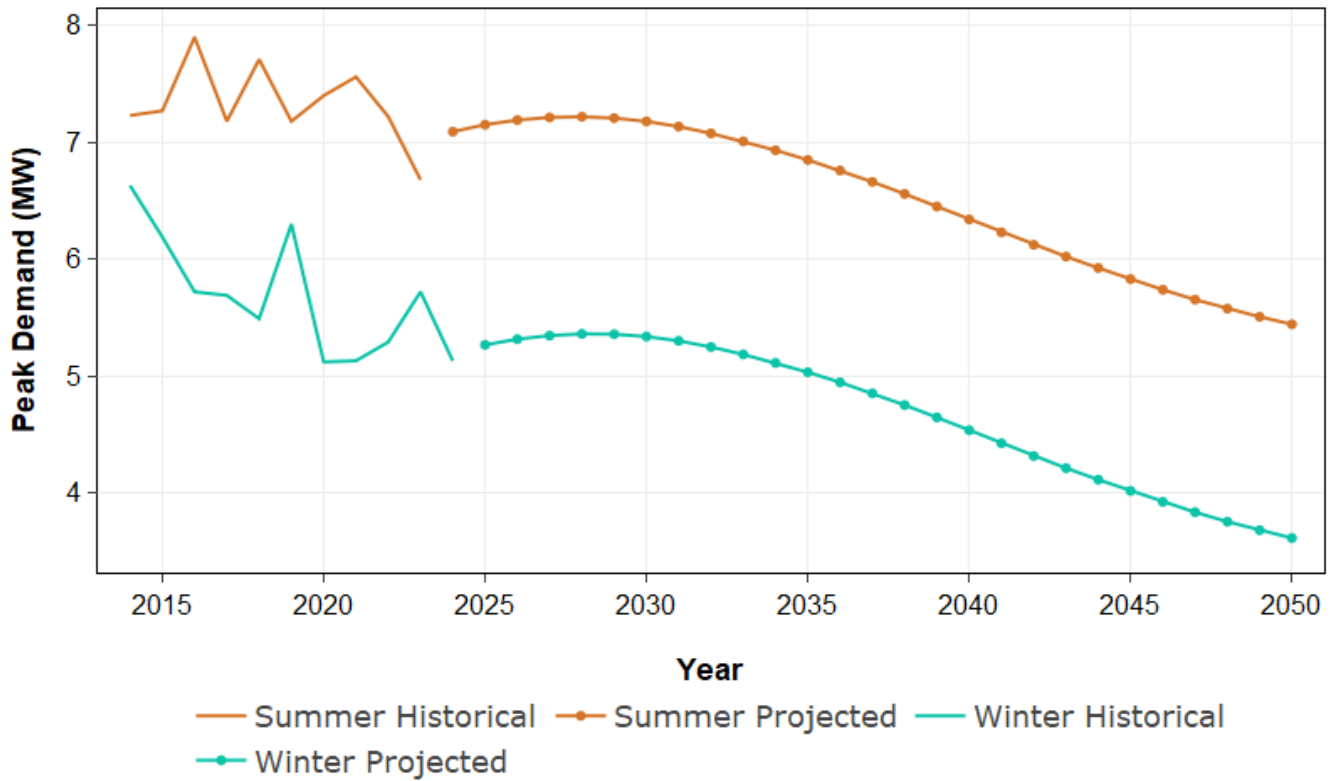


Figure 2. Historical & Projected Seasonal Peak Demand

FORECAST METHODOLOGY

The forecast of total energy and peak demand requirements for Tarentum was developed using a combination of historical load, weather, and economic data. Hourly historical temperature data at the Pittsburgh International Airport weather station was collected from the National Oceanic and Atmospheric Administration’s NCEI database. This data was collected for 1994-2024 based on data availability. Hourly temperature history was then used to calculate the monthly weather variables described in Table 5. An example of monthly history for two weather variables is shown below.

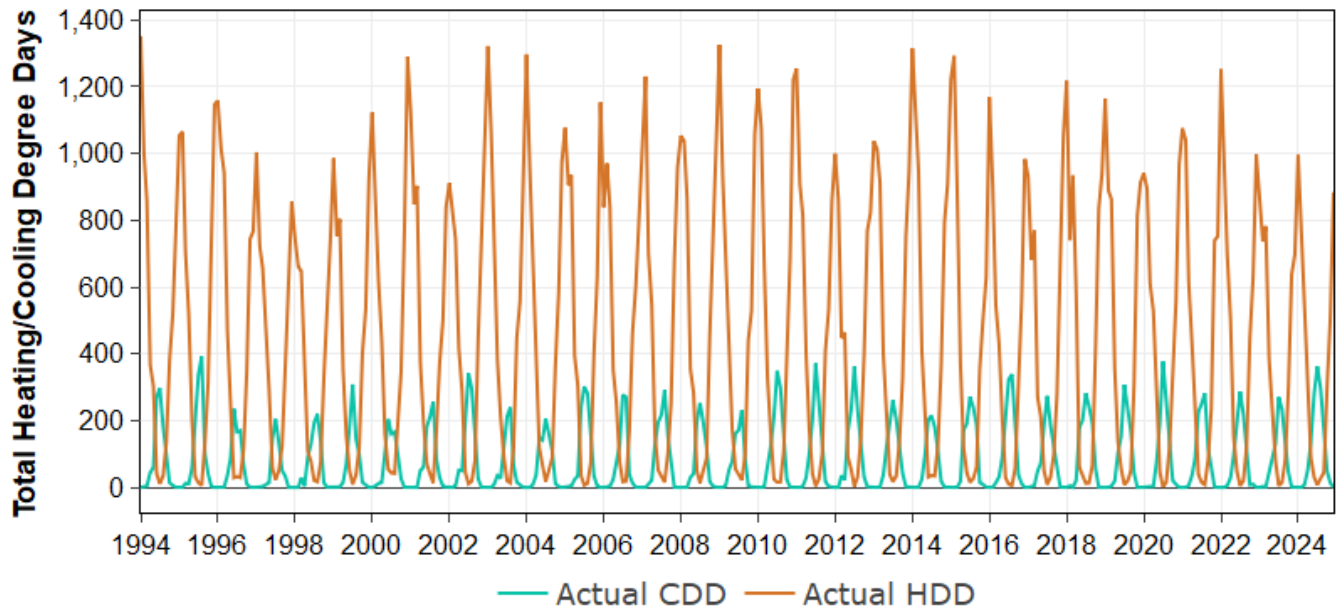


Figure 3. Total Monthly Heating/Cooling Degree Days

Based on the 30 years of history, hourly weather-normal temperature projections were developed using the rank-and-median method. This temperature forecast was then used to calculate normalized monthly values for each weather variable described in Table 5. A comparison of historical and normalized weather for total heating/cooling degree days is shown in Figure 4. This data is aggregated to the annual level for ease of comparison.

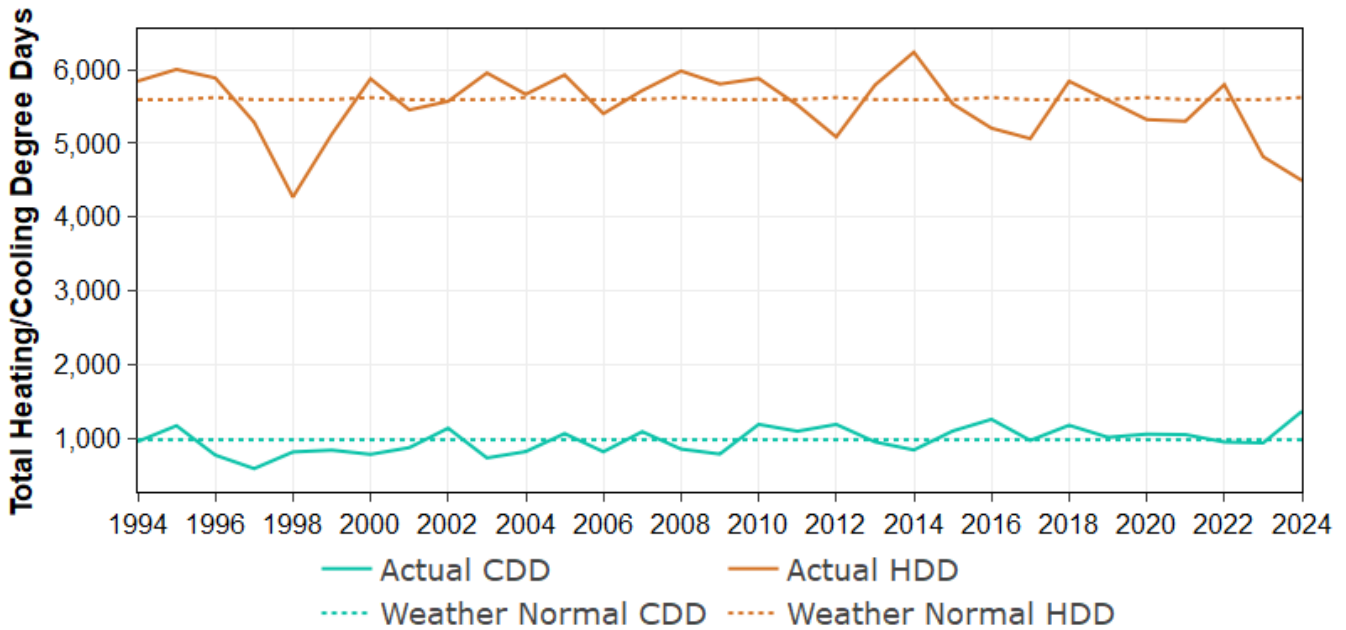


Figure 4. Total Annual Heating/Cooling Degree Days

Economic data for Allegheny County, PA was collected from Woods & Poole’s 2024 Complete Economic and Demographic Data Source. This database includes historical and projected county-level data from 1970-2060 for over 50 economic features. The most impactful economic features were then selected for evaluation. These selected features are listed in Table 5, for reference. Additionally, a more detailed explanation of the basis for Woods & Poole’s economic projections can be found in the appendix section. Figure 5 below shows historical values and projections for one of the economic variables considered.

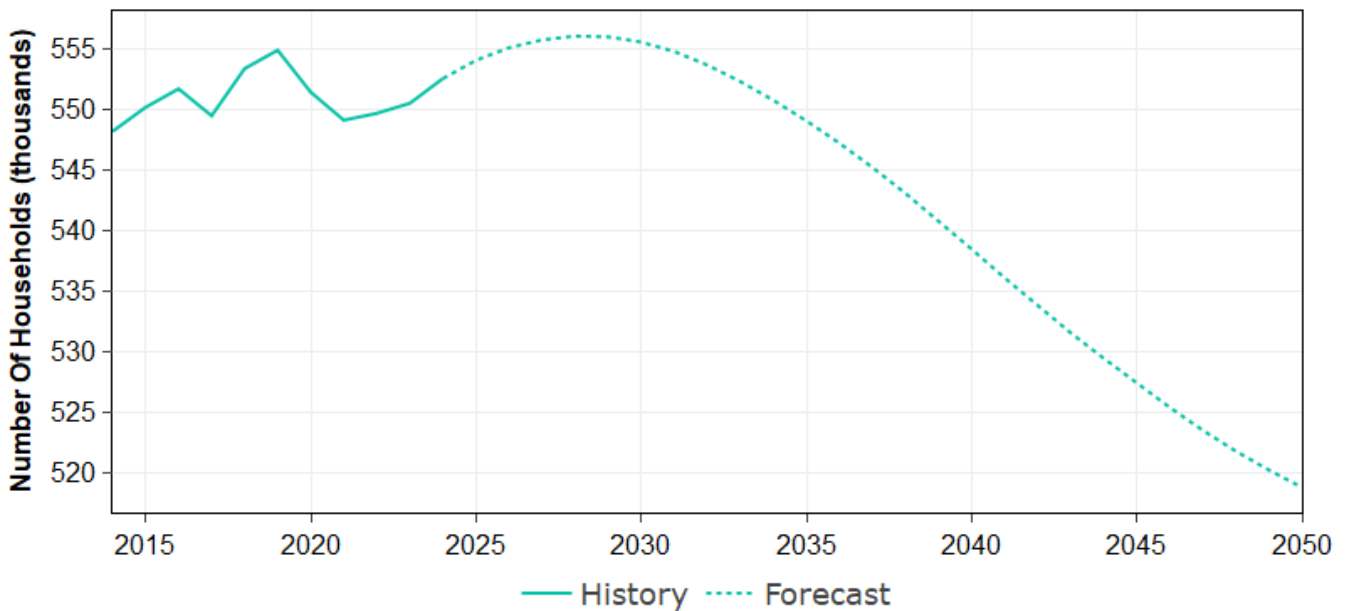


Figure 5. Allegheny County, PA Number Of Households

Monthly total energy provided by AMP was analyzed from 2014-2024 to develop a regression equation describing monthly total energy as a function of economic and weather features. Possible combinations of weather and economic variables were individually evaluated, and the optimal model was determined based on the overall model fit, number of statistically significant predictors, and economic variable's coefficient sign.

The resulting regression model for total energy is shown in Table 3. Based on all combinations of economic and weather predictors tested, Tarentum total energy is best explained by a combination of total cooling degree days, total heating degree days squared, maximum 3-day cooling degree days, and number of households. Figure 6 shows the historical monthly total energy against the model's fitted values.

Projections of monthly non-coincident peak (NCP) demand were developed using the same process described in predicting total energy. Due to data availability, January through December 2018 historical load data was excluded from the model during the training process.

The resulting regression model for peak demand is shown in Table 4, below. Tarentum peak demand is best explained by a combination of maximum heating degree days squared, maximum hourly temperature, maximum 3-day cooling degree days, maximum 3-day heating degree days, and number of households. Figure 7 shows the historical peak demand against the model's fitted values.

APPENDIX

Table 2. Total Energy & Peak Demand

Type	Calendar Year	Total Energy		Summer Peak Demand			Winter Peak Demand		
		MWh	Percent Change	MW	Percent Change	Load Factor	MW	Percent Change	Load Factor
Historical	2014	35,221		7.2		55.6%	6.6		60.6%
	2015	35,272	0.1%	7.3	0.6%	55.4%	6.2	-6.6%	65.0%
	2016	35,284	0.0%	7.9	8.7%	50.8%	5.7	-7.6%	70.2%
	2017	33,434	-5.2%	7.2	-9.1%	53.2%	5.7	-0.5%	67.1%
	2018	21,855	-34.6%	7.7	7.4%	32.4%	5.5	-3.5%	45.4%
	2019	34,161	56.3%	7.2	-6.9%	54.3%	6.3	14.8%	61.9%
	2020	33,231	-2.7%	7.4	3.1%	51.1%	5.1	-18.7%	73.9%
	2021	33,002	-0.7%	7.6	2.2%	49.8%	5.1	0.2%	73.4%
	2022	32,404	-1.8%	7.2	-4.5%	51.2%	5.3	3.1%	69.9%
	2023	30,539	-5.8%	6.7	-7.5%	52.2%	5.7	8.1%	60.9%
Hist/Proj	2024	31,244	2.3%	7.1	6.2%	50.2%	5.1	-10.3%	69.3%
Projected	2025	31,315	0.2%	7.2	0.8%	50.0%	5.3	2.7%	67.9%
	2026	31,382	0.2%	7.2	0.6%	49.8%	5.3	0.9%	67.4%
	2027	31,421	0.1%	7.2	0.3%	49.7%	5.3	0.6%	67.1%
	2028	31,442	0.1%	7.2	0.1%	49.6%	5.4	0.3%	66.8%
	2029	31,413	-0.1%	7.2	-0.2%	49.8%	5.4	-0.1%	66.9%
	2030	31,368	-0.1%	7.2	-0.4%	49.9%	5.3	-0.4%	67.1%
	2031	31,295	-0.2%	7.1	-0.6%	50.1%	5.3	-0.7%	67.4%
	2032	31,213	-0.3%	7.1	-0.8%	50.2%	5.2	-1.0%	67.7%
	2033	31,090	-0.4%	7.0	-1.0%	50.6%	5.2	-1.2%	68.5%
	2034	30,964	-0.4%	6.9	-1.1%	51.0%	5.1	-1.4%	69.1%
	2035	30,828	-0.4%	6.8	-1.2%	51.4%	5.0	-1.6%	69.9%
	2036	30,691	-0.4%	6.8	-1.3%	51.7%	4.9	-1.7%	70.6%
	2037	30,519	-0.6%	6.7	-1.4%	52.3%	4.9	-1.9%	71.8%
	2038	30,351	-0.6%	6.6	-1.6%	52.8%	4.8	-2.1%	72.9%
2039	30,173	-0.6%	6.5	-1.6%	53.4%	4.6	-2.2%	74.2%	
2040	30,003	-0.6%	6.3	-1.7%	53.9%	4.5	-2.4%	75.3%	
2041	29,810	-0.6%	6.2	-1.7%	54.6%	4.4	-2.5%	76.9%	
2042	29,633	-0.6%	6.1	-1.7%	55.2%	4.3	-2.5%	78.4%	
2043	29,466	-0.6%	6.0	-1.7%	55.9%	4.2	-2.4%	79.9%	
2044	29,318	-0.5%	5.9	-1.6%	56.3%	4.1	-2.3%	81.2%	
2045	29,148	-0.6%	5.8	-1.6%	57.1%	4.0	-2.3%	82.8%	
2046	28,998	-0.5%	5.7	-1.6%	57.7%	3.9	-2.3%	84.4%	
2047	28,859	-0.5%	5.7	-1.5%	58.3%	3.8	-2.3%	85.9%	

Type	Calendar Year	Total Energy		Summer Peak Demand			Winter Peak Demand		
		MWh	Percent Change	MW	Percent Change	Load Factor	MW	Percent Change	Load Factor
	2048	28,742	-0.4%	5.6	-1.4%	58.7%	3.8	-2.1%	87.2%
	2049	28,616	-0.4%	5.5	-1.3%	59.3%	3.7	-1.9%	88.8%
	2050	28,510	-0.4%	5.4	-1.2%	59.8%	3.6	-1.8%	90.1%

MONTHLY ACTUALS VS. FITTED PROJECTIONS

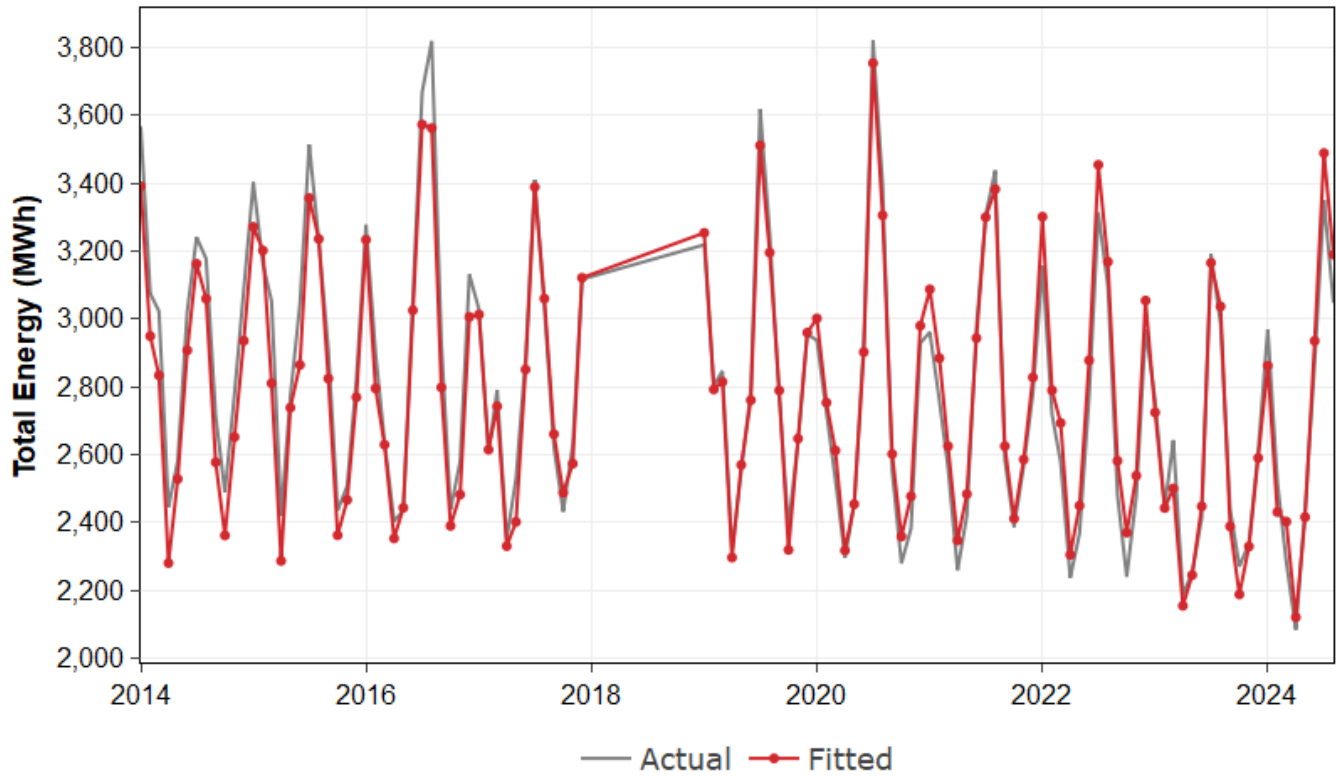


Figure 6. Historical & Fitted Monthly Total Energy

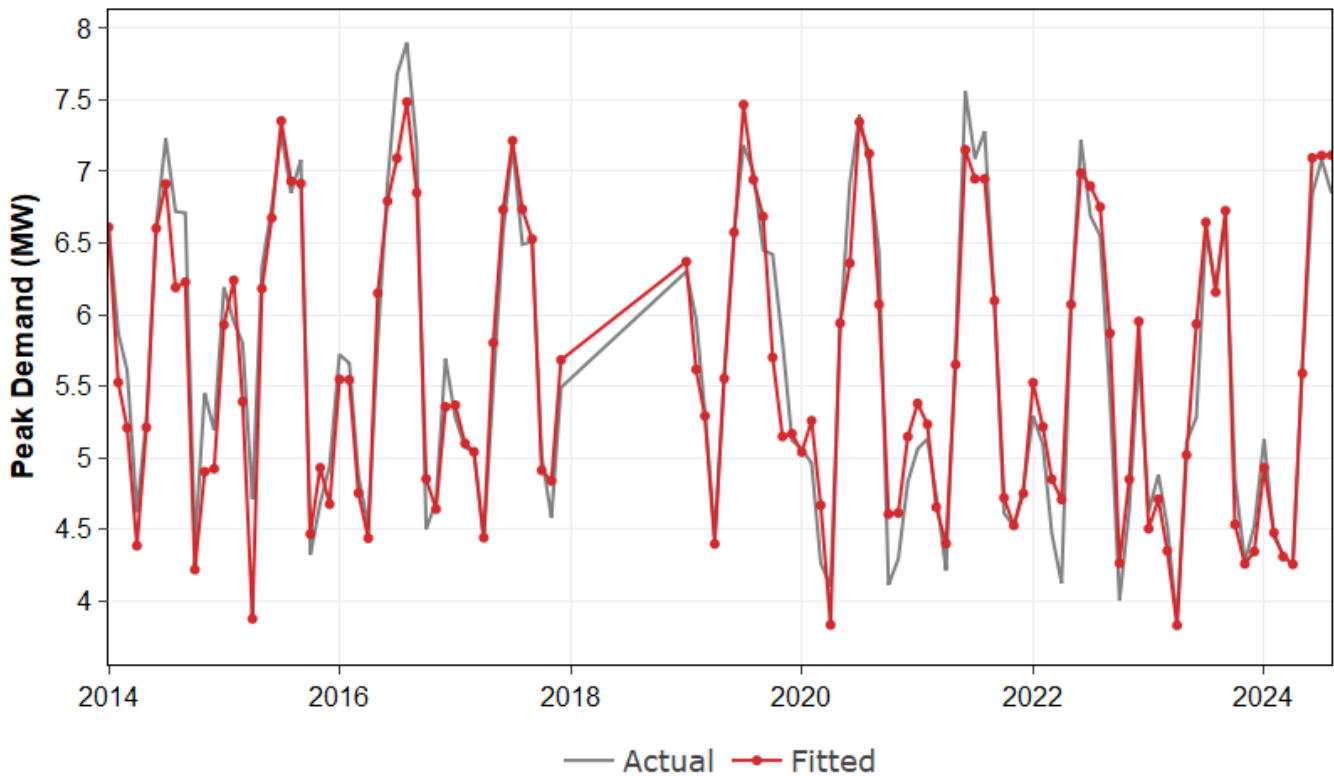


Figure 7. Historical & Fitted Monthly Peak Demand

FITTED MODEL STATISTICS

Table 3. Total Energy Model Statistics

Model	Total Energy
Method	Least Squares
Number of Observations	116
Dependent Variables	TotalEnergy
Independent Variables	CDDSUM, HDDSQSUM, CDD3DAYMAX, NumberOfHouseholds, ManualAdjustment1, Month2, Month3, Month4, Month5, Month6, Month7, Month8, Month9, Month10, Month11, Month12

Variable	Estimate	Std. Error	t-Statistic	P-value
(Intercept)	-969.70	3,718.64	-0.26	7.95e-01
CDDSUM	3.86	0.43	8.98	1.81e-14
HDDSQSUM	0.01	0.00	8.20	9.06e-13
CDD3DAYMAX	-5.24	2.20	-2.38	1.92e-02
NumberOfHouseholds	6.44	6.75	0.95	3.43e-01
ManualAdjustment1	-212.79	22.86	-9.31	3.51e-15
Month2	-231.90	43.88	-5.28	7.51e-07
Month3	-157.08	53.82	-2.92	4.35e-03
Month4	-404.91	72.23	-5.61	1.88e-07
Month5	-327.38	88.39	-3.70	3.50e-04
Month6	-253.09	105.52	-2.40	1.83e-02
Month7	-24.85	124.23	-0.20	8.42e-01
Month8	-70.80	112.32	-0.63	5.30e-01
Month9	-272.53	95.04	-2.87	5.06e-03
Month10	-310.06	77.35	-4.01	1.19e-04
Month11	-255.71	58.36	-4.38	2.94e-05
Month12	-19.77	47.57	-0.42	6.79e-01

R-squared	0.9520
Adjusted R-squared	0.9443
Residual Std. Error	13.2663
F-statistic	122.7735

Table 4. Peak Demand Model Statistics

Model	Peak Demand
Method	Least Squares
Number of Observations	116
Dependent Variables	PeakDemand
Independent Variables	HDDSQMAX, TMAX, CDD3DAYMAX, HDD3DAYMAX, NumberOfHouseholds, ManualAdjustment1, Month2, Month3, Month4, Month5, Month6, Month7, Month8, Month9, Month10, Month11, Month12

Variable	Estimate	Std. Error	t-Statistic	P-value
(Intercept)	-19.32	11.90	-1.62	1.08e-01
HDDSQMAX	0.00	0.00	4.96	2.97e-06
TMAX	-0.02	0.01	-2.43	1.69e-02
CDD3DAYMAX	0.06	0.01	8.77	5.68e-14
HDD3DAYMAX	-0.01	0.00	-2.20	3.02e-02
NumberOfHouseholds	0.05	0.02	2.16	3.35e-02
ManualAdjustment1	-0.53	0.07	-7.22	1.11e-10
Month2	-0.03	0.14	-0.22	8.25e-01
Month3	-0.17	0.18	-0.92	3.61e-01
Month4	-0.85	0.24	-3.61	4.91e-04
Month5	-0.11	0.30	-0.36	7.18e-01
Month6	0.27	0.39	0.69	4.89e-01
Month7	0.34	0.42	0.79	4.29e-01
Month8	0.43	0.40	1.08	2.84e-01
Month9	0.39	0.35	1.12	2.66e-01
Month10	-0.45	0.25	-1.79	7.67e-02
Month11	-0.24	0.18	-1.33	1.87e-01
Month12	-0.16	0.14	-1.13	2.60e-01

R-squared	0.9363
Adjusted R-squared	0.9252
Residual Std. Error	0.0420
F-statistic	84.6753

MODELLED INDEPENDENT VARIABLES

Table 5. Model Variables Considered

Type	Variable Name	Description
Economic	TotalEmployment	Total Employment
	TotalPersonalIncome	Total Personal Income
	GrossRegionalProduct	Gross Regional Product
	NumberOfHouseholds	Number Of Households
	TotalRetailSalesIncludingFoodSales	Total Retail Sales
	WPWealthIndex	Woods & Poole Wealth Index
	IncomePerCapita	Income Per Capita
	MeanHouseholdIncome	Mean Household Income
Weather	CDDSUM	Total Cooling Degree Days
	HDDSUM	Total Heating Degree Days
	CDDSQSUM	Total Cooling Degree Days Squared
	HDDSQSUM	Total Heating Degree Days Squared
	CDDMAX	Maximum Cooling Degree Days
	HDDMAX	Maximum Heating Degree Days
	CDDSQMAX	Maximum Cooling Degree Days Squared
	HDDSQMAX	Maximum Heating Degree Days Squared
	TMIN	Minimum Hourly Temperature
	TMAX	Maximum Hourly Temperature
	CDD3DAYMAX	Maximum 3-Day Cooling Degree Days
	HDD3DAYMAX	Maximum 3-Day Heating Degree Days

WOODS & POOLE ECONOMIC FORECAST ASSUMPTIONS

Woods & Poole’s economic projections are developed in five main steps, visualized below in Figure 8. The process first creates forecasts of total United States personal income, earnings by industry, employment by industry, population, inflation, and other variables. These projections are primarily developed using historical data from the U.S. Bureau of Economic Analysis.

The country is then divided into 179 economic areas as defined by the Bureau of Economic Analysis. These areas are aggregates of contiguous counties within the United States. For each economic area, a simultaneous projection is created for employment, controlled using the nation-wide employment forecast. Based on these employment projections, total population and total earnings forecasts are created for each economic area, assuming employment is the primary driver for earnings and population growth. This process is then repeated at the county level, controlled using the forecast for each economic area developed in prior steps.



Figure 8. Woods & Poole Economic Forecast Overview

Figure 9 below shows the history and resulting projections for total employment in Allegheny County, along with the year-over-year growth rates. Employment growth over the last 10-year period has averaged 0.7% in Allegheny County, while forecasted growth is expected to average 0.4% over the next decade.

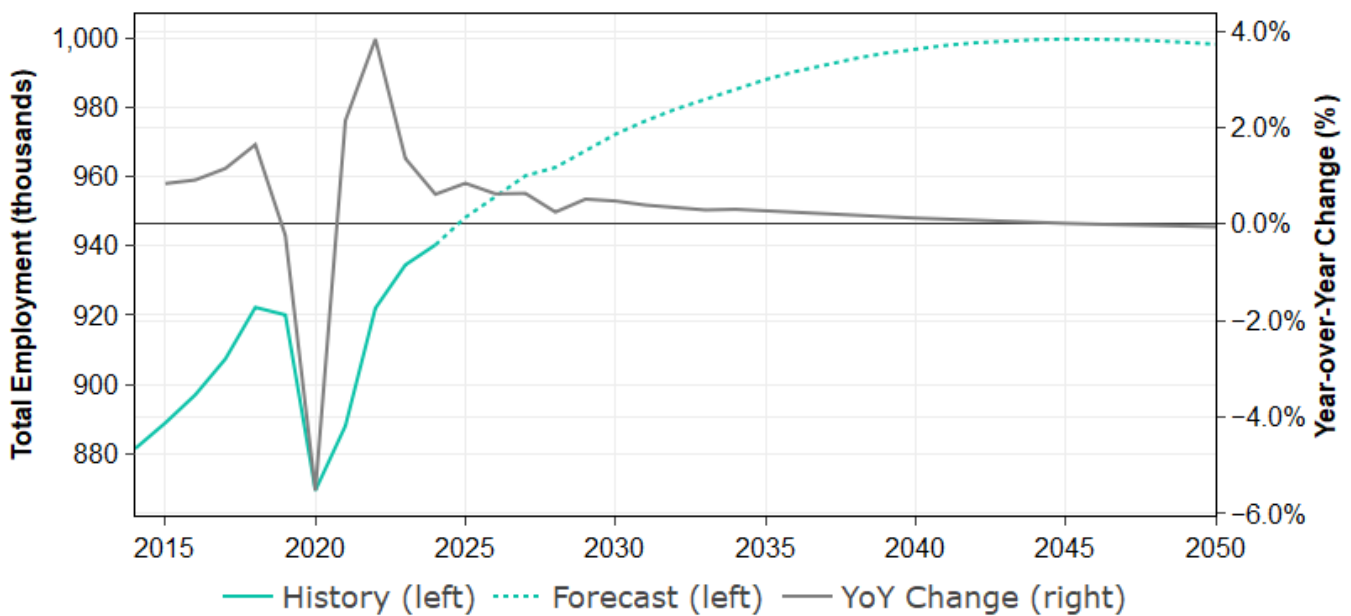


Figure 9. Woods & Poole Allegheny County Employment

Comparing the county-level employment forecast to more regional projections, Figure 10 provides an overview of the historical and projected employment growth rates for Allegheny County, its corresponding economic area (Pittsburgh-New Castle, PA), and the U.S. as a whole. Overall, employment growth in Allegheny County is expected to lag growth in its respective economic area by 0.1% over the next 10 years. This compares to U.S. employment growth, which is projected to outpace growth in Allegheny County employment over the next 10 years by 0.8%.

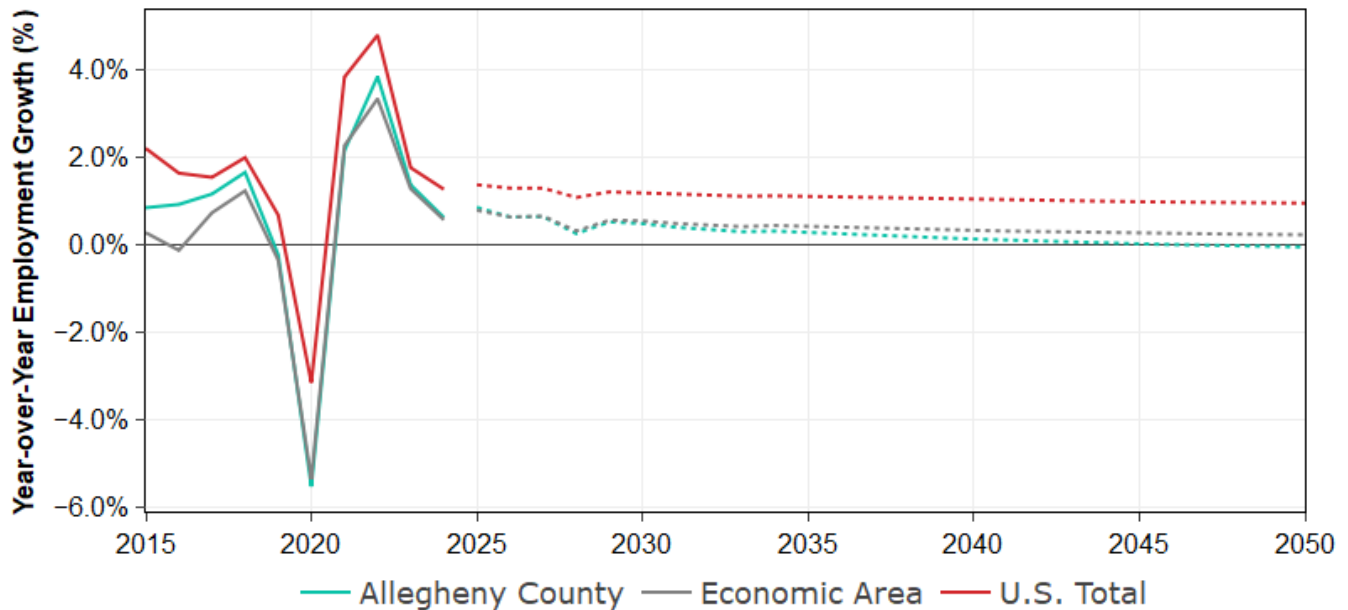


Figure 10. County, Economic Area, & U.S. Employment Growth

Contrary to employment, future population growth in Allegheny County is expected to average -0.2% over the next 10 years. This difference between employment and population growth is generally reflective of an increase of commuter populations within surrounding counties. Figure 11 below reflects historical and forecasted population growth, for reference.

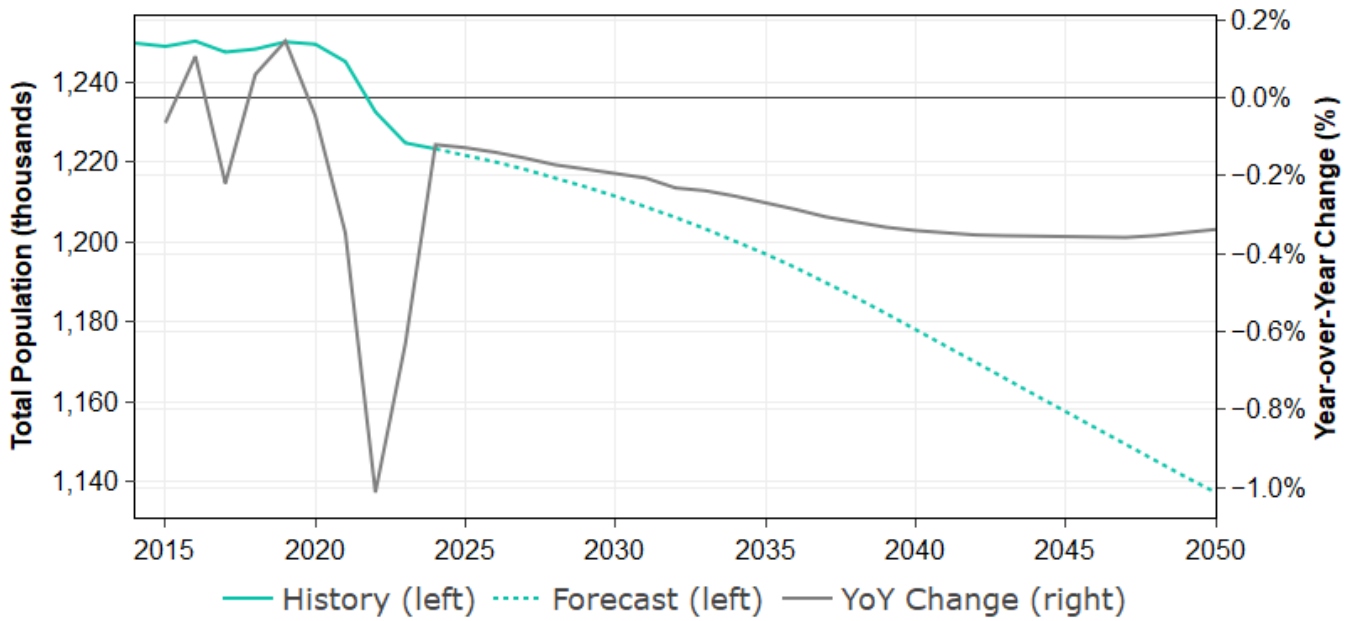


Figure 11. Woods & Poole Allegheny County Population