

Trends in Regulated Retail Electricity and Natural Gas Bills

September 6, 2016

Taking action to promote effective competition and a culture of compliance and accountability in Alberta's electricity and retail natural gas markets

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Executive Summary

As part of its retail market monitoring mandate, the MSA is tasked with examining the state of regulated consumer electricity and natural gas bills.

This report examines trends present in regulated retail electricity and natural gas bills from 2012 to early 2016. Section 1 describes the structural characteristics of Alberta's regulated retail energy market. The following sections examine recent trends in regulated energy bills.

Several conclusions are reached (numbered according to section):

2 Regulated energy bills in Alberta vary substantially by region and municipality

The province is separated into four main service areas for electricity (and three for natural gas) served by different distribution utilities (Figures 1.1 and 1.2). Transmission and distribution charges for consumers vary dramatically by service area, primarily due to differences in population density, which affect costs. Regional differences in weather also impact energy consumption, leading to varying energy bills. Consumers are also charged access fees, imposed by municipal governments, which vary significantly by municipality.

3 Regulated energy bills have fallen, driven primarily by wholesale prices

Since 2012, residential consumers of the regulated rate option have paid less for electricity as a result of lower wholesale prices. While transmission and distribution charges have increased over the same period, overall residential consumers' electricity bills have fallen.

Similarly, consumers have paid less for regulated natural gas products since 2014, also driven by lower wholesale prices. During this period distribution charges have increased, but this increase has been offset by lower energy charges, leading to lower bills overall.

4 Distribution and transmission costs have increased steadily

The amount paid by residential consumers for transmission and distribution is increasing. Because energy prices have fallen considerably, not only are transmission and distribution costs increasing in absolute, their share of consumers' bills is increasing.

5 Different dwelling types face fundamentally different energy bills

Larger homes tend to consume a greater amount of energy than smaller homes, resulting in higher overall energy bills. However, due to the existence of fixed charges that do not vary with the level of consumption, consumers with lower consumption tend to pay more per delivered unit of energy. Changes in fixed and variable rates between periods have resulted in years that bills have decreased for one type of consumer, but increased for another type of consumer.

6 The marginal cost of energy has implications for energy efficiency

The marginal cost of energy is the cost consumers can avoid by consuming one less unit of energy. Higher marginal costs provide consumers with greater financial incentive to reduce consumption, because more costs can be avoided. Falling regulated energy rates have lowered the marginal cost of energy since 2012, which may provide fewer incentives to reduce consumption.

To promote transparency and to supplement regular retail market reporting,¹ the MSA has released a Billing Tool that contains a comprehensive set of retail billing information for regulated electricity and natural gas bills, all drawn from publically available sources.

1 Structural Characteristics of Regulated Retail Energy Markets

1.1 Service Zones and Regulated Energy Providers

A household that purchases regulated energy does so from their regulated energy provider.² Regulated energy providers differ by service zone.

Alberta has four main electricity service zones, serving specific geographic areas:

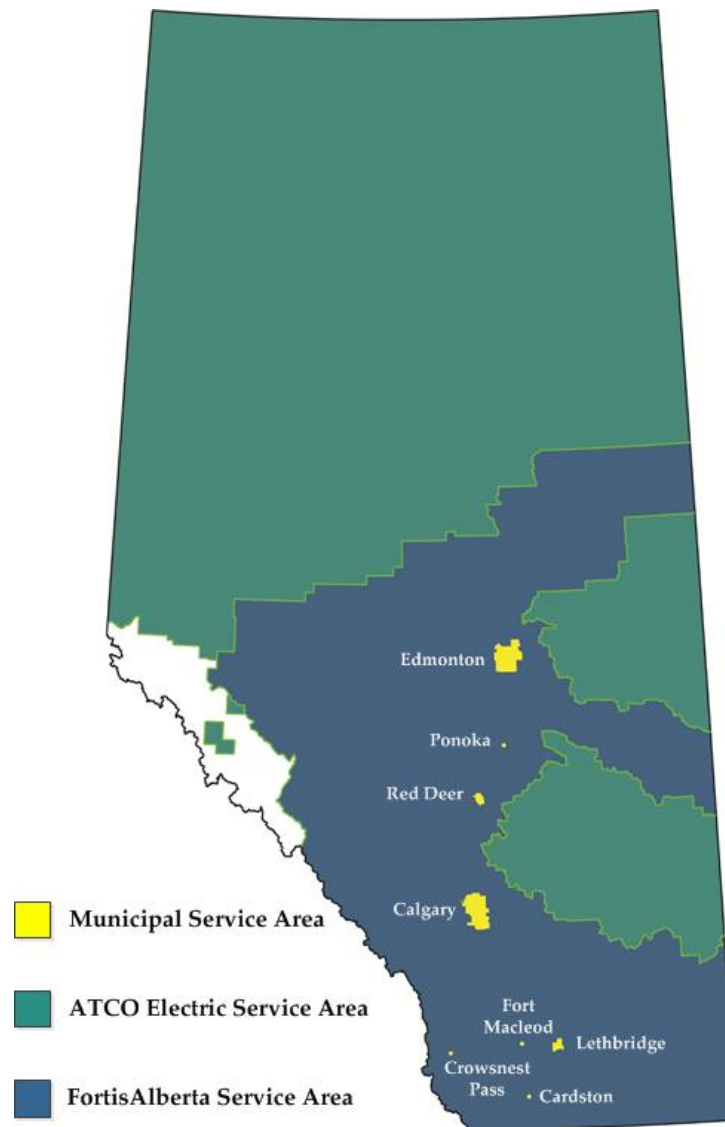
1. ENMAX (Serving the City of Calgary)
2. EPCOR (Serving the City of Edmonton)
3. FortisAlberta
4. ATCO

The ENMAX and EPCOR provide the regulated rate option (RRO) in their respective zones, while Direct Energy provides the RRO in the ATCO service zone and EPCOR provides the RRO in the FortisAlberta zone.

¹ In addition to the MSA's Retail Quarterly Report updates, several standalone reports have been released, including: [Retail Market Update 2015](#), [State of the market 2014: The residential retail markets for electricity and natural gas](#), and [Alberta Retail Markets for Electricity and Natural Gas: A description of basic structural features](#). Retail Market Statistics are available on the [MSA Website](#) (updated periodically).

² Any reference to ENMAX, EPCOR, FortisAlberta, ATCO, Direct Energy and AltaGas in this report is in reference to the regulated energy component of the business and/or distribution zone. This report makes no comment on competitive contracts or other services offered by the above.

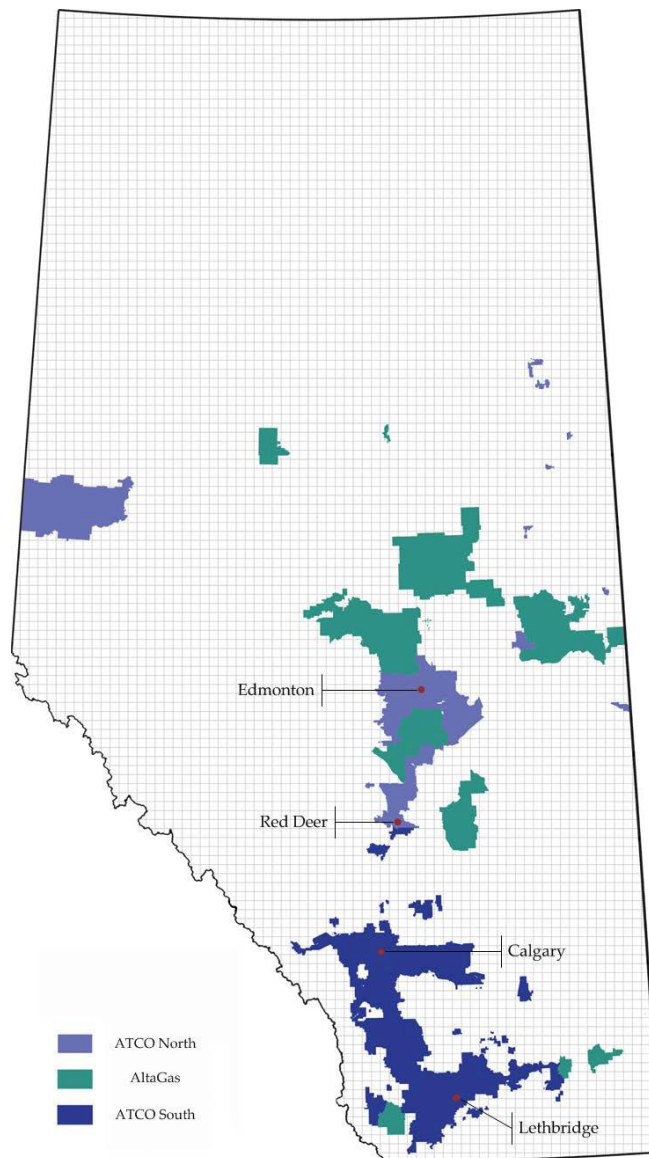
Figure 1.1 – Electricity Service Zones in Alberta



Alberta also has three natural gas service zones, serving specific geographic areas:

1. ATCO North
2. ATCO South
3. AltaGas

Figure 1.2 – Natural Gas Service Zones in Alberta



Note that the cities of Calgary and Edmonton receive electricity distribution service from ENMAX and EPCOR, respectively. This report and the Billing Tool developed to accompany it do not consider some of the data for smaller municipal service areas or Rural Electrification Associations.

All rates appearing on a consumer's energy bills are specific to a service zone and energy provider, resulting in different regulated billing rates depending on where a consumer resides.

1.2 The Regulated Rate Option and Default Rate Tariff

Consumers that have not signed a competitive contract for electricity or natural gas purchase regulated energy by default. Regulated electricity is referred to as the Regulated Rate Option,

while regulated natural gas is called the Default Rate Tariff (DRT). These rates exist by provincial mandate, but are not themselves set by government.

The electric energy itself is sold to consumers at the RRO Rate. Regulated energy providers set RRO Rates based on the cost of energy procured for each delivery month through auctions or the forward market. These procurement periods begin up to four months ahead of delivery, depending on the service zone.³

Regulated natural gas is sold to consumers at the DRT Rate: a flow-through cost based on wholesale natural gas prices. Similarly to electricity, most regulated natural gas is procured one or two months prior to delivery.

1.3 Regulated Retail Energy Bills

A standard regulated energy bill is comprised of various components that cover the costs of providing energy to consumers, as described in Table 1.3. Many of these components are composed of a variety of sub-components, which may be billed at fixed or variable rates, or a percentage rate.⁴

Table 1.3 – Regulated Electricity & Natural Gas Bill Components

<u>Bill Component</u>	<u>Description</u>
Energy	Payment for the energy itself.
Transmission	Recovers the cost of using the transmission system. Natural gas bills recover transmission costs using rate riders, while electricity bills contain explicit transmission charges.
Distribution	Payment for the use of the distribution system.
Access Fees	Paid to the local municipality. Typically comprised of an assessment charge and franchise fee.
Rate Riders	Used to true-up any past over/under-collections; may be a charge or a refund.
Administration	Paid to the regulated energy provider for its administrative services.
GST	Paid to the federal government.

³ While the regulated energy provider for the ENMAX and ATCO zones uses a price-setting period of 45 days, the provider for the EPCOR and FortisAlberta zones uses a 120-day price-setting period.

A basic description of the Regulated Rate Option can be found in Pages 4 – 6 of the [Alberta Retail Markets for Electricity and Natural Gas: A description of basic structural features](#).

A basic description of the Regulated Rate Option can be found in Pages 4 – 6 of the [Alberta Retail Markets for Electricity and Natural Gas: A description of basic structural features](#).

An explanation of the differences in RRO energy procurement between service zones has been provided on Page 16 of the [Q4/15 Quarterly Report](#).

The 120-day price setting period now used by EPCOR was established in 2013, as described on Page 11 of the [AUC 2015 Regulated Rate Tariff and Energy Price Setting Plans Generic Proceeding](#).

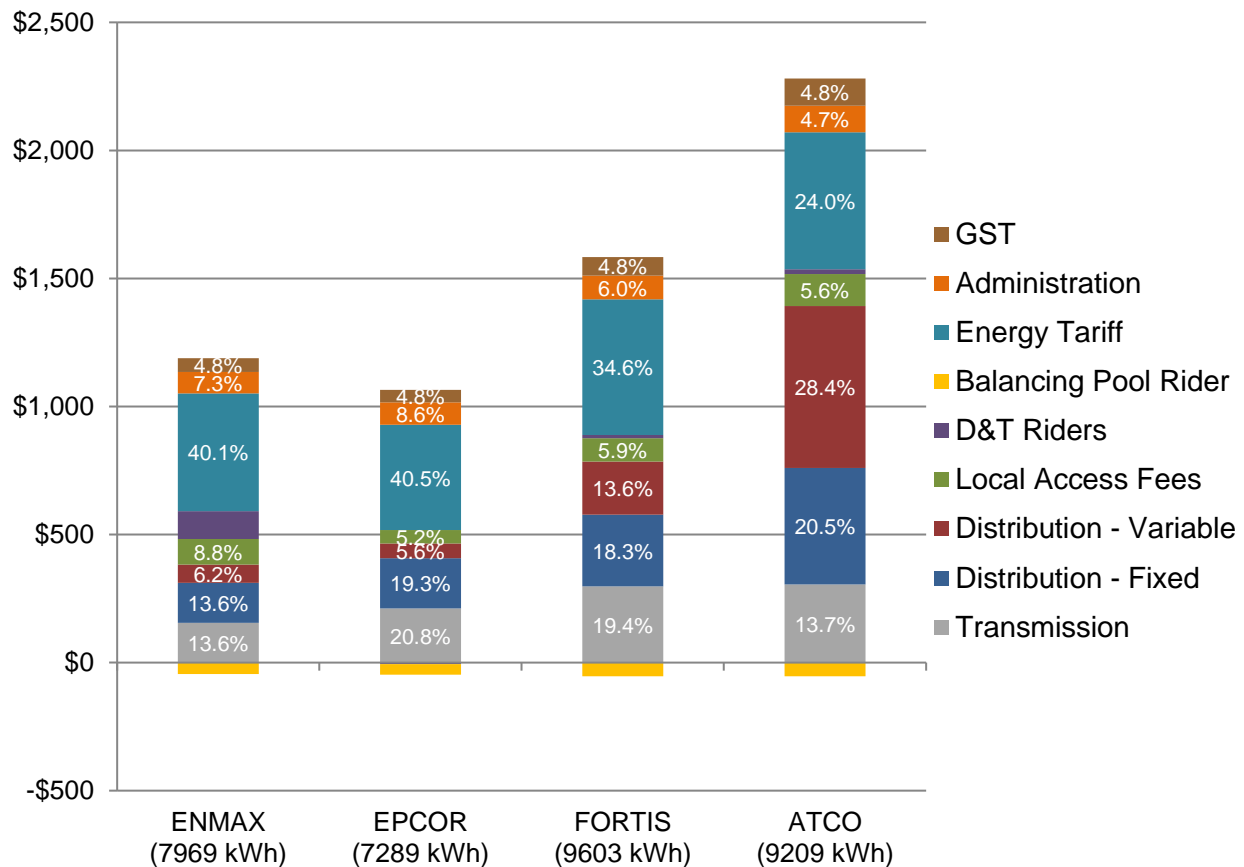
⁴ This refers to sub-charges that are calculated as a percentage of a sum of fixed and/or variable charges. Most access fees and some rate riders (as well as GST) are calculated using this method.

2 Regulated energy bills in Alberta vary substantially by region and municipality

2.1 Electricity

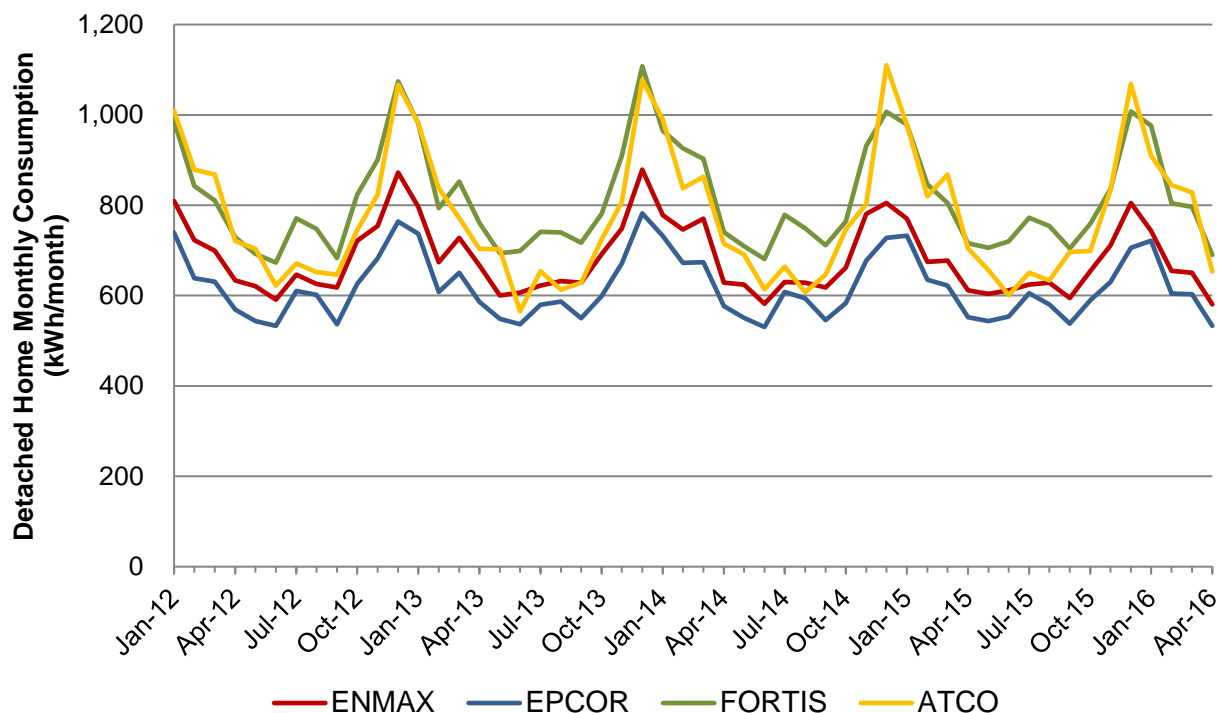
As shown by Figure 2.1 below, typical detached homes in different regions of the province paid dramatically different amounts for electricity in 2015.

Figure 2.1 – Typical Detached Home Annual Total Regulated Electricity Bill in 2015 by Service Zone (Annual Consumption in kWh)



This regional variation is primarily driven by differences in transmission and distribution costs ([Section 4](#)), but is also influenced by varying regional consumption levels. Figure 2.2 illustrates the differences in average monthly consumption for a detached home.

Figure 2.2 – Typical Detached Home Monthly Electricity Consumption by Service Zone, January 2012 – April 2016



Notably, consumers in the ATCO service area have the highest annual bill but often consume less than those in the FortisAlberta service area. This is a result of higher rates in the ATCO service area. Consumers in the EPCOR service area have the lowest bills but also consume the least, meaning low EPCOR rates are not entirely responsible for the low bills.

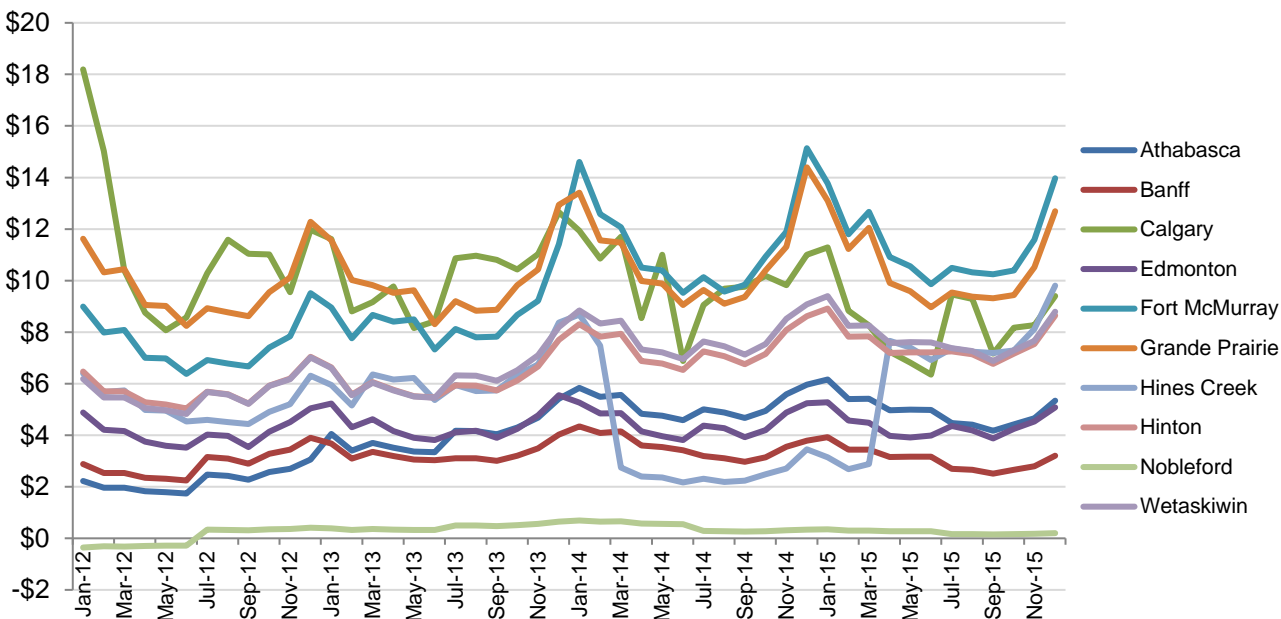
Regulated bills also vary by municipality. An access fee is collected on behalf of a customer's municipality, which includes a franchise fee / local access fee and often an assessment charge. Franchise fees are paid to the municipality for the right to be the exclusive distribution provider, while the assessment charge is a property tax paid on linear property (such as power lines) built on municipal land.⁵ Typically, both access fees are charged to the consumer as a percentage of monthly transmission and distribution charges, although EPCOR (Edmonton) uses a fixed ¢/kWh energy rate and ENMAX (Calgary) uses a single percentage rate applicable to transmission, distribution, energy and rate riders.

Figure 2.3 shows the total monthly access fee charges paid for a typical detached home in select municipalities. Note that because consumption values vary based on service zone, these charges reflect the percentage access fee rate, regional consumption levels, as well as the rates to which the percentages are applied.

⁵ [AUC Franchise Agreement between Town of Hinton and FortisAlberta Inc.](#), Page 8.

Access fees have historically varied considerably between municipalities,⁶ due to the high variability in access fee rates, regional consumption patterns, and differences in transmission and distribution charges between service zones.⁷

Figure 2.3: Monthly Electricity Access Fees for Select Municipalities, 2012 – 2015



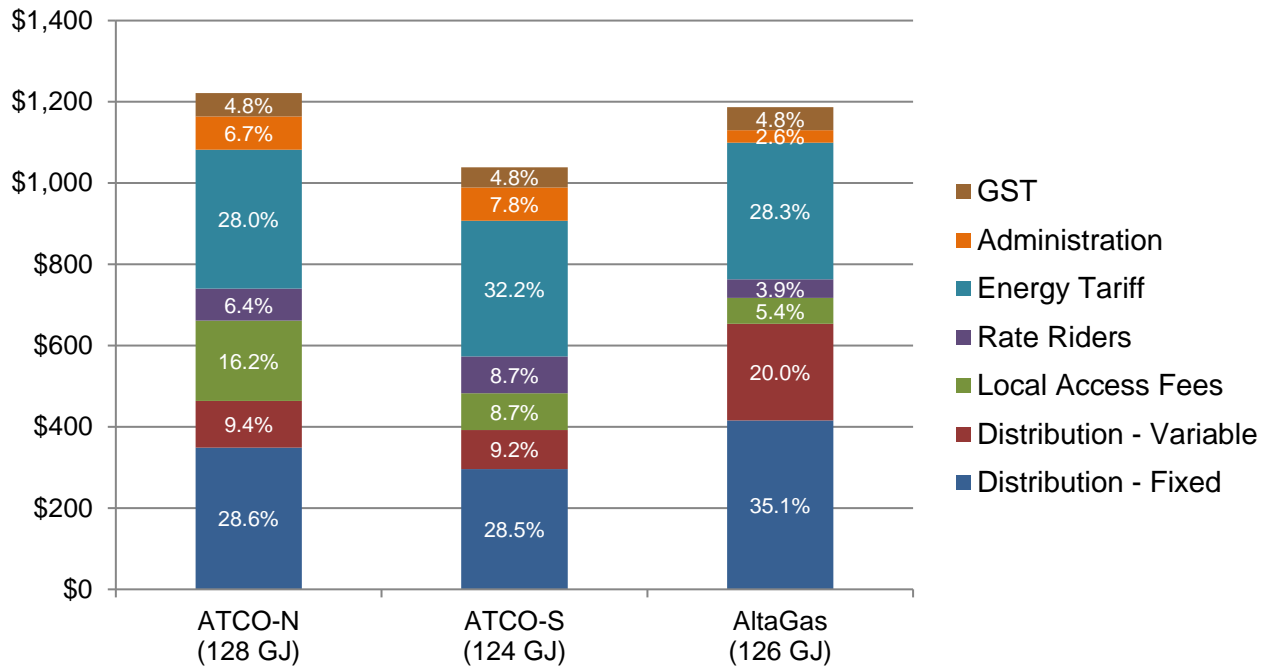
2.2 Natural Gas

Annual regulated natural gas bills also vary by service region, with ATCO North and AltaGas regions typically paying more than the ATCO South zone.

⁶ A [January 2010 ATCO tariff](#) illustrates the variability in municipal assessment rates (referred to as Rider A-1).

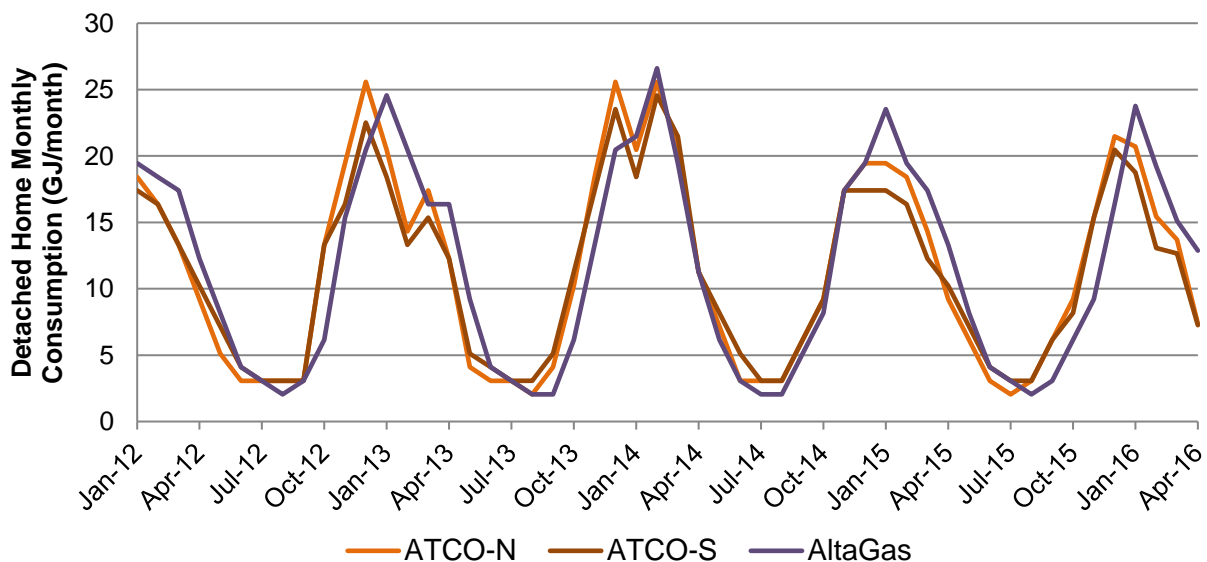
⁷ As Calgary has not adjusted its local access fee [since 2004](#), the entirety of the variation in Calgary access fees in Figure 2.3 is due to changes in consumption and other rates to which the 11.11% access rate is applied.

Figure 2.4 – Typical Detached Home Annual Total Regulated Natural Gas Bill in 2015 by Service Zone (Annual Consumption in GJ)



Differences in regional bills can be explained by differences in distribution charges, which are considerably higher in the lower density AltaGas region than the two ATCO zones, as well as differences in access fees. Unlike electricity, natural gas consumption is similar across zones, and does not play a substantial role in explaining regional bill differences.

Figure 2.5 – Typical Detached Home Monthly Natural Gas Consumption by Service Zone, January 2012 – April 2016



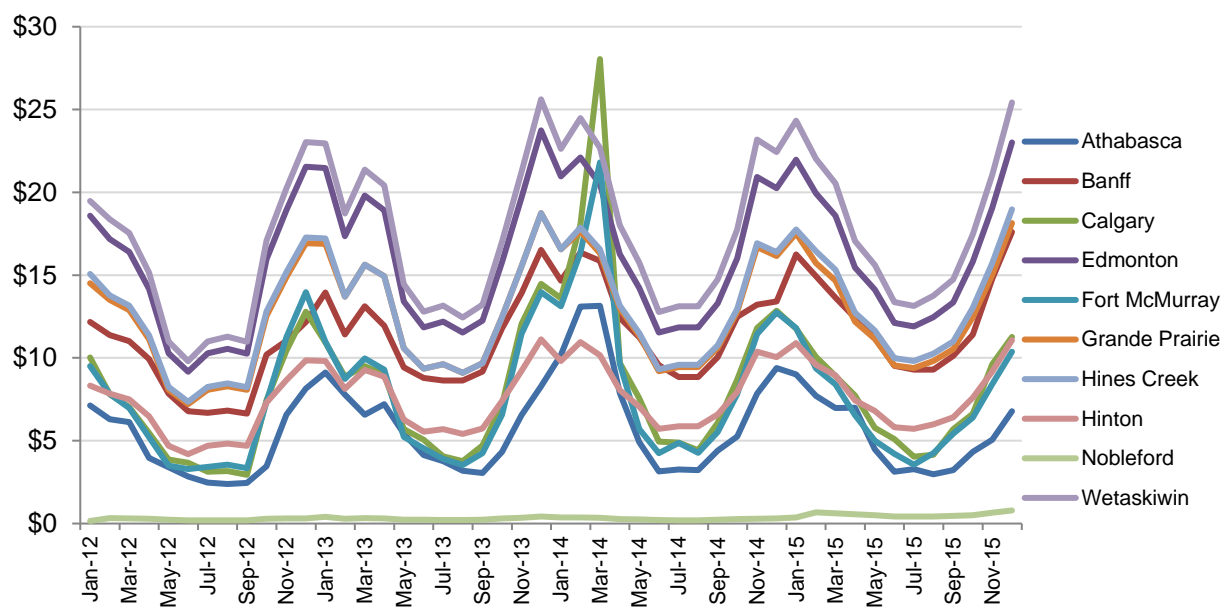
Natural gas access fees function similarly to those in electricity, although they are typically applied as percentages of monthly distribution and rate rider charges.

Because variable bill charges increase with consumption (typically higher in winter months), taxable bill components also rise in the same periods, resulting in higher access fees in winter months.

Figure 2.6 shows the monthly total access fee charges associated with typical detached home consumption in select municipalities. Note that because these consumption values vary based on service zone, these charges reflect the percentage access fee rate, regional consumption levels, as well as the rates to which the percentages are applied.

Access fees have historically varied substantially between municipalities,⁸ due to the high variability in access rates, regional consumption patterns, and differences in distribution charges between service zones.⁹

Figure 2.6: Monthly Natural Gas Access Fees for Select Municipalities, 2012 – 2015



3 Regulated energy bills have fallen, driven primarily by wholesale prices

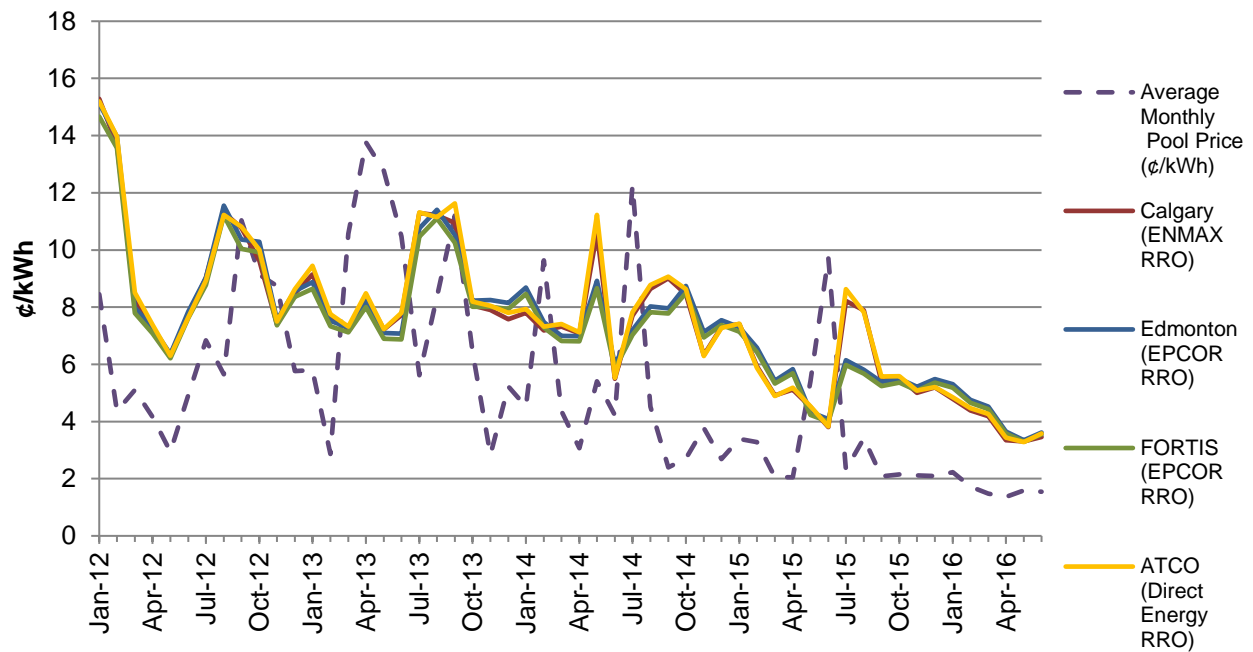
3.1 Electricity

The downward trend in pool price since 2012 has decreased RRO Rates paid by consumers, lowering the energy component of regulated residential electricity bills.

⁸ A [January 2010 ATCO tariff](#) illustrates the variability in municipal assessment rates (referred to as Rider A-1).

⁹ As Calgary has not adjusted its local access fee [since 2004](#), the entirety of the variation in Calgary access fees in Figure 2.6 is due to changes in consumption and other rates to which the 11.11% access rate is applied.

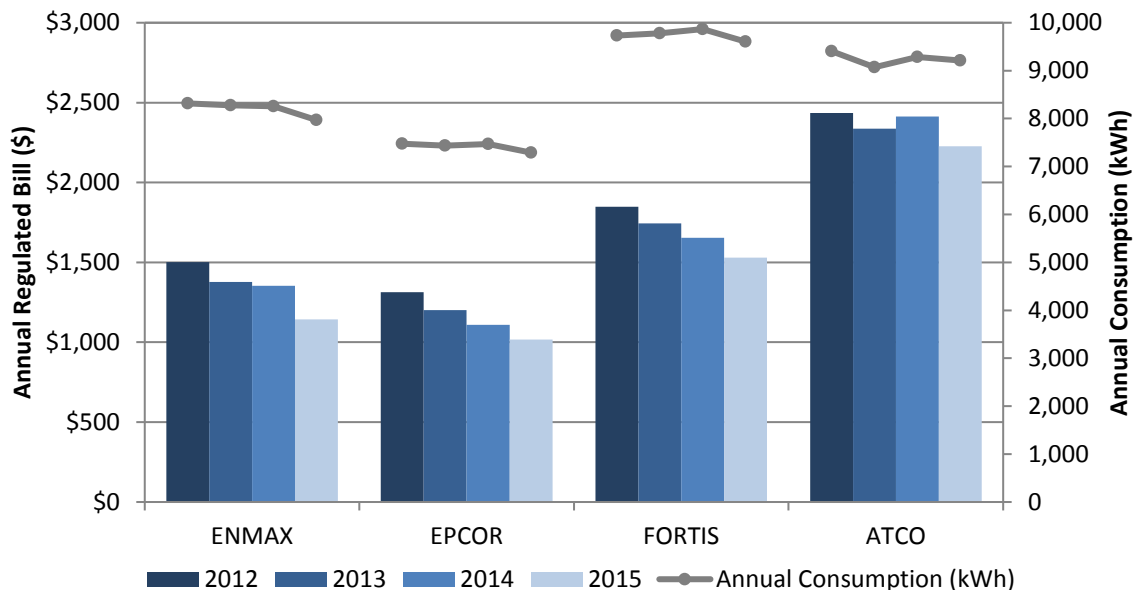
Figure 3.1 – Monthly RRO Rate (¢/kWh) by Service Zone vs Pool Price¹⁰, January 2012 – June 2016



While most other bill components have increased over the same period, decreases in energy charges have been sufficiently large that electricity bills have generally declined since 2012. Additionally, some zones and municipalities have seen access fees fall since 2012.¹¹ Figure 3.2 illustrates this decrease in annual regulated electricity bills for a typical detached home.

¹⁰ The RRO providers for the service zones have been indicated with brackets.

¹¹ Access fees have fallen in some cases due to adjustments in the access fee percentage rate, lower energy charges on which access fee rates are then applied, slightly lower consumption, or a combination of the above.

Figure 3.2 – Annual Regulated Electricity Bill for a Typical Detached Home, 2012-2015

Recent decreases in electricity bills have been largely driven by an excess supply of generation in Alberta; this has driven down the electricity pool price, leading to lower energy rates for consumers (especially those on regulated and floating rate plans). However, this occurred concurrently with increases in other bill components, notably distribution and transmission.

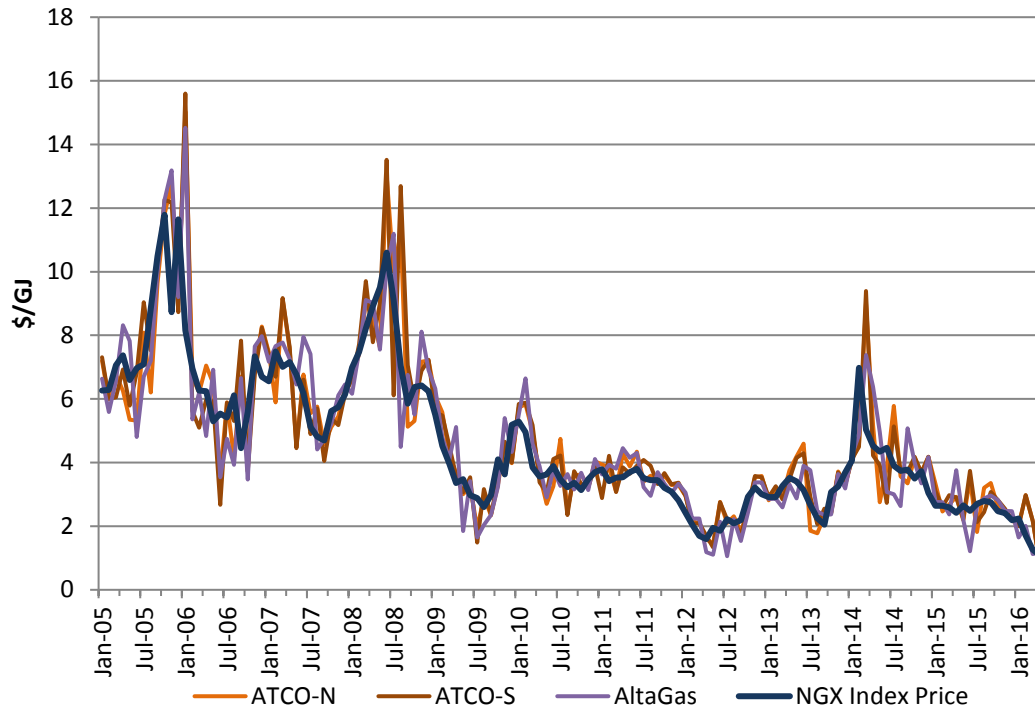
Currently, wholesale energy rates do not have considerable space to decrease further and distribution and transmission costs are forecast to increase.¹² Consequently, it is unlikely that electricity bills will continue to fall.

3.2 Natural Gas

Residential annual natural gas bills have only decreased more recently in 2015 after three years of increases, primarily due to the effects of wholesale natural gas prices on the DRT Rate. Natural gas demand is highly weather-dependent, which can cause wholesale prices and the DRT Rate to fluctuate dramatically during periods of extreme weather, such as that which occurred in 2014 (Figure 3.3).

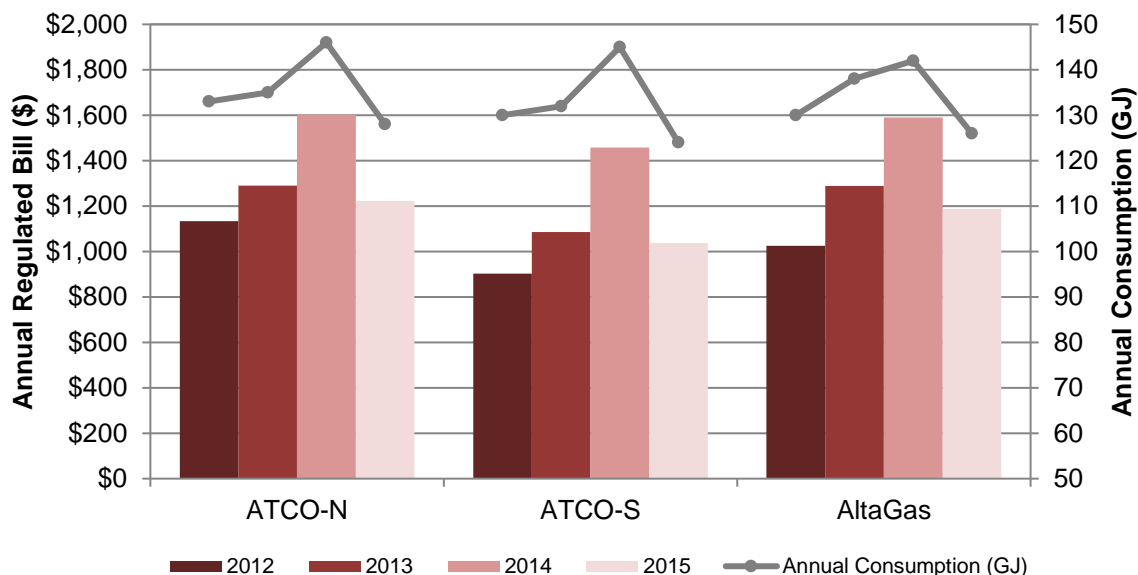
¹² See, for example, [AESO Transmission Rate Impact Projection Model](#).

Figure 3.3 – Monthly DRT Rate (\$/GJ) by Service Zone, January 2005 – April 2016¹³



The effect of changes in the DRT Rate is evident in the annual regulated natural gas bills paid by consumers. Recent decreases in the DRT Rate after 2014 have led to dramatically lower annual bills, although not as low as bills in 2012.

¹³ Monthly DRT Rate data is available from [AltaGas](#) (as the “GCRR”) and ATCO Gas for the [North](#) and [South](#) service zones.

Figure 3.4 – Annual Regulated Natural Gas Bill for a Typical Detached Home, 2012-2015

4 Distribution and transmission costs have increased steadily

The costs of paying for and maintaining energy distribution and transmission systems are passed on to consumers in the form of fixed and variable charges on monthly energy bills. Unlike the RRO and DRT Rates, distribution and transmission rates are regulated by the Alberta Utilities Commission, and are based on various cost and economic factors.¹⁴

Transmission and distribution costs appear on consumers' electricity bills as explicit charges, while natural gas bills only list distribution charges explicitly.¹⁵

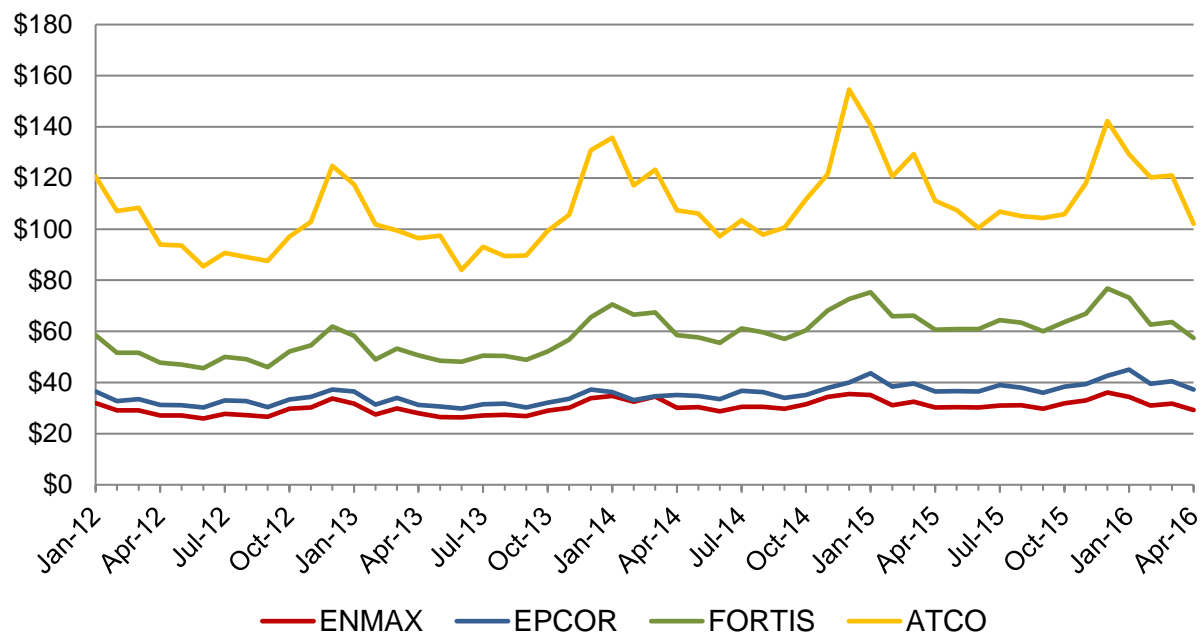
4.1 Electricity

Electricity consumers in all service zones pay for transmission at a variable rate (¢/kWh) and distribution at both a fixed ($\text{\$/day}$) and variable rate, with rates varying across zones. Distribution and transmission charges have steadily increased in all zones except the ENMAX zone since 2012. This is most noticeable in the ATCO and FortisAlberta service zones, which experience greater seasonal variation in consumption and serve larger areas than the ENMAX or EPCOR zones, resulting in higher, more varied charges month to month.

¹⁴ In most service zones, transmission rates are determined using a Cost of Service methodology whereby distributors pass the cost of using the shared transmission system onto consumers. Distribution rates are set using a price cap mechanism, where rates are adjusted based on economic indicators.

¹⁵ Natural gas bills classify transmission charges as a rate rider; this report has continued to treat it as such.

Figure 4.1 – Typical Detached Home Monthly Distribution and Transmission Charges by Service Zone, January 2012 – April 2016



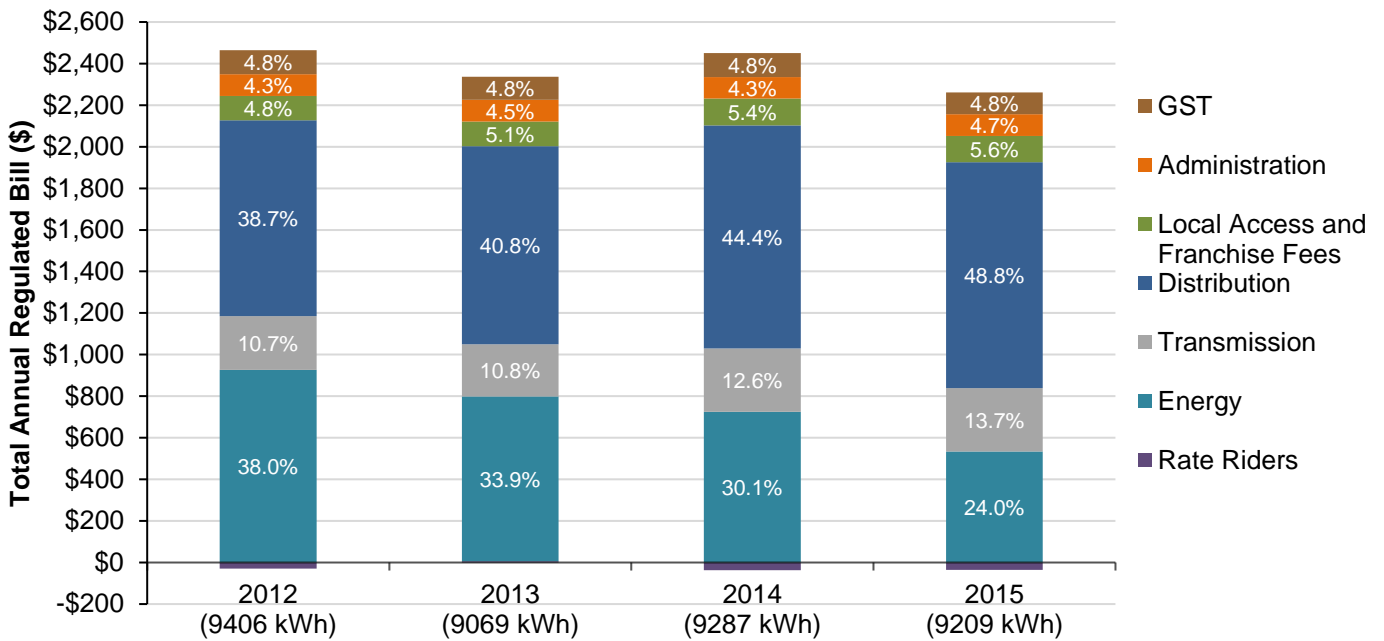
Distribution charges are higher than transmission charges in all zones, especially in the FortisAlberta and ATCO service zones. ENMAX transmission charges are unique in that the variable transmission rate has been unchanged over the January 2012 to April 2016 period, as any changes in the ENMAX transmission revenue requirement have been accounted for in its Transmission Access Charge Deferral Account Rider.¹⁶

All electricity service zones use a similar rider to collect or refund its transmission deferral account with the AESO. For the purposes of this report, we treat riders as separate from their cost-related rates. Residential consumers in different service zones pay similar amounts of transmission charges when deferral account riders are included in the analysis of transmission costs.

The shares of annual detached home total bills accounted for by transmission and distribution have increased since 2012, with distribution representing the higher annual cost in all service zones. The distribution share is largest in the ATCO zone at 48.8% of the total bill in 2015. Combined, distribution and transmission encompassed more than 50% of the total bill in both the FortisAlberta and ATCO service zones in 2015.

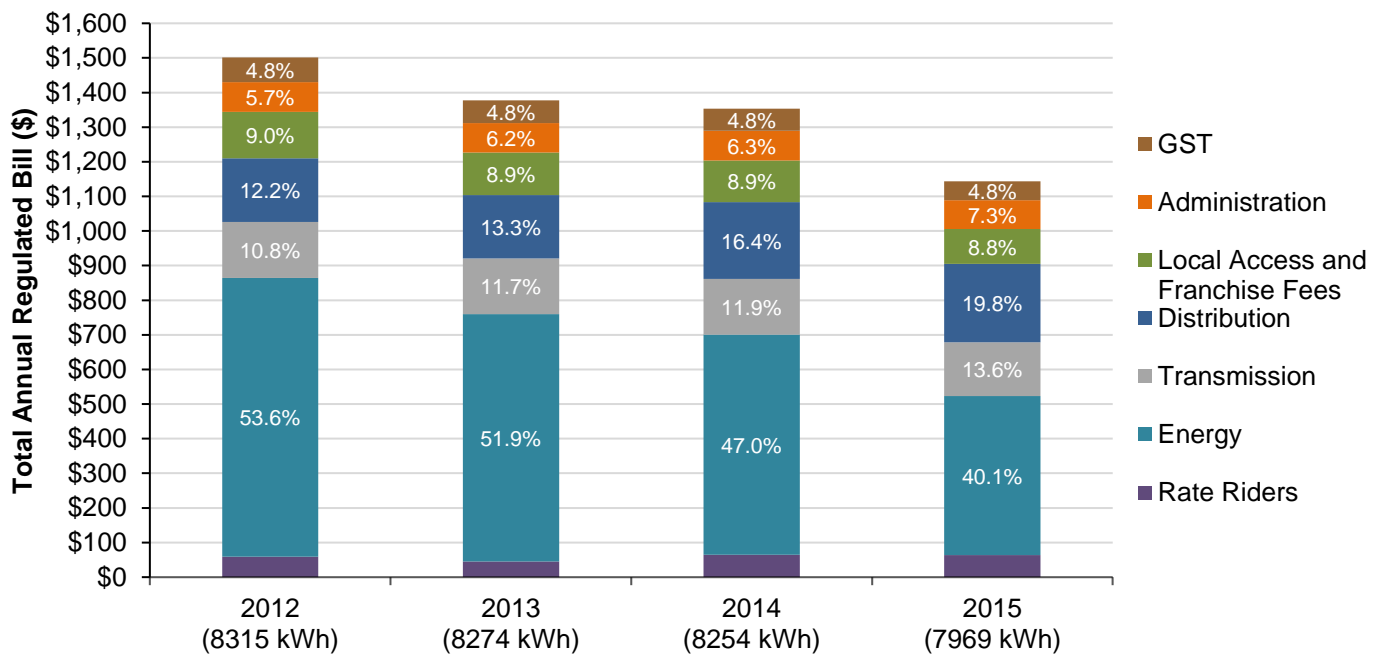
¹⁶ The Transmission Access Charge Deferral Account Rider is designed to recover any excesses or deficiencies in ENMAX's forecasted deferral account with the AESO. The AESO's forecasted deferral account contains the expected difference in transmission revenues and costs, the balance of which is charged or refunded to market participants through the AESO's Rider C.

Figure 4.2 – Components of Annual ATCO Service Zone Typical Detached Home RRO Bills, 2012-2015



In contrast, ENMAX has consistently had the lowest percentage shares of distribution and transmission since 2012.

Figure 4.3 – Components of Annual ENMAX Service Zone Typical Detached Home RRO Bills, 2012-2015



There are three causes for the increased distribution and transmission shares of regulated electricity bills:

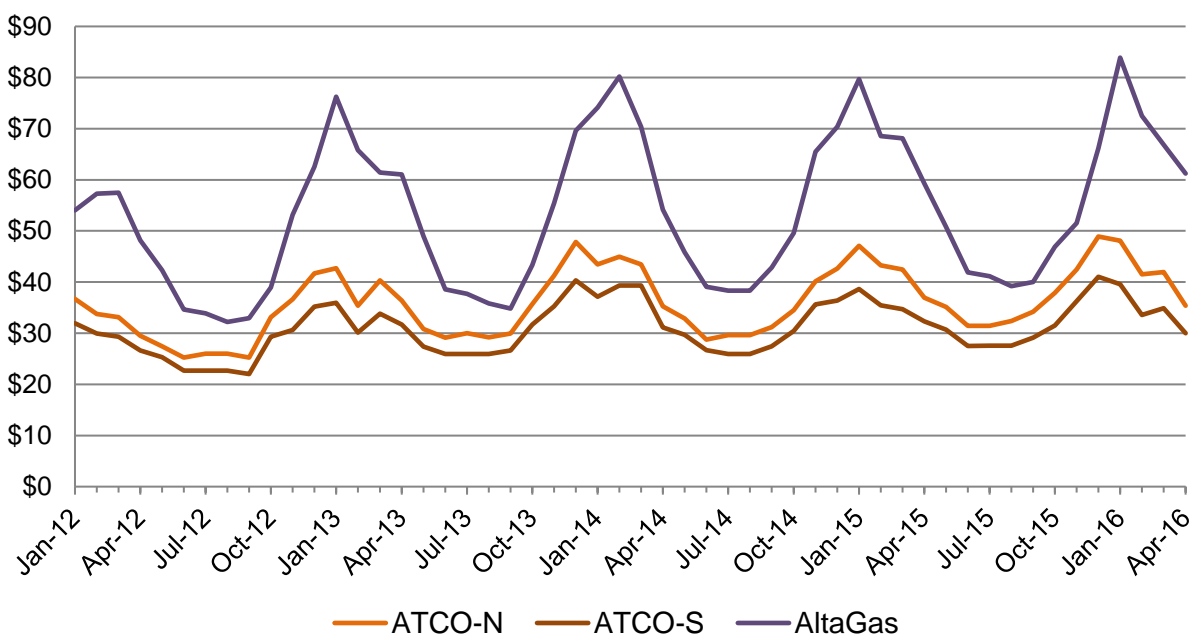
- 1) Decreases in the RRO Rate have caused decreases in energy charges, increasing the bill-share of other components.
- 2) Most distribution rates have increased since 2012.
- 3) Most transmission rates have increased since 2012 (with ENMAX the exception).

Overall, this four-year trend indicates that for most service zones, transmission and distribution components of a typical detached home RRO bill are increasing in absolute value, and are encompassing an ever-greater share of annual regulated electricity bills.

4.2 Natural Gas

Natural gas consumers in all service zones pay for distribution at both a fixed (\$/day) and variable rate (¢/kWh), with rates varying by zone. Annual total natural gas distribution charges have consistently increased in the ATCO-N and ATCO-S zones since 2012, and generally increased in the AltaGas region, with the exception of late 2015, where abnormally low consumption stemming from mild winter weather in the region decreased variable distribution charges sufficiently to offset increases in the fixed distribution rate (see Figure 2.5).

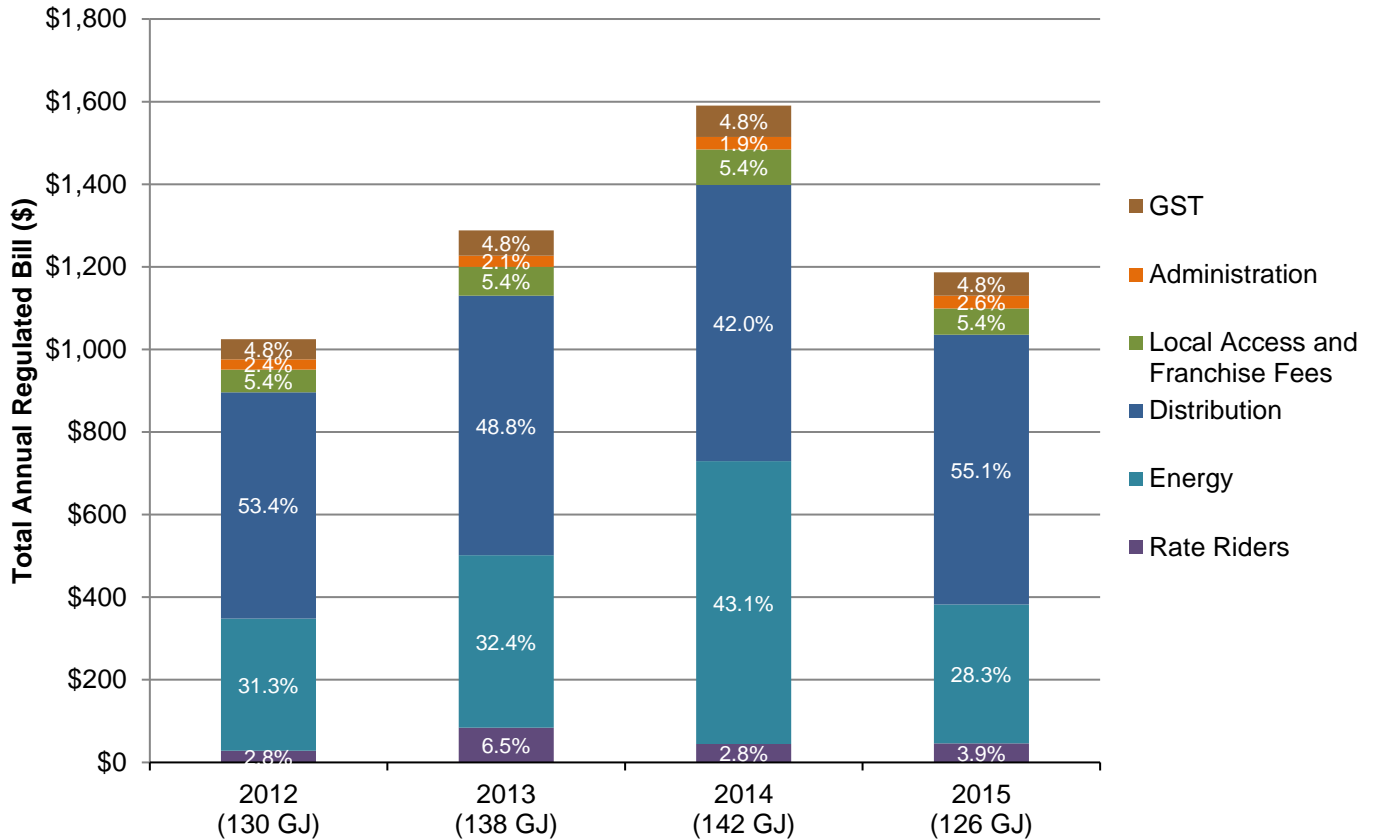
Figure 4.4 – Typical Detached Home Monthly Total Distribution Charges by Service Zone, January 2012 – April 2016



Distribution charges are now the largest component of a typical detached home's total annual natural gas bills in each service zone, as a result of the decrease in price of natural gas. Notably, distribution components now account for 55.1% of annual AltaGas bills, which is

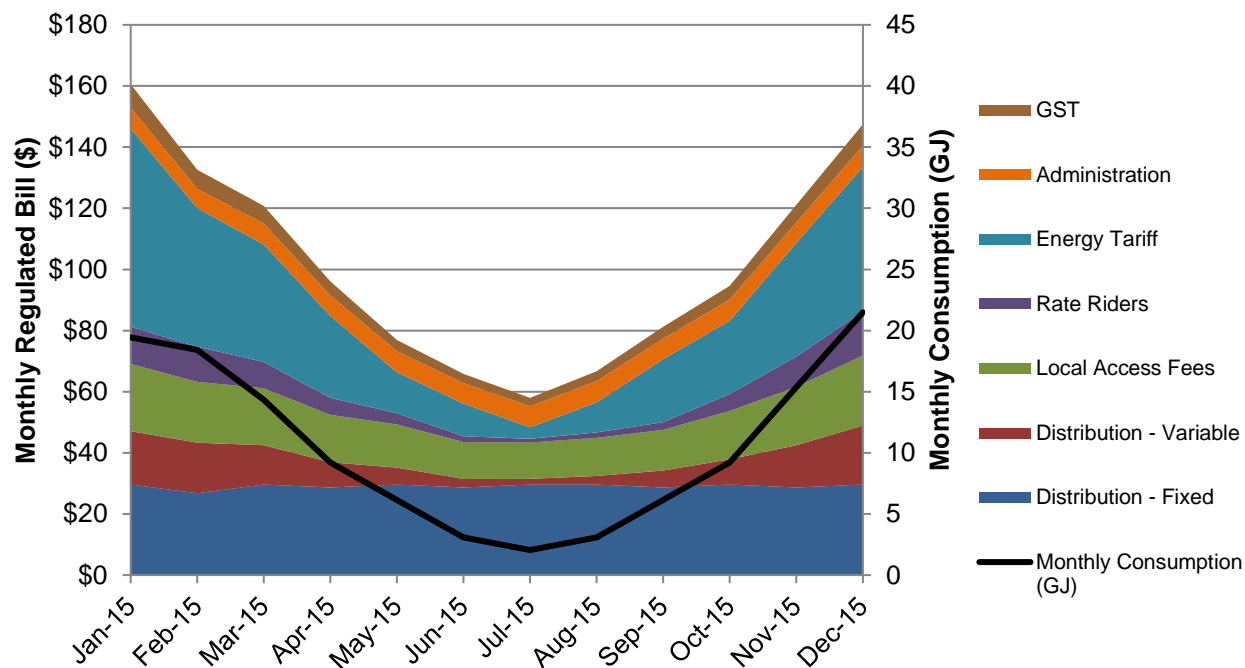
partially attributable to increases in annual distribution charges totalling approximately \$100 since 2012.

Figure 4.5 – Components of Annual AltaGas Service Zone Typical Detached Home DRT Bills, 2012-2015



Seasonality also plays a role in monthly distribution charges. Winter months consistently see distribution charges displaced by energy charges as the largest bill component. Additionally, higher winter natural gas consumption leads to considerably higher monthly distribution charges through the variable rate components, which decrease dramatically over the summer months as consumption falls. Monthly detached home bills in the ATCO North region illustrate these seasonal effects (Figure 4.6).

Figure 4.6 – Typical Detached Home Monthly Total Regulated Natural Gas Bill in 2015 for ATCO North



5 Different dwelling types face fundamentally different energy bills

5.1 Modelling Energy Bills by Dwelling Type

Attempting to analyze energy bills for an “average” consumer in Alberta would not appropriately model the consumption patterns of different types of homes, which consume different amounts and types of energy. To resolve this, the MSA has developed energy consumption levels for three dwelling type classifications (Detached Home, Attached Home and Apartment), in order to better model energy bills homeowners face.

These dwelling consumption levels are derived using 2013 annual home energy consumption data available from Natural Resources Canada’s Comprehensive Energy Use Database,¹⁷ each dwelling consumption value being shaped with average monthly RRO consumption by service zone.¹⁸

¹⁷ [Natural Resources Canada - Comprehensive Energy Use Database](#), Tables 34, 36, 38.

¹⁸ Typical dwelling consumption is estimated using the 2013 annual average consumption value for the corresponding dwelling type (the latest available from Natural Resources Canada). For each month this annual consumption value is scaled by the actual monthly consumption in each service region (relative to the actual 2013 average RRO consumption). For example, if average monthly consumption was relatively high in the ENMAX region in January 2014 compared to the 2013 annual Alberta RRO average, each of the dwelling types’ average consumptions for January 2014 in the ENMAX region is scaled accordingly.

Table 5.1 – Average Alberta Energy Consumption by Dwelling Type¹⁹

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Average Monthly Electricity Consumption (kWh)														
Detached	613	650	659	610	607	603	605	656	682	684	699	774	685	714
Attached	464	495	498	461	458	456	456	491	512	510	524	577	513	536
Apartment	337	359	363	336	336	336	334	362	377	377	390	430	382	398
Average Monthly Natural Gas Consumption (GJ)														
Detached	14.6	12.3	13.6	13.6	13.2	11.8	11.4	13.2	12.6	12.0	11.1	11.5	11.3	11.2
Attached	7.8	6.7	7.3	7.5	7.3	6.7	6.4	7.4	7.2	7.0	6.6	7.0	7.0	7.1

5.2 Energy Bill Differences by Dwelling Type

Due to differences in energy consumption, different dwelling types pay bills of varying scale and composition. Consumers with greater consumption have higher bills, with a greater proportion of their annual bills paying for energy components. In contrast, consumers with lower consumption – such as those living in apartments or detached homes – pay lower bills, but also pay a greater proportion of their bills to non-energy components. Figures 5.2 and 5.3 illustrate these dwelling type energy bill differences for homes in the ENMAX and ATCO-South service zones.

¹⁹ Apartment natural gas consumption has been excluded because a building with a sufficiently large number of units that aggregates natural gas consumption and then applies charges to individual units (in the form of rent) might be subject to a different customer classification. For example, a Calgary apartment with 20 units each consuming a monthly average of 5.25 GJ of natural gas would consume 1260 GJ annually, and would be subject to different rates than would the majority of residential homes.

Figure 5.2 – Annual Regulated Electricity Bills in the ENMAX Service Zone by Dwelling Type, 2012 – 2015

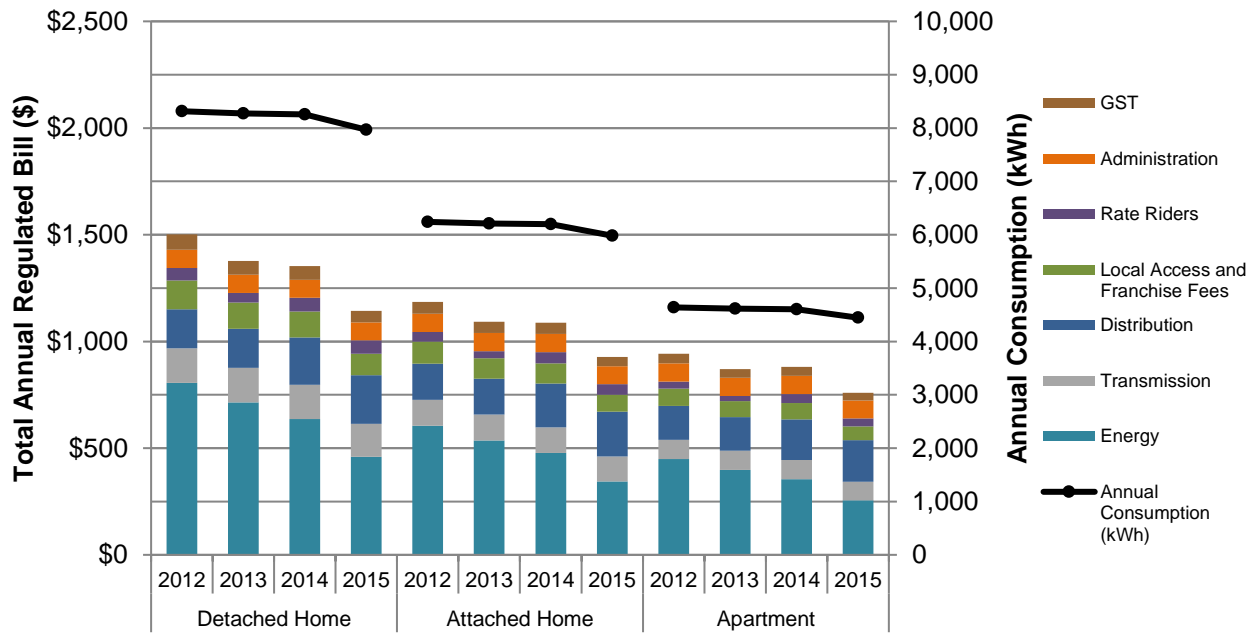


Figure 5.3 – Annual Regulated Natural Gas Bills in the ATCO-South Service Zone by Dwelling Type, 2012 – 2015

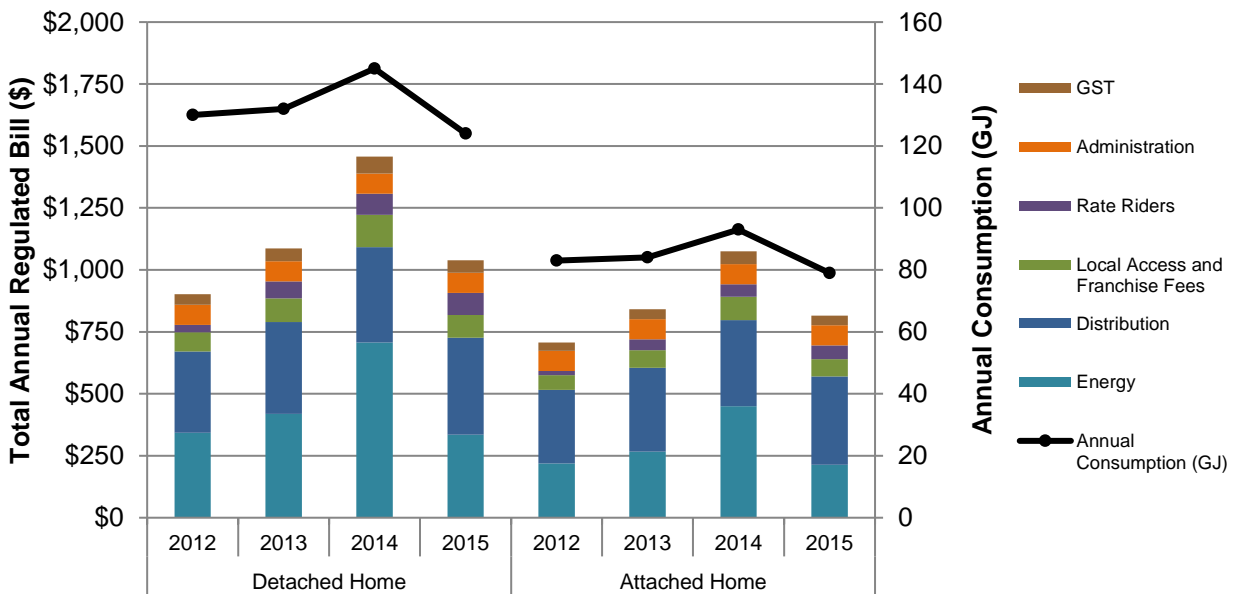


Figure 5.2 also shows that typical detached homes in Calgary saw their annual electricity bills fall by approximately \$24 between 2013 and 2014, while a typical apartment's annual bill increased by approximately \$10 over the same period. This was largely due to the lower 2014 RRO Rate and transmission rider outweighing an increased fixed distribution charge for typical detached home electricity bills, while typical apartment consumption was not sufficiently large to see their lower variable charges outweigh the increased fixed charge.

Because smaller consumers pay a greater proportion of their bill towards unavoidable fixed costs, these smaller consumers pay a higher all-in rate for energy (although the all-in rate should not be treated as the price of energy – see [Section 6](#)).²⁰

6 The marginal cost of energy has implications for energy efficiency

The marginal cost of energy is the sum of variable rates that a consumer pays per unit of energy (¢/kWh for electricity, $\text{\$/GJ}$ for natural gas);²¹ these costs can be actively avoided by reducing consumption.²² This is in contrast to the all-in rate, which includes fixed costs, and is not an appropriate measure of the cost of additional consumption.

Rates on residential regulated bills are consistent across all types of residential consumers within a service zone and are not dependent on consumption behavior. As such, the marginal cost of energy is the same for all households and levels of consumption.

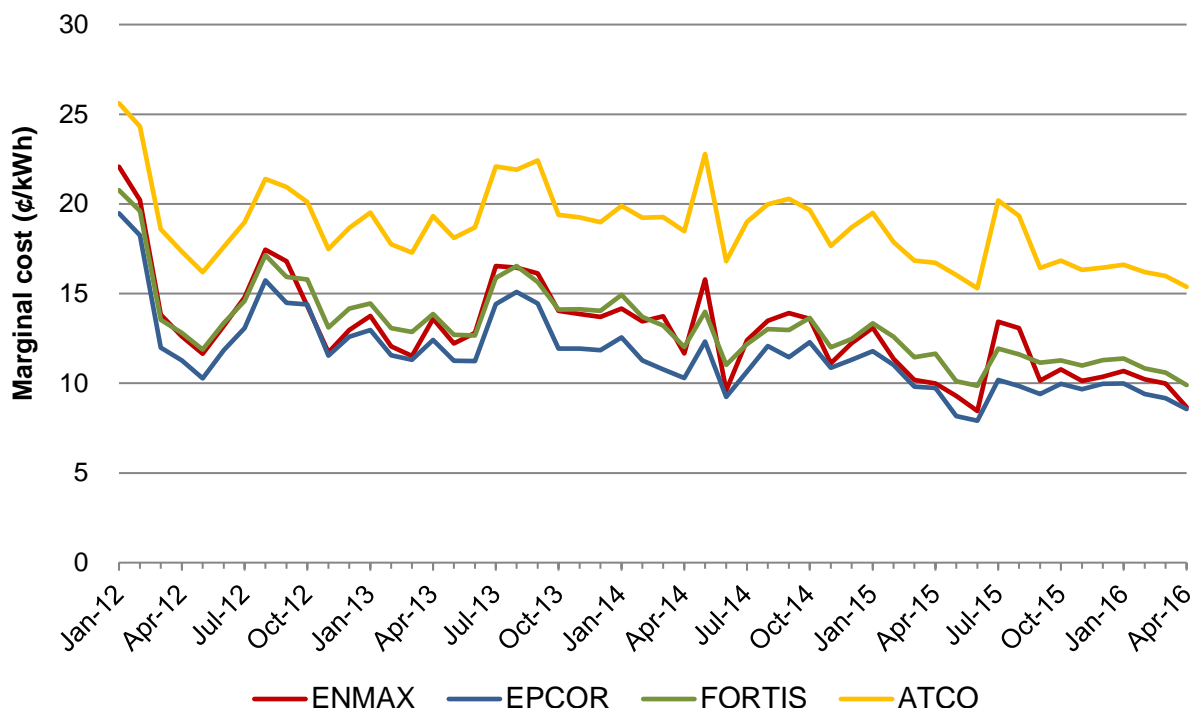
6.1 Electricity

Since 2012, the marginal cost of electricity has fallen in all four electricity service zones (Figure 6.1), as a result of falling RRO Rates (Figure 3.1). As a result, the financial incentive for households to become more energy efficient and decrease consumption has fallen.

²⁰ For a given month, the all-in rate is the total monthly bill divided by consumption in that month.

²¹ Note that because residential consumers pay constant energy rates, the marginal cost is equal to the Variable Cost. We use the term marginal cost for simplicity purposes.

²² The marginal cost of energy is calculated by summing all base variable rates and variable rate portions of any percentage-based charges. For example, if the sum of base variable rates is \$5 per kWh, but a 10% access fee is applied to all fixed and variable rates, the marginal cost is \$5.50 per kWh.

Figure 6.1 – Monthly Marginal Cost of Electricity by Service Zone, January 2012 – April 2016

It is notable that ATCO customers currently pay approximately 7 cents more in marginal costs compared to other service zones. This is primarily due to the considerably higher variable distribution rates paid by ATCO customers (as described in [Section 4](#)).

Table 6.2 – Annual Marginal cost (¢/kWh) by Service Zone, 2012-2015

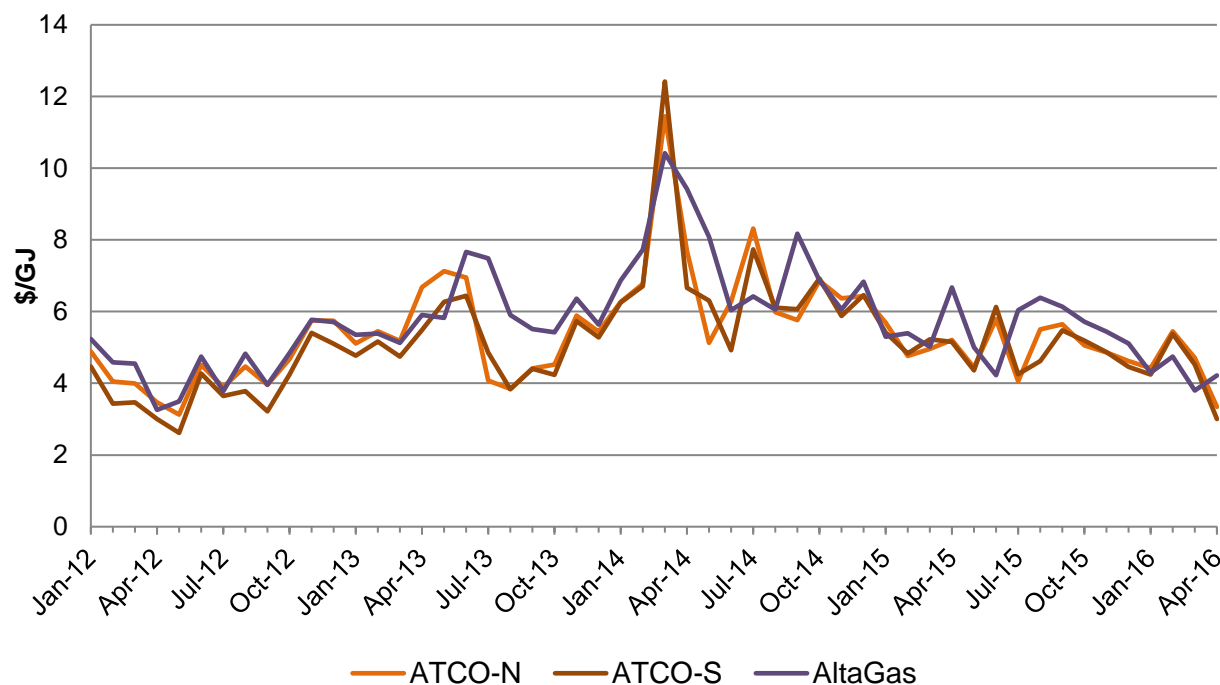
	ENMAX	EPCOR	FortisAlberta	ATCO
2012	15.13¢	13.74¢	15.23¢	19.77¢
2013	13.89¢	12.54¢	14.16¢	19.56¢
2014	12.93¢	11.26¢	12.93¢	19.31¢
2015	10.86¢	9.79¢	11.44¢	17.32¢
<u>Change from 2012 to 2015</u>	-4.27¢	-3.95¢	-3.79¢	-2.45¢
<u>Average Annual Change</u>	-1.42¢	-1.32¢	-1.26¢	-0.82¢

6.2 Natural Gas

Marginal costs for natural gas have only more recently begun to fall since a recent peak in early 2014, again driven by falling DRT Rates and corresponding wholesale prices. Similar to retail

electricity, lower energy rates have driven the majority of this decrease, and have outweighed steady increases in other variable rates (such as distribution).

Figure 6.3 – Monthly Marginal Cost of Natural Gas by Service Zone, January 2012 – April 2016



Unlike retail electricity, natural gas consumers in all three service zones have similar marginal costs.

Table 6.4 – Average Monthly Marginal Cost (\$/GJ) per Year by Service Zone, 2012-2015

	ATCO-N	ATCO-S	AltaGas
2012	\$ 4.38	\$ 3.89	\$ 4.56
2013	\$ 5.39	\$ 5.10	\$ 5.97
2014	\$ 6.94	\$ 6.87	\$ 7.41
2015	\$ 5.05	\$ 5.00	\$ 5.54
<u>Change from 2012 to 2015</u>	\$ 0.67	\$ 1.11	\$ 0.98

Appendix A The MSA Billing Tool

The MSA retail billing tool (Billing Tool) for electricity and natural gas uses publicly available information to help monitor regulated retail bills and costs. As it may be of interest to others, the MSA is releasing the tool as a supplement to our regular retail market reporting. The Billing Tool makes several significant improvements over previous retail information releases, including the

use of average consumption in Alberta by dwelling type and by separating out the fixed and variable portions of each bill. This may help inform consumers of relevant comparisons based on their consumption level, as well as the effect of changing their consumption level. Furthermore, this tool allows for the comparison of costs over time by region, and allows users to see the impact of varying consumption or living in a different municipality.

The purpose of the Billing Tool is to provide a detailed breakdown of the cost components of regulated energy bills.²³ The tool contains a comprehensive set of retail billing information, including distribution and transmission charges, local access and franchises fees, rate riders, administration charges, taxes and regulated commodity costs. The billing data spans January 2012 – April 2016,²⁴ and includes the option to manually enter historical consumption levels and view the related billing outcomes.

The analysis worksheets allow a user to construct a wide-range of analytical figures, which present retail billing information in useful ways (see [Appendix A.1](#) for a sampling of the analysis that is readily produced by the tool). The Billing Tool has various settings that can be adjusted to precisely examine billing outcomes, including municipality and consumption type selection.

To account for differences in municipal fees (including access fees, franchise fees and property taxes), 32 municipalities have been selected for inclusion in the tool.²⁵ In past MSA reports, Calgary, Edmonton, Hinton and Grande Prairie have been used as the municipalities to represent the four electricity service areas (ENMAX, EPCOR, FortisAlberta, and ATCO, respectively) while Calgary, Edmonton and Athabasca have represented the three natural gas regions (ATCO-S, ATCO-N, and AltaGas, respectively). For consistency, this report has made use of these municipalities, but the user is free to use the tool to adjust this as desired.

The tool also includes various pre-set historical consumption levels that are available to the user, including regional and provincial average consumption, as well as dwelling average consumption levels for attached and detached homes as well as apartment energy usage (described in [Section 5](#)).

A.1 Use of the Billing Tool to Compare Service Zones to EPCOR

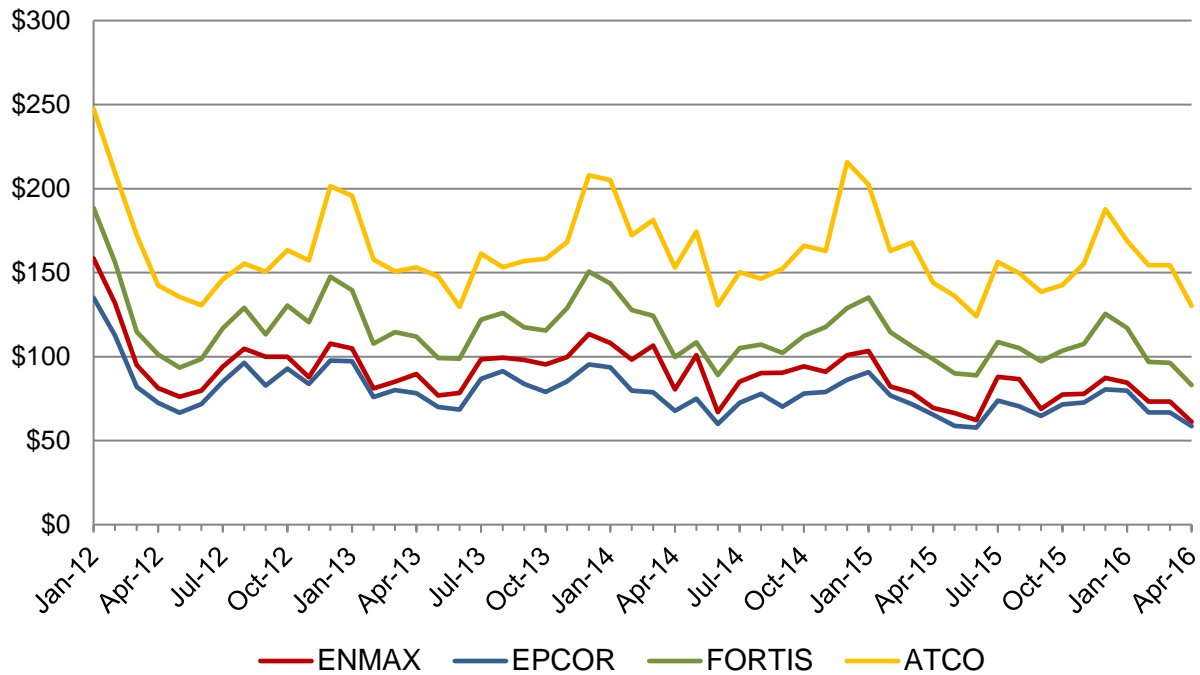
Although regulated electricity bills vary widely between service zones and municipalities, the EPCOR zone (the city of Edmonton) has maintained the lowest of any of the four service zones from 2012 to present, as illustrated in Figure A.1:

²³ This refers to the Regulated Rate Option (RRO) for electricity, and Default Rate Tariff (DRT) for natural gas. Regulated bills were chosen based on their “default” nature and for their comparability across service zones.

²⁴ The period of January 2012 to April 2016 was chosen based on the availability of household consumption data (which can be retrieved using the MSA’s Retail Market Statistics workbook).

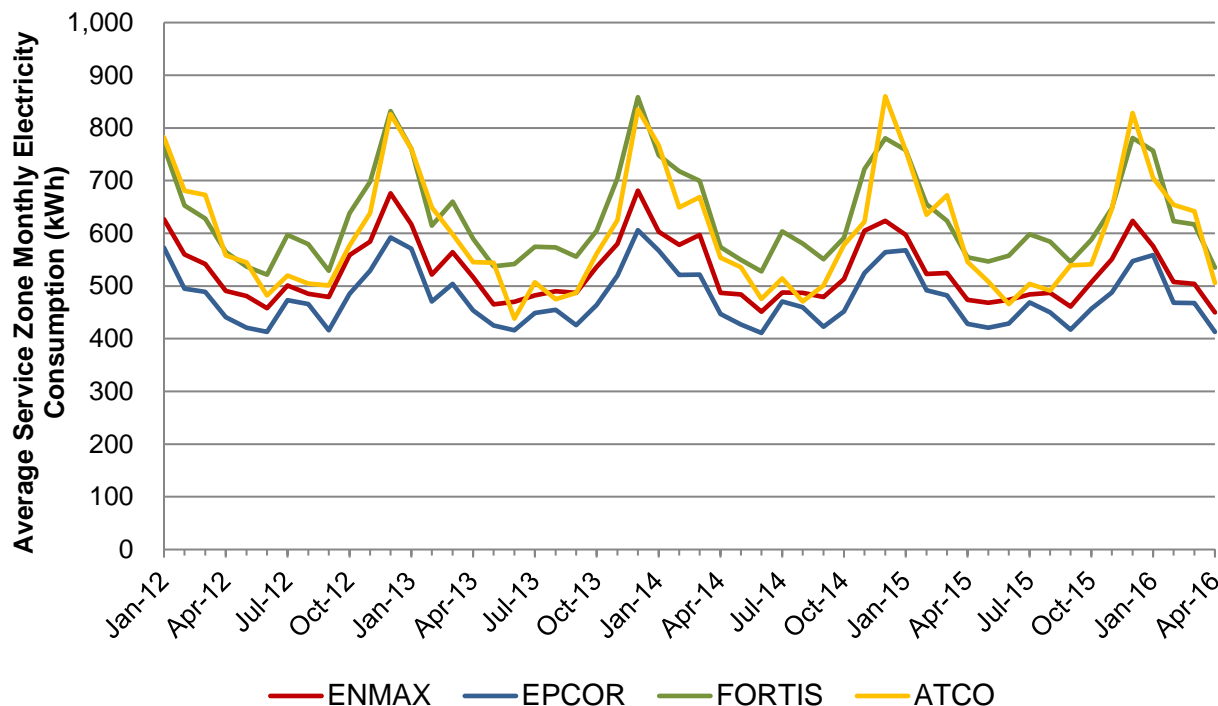
²⁵ A municipality has been included if it has a population of 10,000 or greater (in the 2011 Statistics Canada Census), has the highest or lowest municipal fees (subject to data availability), or is of significant regional importance.

Figure A.1 – Average Monthly Total Regulated Bill by Service Zone (Average Consumption), January 2012 – April 2016



However, EPCOR has, without exception, maintained the lowest average monthly electricity consumption levels over the same period, as illustrated in Figure A.2 below. Controlling for consumption between zones would reveal how much of the inter-regional bill difference is due to differences in regional rates, and how much is due to consumption behaviour.

Figure A.2 – Average Monthly Electricity Consumption by Service Zone, January 2012 – April 2016

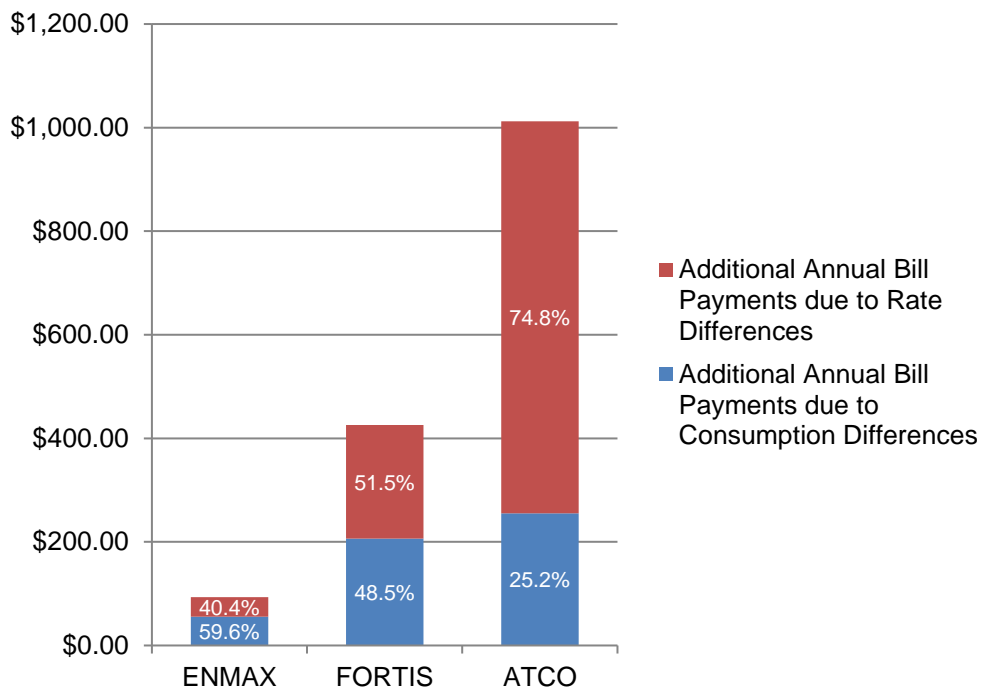


The Billing Tool (described in [Appendix A](#)) provides various ways of controlling for consumption between service zones without the use of statistical tools, including tool calibration with provincial average consumption (to control for inter-regional differences in annual average consumption and consumption trends) or using one of the default housing consumption levels (to control for inter-regional differences in annual average consumption and provincial annual changes in average consumption). To answer this question, one could examine a hypothetical case where all service zones consumed at EPCOR average levels, which can also be done using the billing tool.²⁶

This analysis was performed for the year 2015, with the results of the analysis displayed in Figure A.3 below. It shows that a large share of the differences between EPCOR's annual electricity bills and those of ENMAX and FortisAlberta service zones are due to consumption behaviour, while the EPCOR-ATCO difference is largely due to rate differences.

²⁶ To replicate this analysis using the Billing Tool, the "Actual RRO Consumption (EPCOR)" values can be entered into the Manual Consumption Entry field of the Regulated Bill Menu, and then applied to all four service zones by selecting the "Manually-Entered Consumption" option in the service zone consumption drop-down lists in the Service Zone Menu.

Figure A.3 – 2015 Additional Annual Bill Payments Relative to EPCOR by Service Zone (Average RRO Consumption)



A.2 Transmission Rate Impact Projection (TRIP) Model

In June 2014, the Alberta Electric System Operator (AESO) released its TRIP model²⁷ – a publically available tool containing retail electricity billing data. Its purpose was to forecast transmission costs and estimate the related impact on retail electricity bills and bill component shares.²⁸

The Billing Tool produces results that are broadly comparable to the AESO’s TRIP model for electricity (for its historical values), given the methodological differences.

²⁷ [AESO Transmission Rate Impact Projection Model.](#)

²⁸ [AESO Long-term Transmission Rate Impacts.](#)

Table A.4 – Components of Annual Total Regulated Bills in 2015 and TRIP Projection

	<i>MSA Billing Tool Observed Component Shares</i>				<i>TRIP Model Component Projection</i>
	ENMAX	EPCOR	FortisAlberta	ATCO	All Zones
Energy	40.1%	40.5%	34.6%	24.0%	40%
Transmission	13.6%	20.8%	19.4%	13.7%	20%
Distribution	19.8%	24.9%	31.9%	48.8%	35%
Local Access and Franchise Fees	8.8%	5.2%	5.9%	5.6%	5%
Rate Riders	5.6%	-4.7%	-2.7%	-1.6%	-
Administration	7.3%	8.6%	6.0%	4.7%	-
GST	4.8%	4.8%	4.8%	4.8%	-
Total	100%	100%	100%	100%	100%

However, the purpose and scope of the tools are very different. The Billing Tool is focused on retail customers for both electricity and natural gas using historical data. Conversely, the TRIP model is designed for forecasting the future impact of electricity transmission costs.

A.3 Cost Comparison Tool

The Utilities Consumer Advocate Cost Comparison Tool²⁹ is another means of estimating monthly household energy bills, but also serves a different purpose than the Billing Tool. The UCA's tool is designed for small residential and commercial consumers interested in switching to an energy plan (competitive or regulated) that might better suit their needs (with respect to rate types, retailers and contract length). Conversely, the Billing Tool is designed to function as a research tool, with a specific focus on historical regulated energy bills. Furthermore, the Billing Tool disaggregates the components of bills over time and by location, providing insight into trends.

²⁹ [UCA Cost Comparison Tool](#).