Analysis Approach—Bill Calculations

We estimate how residential customer utility bills change under different tariff structures by combining representative building load data with utility-specific tariff data. We filter a set of representative homes for a given utility territory, aggregate the baseline and post-electrification load profiles for those homes, apply the relevant electric and gas tariffs as well as 2025 average state-level delivered fuel prices, and compare annual and seasonal bill outcomes across rate options. This structure allows us to test both existing tariffs and alternative rate designs using a consistent analytical framework.

The load profiles are drawn from NREL's ResStock dataset, which provides modeled residential building samples and time-series energy use profiles. We map ResStock building samples to electric and gas utility territories using geographic service territory data, and then filter those samples based on the relevant analysis criteria, such as heating fuel type and upgrade scenario. For electrification scenarios, the tool uses ResStock's 2024.2 release and upgrade scenario 2, representing upgrading to a high efficiency cold-climate air-to-air heat pump with electric backup. The result is a set of hourly electric and gas load profiles that can be aggregated or assessed at the individual-building level.

Tariff data are then pulled from Genability for electric rates and RateAcuity for gas rates, which together provide the fixed charges, volumetric rates, riders, seasonal structures, and other tariff components needed to calculate monthly and annual bills. In practice, this step sometimes requires manual review or targeted adjustments, particularly where percentage-based riders, overlapping surcharges, or utility-specific tariff conventions are not captured cleanly in the source databases. We use state-average monthly delivered fuel prices (fuel oil and propane) from the Energy Information Administration. Once tariffs are structured, we apply them to each building's load profile to calculate bills under the baseline and electrification scenario. We then summarize the results across the sample to evaluate average bill impacts, the distribution of outcomes across customers, and how rate design changes affect households that electrify.

Utility-Specific Notes

In some cases, we adjusted the downloaded tariffs to ensure a consistent analytical approach and that the tariffs reflected the costs paid by residential customers. Relevant adjustments are documented below.

1. Xcel Energy (Minnesota)

Percent-Based Rider djustments

The percent-based riders in Xcel Minnesota's tariffs required manual adjustment to reflect their appropriate applicability across tariff components.

Key assumption: Percent-based interim rate adjustment surcharges do **not** apply universally across all tariff components. Instead, specific exclusions were implemented to prevent over-application. We assume that the affordability surcharge counts as one of the "low-income program surcharges" that are listed for exclusion in the rider book. The modeling approach assumes that the interim rate adjustment surcharge is not intended to be layered on top of other riders and is therefore restricted to a subset of applicable volumetric delivery or supply components and/or fixed/customer-level charges (as appropriate). The relevant tariff information can be seen at this link.

Excluded components (surcharge NOT applied):

- Conservation Improvement Program Adjustment
- Environmental Improvement Charge
- Mercury Cost Recovery
- Renewable Development Fund
- Affordability Surcharge
- Renewable Energy Standard Adjustment

CenterPoint Residential Sales Gas Tariff

We recreated the CenterPoint Residential Sales Gas Tariff for calendar year 2025 using information from the latest rate case. Some of the rates and riders within the tariff were changed in September 2025 due to the implementation of an approved rate case. We assumed that these riders were updated to match the new rate case from September through December 2025. CenterPoint also applies a city-specific franchise fee to residential customers, which is either a percent-based fee or a flat dollar charge. We assumed that the average of the flat dollar charges across all cities was applied to each customer's monthly bills. This equates to an additional $3.40 monthly charge for each customer.

2. Pepco (Maryland)

As discussed in our blog, the default Pepco Maryland rate includes seasonally differentiated volumetric charges between summer and winter and is considered our 'electrification-friendly' rate design. To provide a comparable point of reference with the other utility examples, we designed a hypothetical flat rate with consistent volumetric charges across the year, labeled as the 'default' rate in our analysis.

Relevant data to assess the hypothetical flat rate were drawn from Pepco Maryland's testimony in rate case 9820 before the Maryland Public Service Commission. The total revenue collected by the utility in the residential class by volumetric charges was calculated by summing the products of kWh consumed and the corresponding rate for summer and winter, as indicated by the table below. The flat rate was assumed to equal the dollar-per-kWh value obtained by dividing total revenue by total annual kWh consumption in the rate case filing.

	kWh Consumption	Current Rate
Summer (Residential -R)	2,041,124,680	$0.08760
Winter (Residential -R)	2,694,288,870	$0.04328
Summer (Residential Time Metered R-TM)	353,617,820	$0.05296
Winter (Residential Time Metered R-TM)	462,824,040	$0.04493
Total (R)	4,735,413,550	NA
Total (R-TM)	816,441,860	NA

3. Central Maine Power (Maine)

No adjustments were made to the Central Maine Power electric and gas rates.

4. Eversource Energy (Massachusetts)

No adjustments were made to the Eversource Massachusetts electric and gas rates.

Approximating Electrification-Friendly Rate Enrollment

We assessed the approximate number of heat pumps in each utility territory and the number of heat pump customers enrolled in the "electrification-friendly" rate to illustrate the impact of various customer enrollment approaches.

For Central Maine Power, the total number of customers with heat pumps in the state of Maine was estimated using public reporting. We approximated the number of heat pump customers in Central Maine Power territory by applying the ratio of Central Maine Power customers compared to all electricity customers in the state to the total number of heat pump customers in the state using EIA electricity sales data. We then assumed that 10,000 customers are enrolled in the opt-in rate. This is a loose approximation, based on twice the number of customers eligible to enroll in the previous heat pump-specific rate offered by the utility.

For Pepco Maryland, the total number of customers with heat pumps in the state of Maryland was identified primarily using EIA RECS data. We approximated the number of heat pump customers in Pepco Maryland territory by applying the ratio of Pepco Maryland customers compared to all electricity customers in the state to the total number of heat pump customers in the state using EIA electricity sales data. Pepco Maryland's "electrification-friendly" rate applies to all customers.

Estimates for electrification-friendly enrollment in Eversource Massachusetts and Xcel Minnesota come from Genability. The total number of heat pump customers in each of those territories was estimated to be 10% higher than the number of customers enrolled in each rate, to reflect that these rates automatically enroll customers and therefore likely see the vast majority of heat pump customers taking advantage of them.