



Information Document

Discount Rates for the ISO Tariff

ID #2011-005T

Information Documents are not authoritative. Information Documents are for information purposes only and are intended to provide guidance. In the event of any discrepancy between an Information Document and any Authoritative Document(s) in effect, the Authoritative Document(s) governs.

1 Purpose

This Information Document relates to the following Authoritative Documents,¹ starting from the 2011 ISO tariff:

- Rate DTS of the ISO tariff, *Demand Transmission Service* ;
- Section 4 of the ISO tariff, *Classification and Allocation of Connection Projects Costs* ; and
- Section 5 of the ISO tariff, *Changes to System Access Service*.

The purpose of this Information Document is to provide the discount rate primarily used, when applicable, in calculations relating to a construction contribution for system access service under Rate DTS of the ISO tariff, *Demand Transmission Service* . The discount rate is described in subsection 9 of section 4 of the ISO tariff.

2 Applicability of Discount Rate

The ISO tariff specifies the use of the discount rate to reflect the time value of money in the determination of four amounts:

- (1) costs associated with the advancement of transmission facilities related to a connection project, in subsection 4.2(3)(a) of section 4 of the ISO tariff;
- (2) local investment when a market participant includes increases or decreases to contract capacity over the investment term for a connection project, in subsection 4.7(4) of section 4 of the ISO tariff;
- (3) an operations and maintenance charge estimated by a market participant, in subsection 4.8(2) of section 4 of the ISO tariff; and
- (4) a lump sum payment in lieu of all or a portion of the 5-year notice period required for reductions or terminations of contract capacity, in subsections 5.3(3) and 5.3(4) of section 5 of the ISO tariff.

For the first three amounts (those specified in section 4 of the ISO tariff), the discount rate to be used is for the month in which the Alberta Utilities Commission issues permit and licence for the connection project, consistent with the construction contribution provisions specified in subsection 4.6 of section 4 of the ISO tariff. If the Commission has not yet issued permit and licence for the project, the discount rate to be used is the most recent rate available.

For the payment in lieu of notice (specified in section 5 of the ISO tariff), the discount rate to be used is for the month in which the market participant makes the payment in lieu of notice.

¹ "Authoritative Documents" is the general name given by the AESO to categories of documents made by the AESO under the authority of the Electric Utilities Act and regulations, and that contain binding legal requirements for either market participants or the AESO, or both. AESO Authoritative Documents include: the ISO rules, the Alberta reliability standards, and the ISO tariff.

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3 Calculation

As described in subsection 4.9(1) of section 4 of the ISO tariff, the discount rate is calculated as:

$$\text{discount rate} = [(1 - E) \times (\text{YLD} + 1\%)] + \left(\frac{E \times \text{ROE}}{1 - T} \right)$$

where:

- (a) E is equal to the Commission-approved equity ratio applicable to the owner of the transmission facilities, as amended from time to time;
- (b) YLD is equal to the yield on 30-year Government of Canada bonds;
- (c) ROE is equal to the Commission-approved rate of return on equity applicable to the owner of the transmission facilities, as amended from time to time; and
- (d) T is equal to the combined federal and provincial income tax rate applicable to the owner of the transmission facilities.

transmission facilities, the tax rate T is 0% in the discount rate calculation. For the discount rate calculation, an owner of transmission facilities is considered to be non-income tax paying if income tax is not included in its revenue requirement as approved by the Commission. Income tax is not included in the approved revenue requirements of ENMAX, EPCOR, the City of Lethbridge and the City of Red Deer, and the tax rate T is 0% for the calculation of discount rates applicable to those owners.

The AESO provides the discount rates calculated for each of these owners of transmission facilities in the attachment to this information document.

4 Information Sources

The Commission generally establishes the equity ratio (E) and return on equity (ROE) for each owner of transmission facilities in a decision resulting from a generic cost of capital proceeding. The Commission may also adjust those amounts in a decision on the tariff application of an owner of transmission facilities.

The yield on 30-year Government of Canada bonds (YLD) is available from the Bank of Canada, accessible from its website by following the path www.bankofcanada.ca ► Rates and Statistics ► Interest Rates ► Canadian bond yields: 10-year lookup. The relevant bond yield is provided by the monthly series for Government of Canada benchmark bond yields - long-term (CANSIM identifier V122544).

The federal income tax rate is available from the Canada Revenue Agency, accessible from its website by following the path www.cra-arc.gc.ca ► Business ► All rates ► Corporation tax rates. The provincial income tax rate is available from Alberta Finance and Enterprise, accessible from its website by following the path www.finance.alberta.ca ► Taxes & Rebates ► Corporate Tax ► Alberta Corporate Tax Rates and Small Business Deduction. The combined tax rate (T) is the sum of the federal and provincial income tax rates.

Revision History

Posting Date	Description
2017-01-24	Clarification that this ID relates to all ISO tariffs starting from the 2011 ISO tariff, administrative revisions to make this ID consistent with other IDs and updated source references for tax rates.
2011-10-07	Initial release.

Attachment: Discount Rates Determined Under Subsection 9 of Section 4 of the ISO Tariff

Last Updated
January 6, 2025

			Tax-Applicable Owners (Tax Rate as in 3rd Column)						Non-Tax Applicable Owners of Transmission Facilities (Tax Rate = 0%)											
			AltaLink			ATCO Electric			ENMAX			EPCOR			City of Lethbridge			City of Red Deer		
Month	Bond Yield [YLD]	Tax Rate [T]	Return on Equity [ROE]	Equity Ratio [E]	Discount Rate	Return on Equity [ROE]	Equity Ratio [E]	Discount Rate	Return on Equity [ROE]	Equity Ratio [E]	Discount Rate	Return on Equity [ROE]	Equity Ratio [E]	Discount Rate	Return on Equity [ROE]	Equity Ratio [E]	Discount Rate	Return on Equity [ROE]	Equity Ratio [E]	Discount Rate
Jan 2025	3.36%	23.00%	8.97%	37.00%	7.06%	8.97%	37.00%	7.06%	8.97%	37.00%	6.07%	8.97%	37.00%	6.07%	8.97%	37.00%	6.07%	8.97%	37.00%	6.07%
Dec 2024	3.26%	23.00%	9.28%	37.00%	7.14%	9.28%	37.00%	7.14%	9.28%	37.00%	6.12%	9.28%	37.00%	6.12%	9.28%	37.00%	6.12%	9.28%	37.00%	6.12%
Nov 2024	3.34%	23.00%	9.28%	37.00%	7.19%	9.28%	37.00%	7.19%	9.28%	37.00%	6.17%	9.28%	37.00%	6.17%	9.28%	37.00%	6.17%	9.28%	37.00%	6.17%
Oct 2024	3.20%	23.00%	9.28%	37.00%	7.11%	9.28%	37.00%	7.11%	9.28%	37.00%	6.08%	9.28%	37.00%	6.08%	9.28%	37.00%	6.08%	9.28%	37.00%	6.08%
Sep 2024	3.18%	23.00%	9.28%	37.00%	7.09%	9.28%	37.00%	7.09%	9.28%	37.00%	6.07%	9.28%	37.00%	6.07%	9.28%	37.00%	6.07%	9.28%	37.00%	6.07%
Aug 2024	3.22%	23.00%	9.28%	37.00%	7.12%	9.28%	37.00%	7.12%	9.28%	37.00%	6.09%	9.28%	37.00%	6.09%	9.28%	37.00%	6.09%	9.28%	37.00%	6.09%
Jul 2024	3.35%	23.00%	9.28%	37.00%	7.20%	9.28%	37.00%	7.20%	9.28%	37.00%	6.17%	9.28%	37.00%	6.17%	9.28%	37.00%	6.17%	9.28%	37.00%	6.17%
Jun 2024	3.61%	23.00%	9.28%	37.00%	7.36%	9.28%	37.00%	7.36%	9.28%	37.00%	6.34%	9.28%	37.00%	6.34%	9.28%	37.00%	6.34%	9.28%	37.00%	6.34%
May 2024	3.70%	23.00%	9.28%	37.00%	7.42%	9.28%	37.00%	7.42%	9.28%	37.00%	6.39%	9.28%	37.00%	6.39%	9.28%	37.00%	6.39%	9.28%	37.00%	6.39%
Apr 2024	3.35%	23.00%	9.28%	37.00%	7.20%	9.28%	37.00%	7.20%	9.28%	37.00%	6.17%	9.28%	37.00%	6.17%	9.28%	37.00%	6.17%	9.28%	37.00%	6.17%
Mar 2024	3.40%	23.00%	9.28%	37.00%	7.23%	9.28%	37.00%	7.23%	9.28%	37.00%	6.21%	9.28%	37.00%	6.21%	9.28%	37.00%	6.21%	9.28%	37.00%	6.21%
Feb 2024	3.27%	23.00%	9.28%	37.00%	7.15%	9.28%	37.00%	7.15%	9.28%	37.00%	6.12%	9.28%	37.00%	6.12%	9.28%	37.00%	6.12%	9.28%	37.00%	6.12%
Jan 2024	2.96%	23.00%	9.28%	37.00%	6.95%	9.28%	37.00%	6.95%	9.28%	37.00%	5.93%	9.28%	37.00%	5.93%	9.28%	37.00%	5.93%	9.28%	37.00%	5.93%
Dec 2023	3.34%	23.00%	8.50%	37.00%	6.82%	8.50%	37.00%	6.82%	8.50%	37.00%	5.88%	8.50%	37.00%	5.88%	8.50%	37.00%	5.88%	8.50%	37.00%	5.88%
Nov 2023	3.88%	23.00%	8.50%	37.00%	7.16%	8.50%	37.00%	7.16%	8.50%	37.00%	6.22%	8.50%	37.00%	6.22%	8.50%	37.00%	6.22%	8.50%	37.00%	6.22%
Oct 2023	3.87%	23.00%	8.50%	37.00%	7.15%	8.50%	37.00%	7.15%	8.50%	37.00%	6.21%	8.50%	37.00%	6.21%	8.50%	37.00%	6.21%	8.50%	37.00%	6.21%
Sep 2023	3.41%	23.00%	8.50%	37.00%	6.86%	8.50%	37.00%	6.86%	8.50%	37.00%	5.92%	8.50%	37.00%	5.92%	8.50%	37.00%	5.92%	8.50%	37.00%	5.92%
Aug 2023	3.29%	23.00%	8.50%	37.00%	6.79%	8.50%	37.00%	6.79%	8.50%	37.00%	5.85%	8.50%	37.00%	5.85%	8.50%	37.00%	5.85%	8.50%	37.00%	5.85%
Jul 2023	3.11%	23.00%	8.50%	37.00%	6.67%	8.50%	37.00%	6.67%	8.50%	37.00%	5.73%	8.50%	37.00%	5.73%	8.50%	37.00%	5.73%	8.50%	37.00%	5.73%
Jun 2023	3.14%	23.00%	8.50%	37.00%	6.69%	8.50%	37.00%	6.69%	8.50%	37.00%	5.75%	8.50%	37.00%	5.75%	8.50%	37.00%	5.75%	8.50%	37.00%	5.75%
May 2023	2.97%	23.00%	8.50%	37.00%	6.59%	8.50%	37.00%	6.59%	8.50%	37.00%	5.65%	8.50%	37.00%	5.65%	8.50%	37.00%	5.65%	8.50%	37.00%	5.65%
Apr 2023	3.04%	23.00%	8.50%	37.00%	6.63%	8.50%	37.00%	6.63%	8.50%	37.00%	5.69%	8.50%	37.00%	5.69%	8.50%	37.00%	5.69%	8.50%	37.00%	5.69%
Mar 2023	3.30%	23.00%	8.50%	37.00%	6.79%	8.50%	37.00%	6.79%	8.50%	37.00%	5.85%	8.50%	37.00%	5.85%	8.50%	37.00%	5.85%	8.50%	37.00%	5.85%
Feb 2023	2.91%	23.00%	8.50%	37.00%	6.55%	8.50%	37.00%	6.55%	8.50%	37.00%	5.61%	8.50%	37.00%	5.61%	8.50%	37.00%	5.61%	8.50%	37.00%	5.61%
Jan 2023	3.28%	23.00%	8.50%	37.00%	6.78%	8.50%	37.00%	6.78%	8.50%	37.00%	5.84%	8.50%	37.00%	5.84%	8.50%	37.00%	5.84%	8.50%	37.00%	5.84%
Dec 2022	3.01%	23.00%	8.50%	37.00%	6.61%	8.50%	37.00%	6.61%	8.50%	37.00%	5.67%	8.50%	37.00%	5.67%	8.50%	37.00%	5.67%	8.50%	37.00%	5.67%
Nov 2022	3.42%	23.00%	8.50%	37.00%	6.87%	8.50%	37.00%	6.87%	8.50%	37.00%	5.93%	8.50%	37.00%	5.93%	8.50%	37.00%	5.93%	8.50%	37.00%	5.93%
Oct 2022	2.97%	23.00%	8.50%	37.00%	6.59%	8.50%	37.00%	6.59%	8.50%	37.00%	5.65%	8.50%	37.00%	5.65%	8.50%	37.00%	5.65%	8.50%	37.00%	5.65%
Sep 2022	3.02%	23.00%	8.50%	37.00%	6.62%	8.50%	37.00%	6.62%	8.50%	37.00%	5.68%	8.50%	37.00%	5.68%	8.50%	37.00%	5.68%	8.50%	37.00%	5.68%
Aug 2022	2.83%	23.00%	8.50%	37.00%	6.50%	8.50%	37.00%	6.50%	8.50%	37.00%	5.56%	8.50%	37.00%	5.56%	8.50%	37.00%	5.56%	8.50%	37.00%	5.56%

Jul 2022	3.21%	23.00%	8.50%	37.00%	6.74%	8.50%	37.00%	6.74%	8.50%	37.00%	5.80%	8.50%	37.00%	5.80%	8.50%	37.00%	5.80%	8.50%	37.00%	5.80%
Jun 2022	2.76%	23.00%	8.50%	37.00%	6.45%	8.50%	37.00%	6.45%	8.50%	37.00%	5.51%	8.50%	37.00%	5.51%	8.50%	37.00%	5.51%	8.50%	37.00%	5.51%
May 2022	2.79%	23.00%	8.50%	37.00%	6.47%	8.50%	37.00%	6.47%	8.50%	37.00%	5.53%	8.50%	37.00%	5.53%	8.50%	37.00%	5.53%	8.50%	37.00%	5.53%
Apr 2022	2.41%	23.00%	8.50%	37.00%	6.23%	8.50%	37.00%	6.23%	8.50%	37.00%	5.29%	8.50%	37.00%	5.29%	8.50%	37.00%	5.29%	8.50%	37.00%	5.29%
Mar 2022	2.23%	23.00%	8.50%	37.00%	6.12%	8.50%	37.00%	6.12%	8.50%	37.00%	5.18%	8.50%	37.00%	5.18%	8.50%	37.00%	5.18%	8.50%	37.00%	5.18%
Feb 2022	2.07%	23.00%	8.50%	37.00%	6.02%	8.50%	37.00%	6.02%	8.50%	37.00%	5.08%	8.50%	37.00%	5.08%	8.50%	37.00%	5.08%	8.50%	37.00%	5.08%
Jan 2022	1.76%	23.00%	8.50%	37.00%	5.82%	8.50%	37.00%	5.82%	8.50%	37.00%	4.88%	8.50%	37.00%	4.88%	8.50%	37.00%	4.88%	8.50%	37.00%	4.88%
Dec 2021	2.07%	23.00%	8.50%	37.00%	6.02%	8.50%	37.00%	6.02%	8.50%	37.00%	5.08%	8.50%	37.00%	5.08%	8.50%	37.00%	5.08%	8.50%	37.00%	5.08%
Nov 2021	1.92%	23.00%	8.50%	37.00%	5.92%	8.50%	37.00%	5.92%	8.50%	37.00%	4.98%	8.50%	37.00%	4.98%	8.50%	37.00%	4.98%	8.50%	37.00%	4.98%
Oct 2021	1.98%	23.00%	8.50%	37.00%	5.96%	8.50%	37.00%	5.96%	8.50%	37.00%	5.02%	8.50%	37.00%	5.02%	8.50%	37.00%	5.02%	8.50%	37.00%	5.02%
Sep 2021	1.82%	23.00%	8.50%	37.00%	5.86%	8.50%	37.00%	5.86%	8.50%	37.00%	4.92%	8.50%	37.00%	4.92%	8.50%	37.00%	4.92%	8.50%	37.00%	4.92%
Aug 2021	1.73%	23.00%	8.50%	37.00%	5.80%	8.50%	37.00%	5.80%	8.50%	37.00%	4.86%	8.50%	37.00%	4.86%	8.50%	37.00%	4.86%	8.50%	37.00%	4.86%
Jul 2021	1.84%	23.00%	8.50%	37.00%	5.87%	8.50%	37.00%	5.87%	8.50%	37.00%	4.93%	8.50%	37.00%	4.93%	8.50%	37.00%	4.93%	8.50%	37.00%	4.93%
Jun 2021	2.04%	23.00%	8.50%	37.00%	6.00%	8.50%	37.00%	6.00%	8.50%	37.00%	5.06%	8.50%	37.00%	5.06%	8.50%	37.00%	5.06%	8.50%	37.00%	5.06%
May 2021	2.07%	23.00%	8.50%	37.00%	6.02%	8.50%	37.00%	6.02%	8.50%	37.00%	5.08%	8.50%	37.00%	5.08%	8.50%	37.00%	5.08%	8.50%	37.00%	5.08%
Apr 2021	1.97%	23.00%	8.50%	37.00%	5.96%	8.50%	37.00%	5.96%	8.50%	37.00%	5.02%	8.50%	37.00%	5.02%	8.50%	37.00%	5.02%	8.50%	37.00%	5.02%
Mar 2021	1.88%	23.00%	8.50%	37.00%	5.90%	8.50%	37.00%	5.90%	8.50%	37.00%	4.96%	8.50%	37.00%	4.96%	8.50%	37.00%	4.96%	8.50%	37.00%	4.96%
Feb 2021	1.45%	23.00%	8.50%	37.00%	5.63%	8.50%	37.00%	5.63%	8.50%	37.00%	4.69%	8.50%	37.00%	4.69%	8.50%	37.00%	4.69%	8.50%	37.00%	4.69%
Jan 2021	1.24%	23.00%	8.50%	37.00%	5.50%	8.50%	37.00%	5.50%	8.50%	37.00%	4.56%	8.50%	37.00%	4.56%	8.50%	37.00%	4.56%	8.50%	37.00%	4.56%
Dec 2020	1.22%	23.00%	8.50%	37.00%	5.48%	8.50%	37.00%	5.48%	8.50%	37.00%	4.54%	8.50%	37.00%	4.54%	8.50%	37.00%	4.54%	8.50%	37.00%	4.54%
Nov 2020	1.17%	23.00%	8.50%	37.00%	5.45%	8.50%	37.00%	5.45%	8.50%	37.00%	4.51%	8.50%	37.00%	4.51%	8.50%	37.00%	4.51%	8.50%	37.00%	4.51%
Oct 2020	1.11%	23.00%	8.50%	37.00%	5.41%	8.50%	37.00%	5.41%	8.50%	37.00%	4.47%	8.50%	37.00%	4.47%	8.50%	37.00%	4.47%	8.50%	37.00%	4.47%
Sep 2020	1.12%	23.00%	8.50%	37.00%	5.42%	8.50%	37.00%	5.42%	8.50%	37.00%	4.48%	8.50%	37.00%	4.48%	8.50%	37.00%	4.48%	8.50%	37.00%	4.48%
Aug 2020	0.95%	23.00%	8.50%	37.00%	5.31%	8.50%	37.00%	5.31%	8.50%	37.00%	4.37%	8.50%	37.00%	4.37%	8.50%	37.00%	4.37%	8.50%	37.00%	4.37%
Jul 2020	1.02%	23.00%	8.50%	37.00%	5.36%	8.50%	37.00%	5.36%	8.50%	37.00%	4.42%	8.50%	37.00%	4.42%	8.50%	37.00%	4.42%	8.50%	37.00%	4.42%
Jun 2020	1.10%	25.00%	8.50%	37.00%	5.52%	8.50%	37.00%	5.52%	8.50%	37.00%	4.47%	8.50%	37.00%	4.47%	8.50%	37.00%	4.47%	8.50%	37.00%	4.47%
May 2020	1.15%	25.00%	8.50%	37.00%	5.55%	8.50%	37.00%	5.55%	8.50%	37.00%	4.50%	8.50%	37.00%	4.50%	8.50%	37.00%	4.50%	8.50%	37.00%	4.50%
Apr 2020	1.36%	25.00%	8.50%	37.00%	5.68%	8.50%	37.00%	5.68%	8.50%	37.00%	4.63%	8.50%	37.00%	4.63%	8.50%	37.00%	4.63%	8.50%	37.00%	4.63%
Mar 2020	1.35%	25.00%	8.50%	37.00%	5.67%	8.50%	37.00%	5.67%	8.50%	37.00%	4.63%	8.50%	37.00%	4.63%	8.50%	37.00%	4.63%	8.50%	37.00%	4.63%
Feb 2020	1.45%	25.00%	8.50%	37.00%	5.74%	8.50%	37.00%	5.74%	8.50%	37.00%	4.69%	8.50%	37.00%	4.69%	8.50%	37.00%	4.69%	8.50%	37.00%	4.69%
Jan 2020	1.67%	25.00%	8.50%	37.00%	5.88%	8.50%	37.00%	5.88%	8.50%	37.00%	4.83%	8.50%	37.00%	4.83%	8.50%	37.00%	4.83%	8.50%	37.00%	4.83%
Dec 2019	1.58%	26.00%	8.50%	37.00%	5.88%	8.50%	37.00%	5.88%	8.50%	37.00%	4.77%	8.50%	37.00%	4.77%	8.50%	37.00%	4.77%	8.50%	37.00%	4.77%
Nov 2019	1.60%	26.00%	8.50%	37.00%	5.89%	8.50%	37.00%	5.89%	8.50%	37.00%	4.78%	8.50%	37.00%	4.78%	8.50%	37.00%	4.78%	8.50%	37.00%	4.78%
Oct 2019	1.57%	26.00%	8.50%	37.00%	5.87%	8.50%	37.00%	5.87%	8.50%	37.00%	4.76%	8.50%	37.00%	4.76%	8.50%	37.00%	4.76%	8.50%	37.00%	4.76%
Sep 2019	1.37%	26.00%	8.50%	37.00%	5.74%	8.50%	37.00%	5.74%	8.50%	37.00%	4.64%	8.50%	37.00%	4.64%	8.50%	37.00%	4.64%	8.50%	37.00%	4.64%
Aug 2019	1.70%	26.00%	8.50%	37.00%	5.95%	8.50%	37.00%	5.95%	8.50%	37.00%	4.85%	8.50%	37.00%	4.85%	8.50%	37.00%	4.85%	8.50%	37.00%	4.85%
Jul 2019	1.73%	26.00%	8.50%	37.00%	5.97%	8.50%	37.00%	5.97%	8.50%	37.00%	4.86%	8.50%	37.00%	4.86%	8.50%	37.00%	4.86%	8.50%	37.00%	4.86%

Jun 2019	1.82%	27.00%	8.50%	37.00%	6.08%	8.50%	37.00%	6.08%	8.50%	37.00%	4.92%	8.50%	37.00%	4.92%	8.50%	37.00%	4.92%	8.50%	37.00%	4.92%
May 2019	1.99%	27.00%	8.50%	37.00%	6.19%	8.50%	37.00%	6.19%	8.50%	37.00%	5.03%	8.50%	37.00%	5.03%	8.50%	37.00%	5.03%	8.50%	37.00%	5.03%
Apr 2019	1.84%	27.00%	8.50%	37.00%	6.10%	8.50%	37.00%	6.10%	8.50%	37.00%	4.93%	8.50%	37.00%	4.93%	8.50%	37.00%	4.93%	8.50%	37.00%	4.93%
Mar 2019	2.16%	27.00%	8.50%	37.00%	6.30%	8.50%	37.00%	6.30%	8.50%	37.00%	5.14%	8.50%	37.00%	5.14%	8.50%	37.00%	5.14%	8.50%	37.00%	5.14%
Feb 2019	2.17%	27.00%	8.50%	37.00%	6.31%	8.50%	37.00%	6.31%	8.50%	37.00%	5.14%	8.50%	37.00%	5.14%	8.50%	37.00%	5.14%	8.50%	37.00%	5.14%
Jan 2019	2.15%	27.00%	8.50%	37.00%	6.29%	8.50%	37.00%	6.29%	8.50%	37.00%	5.13%	8.50%	37.00%	5.13%	8.50%	37.00%	5.13%	8.50%	37.00%	5.13%
Dec 2018	2.41%	27.00%	8.50%	37.00%	6.46%	8.50%	37.00%	6.46%	8.50%	37.00%	5.29%	8.50%	37.00%	5.29%	8.50%	37.00%	5.29%	8.50%	37.00%	5.29%
Nov 2018	2.52%	27.00%	8.50%	37.00%	6.53%	8.50%	37.00%	6.53%	8.50%	37.00%	5.36%	8.50%	37.00%	5.36%	8.50%	37.00%	5.36%	8.50%	37.00%	5.36%
Oct 2018	2.42%	27.00%	8.50%	37.00%	6.46%	8.50%	37.00%	6.46%	8.50%	37.00%	5.30%	8.50%	37.00%	5.30%	8.50%	37.00%	5.30%	8.50%	37.00%	5.30%
Sep 2018	2.32%	27.00%	8.50%	37.00%	6.40%	8.50%	37.00%	6.40%	8.50%	37.00%	5.24%	8.50%	37.00%	5.24%	8.50%	37.00%	5.24%	8.50%	37.00%	5.24%
Aug 2018	2.30%	27.00%	8.50%	37.00%	6.39%	8.50%	37.00%	6.39%	8.50%	37.00%	5.22%	8.50%	37.00%	5.22%	8.50%	37.00%	5.22%	8.50%	37.00%	5.22%
Jul 2018	2.16%	27.00%	8.50%	37.00%	6.30%	8.50%	37.00%	6.30%	8.50%	37.00%	5.14%	8.50%	37.00%	5.14%	8.50%	37.00%	5.14%	8.50%	37.00%	5.14%
Jun 2018	2.28%	27.00%	8.50%	37.00%	6.37%	8.50%	37.00%	6.37%	8.50%	37.00%	5.21%	8.50%	37.00%	5.21%	8.50%	37.00%	5.21%	8.50%	37.00%	5.21%
May 2018	2.47%	27.00%	8.50%	37.00%	6.49%	8.50%	37.00%	6.49%	8.50%	37.00%	5.33%	8.50%	37.00%	5.33%	8.50%	37.00%	5.33%	8.50%	37.00%	5.33%
Apr 2018	2.25%	27.00%	8.50%	37.00%	6.36%	8.50%	37.00%	6.36%	8.50%	37.00%	5.19%	8.50%	37.00%	5.19%	8.50%	37.00%	5.19%	8.50%	37.00%	5.19%
Mar 2018	2.37%	27.00%	8.50%	37.00%	6.43%	8.50%	37.00%	6.43%	8.50%	37.00%	5.27%	8.50%	37.00%	5.27%	8.50%	37.00%	5.27%	8.50%	37.00%	5.27%
Feb 2018	2.36%	27.00%	8.50%	37.00%	6.43%	8.50%	37.00%	6.43%	8.50%	37.00%	5.26%	8.50%	37.00%	5.26%	8.50%	37.00%	5.26%	8.50%	37.00%	5.26%
Jan 2018	2.20%	27.00%	8.50%	37.00%	6.32%	8.50%	37.00%	6.32%	8.50%	37.00%	5.16%	8.50%	37.00%	5.16%	8.50%	37.00%	5.16%	8.50%	37.00%	5.16%
Dec 2017	2.23%	27.00%	8.30%	36.00%	6.16%	8.30%	36.00%	6.16%	8.30%	36.00%	5.06%	8.30%	36.00%	5.06%	8.30%	36.00%	5.06%	8.30%	36.00%	5.06%
Nov 2017	2.38%	27.00%	8.30%	36.00%	6.26%	8.30%	36.00%	6.26%	8.30%	36.00%	5.15%	8.30%	36.00%	5.15%	8.30%	36.00%	5.15%	8.30%	36.00%	5.15%
Oct 2017	2.49%	27.00%	8.30%	36.00%	6.33%	8.30%	36.00%	6.33%	8.30%	36.00%	5.22%	8.30%	36.00%	5.22%	8.30%	36.00%	5.22%	8.30%	36.00%	5.22%
Sep 2017	2.27%	27.00%	8.30%	36.00%	6.19%	8.30%	36.00%	6.19%	8.30%	36.00%	5.08%	8.30%	36.00%	5.08%	8.30%	36.00%	5.08%	8.30%	36.00%	5.08%
Aug 2017	2.35%	27.00%	8.30%	36.00%	6.24%	8.30%	36.00%	6.24%	8.30%	36.00%	5.13%	8.30%	36.00%	5.13%	8.30%	36.00%	5.13%	8.30%	36.00%	5.13%
Jul 2017	2.06%	27.00%	8.30%	36.00%	6.05%	8.30%	36.00%	6.05%	8.30%	36.00%	4.95%	8.30%	36.00%	4.95%	8.30%	36.00%	4.95%	8.30%	36.00%	4.95%
Jun 2017	2.05%	27.00%	8.30%	36.00%	6.05%	8.30%	36.00%	6.05%	8.30%	36.00%	4.94%	8.30%	36.00%	4.94%	8.30%	36.00%	4.94%	8.30%	36.00%	4.94%
May 2017	2.16%	27.00%	8.30%	36.00%	6.12%	8.30%	36.00%	6.12%	8.30%	36.00%	5.01%	8.30%	36.00%	5.01%	8.30%	36.00%	5.01%	8.30%	36.00%	5.01%
Apr 2017	2.28%	27.00%	8.30%	36.00%	6.19%	8.30%	36.00%	6.19%	8.30%	36.00%	5.09%	8.30%	36.00%	5.09%	8.30%	36.00%	5.09%	8.30%	36.00%	5.09%
Mar 2017	2.42%	27.00%	8.30%	36.00%	6.28%	8.30%	36.00%	6.28%	8.30%	36.00%	5.18%	8.30%	36.00%	5.18%	8.30%	36.00%	5.18%	8.30%	36.00%	5.18%
Feb 2017	2.45%	27.00%	8.30%	36.00%	6.30%	8.30%	36.00%	6.30%	8.30%	36.00%	5.20%	8.30%	36.00%	5.20%	8.30%	36.00%	5.20%	8.30%	36.00%	5.20%
Jan 2017	2.34%	27.00%	8.30%	36.00%	6.23%	8.30%	36.00%	6.23%	8.30%	36.00%	5.13%	8.30%	36.00%	5.13%	8.30%	36.00%	5.13%	8.30%	36.00%	5.13%
Dec 2016	2.16%	27.00%	8.30%	36.00%	6.12%	8.30%	36.00%	6.12%	8.30%	36.00%	5.01%	8.30%	36.00%	5.01%	8.30%	36.00%	5.01%	8.30%	36.00%	5.01%
Nov 2016	1.82%	27.00%	8.30%	36.00%	5.90%	8.30%	36.00%	5.90%	8.30%	36.00%	4.79%	8.30%	36.00%	4.79%	8.30%	36.00%	4.79%	8.30%	36.00%	4.79%
Oct 2016	1.64%	27.00%	8.30%	36.00%	5.78%	8.30%	36.00%	5.78%	8.30%	36.00%	4.68%	8.30%	36.00%	4.68%	8.30%	36.00%	4.68%	8.30%	36.00%	4.68%
Sep 2016	1.63%	27.00%	8.30%	36.00%	5.78%	8.30%	36.00%	5.78%	8.30%	36.00%	4.67%	8.30%	36.00%	4.67%	8.30%	36.00%	4.67%	8.30%	36.00%	4.67%
Aug 2016	1.69%	27.00%	8.30%	36.00%	5.81%	8.30%	36.00%	5.81%	8.30%	36.00%	4.71%	8.30%	36.00%	4.71%	8.30%	36.00%	4.71%	8.30%	36.00%	4.71%
Jul 2016	1.76%	27.00%	8.30%	36.00%	5.86%	8.30%	36.00%	5.86%	8.30%	36.00%	4.75%	8.30%	36.00%	4.75%	8.30%	36.00%	4.75%	8.30%	36.00%	4.75%
Jun 2016	2.01%	27.00%	8.30%	36.00%	6.02%	8.30%	36.00%	6.02%	8.30%	36.00%	4.91%	8.30%	36.00%	4.91%	8.30%	36.00%	4.91%	8.30%	36.00%	4.91%

May 2016	2.06%	27.00%	8.30%	36.00%	6.05%	8.30%	36.00%	6.05%	8.30%	36.00%	4.95%	8.30%	36.00%	4.95%	8.30%	36.00%	4.95%	8.30%	36.00%	4.95%
Apr 2016	2.00%	27.00%	8.30%	36.00%	6.01%	8.30%	36.00%	6.01%	8.30%	36.00%	4.91%	8.30%	36.00%	4.91%	8.30%	36.00%	4.91%	8.30%	36.00%	4.91%
Mar 2016	1.93%	27.00%	8.30%	36.00%	5.97%	8.30%	36.00%	5.97%	8.30%	36.00%	4.86%	8.30%	36.00%	4.86%	8.30%	36.00%	4.86%	8.30%	36.00%	4.86%
Feb 2016	2.05%	27.00%	8.30%	36.00%	6.05%	8.30%	36.00%	6.05%	8.30%	36.00%	4.94%	8.30%	36.00%	4.94%	8.30%	36.00%	4.94%	8.30%	36.00%	4.94%
Jan 2016	2.16%	27.00%	8.30%	36.00%	6.12%	8.30%	36.00%	6.12%	8.30%	36.00%	5.01%	8.30%	36.00%	5.01%	8.30%	36.00%	5.01%	8.30%	36.00%	5.01%
Dec 2015	2.29%	27.00%	8.30%	36.00%	6.20%	8.30%	36.00%	6.20%	8.30%	36.00%	5.09%	8.30%	36.00%	5.09%	8.30%	36.00%	5.09%	8.30%	36.00%	5.09%
Nov 2015	2.26%	27.00%	8.30%	36.00%	6.18%	8.30%	36.00%	6.18%	8.30%	36.00%	5.07%	8.30%	36.00%	5.07%	8.30%	36.00%	5.07%	8.30%	36.00%	5.07%
Oct 2015	2.21%	27.00%	8.30%	36.00%	6.15%	8.30%	36.00%	6.15%	8.30%	36.00%	5.04%	8.30%	36.00%	5.04%	8.30%	36.00%	5.04%	8.30%	36.00%	5.04%
Sep 2015	2.20%	27.00%	8.30%	36.00%	6.14%	8.30%	36.00%	6.14%	8.30%	36.00%	5.04%	8.30%	36.00%	5.04%	8.30%	36.00%	5.04%	8.30%	36.00%	5.04%
Aug 2015	2.20%	27.00%	8.30%	36.00%	6.14%	8.30%	36.00%	6.14%	8.30%	36.00%	5.04%	8.30%	36.00%	5.04%	8.30%	36.00%	5.04%	8.30%	36.00%	5.04%
Jul 2015	2.38%	27.00%	8.30%	36.00%	6.26%	8.30%	36.00%	6.26%	8.30%	36.00%	5.15%	8.30%	36.00%	5.15%	8.30%	36.00%	5.15%	8.30%	36.00%	5.15%
Jun 2015	2.25%	25.00%	8.30%	36.00%	6.06%	8.30%	36.00%	6.06%	8.30%	36.00%	5.07%	8.30%	36.00%	5.07%	8.30%	36.00%	5.07%	8.30%	36.00%	5.07%
May 2015	2.19%	25.00%	8.30%	36.00%	6.03%	8.30%	36.00%	6.03%	8.30%	36.00%	5.03%	8.30%	36.00%	5.03%	8.30%	36.00%	5.03%	8.30%	36.00%	5.03%
Apr 2015	1.97%	25.00%	8.30%	36.00%	5.88%	8.30%	36.00%	5.88%	8.30%	36.00%	4.89%	8.30%	36.00%	4.89%	8.30%	36.00%	4.89%	8.30%	36.00%	4.89%
Mar 2015	1.95%	25.00%	8.30%	36.00%	5.87%	8.30%	36.00%	5.87%	8.30%	36.00%	4.88%	8.30%	36.00%	4.88%	8.30%	36.00%	4.88%	8.30%	36.00%	4.88%
Feb 2015	1.93%	25.00%	8.30%	36.00%	5.86%	8.30%	36.00%	5.86%	8.30%	36.00%	4.86%	8.30%	36.00%	4.86%	8.30%	36.00%	4.86%	8.30%	36.00%	4.86%
Jan 2015	2.33%	25.00%	8.30%	36.00%	6.12%	8.30%	36.00%	6.12%	8.30%	36.00%	5.12%	8.30%	36.00%	5.12%	8.30%	36.00%	5.12%	8.30%	36.00%	5.12%
Dec 2014	2.48%	25.00%	8.30%	36.00%	6.21%	8.30%	36.00%	6.21%	8.30%	36.00%	5.22%	8.30%	36.00%	5.22%	8.30%	36.00%	5.22%	8.30%	36.00%	5.22%
Nov 2014	2.59%	25.00%	8.30%	36.00%	6.28%	8.30%	36.00%	6.28%	8.30%	36.00%	5.29%	8.30%	36.00%	5.29%	8.30%	36.00%	5.29%	8.30%	36.00%	5.29%
Oct 2014	2.73%	25.00%	8.30%	36.00%	6.37%	8.30%	36.00%	6.37%	8.30%	36.00%	5.38%	8.30%	36.00%	5.38%	8.30%	36.00%	5.38%	8.30%	36.00%	5.38%
Sep 2014	2.57%	25.00%	8.30%	36.00%	6.27%	8.30%	36.00%	6.27%	8.30%	36.00%	5.27%	8.30%	36.00%	5.27%	8.30%	36.00%	5.27%	8.30%	36.00%	5.27%
Aug 2014	2.70%	25.00%	8.30%	36.00%	6.35%	8.30%	36.00%	6.35%	8.30%	36.00%	5.36%	8.30%	36.00%	5.36%	8.30%	36.00%	5.36%	8.30%	36.00%	5.36%
Jul 2014	2.82%	25.00%	8.30%	36.00%	6.43%	8.30%	36.00%	6.43%	8.30%	36.00%	5.43%	8.30%	36.00%	5.43%	8.30%	36.00%	5.43%	8.30%	36.00%	5.43%
Jun 2014	2.76%	25.00%	8.30%	36.00%	6.39%	8.30%	36.00%	6.39%	8.30%	36.00%	5.39%	8.30%	36.00%	5.39%	8.30%	36.00%	5.39%	8.30%	36.00%	5.39%
May 2014	2.93%	25.00%	8.30%	36.00%	6.50%	8.30%	36.00%	6.50%	8.30%	36.00%	5.50%	8.30%	36.00%	5.50%	8.30%	36.00%	5.50%	8.30%	36.00%	5.50%
Apr 2014	2.96%	25.00%	8.30%	36.00%	6.52%	8.30%	36.00%	6.52%	8.30%	36.00%	5.52%	8.30%	36.00%	5.52%	8.30%	36.00%	5.52%	8.30%	36.00%	5.52%
Mar 2014	2.96%	25.00%	8.30%	36.00%	6.52%	8.30%	36.00%	6.52%	8.30%	36.00%	5.52%	8.30%	36.00%	5.52%	8.30%	36.00%	5.52%	8.30%	36.00%	5.52%
Feb 2014	2.94%	25.00%	8.30%	36.00%	6.51%	8.30%	36.00%	6.51%	8.30%	36.00%	5.51%	8.30%	36.00%	5.51%	8.30%	36.00%	5.51%	8.30%	36.00%	5.51%
Jan 2014	3.20%	25.00%	8.30%	36.00%	6.67%	8.30%	36.00%	6.67%	8.30%	36.00%	5.68%	8.30%	36.00%	5.68%	8.30%	36.00%	5.68%	8.30%	36.00%	5.68%
Dec 2013	3.14%	25.00%	8.30%	36.00%	6.63%	8.30%	36.00%	6.63%	8.30%	36.00%	5.64%	8.30%	36.00%	5.64%	8.30%	36.00%	5.64%	8.30%	36.00%	5.64%
Nov 2013	3.01%	25.00%	8.30%	36.00%	6.55%	8.30%	36.00%	6.55%	8.30%	36.00%	5.55%	8.30%	36.00%	5.55%	8.30%	36.00%	5.55%	8.30%	36.00%	5.55%
Oct 2013	3.09%	25.00%	8.30%	36.00%	6.60%	8.30%	36.00%	6.60%	8.30%	36.00%	5.61%	8.30%	36.00%	5.61%	8.30%	36.00%	5.61%	8.30%	36.00%	5.61%
Sep 2013	3.09%	25.00%	8.30%	36.00%	6.60%	8.30%	36.00%	6.60%	8.30%	36.00%	5.61%	8.30%	36.00%	5.61%	8.30%	36.00%	5.61%	8.30%	36.00%	5.61%
Aug 2013	2.97%	25.00%	8.30%	36.00%	6.52%	8.30%	36.00%	6.52%	8.30%	36.00%	5.53%	8.30%	36.00%	5.53%	8.30%	36.00%	5.53%	8.30%	36.00%	5.53%
Jul 2013	2.96%	25.00%	8.30%	36.00%	6.52%	8.30%	36.00%	6.52%	8.30%	36.00%	5.52%	8.30%	36.00%	5.52%	8.30%	36.00%	5.52%	8.30%	36.00%	5.52%
Jun 2013	2.65%	25.00%	8.30%	36.00%	6.32%	8.30%	36.00%	6.32%	8.30%	36.00%	5.32%	8.30%	36.00%	5.32%	8.30%	36.00%	5.32%	8.30%	36.00%	5.32%
May 2013	2.38%	25.00%	8.30%	36.00%	6.15%	8.30%	36.00%	6.15%	8.30%	36.00%	5.15%	8.30%	36.00%	5.15%	8.30%	36.00%	5.15%	8.30%	36.00%	5.15%

Apr 2013	2.49%	25.00%	8.30%	36.00%	6.22%	8.30%	36.00%	6.22%	8.30%	36.00%	5.22%	8.30%	36.00%	5.22%	8.30%	36.00%	5.22%	8.30%	36.00%	5.22%
Mar 2013	2.53%	25.00%	8.30%	36.00%	6.24%	8.30%	36.00%	6.24%	8.30%	36.00%	5.25%	8.30%	36.00%	5.25%	8.30%	36.00%	5.25%	8.30%	36.00%	5.25%
Feb 2013	2.57%	25.00%	8.30%	36.00%	6.27%	8.30%	36.00%	6.27%	8.30%	36.00%	5.27%	8.30%	36.00%	5.27%	8.30%	36.00%	5.27%	8.30%	36.00%	5.27%
Jan 2013	2.37%	25.00%	8.30%	36.00%	6.14%	8.30%	36.00%	6.14%	8.30%	36.00%	5.14%	8.30%	36.00%	5.14%	8.30%	36.00%	5.14%	8.30%	36.00%	5.14%
Dec 2012	2.30%	25.00%	8.75%	37.00%	6.40%	8.75%	37.00%	6.40%	8.75%	37.00%	5.32%	8.75%	37.00%	5.32%	8.75%	37.00%	5.32%	8.75%	37.00%	5.32%
Nov 2012	2.38%	25.00%	8.75%	37.00%	6.45%	8.75%	37.00%	6.45%	8.75%	37.00%	5.37%	8.75%	37.00%	5.37%	8.75%	37.00%	5.37%	8.75%	37.00%	5.37%
Oct 2012	2.33%	25.00%	8.75%	37.00%	6.41%	8.75%	37.00%	6.41%	8.75%	37.00%	5.34%	8.75%	37.00%	5.34%	8.75%	37.00%	5.34%	8.75%	37.00%	5.34%
Sep 2012	2.37%	25.00%	8.75%	37.00%	6.44%	8.75%	37.00%	6.44%	8.75%	37.00%	5.36%	8.75%	37.00%	5.36%	8.75%	37.00%	5.36%	8.75%	37.00%	5.36%
Aug 2012	2.22%	25.00%	8.75%	37.00%	6.35%	8.75%	37.00%	6.35%	8.75%	37.00%	5.27%	8.75%	37.00%	5.27%	8.75%	37.00%	5.27%	8.75%	37.00%	5.27%
Jul 2012	2.32%	25.00%	8.75%	37.00%	6.41%	8.75%	37.00%	6.41%	8.75%	37.00%	5.33%	8.75%	37.00%	5.33%	8.75%	37.00%	5.33%	8.75%	37.00%	5.33%
Jun 2012	2.33%	25.00%	8.75%	37.00%	6.41%	8.75%	37.00%	6.41%	8.75%	37.00%	5.34%	8.75%	37.00%	5.34%	8.75%	37.00%	5.34%	8.75%	37.00%	5.34%
May 2012	2.65%	25.00%	8.75%	37.00%	6.62%	8.75%	37.00%	6.62%	8.75%	37.00%	5.54%	8.75%	37.00%	5.54%	8.75%	37.00%	5.54%	8.75%	37.00%	5.54%
Apr 2012	2.67%	25.00%	8.75%	37.00%	6.63%	8.75%	37.00%	6.63%	8.75%	37.00%	5.55%	8.75%	37.00%	5.55%	8.75%	37.00%	5.55%	8.75%	37.00%	5.55%
Mar 2012	2.60%	25.00%	8.75%	37.00%	6.58%	8.75%	37.00%	6.58%	8.75%	37.00%	5.51%	8.75%	37.00%	5.51%	8.75%	37.00%	5.51%	8.75%	37.00%	5.51%
Feb 2012	2.64%	25.00%	8.75%	37.00%	6.61%	8.75%	37.00%	6.61%	8.75%	37.00%	5.53%	8.75%	37.00%	5.53%	8.75%	37.00%	5.53%	8.75%	37.00%	5.53%
Jan 2012	2.50%	25.00%	8.75%	37.00%	6.52%	8.75%	37.00%	6.52%	8.75%	37.00%	5.44%	8.75%	37.00%	5.44%	8.75%	37.00%	5.44%	8.75%	37.00%	5.44%
Dec 2011	2.69%	26.50%	8.75%	37.00%	6.73%	8.75%	37.00%	6.73%	8.75%	37.00%	5.56%	8.75%	37.00%	5.56%	8.75%	37.00%	5.56%	8.75%	37.00%	5.56%
Nov 2011	3.02%	26.50%	8.75%	37.00%	6.94%	8.75%	37.00%	6.94%	8.75%	37.00%	5.77%	8.75%	37.00%	5.77%	8.75%	37.00%	5.77%	8.75%	37.00%	5.77%
Oct 2011	2.83%	26.50%	8.75%	37.00%	6.82%	8.75%	37.00%	6.82%	8.75%	37.00%	5.65%	8.75%	37.00%	5.65%	8.75%	37.00%	5.65%	8.75%	37.00%	5.65%
Sep 2011	3.10%	26.50%	8.75%	37.00%	6.99%	8.75%	37.00%	6.99%	8.75%	37.00%	5.82%	8.75%	37.00%	5.82%	8.75%	37.00%	5.82%	8.75%	37.00%	5.82%
Aug 2011	3.35%	26.50%	8.75%	37.00%	7.15%	8.75%	37.00%	7.15%	8.75%	37.00%	5.98%	8.75%	37.00%	5.98%	8.75%	37.00%	5.98%	8.75%	37.00%	5.98%
Jul 2011	3.53%	26.50%	8.75%	37.00%	7.26%	8.75%	37.00%	7.26%	8.75%	37.00%	6.09%	8.75%	37.00%	6.09%	8.75%	37.00%	6.09%	8.75%	37.00%	6.09%