



Pricing Supplement

Dated April 25, 2023

To the Product Prospectus Supplement ERN-EI-1, the Prospectus Supplement and the Prospectus, Each Dated September 14, 2021

\$3,782,000

Notes Linked to the MSCI USA ESG Quality Select Low Volatility 10% Risk Control 2% Decrement Index, Due April 28, 2028
Royal Bank of Canada

Royal Bank of Canada is offering the notes (the "Notes") linked to the performance of the MSCI USA ESG Quality Select Low Volatility 10% Risk Control 2% Decrement Index (the "Reference Asset").

The CUSIP number for the Notes is 78016HXD7. The Notes do not pay interest. If the level of the Reference Asset increases from the Initial Level to the Final Level, the Notes provide a return based on 106% of that increase. If the Final Level of the Reference Asset is less than or equal to the Initial Level, the Notes will pay the principal amount of the Notes, and no additional return. Any payments on the Notes are subject to our credit risk.

We intend to allocate an amount equal to the principal amount of the Notes to finance or refinance, in part or in full, new and/or existing "Eligible Green Assets" (as defined in our Sustainable Bond Framework). Please see the section below, "Use of Proceeds."

Issue Date: April 28, 2023 Maturity Date: April 28, 2028

The Notes will not be listed on any securities exchange.

Investing in the Notes involves a number of risks. See "Selected Risk Considerations" beginning on page P-6 of this pricing supplement, "Additional Risk Factors Specific to the Notes" beginning on page PS-4 of the product prospectus supplement dated September 14, 2021, and "Risk Factors" beginning on page S-2 of the prospectus supplement dated September 14, 2021.

The Notes will not constitute deposits insured by the Canada Deposit Insurance Corporation, the U.S. Federal Deposit Insurance Corporation or any other Canadian or U.S. government agency or instrumentality. The Notes are not subject to conversion into our common shares under subsection 39.2(2.3) of the Canada Deposit Insurance Corporation Act.

Neither the Securities and Exchange Commission nor any state securities commission has approved or disapproved of these securities or determined that this pricing supplement is truthful or complete. Any representation to the contrary is a criminal offense.

	Per Note	Total
Price to public ⁽¹⁾	100.00%	\$3,782,000
Underwriting discounts and commissions ⁽¹⁾	3.25%	\$122,915
Proceeds to Royal Bank of Canada	96.75%	\$3,659,085

⁽¹⁾Certain dealers who purchase the Notes for sale to certain fee-based advisory accounts may forego some or all of their underwriting discount or selling concessions. The public offering price for investors purchasing the Notes in these accounts may be between \$967.50 and \$1,000 per \$1,000 in principal amount.

RBC Capital Markets, LLC ("RBCCM"), acting as our agent, will receive a commission of \$32.50 per \$1,000 in principal amount of the Notes and will use a portion of that commission to allow selling concessions to other dealers of up to \$32.50 per \$1,000 in principal amount of the Notes. The other dealers may forego, in their sole discretion, some or all of their selling concessions. See "Supplemental Plan of Distribution (Conflicts of Interest)" below.

The initial estimated value of the Notes as of the Trade Date was \$948.91 per \$1,000 in principal amount, which is less than the price to public. The actual value of the Notes at any time will reflect many factors, cannot be predicted with accuracy, and may be less than this amount. We describe our determination of the initial estimated value in more detail below.

SUMMARY

The information in this "Summary" section is qualified by the more detailed information set forth in this pricing supplement, the product prospectus supplement, the prospectus supplement, and the prospectus.

Issuer:	Royal Bank of Canada ("Royal Bank")
Underwriter:	RBC Capital Markets, LLC ("RBCCM")
Reference Asset:	<p>MSCI USA ESG Quality Select Low Volatility 10% Risk Control 2% Decrement Index ("MXUSEQLV")</p> <p>The Reference Asset is designed to measure the performance of the MSCI USA ESG Quality Select Low Volatility Index, Gross Total Return (the "Base Index"), while (a) targeting a specific level of risk and (b) applying a constant markdown (a "synthetic dividend"), expressed as a percentage of performance.</p> <p>Please see the section below, "Information About the Reference Asset," for additional information.</p>
Use of Proceeds:	We intend to allocate an amount equal to the principal amount of the Notes to finance or refinance, in part or in full, new and/or existing "Eligible Green Assets" (as defined in the Bank's Sustainable Bond Framework). Please see the section below, "Use of Proceeds" for additional information.
Minimum Investment:	\$1,000 and minimum denominations of \$1,000 in excess thereof.
Trade Date (Pricing Date):	April 25, 2023
Issue Date:	April 28, 2023
Valuation Date:	April 25, 2028
Maturity Date:	April 28, 2028, subject to extension for market and other disruptions, as described in the product prospectus supplement dated September 14, 2021.
Payment at Maturity (if held to maturity):	<p>If the Percentage Change is positive, then the investor will receive an amount per \$1,000 principal amount per Note equal to:</p> <p>Principal Amount + [Principal Amount x (Percentage Change x Leverage Factor)]</p> <p>If the Percentage Change is less than or equal to 0%, then the investor will receive:</p> <p>\$1,000 per \$1,000 in principal amount of the Notes.</p> <p>Accordingly, investors in the Notes will receive a minimum payment of \$1,000 per \$1,000 in principal amount at maturity.</p>
Percentage Change:	<p>The Percentage Change, expressed as a percentage, is calculated using the following formula:</p> $\frac{\text{Final Level} - \text{Initial Level}}{\text{Initial Level}}$
Leverage Factor:	106%
Initial Level:	2,584.298, which was the closing level of the Reference Asset on the Trade Date.

Final Level:	The closing level of the Reference Asset on the Valuation Date.
Calculation Agent:	RBCCM
U.S. Tax Treatment:	We intend to take the position that the Notes will be treated as debt instruments subject to the special tax rules governing contingent payment debt instruments for U.S. federal income tax purposes. Please see the section below, “Supplemental Discussion of U.S. Federal Income Tax Consequences” which applies to the Notes.
Secondary Market:	RBCCM (or one of its affiliates), though not obligated to do so, may maintain a secondary market in the Notes after the issue date. The amount that you may receive upon sale of your Notes prior to maturity may be less than the principal amount of your Notes.
Listing:	The Notes will not be listed on any securities exchange.
Clearance and Settlement:	DTC global (including through its indirect participants Euroclear and Clearstream, Luxembourg as described under “Ownership and Book-Entry Issuance” in the prospectus dated September 14, 2021).
Terms Incorporated in the Master Note:	All of the terms appearing above the item captioned “Secondary Market” on pages P-2 and P-3 of this pricing supplement and the terms appearing under the caption “General Terms of the Notes” in the product prospectus supplement dated September 14, 2021, as modified by this pricing supplement.

ADDITIONAL TERMS OF YOUR NOTES

You should read this pricing supplement together with the prospectus dated September 14, 2021, as supplemented by the prospectus supplement dated September 14, 2021 and the product prospectus supplement dated September 14, 2021, relating to our Senior Global Medium Term Notes, Series I, of which these Notes are a part. Capitalized terms used but not defined in this pricing supplement will have the meanings given to them in the product prospectus supplement. In the event of any conflict, this pricing supplement will control. ***The Notes vary from the terms described in the product prospectus supplement in several important ways. You should read this pricing supplement carefully.***

This pricing supplement, together with the documents listed below, contains the terms of the Notes and supersedes all prior or contemporaneous oral statements as well as any other written materials including preliminary or indicative pricing terms, correspondence, trade ideas, structures for implementation, sample structures, brochures or other educational materials of ours. You should carefully consider, among other things, the matters set forth in “Risk Factors” in the prospectus supplement dated September 14, 2021 and “Additional Risk Factors Specific to the Notes” in the product prospectus supplement dated September 14, 2021, as the Notes involve risks not associated with conventional debt securities. We urge you to consult your investment, legal, tax, accounting and other advisors before you invest in the Notes. You may access these documents on the Securities and Exchange Commission (the “SEC”) website at www.sec.gov as follows (or if that address has changed, by reviewing our filings for the relevant date on the SEC website):

Prospectus dated September 14, 2021:

<https://www.sec.gov/Archives/edgar/data/1000275/000121465921009470/rbc911212424b3.htm>

Prospectus Supplement dated September 14, 2021:

<https://www.sec.gov/Archives/edgar/data/1000275/000121465921009472/rbcsupp911210424b3.htm>

Product Prospectus Supplement ERN-EI-1 dated September 14, 2021:

https://www.sec.gov/Archives/edgar/data/1000275/000114036121031150/brhc10028901_424b5.htm

Our Central Index Key, or CIK, on the SEC website is 1000275. As used in this pricing supplement, “we,” “us,” or “our” refers to Royal Bank of Canada.

HYPOTHETICAL RETURNS

The examples set out below are included for illustration purposes only. The **hypothetical** Percentage Changes of the Reference Asset used to illustrate the calculation of the Payment at Maturity (rounded to two decimal places) are not estimates or forecasts of the Final Level or the level of the Reference Asset on any trading day prior to the Maturity Date. All examples are based on the leverage factor of 106%, and assume that a holder purchased Notes with an aggregate principal amount of \$1,000 and that no market disruption event occurs on the Valuation Date.

- Example 1 — Calculation of the Payment at Maturity where the Percentage Change is -2%.
- Percentage Change: -2%
- Payment at Maturity: $\$1,000 + (\$1,000 \times -2\%) = \$1,000 - \$20 = \$980$. However, the minimum payment on the Notes is \$1,000 per \$1,000 in principal amount.
- In this case, on a \$1,000 investment, a -2% Percentage Change results in a Payment at Maturity of \$1,000, a 0% return on the Notes.
- Example 2 — Calculation of the Payment at Maturity where the Percentage Change is -20%.
- Percentage Change: -20%
- Payment at Maturity: $\$1,000 + (\$1,000 \times -20\%) = \$1,000 - \$200 = \$800$. However, the minimum payment on the Notes is \$1,000 per \$1,000 in principal amount.
- In this case, on a \$1,000 investment, a -20% Percentage Change results in a Payment at Maturity of \$1,000, a 0% return on the Notes.
- Example 3 — Calculation of the Payment at Maturity where the Percentage Change is positive.
- Percentage Change: 10%
- Payment at Maturity: $\$1,000 + [\$1,000 \times (10\% \times 106\%)] = \$1,000 + \$106 = \$1,106$
- On a \$1,000 investment, a 10% Percentage Change results in a Payment at Maturity of \$1,106, a 10.60% return on the Notes.

SELECTED RISK CONSIDERATIONS

An investment in the Notes involves significant risks. Investing in the Notes is not equivalent to investing directly in the Reference Asset. These risks are explained in more detail in the section “Additional Risk Factors Specific to the Notes” in the product prospectus supplement. In addition to the risks described in the prospectus supplement and the product prospectus supplement, you should consider the following:

Risks Relating to the Terms of the Notes

- **The Payment on the Notes May Be Limited to the Principal Amount** — The payment that you receive at maturity will depend upon whether the level of the Reference Asset increases from the Initial Level to the Final Level. If the Final Level is less than or equal to the Initial Level, your payment on the Notes will be limited to the principal amount, and you will not receive a positive return on the Notes.
- **The Notes Do Not Pay Interest and Your Return May Be Lower than the Return on a Conventional Debt Security of Comparable Maturity** — There will be no periodic interest payments on the Notes as there would be on a conventional fixed-rate or floating-rate debt security having the same maturity. The return that you will receive on the Notes, which could be as little as 0%, may be less than the return you could earn on other investments. Even if your return is positive, your return may be less than the return you would earn if you purchased one of our conventional senior interest bearing debt securities.
- **Payments on the Notes Are Subject to Our Credit Risk, and Changes in Our Credit Ratings Are Expected to Affect the Market Value of the Notes** — The Notes are our senior unsecured debt securities. As a result, your receipt of the amount due on the maturity date is dependent upon our ability to repay our obligations at that time. This will be the case even if the level of the Reference Asset increases after the Trade Date. No assurance can be given as to what our financial condition will be at the maturity of the Notes.
- **You Will Be Required to Include Income on the Notes Over Their Term Based Upon a Comparable Yield, Even Though You Will Not Receive Any Payments Until Maturity** — We intend to take the position that the Notes will be treated as debt instruments subject to the special tax rules governing contingent payment debt instruments for U.S. federal income tax purposes. Under such treatment, the Notes are considered to be issued with original issue discount. You will be required to include income on the Notes over their term based upon a comparable yield, even though you will not receive any payments until maturity. You are urged to review the section entitled “Supplemental Discussion of U.S. Federal Income Tax Consequences” and consult your own tax advisor.

Risks Relating to the Secondary Market for the Notes

- **There May Not Be an Active Trading Market for the Notes—Sales in the Secondary Market May Result in Significant Losses** — There may be little or no secondary market for the Notes. The Notes will not be listed on any securities exchange. RBCCM and our other affiliates may make a market for the Notes; however, they are not required to do so. RBCCM or any of our other affiliates may stop any market-making activities at any time. Even if a secondary market for the Notes develops, it may not provide significant liquidity or trade at prices advantageous to you. We expect that transaction costs in any secondary market would be high. As a result, the difference between bid and asked prices for your Notes in any secondary market could be substantial.

Risks Relating to the Initial Estimated Value of the Notes

- **The Initial Estimated Value of the Notes Is Less than the Price to the Public** — The initial estimated value of the Notes that is set forth on the cover page of this pricing supplement does not represent a minimum price at which we, RBCCM or any of our affiliates would be willing to purchase the Notes in any secondary market (if any exists) at any time. If you attempt to sell the Notes prior to maturity, their market value may be lower than the price you paid for them and the initial estimated value. This is due to, among other things, changes in the level of the Reference Asset, the borrowing rate we pay to issue securities of this kind, and the inclusion in the price to the public of the underwriting discount and the estimated costs relating to our hedging of the Notes. These

factors, together with various credit, market and economic factors over the term of the Notes, are expected to reduce the price at which you may be able to sell the Notes in any secondary market and will affect the value of the Notes in complex and unpredictable ways. Assuming no change in market conditions or any other relevant factors, the price, if any, at which you may be able to sell your Notes prior to maturity may be less than your original purchase price, as any such sale price would not be expected to include the underwriting discount or the hedging costs relating to the Notes. In addition to bid-ask spreads, the value of the Notes determined for any secondary market price is expected to be based on the secondary rate rather than the internal funding rate used to price the Notes and determine the initial estimated value. As a result, the secondary price will be less than if the internal funding rate was used. The Notes are not designed to be short-term trading instruments. Accordingly, you should be able and willing to hold your Notes to maturity.

- **The Initial Estimated Value of the Notes that Is Set Forth on the Cover Page of this Pricing Supplement Is an Estimate Only, Calculated as of the Time the Terms of the Notes Were Set** — The initial estimated value of the Notes is based on the value of our obligation to make the payments on the Notes, together with the mid-market value of the derivative embedded in the terms of the Notes. See “Structuring the Notes” below. Our estimate is based on a variety of assumptions, including our credit spreads, expectations as to dividends, interest rates and volatility, and the expected term of the Notes. These assumptions are based on certain forecasts about future events, which may prove to be incorrect. Other entities may value the Notes or similar securities at a price that is significantly different than we do.

The value of the Notes at any time after the Trade Date will vary based on many factors, including changes in market conditions, and cannot be predicted with accuracy. As a result, the actual value you would receive if you sold the Notes in any secondary market, if any, should be expected to differ materially from the initial estimated value of your Notes.

Risks Relating to Conflicts of Interest and Our Trading Activities

- **Our Business Activities May Create Conflicts of Interest** — We and our affiliates expect to engage in trading activities related to the Reference Asset that are not for the account of holders of the Notes or on their behalf. These trading activities may present a conflict between the holders’ interests in the Notes and the interests we and our affiliates will have in their proprietary accounts, in facilitating transactions, including options and other derivatives transactions, for their customers and in accounts under their management. These trading activities, if they influence the level of the Reference Asset, could be adverse to the interests of the holders of the Notes. We and one or more of our affiliates may, at present or in the future, engage in business with companies included in the Reference Asset, including making loans to or providing advisory services. These services could include investment banking and merger and acquisition advisory services. These activities may present a conflict between our or one or more of our affiliates’ obligations and your interests as a holder of the Notes. Moreover, we, and our affiliates may have published, and in the future expect to publish, research reports with respect to the Reference Asset. This research is modified from time to time without notice and may express opinions or provide recommendations that are inconsistent with purchasing or holding the Notes. Any of these activities by us or one or more of our affiliates may affect the level of the Reference Asset, and, therefore, the market value of the Notes.

Risks Relating to the Reference Asset

- **You Will Not Have Any Rights to the Securities Included in the Reference Asset** — As a holder of the Notes, you will not have voting rights or rights to receive cash dividends or other distributions or other rights that holders of securities included in the Reference Asset would have. The Final Level will not reflect any dividends paid on the securities included in the Reference Asset, and accordingly, any positive return on the Notes may be less than the potential positive return on those securities.
- **The Payments on the Notes Are Subject to Market Disruption Events and Adjustments** — The payment at maturity and the Valuation Date are subject to adjustment as described in the product prospectus supplement. For a description of what constitutes a market disruption event as well as the consequences of that market

disruption event, see “General Terms of the Notes—Market Disruption Events” in the product prospectus supplement.

- **We Make No Representation or Assurance as to the Environmental and Social Impact of the Companies Included in the Index** — We make no representation or assurance that the composition of the Reference Asset satisfies, whether in whole or in part, any present or future investor expectations or requirements as to any environmental, social or governance impact of the businesses or products of companies included in the Reference Asset. If the environmental, social or governance impact of the companies included in the Reference Asset is a factor in an investor's decision to invest in the Notes, investors should consult with their legal or other advisers before making an investment in the Notes.
- **The Index May Not Be Successful and May Underperform Alternative Investment Strategies** — There can be no assurance that the Index will achieve positive returns over any period. The components of the Index and the Base Index are selected from the constituents of the MSCI USA Index (the "Parent Index") according to the methodology described below. The Index may underperform relative to the Parent Index or equity markets generally, and the performance of the Index may be less favorable than alternative investment strategies that could have been implemented.
- **The Index Follows a Specific Methodology, Which May Differ Significantly from Alternative Approaches and/or Investor Expectations** — As described below, the Index follows a specific methodology developed by MSCI, with determinations made by the sponsor as to which constituents of the Parent Index will be selected as Index components and how they will be weighted. These determinations are also based on information obtained by MSCI from third-parties and scoring methodologies developed by MSCI and third-parties. The Index methodology and the underlying score methodologies may differ substantially from alternative strategies with similar or related investment objectives. Decisions to include or exclude components of the Index will be made solely by MSCI, and these decisions will affect the performance of the Index on an ongoing basis. Additionally, MSCI will make decisions regarding the stocks included in the Index at its own discretion, using its subjective judgment in many cases, without regard to investor expectations. Any determinations made with respect to the underlying scores or data referenced by MSCI will be made without regard to investors. Neither we nor you will have any ability to affect decisions made regarding the Index or any underlying data, scores or methodologies. The Index may include components that differ significantly from alternative investments strategies with similar objectives, and may underperform these alternative investment strategies, possibly significantly.
- **The Index Has a Limited Operating History and May Perform in Unanticipated Ways** — The Index commenced publication on March 3, 2023, and therefore has very limited operating history. Because the Index is of recent origin and limited actual historical performance data exists with respect to it, your investment in the Notes may involve a greater risk than investing in securities linked to an index with a more established record of performance.

The hypothetical back-tested performance prior to the launch of the Index provided in this document refers to simulated performance data created by applying the Index's calculation methodology to historical prices of the applicable equities. Such simulated performance data has been produced by the retroactive application of a back-tested methodology in hindsight, and may give more preference towards equities that have performed well in the past. Hypothetical back-tested results are neither an indicator nor a guarantor of future results. In addition, there are differences between the current index methodology that is summarized in this document and the index methodology that was applied to generate the hypothetical performance data. For example, the carbon emissions screening was not applied prior to December 1, 2010 due to the unavailability of the necessary carbon data, and screening mechanism for controversial business practices was added to the Index methodology for the Base Index beginning in September 2020. Therefore, the Index may have been comprised of different components and performed differently than it would have been if the current index methodology was applied for the full duration of the period in which the hypothetical back-tested performance information is shown.

- **The Decrement of 2% Per Annum Will Adversely Affect the Performance of the Index in All Cases** — The Index includes a decrement feature, whereby a 2% per annum fee is deducted daily from the level of the Index. The level of the Index will track the performance of the Base Index (as adjusted to reflect the Index's risk control mechanism, the "Adjusted Base Index"), from which no such fee is deducted, and as a result, the Index will

underperform the Adjusted Base Index in all cases. The level of the Index may decline even if the constituents of the Base Index appreciate.

- **Any Potential Benefit From the Gross Total Return Feature of the Index Will Be Reduced by the Decrement of 2% Per Annum** — Although the Index is a gross total return index, which means that any dividends on the constituents of Index are reinvested in the Index, the fee of 2% per annum will reduce any appreciation of the constituents of the Index or any positive benefit from any dividends on those constituents. This fee will be deducted daily from the level of the Index, regardless of the performance of the constituents of the Index and regardless of whether any dividends are paid on them.
- **Even Though the Name of the Reference Asset Includes the Phrase “Risk Control,” the Reference Asset May Decrease Significantly More or Increase Significantly Less Than the Base Index** — The Reference Asset is intended to provide investors with exposure to the Base Index, subject to a risk control strategy that dynamically increases or decreases the exposure to the Base Index in an attempt to achieve a 10% volatility target. The Index's exposure to the Base Index can be greater than, less than or equal to 100%. The performance of the Reference Asset is not taken into account when implementing the risk control strategy and could result in leveraged exposure to the Base Index in a declining stock market, or deleveraged exposure to the Base Index in a rising stock market.

In addition, while the Base Index is designed to reduce its volatility, the MSCI Barra Open Optimizer, which is used to optimize the portfolio based on specified index construction criteria, is not an absolute risk minimizing solution; other models may produce different portfolios resulting in lower expected volatility.

Furthermore, the Reference Asset is designed to measure the return on a hypothetical investment in the Base Index that is made with hypothetically borrowed funds when the Index is allocated more than 100% to the Base Index. Borrowing costs for these funds are assessed at a rate based on the overnight SOFR rate. Any positive performance of the Base Index will be offset to an extent by these hypothetical borrowing costs, and any negative performance of the Base Index will be further adversely impacted by these borrowing costs. Therefore, although the title of the Reference Asset includes the phrase “Risk Control,” the Reference Asset may decrease significantly more or increase significantly less than the Base Index. The Notes are not necessarily less risky than, and will not necessarily have better returns than, notes linked to the Base Index.

- **There Is No Assurance that Calculating Realized Volatility as the Greater of Short-Term Volatility and Long-Term Volatility Is the Best Way to Measure Realized Volatility** — The Base Index Volatility is calculated as the maximum of two volatility estimates: the short-term realized volatility estimate, calculated over a shorter horizon of 20 days, and the long-term realized volatility estimate, calculated over a longer horizon of 60 days. When the volatility of the Base Index increases (or decreases), short-term volatility will increase (or decrease) more quickly than long-term volatility. Because the Base Index Volatility will be the greater of short-term volatility and long-term volatility, realized volatility will increase quickly when volatility increases, which will quickly reduce exposure to the Base Index. Conversely, because realized volatility is the greater of short-term volatility and long-term volatility, realized volatility will decrease slowly when volatility decreases, which in turn will gradually increase exposure to the Base Index. There is no assurance that calculating realized volatility as the greater of short-term volatility and long-term volatility is the most accurate or appropriate way to measure realized volatility. It is possible that exclusively relying on short-term volatility or long-term volatility or on the lesser of short-term volatility and long-term volatility is a more reliable way to measure realized volatility.

In addition, please note that the Base Index Volatility looks at historical volatility, and not any forward-looking models of potential or forecasted future volatility. The Base Index Volatility determined for purposes of the Reference Asset should not be viewed as a prediction of future volatility during the term of the Notes, and actual realized levels of volatility may differ to a significant extent.

- **The Reference Asset Will Not Reflect the Most Current Volatility of the Base Index** — The Index is rebalanced daily in order to adjust its exposure to the Base Index; this rebalancing is based on the applicable realized volatility. Although the Index is rebalanced daily, there is a lag of two trading days between the time that the volatility of the Base Index is calculated, and the rebalancing of the Index in accordance with that volatility. As a result, on any given trading day, the degree of volatility that determines the Index's exposure to the Base Index for that trading day will be based on the realized volatility of the Base Index from two trading days prior to that date. Due to this two trading day delay, and the fact that realized volatility can fluctuate significantly during this

period, and even during a single day, the Index will not be rebalanced to reflect the realized volatility of the Base Index as of the applicable day. As a result, if there is a rapid and severe decline in the level of the Base Index, due to the two trading day lag, the Index may not rebalance into the hypothetical cash position until the Reference Asset has declined by a substantial amount.

- **There Is No Guarantee that the Reference Asset Will Achieve the 10% Volatility Target** — The exposure of the Index to the Base Index is subject to a maximum leverage factor of 150%, which may limit the ability of the Index to fully achieve a volatility target of 10% if achieving such volatility target would require a leverage factor in excess of 150%. Therefore, there is no guarantee that the Index will achieve the 10% volatility target.
- **Investors in the Notes May Be Exposed to Borrowing Costs** — The exposure of the Index to the Base Index can be greater than, less than or equal to 100%. Exposure in excess of 100% (i.e., leverage) is achieved by hypothetically borrowing cash at a rate that is based on overnight SOFR for the exposure above 100%. As leverage increases, the applicable borrowing costs will increase.

The cost of borrowing is not taken into account under the Index methodology when determining leverage above 100% (subject to a maximum leverage factor of 150%), even if any given investor would prefer not to borrow money to invest in the Index at that time. The cost of borrowing may exceed the returns from the Base Index if the return of the Base Index decreases or if the applicable SOFR rate increases (or both).

- **Controlled Volatility Does Not Mean the Index Will Have Lower Volatility than the Base Index** — The Index employs a risk-control strategy that uses mathematical equations to target 10% volatility. The strategy does not have a goal of achieving lower volatility than the Base Index. In fact, if the realized volatility of the Base Index is less than the volatility target of 10%, the exposure to the Base Index will be increased in an attempt to raise the volatility of the Index to 10%. Any time the exposure to the Base Index is greater than 100%, the Index would be more volatile than the Base Index.
- **Low Volatility Does Not Necessarily Mean the Index Will Outperform the Base Index or that the Index Will Have Positive Performance** — The Index employs a risk-control strategy that uses mathematical equations to target 10% volatility. Even if the Index achieves its volatility target, there is no guarantee that the Index will outperform the Base Index, or that the return of the Index will be positive. For example, if the performance of the Base Index remains stable or steadily decreases over time, the Index's volatility target will not cause the Index to outperform the Base Index or result in a positive return on the Index. Moreover, the return of the Index will likely be less than the return of the Base Index due to the borrowing costs included in the calculation of the Index.
- **There May Be Overexposure to the Base Index in Declining Stock Markets or Underexposure in Rising Stock Markets** — The Index is designed to achieve its volatility target regardless of the direction of price movements in the market. Therefore, in rising stock markets, if realized volatility of the Base Index is higher than the volatility target, some of the Index's exposure will be allocated away from the Base Index to the hypothetical cash position, and the Index will experience lower returns than if the full exposure was maintained in the Base Index. In contrast, if realized volatility is less than the volatility target in a declining stock market, the Index will be exposed to more than 100% of the losses in the Base Index, and the Index will experience lower returns than the Base Index. At certain points in the past, the hypothetical cash position has represented a significant portion of the Index. Any rebalancing into a hypothetical cash position will limit your return on the Notes.
- **The Exposure to the Index May Be Rebalanced into a Hypothetical Cash Position on Any or All Days During the Term of the Notes** — The Index has a daily rebalancing feature which can result in a rebalancing between the exposure to the Base Index and the hypothetical cash position. This could have the effect of reducing the exposure of the Base Index to less than 100% in an attempt to reduce the volatility to 10%. The minimum leverage factor is 0%. Therefore, there is no guarantee that the Index will not be rebalanced so that the hypothetical cash position represents a significant portion of the Index (up to 100%). Any rebalancing into a hypothetical cash position will limit your return on the Notes.

Risk Factors Relating to Use of Proceeds of the Notes

- **The Notes May Not Be a Suitable Investment for All Investors Seeking Exposure to Green Assets** — The Bank will exercise its judgement and sole discretion in determining the businesses and projects that will be financed by the proceeds of the Notes. If the use of the proceeds of the Notes is a factor in an investor's decision to invest in the Notes, they should consider the disclosure in "Use of Proceeds" and consult with their legal or

other advisers before making an investment in the Notes. While it is the intention of the Bank, there can be no assurance that any of the businesses and projects funded with the proceeds from the Notes will meet the criteria for Eligible Green Assets in the Bank's Sustainable Bond Framework (as defined below) or an investor's expectations or requirements, whether as to green impact or outcome or otherwise.

Furthermore, while the intention of the Bank is to allocate an amount at least equivalent to the principal amount of the Notes as described in "Use of Proceeds", there is no contractual obligation to allocate that amount to finance Eligible Green Assets or to provide annual progress reports as described therein.

The Bank's failure to so allocate or report or the failure of any of the businesses and projects funded with the proceeds from the Notes to meet the criteria for Eligible Green Assets in the Bank's Sustainable Bond Framework will not constitute an event of default with respect to the Notes or give rise to any other claim by a holder of the Notes against the Bank. Any such failure may affect the value of the Notes and/or have adverse consequences for certain investors with portfolio mandates to invest in green assets. The market price of the Notes may be impacted by our failure to allocate an amount at least equivalent to the principal amount of the Notes from this offering to Eligible Green Assets, to publicly report on such allocation, or to meet or continue to meet the investment requirements of investors with respect to the Notes. Any such event or failure by us will not constitute a default or event of default under the Notes or the indenture.

Furthermore, it should be noted that there is currently no clearly-defined definition (legal, regulatory or otherwise) of, nor market consensus as to what constitutes, a "green" or an equivalently labelled project or business, nor as to what precise attributes are required for a particular project or business to be defined as "green" or such other equivalent label nor can any assurance be given that such a clear definition or consensus will develop over time. Accordingly, while it is the intention of the Bank, no assurance is or can be given to investors that any projects or uses the subject of, or related to, any Eligible Green Assets selected to receive an allocation of funds from the proceeds of the Notes will meet any or all investor expectations regarding such "green" or other equivalently-labelled performance objectives or that any adverse environmental and/or other impacts will not occur during the implementation of any projects or uses the subject of, or related to, any of the Eligible Green Assets funded with the proceeds from the Notes.

No assurance or representation is given as to the suitability or reliability for any purpose whatsoever of any report, assessment, opinion or certification of any third party (whether or not solicited by the Bank) which may be made available in connection with the issue of the Notes and in particular with any of the businesses and projects funded with the proceeds from the Notes to fulfil any environmental and/or other criteria. For the avoidance of doubt, none of the Bank's Sustainable Bond Framework, the second party opinion or any other report, assessment, opinion or certification is, nor shall they be deemed to be, incorporated in and/or form part of this document. Any such report, assessment, opinion or certification is not, nor should be deemed to be, a recommendation by the Bank or any other person to buy, sell or hold the Notes. The second party opinion and any such other report, assessment, opinion or certification is only current as at the date that it was initially issued. Prospective investors must determine for themselves the relevance of any such report, assessment, opinion or certification and/or the information contained therein and/or the provider of such opinion or certification for the purpose of any investment in any Notes. The providers of such reports, assessments, opinions and certifications are not currently subject to any specific regulatory or other regime or oversight.

While it is the intention of the Bank to allocate an amount at least equivalent to the principal amount of the Notes, and to obtain and publish the relevant reports, assessments, opinions and certifications in, or substantially in, the manner described in "Use of Proceeds", there can be no assurance that the Bank will be able to do this. In addition, there can be no assurance that any eligible projects will be completed within any specified period or at all or with the results or outcome (whether or not related to the environment) as originally expected or anticipated by the Bank.

Any such event or failure to allocate any amounts of the proceeds from this offering to any eligible businesses or projects or to obtain and publish any such reports, assessments, opinions and certifications, will not constitute an event of default under the Notes or give rise to any other claim of a holder of the Notes against the Bank. The withdrawal of any report, assessment, opinion or certification as described above, or any such report, assessment, opinion or certification attesting that the Bank is not complying in whole or in part with any matters for which such report, assessment, opinion or certification is reporting, assessing, opining or certifying on may

have a material adverse effect on the value of the Notes and/or result in adverse consequences for certain investors with portfolio mandates to invest in securities to be used for a particular purpose.

INFORMATION ABOUT THE REFERENCE ASSET

All disclosures contained in this pricing supplement regarding the Reference Asset, including, without limitation, its make-up, method of calculation, and changes in its components, have been derived from publicly available sources. The information reflects the policies of, and is subject to change by, MSCI Inc., as the sponsor of the Reference Asset ("MSCI"). MSCI, which owns the copyright and all other rights to the Reference Asset, has no obligation to continue to publish, and may discontinue publication of, the Reference Asset. The consequences of MSCI discontinuing publication of the Reference Asset are discussed in the section of the product prospectus supplement entitled "General Terms of the Notes—Unavailability of the Level of the Reference Asset." Neither we nor RBCCM accepts any responsibility for the calculation, maintenance or publication of the Reference Asset or any successor index.

Introduction

The MSCI USA ESG Quality Select Low Volatility 10% Risk Control 2% Decrement Index (the "Index") is designed to measure the performance of the MSCI USA ESG Quality Select Low Volatility Index, Gross Total Return (the "Base Index"), while (a) targeting a specific level of risk and (b) applying a constant markdown (a "synthetic dividend"), expressed as a percentage of performance. The Base Index is designed to represent the performance of a strategy that seeks lower risk than the MSCI USA Index (the "Parent Index"), along with improvement in the Quality, ESG and Carbon Emission Intensity characteristics, as described in more detail below. The Parent Index is designed to measure the performance of the large and mid cap segments of the U.S. market. With 625 constituents as of February 28, 2023, the index covers approximately 85% of the free float-adjusted market capitalization in the United States.

The Index's exposure to the Base Index can be greater than, less than or equal to 100%. However, the Index's exposure to the Base Index will not exceed 150%, and will not be negative. An exposure greater than 100% of the daily return of the Base Index is a leveraged position, where the exposure to the Base Index in excess of 100% is financed, and a borrowing cost is accrued, at a rate equal to overnight SOFR (or any other successor rate designated by MSCI in accordance with its methodology) is deducted from that return. An exposure less than 100% of the daily return of the Base Index is a deleveraged position, where the exposure to the Base Index is decreased by reducing that exposure, which results in a hypothetical cash position in the Index that is deemed to accrue interest at a rate equal to overnight SOFR. The exposure will be greater than 100% when the Base Index's realized volatility is less than 10%, and will be less than 100% when the Base Index's realized volatility is greater than 10%, as described below.

MSCI Inc. ("MSCI") is the sponsor of the Index. MSCI commenced calculating the Index on March 3, 2023, with a base value of 1,000 as of May 31, 2007.

As of February 28, 2023, there were 101 companies included in the Index and the Base Index, and no company accounted for more than 2.64% of the Index weight. As of that date, the following industries were represented by the Index and the Base Index, in the following percentages: Health Care (28.62%), Consumer Staples (21.96%), Financials (13.47%), Information Technology (11.67%), Communication Services (8.39%), Industrials (7.26%), Consumer Discretionary (4.52%), Utilities (2.41%), Materials (0.92%) and Real Estate (0.79%).

In this section, we describe the Base Index, and the risk control and decrement features of the Index, in more detail. Additional information about the Index and its methodology may be obtained from the MSCI's website. However, information on that website will not be deemed to be included or incorporated by reference in this document.

The ESG Research Framework

The Base Index utilizes research provided by MSCI ESG Research. In particular, the Base Index uses the following MSCI ESG Research LLC products and services: MSCI ESG Ratings, MSCI ESG Controversies, MSCI Business Involvement Screening Research and MSCI Climate Change Metrics.

For additional information about MSCI ESG Research's full suite of ESG products, please refer to:
<https://www.msci.com/esg-investing>

MSCI ESG Business Involvement Screening Research

MSCI ESG Business Involvement Screening Research (BISR) aims to enable institutional investors to manage environmental, social and governance (ESG) standards and restrictions reliably and efficiently. MSCI provides additional information as to MSCI ESG Business Involvement Screening Research at the following webpage:
www.msci.com/resources/factsheets/MSCI_ESG_BISR.pdf

MSCI ESG Ratings

MSCI ESG Ratings aim to measure entities' management of environmental, social and governance risks and opportunities. MSCI ESG Ratings are based on a seven-point scale from 'AAA' to 'CCC', indicating how an entity managements relevant key issues relative to industry peers. MSCI provides additional information about these ratings and their determination at the following webpage: <https://www.msci.com/esg-and-climate-methodologies>

MSCI ESG Controversies

MSCI ESG Controversies provide assessments of controversies concerning the potential negative environmental, social, and/or governance impact of company operations, products and services. The evaluation framework used in MSCI ESG Controversies is designed to be consistent with international norms represented by the UN Declaration of Human Rights, the ILO Declaration on Fundamental Principles and Rights at Work, and the UN Global Compact. MSCI ESG Controversies Scores fall on a 0-10 scale, with "0" being the most severe controversy.

MSCI provides additional information about its determination of these assessments at the following webpage:
www.msci.com/esg-and-climate-methodologies

MSCI Climate Change Metrics

MSCI Climate Change Metrics provide climate data and tools to support institutional investors seeking to integrate climate risk and opportunities into their investment strategy and processes. This includes investors seeking to achieve a range of objectives, including measuring and reporting on climate risk exposure, implementing low carbon and fossil fuel-free strategies, alignment with temperature pathways and factoring climate change research into their risk management processes, in particular through climate scenario analysis for both transition and physical risks. MSCI provides additional information regarding MSCI Climate Change Metrics at the following webpage:
www.msci.com/climate-solutions

Constructing the Base Index and the Index

The Base Index is constructed from the Parent Index. The following steps are applied at the initial construction of the Base Index:

- Defining the Parent Index, Eligible Universe and the base currency for optimization
- Eligible Universe Screening
- Defining the optimization constraints
- Determining the optimized portfolio

The Index is then constructed from the Base Index by applying the following steps sequentially:

- Applying the MSCI Risk Control Indexes methodology
- Applying the MSCI Decrement Indexes methodology

Defining the Parent Index, Eligible Universe and the Base Currency for Optimization

The Base Index is constructed by starting with the Parent Index, applying screens to arrive at the eligible universe, and then applying the relevant optimization tools described below. The optimization tools are designed to reduce the expected volatility of the final portfolio universe, subject to the optimization constraints listed below.

Eligible Universe Screening

Liquidity Criteria

Securities in the Parent Index with 12-month Average Daily Traded Value ("ADTV") greater than or equal to US\$5 million, calculated as set forth in the index methodology, are eligible for inclusion in the Base Index.

To avoid multiple securities of the same company being included in the Base Index, only the most liquid security for each issuer (based on its 12-month ADTV) is eligible for inclusion in the Base Index. For any issuer, if two securities have the same 12-month ADTV, the one with the higher free float-adjusted market capitalization is included.

ESG Ratings Eligibility

The Base Index uses MSCI ESG Ratings to identify companies that have demonstrated an ability to manage their ESG risks and opportunities. Companies having an MSCI ESG Rating of 'AAA', 'AA', 'A' or 'BBB' are eligible for inclusion in the Base Index; companies with an MSCI ESG Rating that is less than 'BBB' are not eligible. Unrated companies (companies not assessed by MSCI ESG Research on MSCI ESG Rating) are excluded from the eligible universe.

ESG Controversies Score Eligibility

The Base Index uses MSCI ESG Controversies Scores to identify those companies that are involved in very serious controversies involving the environmental, social, or governance impact of their operations and/or products and services. Companies are required to have an MSCI ESG Controversies Score of 1 or higher to be eligible for inclusion in the Base Index.

Values-Based Exclusions

The Base Index also uses MSCI ESG Business Involvement Screening Research to identify companies that are involved in the following business activities. Companies that meet the business involvement criteria are excluded from the Base Index. These business activities include:

- Controversial Weapons
- Civilian Firearms
- Nuclear Weapons
- Tobacco
- Alcohol
- Adult Entertainment
- Conventional Weapons
- Gambling
- Genetically Modified Organisms
- Nuclear Power
- Thermal Coal

Carbon Emission Intensity Screening

After applying the above liquidity and ESG eligibility criteria, the Base Index excludes the top 20% of the securities from the remaining universe, as ranked in descending order based on their Carbon Emission Intensity. To select companies with low exposure to fossil fuel reserves, the Parent Index constituents are ranked by low carbon emission intensity. Generally, MSCI's measurement compares a company's carbon emissions relative to its sales. To effect this

measurement, MSCI collects company-specific direct (Scope 1) and indirect (Scope 2) greenhouse gas (GHG) emissions data from company public documents and/or the Carbon Disclosure Project (an international non-profit organization). If a company does not report GHG emissions, then MSCI uses a proprietary methodology to estimate Scope 1 and Scope 2 GHG emissions. The data is updated on an annual basis. Since the current carbon emissions of a company are directly influenced by its current business activity, MSCI normalizes for size by dividing the annual carbon emissions of the company by the annual sales of the company. For newly added companies to the index which do not report emission data and where MSCI has not estimated the greenhouse gas emissions yet, MSCI uses the average emissions per dollar of issuer market capitalization for the companies in the same industry group, multiplied by the market capitalization of the company as the estimated emission for the company. For additional details on Carbon Emission Intensity calculation please refer to MSCI Global Low Carbon Leaders Index methodology at <https://www.msci.com/index-methodology>.

In the case of two or more securities having the same Carbon Emission Intensity, the security with the higher weight in the Parent Index is given a lower rank.

Quality Screening

After applying the Carbon Emission Intensity screen, the Base Index excludes the lowest 20% of the securities from the remaining universe, as ranked in descending order based on their Quality factor score, which is derived from the relevant Barra Equity Model. The Barra Equity Model Quality factor score is calculated for each security by combining in equal proportion the security-level exposures to five factors: Profitability, Investment Quality, Earnings Quality, Leverage and Earnings Variability - from the MSCI Barra Global Equity Model for Long-Term Investors ("GEMLT") model.

A sector-relative score is derived from the combined score by standardizing the latter within each sector and "winsorizing" at +/- 3 standard deviations in order to reduce the impact of companies that have more extreme characteristics:

$$\text{Quality}_i = (0.2) * \text{Profitability}_i + (0.2) * \text{Investment Quality}_i + (0.2) * \text{Earnings Quality}_i + (-1) * (0.2) * \text{Earnings Variability}_i + (-1) * (0.2) * \text{Leverage}_i$$

The winsorizing procedure is designed to reduce or eliminate the inputs that significantly exceed the others. In case of two or more securities having the same Quality factor score, the security with the higher weight in the Parent Index is given a higher rank.

Defining the Optimization Constraints

At each index review (as further described below), the following optimization constraints are employed to construct the Base Index, which aim to ensure replicability and investability, while targeting lower risk. An estimated security co-variance matrix based on the relevant Barra multi-factor equity model is used to forecast lowest risk. Details about the Barra multi-factor risk models are available at <https://www.msci.com/our-solutions/analytics/portfolio-management>

- the maximum weight of an index constituent will be 2.5%.
- the minimum weight of an index constituent will be 0.25%.
- the minimum number of constituents in the index will be 50.
- the sector weights of the Base Index will not deviate more than +/-15% from the sector weights of the Parent Index.

Determining the Optimized Portfolio

The Base Index is constructed using MSCI's Barra Open Optimizer, in combination with the relevant Barra Equity Model (the MSCI Barra Global Equity Model for Long-Term Investors). The MSCI Barra Open Optimizer is a computer program that is used to solve optimization problems subject to constraints. The optimization uses the eligible universe as the universe of eligible securities and the specified optimization objectives and constraints (set forth in the preceding subsection) to determine the Base Index.

Applying the MSCI Risk Control and Decrement Indexes Methodology

The MSCI Risk Control Indexes Methodology and the MSCI Decrement Indexes Methodology are each applied sequentially on the Base Index to construct the Index.

The MSCI Risk Control Indexes Methodology

The Index targets an annualized volatility of 10% by adjusting its exposure on a daily basis between the Base Index and a cash component. The adjustment is based on a ratio between the volatility target and the Base Index's historical (i.e., realized) volatility. In periods of higher volatility than the target, the Index can allocate up to 100% in cash, and in periods of lower volatility, the allocation can be up to 150% of the Base Index's performance. If the exposure to the Base Index is less than or equal to 100%, then the cash allocation will earn interest based on the overnight SOFR rate (or the applicable successor rate); otherwise, the cash allocation is considered to be negative, and that SOFR rate (or the applicable successor rate) will be deducted from the performance of the Base Index in order to finance the leveraged exposure to the Base Index.

Applicable Universe, Cash Component and Specific Risk Levels

Volatility Estimation. The returns of the Base Index are used for volatility estimation. The volatility estimation approach takes into account both the short-term and the long term volatility trends of the Base Index.

The Base Index Volatility is calculated as the maximum of two volatility estimates: the short-term realized volatility estimate, calculated over a shorter horizon of 20 days, and the long-term realized volatility estimate, calculated over a longer horizon of 60 days. The volatility estimation approach uses equally weighted daily gross total returns of the Base Index for both horizons. The realized volatility will impact the Reference Asset's exposure to the Base Index, as discussed below.

Index Leverage of the Index. The objective of the Index is to replicate the performance of a strategy that targets a specific level of risk by varying the weights of the Base Index and a cash component.

The Index Leverage of the Index is the weight of the Base Index and is calculated daily as the ratio of the specific risk level and the Base Index Volatility, subject to a maximum leverage of 150% and turnover buffers.

If the Base Index Volatility is higher than 8%, then the weight of the Base Index will be less than 100%, while the weight of the cash component will be 100% minus the weight of the Base Index. The daily return on the cash component is determined using the applicable SOFR rate (or the applicable successor rate). Similarly, if the Base Index Volatility is lower than the specific risk level, the weight of the Base Index will be more than 100%, subject to a maximum leverage of 150%. The borrowing cost associated with the daily Index Leverage is calculated using such SOFR rate (or the applicable successor rate).

The Index Leverage applicable on an effective date is determined using the Base Index Volatility determined two trading days before the effective date. Accordingly, although the Index is rebalanced daily, there is a lag of two trading days between the time that the Base Index Volatility is calculated, and the rebalancing of the Index in accordance with that volatility.

Turnover Buffers and Exchange Holidays. The Index applies turnover buffers to reduce the turnover associated with changes in Index Leverage arising from changes in the realized volatility of the Base Index. The Index is rebalanced daily, subject to a turnover buffer of 5%, and is rebalanced only when the percentage change in daily Index Leverage exceeds 5%. On days when the Index is not rebalanced, the Index Leverage from the previous trading day is maintained.

The Index is not rebalanced when 10% or more of the constituents of the Base Index (calculated by the constituent weights) are not traded due to exchange holidays on the day prior to the effective date.

Treatment of Corporate Events

The Index is derived from the Base Index. As a result, corporate events are reflected in the Index as they occur and as they are reflected in the Base Index.

Index Calculations

As discussed above, the objective of the Index is to replicate the performance of a strategy that targets a specific level of risk by varying the weights of the Base Index and a cash component. Accordingly, the calculation of the Index takes into account (a) the return of the Base Index (assuming that dividends on the relevant index stocks) and (b) the return of the cash component.

The return of the Base Index will reflect the Index Leverage, determined as described above. An exposure greater than 100% to the Base Index is a leveraged position, where the exposure to the Base Index is increased by hypothetically borrowing cash (and paying interest on that cash). An exposure less than 100% to the Base Index is a deleveraged position where the exposure to the Base Index is decreased by reducing the exposure and holding cash (and earning interest on that cash). The overnight SOFR rate (or the applicable successor rate) is used to calculate the hypothetical interest cost, or the gain from holding cash. A 360-day year is assumed for the interest calculations.

Calculation of the Decrement

The decrement feature of the Index is designed to represent the performance of a strategy tracking the Base Index (after giving effect to the risk control mechanism described above, the "Adjusted Base Index"), from which a pre-determined amount (a "synthetic dividend") of 2% is deducted daily, calculated on an Actual/360 basis, which means that on each business day, the 2% synthetic dividend is divided by 360 and multiplied by the number of days elapsed since the last business day to determine the daily synthetic dividend deduction for that day.

Because the Index deducts this "synthetic dividend" from the performance of the Adjusted Base Index, the Index will systematically underperform the Adjusted Base Index.

The decrement is applied "geometrically," meaning that the Index replicates the performance of the Adjusted Base Index, from which percentage points are subsequently deducted.

As a consequence of the decrement application, it is possible that the level of the Index could become negative on a particular day, even though the performance of the Adjusted Base Index is positive.

Maintaining the Base Index

Index Reviews

The Base Index is reviewed on a quarterly basis as per the steps described above for determining eligible index components, coinciding with the February, May, August and November quarterly index reviews of the Parent Index.

For each rebalance, the Barra Equity Model data as of the end of the month preceding the index review are used. This approach is designed to capture timely updates to the risk characteristics of the companies, and to coincide with the rebalancing frequency of the Parent Index.

In general, MSCI uses MSCI ESG Research data (including MSCI ESG Ratings, MSCI ESG Controversies Scores, MSCI Climate Change Metrics) as of the end of the month preceding the Index Reviews for the rebalancing of the Base Index. For some securities, such data may not be published by MSCI ESG Research by the end of the month preceding the Index Review. For those securities, MSCI will use ESG data published after the end of month, when available, for the rebalancing of the Base Index.

The pro forma index is in general announced nine business days before the effective date.

Ongoing Event-Related Changes

This section briefly describes the treatment of common corporate events within the Base Index. Changes in index market capitalization that occur because of corporate event implementation will be offset by a corresponding change in the Variable Weighting Factor (VWF) of the constituent.

No new securities will be added (except where noted below) to the Base Index between Index Reviews. For cases where additions are noted below, securities will be added to the Index only if added to the Parent Index. Deletions from the Parent Index will be reflected simultaneously.

Event Type Details

New additions to the Parent Index: A new security added to the Parent Index (such as IPO and other early inclusions) will not be added to the Base Index.

Spin-Offs: All securities created as a result of the spin-off of an existing Index constituent will not be added to the Base Index at the time of event implementation. Reevaluation for continued inclusion in the Base Index will occur at the subsequent Index Review.

Merger/Acquisition: For mergers and acquisitions, the acquirer's post event weight will account for the proportionate amount of shares involved in deal consideration, while cash proceeds will be invested across the Base Index.

If an existing Base Index constituent is acquired by a non-Index constituent, the existing constituent will be deleted from the Base Index and the acquiring non-constituent will not be added to the Base Index.

Changes in Security Characteristics: A security will continue to be an Base Index constituent if there are changes in characteristics (country, sector, size segment, etc.) Reevaluation for continued inclusion in the Base Index will occur at the subsequent Index Review.

License Agreement

We have entered into a license agreement with MSCI providing for the license to us and certain of our affiliated or subsidiary companies, in exchange for a fee, of the right to use the Index in connection with certain securities, including the Notes offered hereby.

The license agreement between us and MSCI requires that the following language be stated in this document:

THE NOTES ARE NOT SPONSORED, ENDORSED, SOLD OR PROMOTED BY MSCI INC. ("MSCI"), ANY AFFILIATE OF MSCI OR ANY OTHER PARTY INVOLVED IN, OR RELATED TO, MAKING OR COMPILING ANY MSCI INDEX. THE MSCI INDEXES ARE THE EXCLUSIVE PROPERTY OF MSCI. MSCI AND THE MSCI INDEX NAMES ARE SERVICE MARK(S) OF MSCI OR ITS AFFILIATES AND HAVE BEEN LICENSED FOR USE FOR CERTAIN PURPOSES BY ROYAL BANK OF CANADA. NEITHER MSCI, ANY OF ITS AFFILIATES NOR ANY OTHER PARTY INVOLVED IN, OR RELATED TO, MAKING OR COMPILING ANY MSCI INDEX MAKES ANY REPRESENTATION OR WARRANTY, EXPRESS OR IMPLIED, TO THE OWNERS OF THE NOTES OR ANY MEMBER OF THE PUBLIC REGARDING THE ADVISABILITY OF INVESTING IN FINANCIAL SECURITIES GENERALLY OR IN THE NOTES PARTICULARLY OR THE ABILITY OF ANY MSCI INDEX TO TRACK CORRESPONDING STOCK MARKET PERFORMANCE. MSCI OR ITS AFFILIATES ARE THE LICENSORS OF CERTAIN TRADEMARKS, SERVICE MARKS AND TRADE NAMES AND OF THE MSCI INDEXES WHICH ARE DETERMINED, COMPOSED AND CALCULATED BY MSCI WITHOUT REGARD TO THE NOTES OR THE ISSUER OR OWNER OF THE NOTES. NEITHER MSCI, ANY OF ITS AFFILIATES NOR ANY OTHER PARTY INVOLVED IN, OR RELATED TO, MAKING OR COMPILING ANY MSCI INDEX HAS ANY OBLIGATION TO TAKE THE NEEDS OF THE ISSUERS OR OWNERS OF THE NOTES INTO CONSIDERATION IN DETERMINING, COMPOSING OR CALCULATING THE MSCI INDEXES. NEITHER MSCI, ITS AFFILIATES NOR ANY OTHER PARTY INVOLVED IN, OR RELATED TO, MAKING OR COMPILING ANY MSCI INDEX IS RESPONSIBLE FOR OR HAS PARTICIPATED IN THE DETERMINATION OF THE TIMING OF, PRICES AT, OR QUANTITIES OF THE NOTES TO BE ISSUED OR IN THE DETERMINATION OR CALCULATION OF THE EQUATION BY WHICH THE NOTES IS REDEEMABLE FOR CASH. NEITHER MSCI, ANY OF ITS AFFILIATES NOR ANY OTHER PARTY INVOLVED IN, OR RELATED TO, THE MAKING OR COMPILING ANY MSCI INDEX HAS ANY OBLIGATION OR LIABILITY TO THE OWNERS OF THE NOTES IN CONNECTION WITH THE ADMINISTRATION, MARKETING OR OFFERING OF THE NOTES.

ALTHOUGH MSCI SHALL OBTAIN INFORMATION FOR INCLUSION IN OR FOR USE IN THE CALCULATION OF THE MSCI INDEXES FROM SOURCES WHICH MSCI CONSIDERS RELIABLE, NEITHER MSCI, ANY OF ITS AFFILIATES NOR ANY OTHER PARTY INVOLVED IN, OR RELATED TO MAKING OR COMPILING ANY MSCI INDEX WARRANTS OR GUARANTEES THE ORIGINALITY, ACCURACY AND/OR THE COMPLETENESS OF ANY MSCI INDEX OR ANY DATA INCLUDED THEREIN. NEITHER MSCI, ANY OF ITS AFFILIATES NOR ANY OTHER PARTY INVOLVED IN, OR RELATED TO, MAKING OR COMPILING ANY MSCI INDEX MAKES ANY WARRANTY, EXPRESS OR IMPLIED, AS TO RESULTS TO BE OBTAINED BY LICENSEE, LICENSEE'S CUSTOMERS OR COUNTERPARTIES, THE ISSUER OF THE NOTES, OWNERS OF THE NOTES, OR ANY OTHER PERSON OR ENTITY, FROM THE USE OF ANY MSCI INDEX OR ANY DATA INCLUDED THEREIN IN CONNECTION WITH THE RIGHTS LICENSED HEREUNDER OR FOR ANY OTHER USE. NEITHER MSCI, ANY OF ITS AFFILIATES NOR ANY OTHER PARTY INVOLVED IN, OR RELATED TO, MAKING OR COMPILING ANY MSCI INDEX SHALL HAVE ANY LIABILITY FOR ANY ERRORS, OMISSIONS OR INTERRUPTIONS OF OR IN CONNECTION WITH ANY MSCI INDEX OR ANY DATA INCLUDED THEREIN. FURTHER, NEITHER MSCI, ANY OF ITS AFFILIATES NOR ANY OTHER PARTY INVOLVED IN, OR RELATED TO, MAKING OR COMPILING ANY MSCI INDEX MAKES ANY EXPRESS OR IMPLIED WARRANTIES OF ANY KIND, AND MSCI, ANY OF ITS AFFILIATES AND ANY OTHER PARTY INVOLVED IN, OR RELATED TO MAKING OR COMPILING ANY MSCI INDEX HEREBY EXPRESSLY DISCLAIM ALL WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, WITH RESPECT TO ANY MSCI INDEX AND ANY DATA INCLUDED THEREIN. WITHOUT LIMITING ANY OF THE FOREGOING, IN NO EVENT SHALL MSCI, ANY OF ITS AFFILIATES OR ANY OTHER PARTY INVOLVED IN, OR RELATED TO, MAKING OR COMPILING ANY MSCI INDEX HAVE ANY LIABILITY FOR ANY DIRECT, INDIRECT, SPECIAL, PUNITIVE, CONSEQUENTIAL OR ANY OTHER DAMAGES (INCLUDING LOST PROFITS) EVEN IF NOTIFIED OF THE POSSIBILITY OF SUCH DAMAGES.

No purchaser, seller or holder of the Notes, or any other person or entity, should use or refer to any MSCI trade name, trademark or service mark to sponsor, endorse, market or promote the Notes without first contacting MSCI to determine whether MSCI's permission is required. Under no circumstances may any person or entity claim any affiliation with MSCI without the prior written permission of MSCI.

Historical and Hypothetical Index Performance Information

The graph below sets forth information relating to the performance of the Reference Asset. The information provided in this graph is for the period from May 31, 2007 to through April 25, 2023.

The Reference Asset was launched on March 3, 2023. Accordingly, all of the information about the performance of the Reference Asset prior to its launch date is based on hypothetical back-tested information. There are differences between the current index methodology described herein and the index methodology that was applied to generate the hypothetical and historical performance data. For example, (i) the carbon emissions screening was not applied prior to December 1, 2010 due to the unavailability of the necessary carbon data and (ii) the controversial business practices screen was added to the index methodology for the Base Index and applied starting on September 1, 2020. Therefore, the Reference Asset may have been comprised of different components and performed differently than it would have if the current index methodology was applied for the full duration of the hypothetical historical and historical period.

The hypothetical performance of the Reference Asset is based on criteria that have been applied retroactively with the benefit of hindsight; these criteria cannot account for all financial risk that may affect the actual performance of the Reference Asset in the future. The future performance of the Reference Asset may vary significantly from the hypothetical performance data set forth below.

We obtained the information regarding the historical and hypothetical performance of the Reference Asset in the graph below from Bloomberg Financial Markets. We have not independently verified the accuracy or completeness of the information obtained from Bloomberg Financial Markets. The historical and hypothetical performance of the Reference Asset should not be taken as an indication of its future performance, and no assurance can be given as to the Final Level of the Reference Asset. We cannot give you assurance that the performance of the Reference Asset will result in any positive return on your initial investment.



PAST PERFORMANCE IS NOT INDICATIVE OF FUTURE RESULTS.

USE OF PROCEEDS

We intend to allocate an amount equal to the principal amount of the Notes to finance or refinance, in part or in full, new and/or existing Eligible Green Assets (as defined in the Bank's Sustainable Bond Framework).

Eligible Green Assets may include, but are not limited to, loans to businesses and projects that meet the eligibility criteria for Eligible Green Assets as described in the Bank's Sustainable Bond Framework dated June 2020 (as may be amended from time to time, the "Sustainable Bond Framework"). Our eligibility criteria for Eligible Green Assets have been developed in line with the International Capital Market Association's Green Bond Principles 2018 (the "GBP") and our Sustainable Bond Framework, and are based on four core components: (1) use of proceeds, (2) process for project evaluation and selection, (3) management of proceeds and (4) reporting. The Bank's Sustainable Bond Framework is available at <https://www.rbc.com/investor-relations/sustainable-bonds.html>.

Information contained on our website is not and should not be deemed a part of, or incorporated by references into, this document.

Eligibility Criteria

Where an organization derives 90% or more of its revenues from activities in the categories below, as more fully described in the Bank's Sustainable Bond Framework (the "Eligible Categories"), it will be considered eligible for financing using the proceeds from the sale of the Notes:

- renewable energy;
- energy efficiency;
- pollution prevention and control;
- sustainable land use;
- clean transportation;
- sustainable water and wastewater management;
- green buildings; and
- climate adaptation and resilience.

In such instances, the use of proceeds can be used by the organization for general purposes, so long as the financing does not fund activities that contravene the Eligible Categories.

The Bank will not knowingly allocate any proceeds from the issuance of the Notes to finance any businesses whose current principal industry or primary activity has been assessed by the Bank as being weapons, tobacco, gambling, adult entertainment and/or predatory lending.

Process for Asset Evaluation and Selection

A Sustainable Bond Working Group ("Working Group") oversees the implementation of the Bank's Sustainable Bond Framework.

The Bank maintains a register of eligible sustainability assets, which will include a separate portfolio of Eligible Green Assets ("Green Asset Portfolio").

The Green Asset Portfolio is reviewed by the Working Group on a quarterly basis to ensure that all Eligible Green Assets continue to meet the Eligible Categories. Assets that have been terminated or no longer comply will be removed from the Green Asset Portfolio.

Management of Proceeds

All Eligible Green Assets in the Green Asset Portfolio are tagged as Eligible Green Assets in the Bank's information management systems. As such, the Green Asset Portfolio is dynamic, with Eligible Green Assets maturing and new Eligible Green Assets being added.

Proceeds from the offering of the Notes will be managed in a portfolio approach. The Bank's Working Group will monitor the aggregate amount of assets in the Bank's Green Asset Portfolio on a quarterly basis to ensure the total Eligible Green Assets in the portfolio is equal to or greater than the aggregate amount of proceeds raised by the offering of the Notes.

If for any reason the total amount of Eligible Green Assets in the Green Asset Portfolio is less than the total outstanding amount of the Notes issued, the Bank will hold the unallocated amount in cash or liquid securities in accordance with the Bank's normal liquidity management policy until the amount can be allocated to the Eligible Green Assets.

Reporting

The Bank intends to make and keep readily available reports within a year from issuance of the Notes, to be renewed annually until full allocation and in case of any material changes. Such reports will be made publicly available on rbc.com and may include, but will not be limited to:

- the proceeds raised from the Notes issued in this offering;
- aggregate amounts of funds allocated to each of the Eligible Categories; and
- the balance of unallocated proceeds at the reporting period end.

Where feasible, the Bank will provide further information and examples of eligible businesses and projects financed or refinanced using the proceeds from the Notes, including quantitative performance measures. Disclosure of information related to use of proceeds, impact reporting, and businesses and projects financed or refinanced will be made subject to the Bank's confidentiality obligations and the availability of information.

The Bank has obtained a second-party opinion to confirm the alignment of the Bank's framework with the GBP. The Bank may request on an annual basis a limited assurance report of the allocation of the proceeds from the issuance of the Notes to Eligible Green Assets, provided by its external auditor, but is under no obligation to do so.

SUPPLEMENTAL DISCUSSION OF U.S. FEDERAL INCOME TAX CONSEQUENCES

The following is a general description of the material U.S. tax considerations relating to the Notes. It does not purport to be a complete analysis of all tax considerations relating to the Notes. Prospective purchasers of the Notes should consult their tax advisors as to the consequences under the tax laws of the country of which they are resident for tax purposes and the tax laws of the U.S. of acquiring, holding and disposing of the Notes and receiving payments under the Notes. This summary is based upon the law as in effect on the date of this document and is subject to any change in law that may take effect after such date.

The following section supplements the discussion of U.S. federal income taxation in the accompanying prospectus and prospectus supplement and it supersedes the discussion of U.S. federal income taxation in the accompanying product prospectus supplement. It applies only to those holders who are not excluded from the discussion of U.S. federal income taxation in the accompanying prospectus. This discussion applies only to holders that will purchase the Notes upon original issuance and will hold the Notes as capital assets for U.S. federal income tax purposes. Further, this discussion does not address the tax consequences applicable to any holders under section 451(b) of the U.S. Internal Revenue Code of 1986, as amended (the "Code").

You should consult your tax advisor concerning the U.S. federal income tax and other tax consequences of your investment in the Notes in your particular circumstances, including the application of state, local or other tax laws and the possible effects of changes in federal or other tax laws.

NO STATUTORY, JUDICIAL OR ADMINISTRATIVE AUTHORITY DIRECTLY DISCUSSES HOW THE NOTES SHOULD BE TREATED FOR U.S. FEDERAL INCOME TAX PURPOSES. AS A RESULT, THE U.S. FEDERAL INCOME TAX CONSEQUENCES OF AN INVESTMENT IN THE NOTES ARE UNCERTAIN. BECAUSE OF THE UNCERTAINTY, YOU SHOULD CONSULT YOUR TAX ADVISOR IN DETERMINING THE U.S. FEDERAL INCOME TAX AND OTHER TAX CONSEQUENCES OF YOUR INVESTMENT IN THE NOTES, INCLUDING THE APPLICATION OF STATE, LOCAL OR OTHER TAX LAWS AND THE POSSIBLE EFFECTS OF CHANGES IN FEDERAL OR OTHER TAX LAWS.

We intend to take the position that the Notes will be treated as debt instruments subject to the special tax rules governing contingent payment debt instruments for U.S. federal income tax purposes. Under those rules, the amount of interest you are required to take into account for each accrual period and adjustments in respect of the Notes will be determined by constructing a projected payment schedule for the Notes, and applying the rules similar to those for accruing original issue discount ("OID") on a hypothetical noncontingent debt instrument with that projected payment schedule. Under these rules, you will be required to include amounts in income during the term of the Notes, although we will not make any payments on the Notes until maturity.

This method is applied by first determining the yield at which we would issue a noncontingent fixed rate debt instrument with terms and conditions similar to the Notes (the "comparable yield") including the level of subordination, term, timing of payment and general market conditions, but excluding any adjustments for riskiness of the contingencies or liquidity of the Notes, and then determining a payment schedule as of the issue date that would produce the comparable yield. A projected payment schedule with respect to a note generally is a series of projected payments, the amount and timing of which would produce a yield to maturity on that note equal to the comparable yield. This projected payment schedule and comparable yield are constructed solely for tax purposes, and does not constitute a representation of the amount of contingent payments (if any) that we will make on the Notes.

The amount of interest that you will be required to include in income during each accrual period for the Notes will equal the product of the adjusted issue price for the Notes at the beginning of the accrual period and the comparable yield for the Notes for such period, adjusted upward or downward to reflect the difference, if any, between the actual and projected amount of any contingent payments. Any net differences between actual payments received by a holder on a Note in a taxable year and the projected amounts of those payments will be accounted for as additional interest (in the case of a net positive adjustment) or as an offset to interest income in respect of the Notes (in the case of a net negative adjustment), for that taxable year. If the net negative adjustment for a taxable year exceeds the amount of interest on the Notes for that year, the excess will be treated as an ordinary loss in that year, but only to the extent the holder's total interest inclusions

on the Notes exceed the total amount of any ordinary loss in respect of the Notes claimed by the U.S. holder under this rule in prior taxable years. Any net negative adjustment that is not allowed as an ordinary loss for the taxable year is carried forward to the next taxable year, and is taken into account in determining whether the U.S. holder has a net positive or negative adjustment for that year. Any net negative adjustment that is carried forward to a taxable year in which a holder sells or taxably disposes of the Notes reduces the holder's amount realized on the sale or other taxable disposition.

To obtain the comparable yield and projected payment schedule for your Note, you should call RBC Capital Markets, LLC toll free at 1-877-688-2301. You are required to use such comparable yield and projected payment schedule in determining your interest accruals in respect of your Notes, unless you timely disclose and justify on your federal income tax return the use of a different comparable yield and projected payment schedule. ***The comparable yield and projected payment schedule are not provided to you for any purpose other than the determination of your interest accruals in respect of the Notes, and we make no representations regarding the amount of contingent payments with respect to the Notes.***

The adjusted issue price of the Notes will equal the Notes' original offering price plus any interest deemed to be accrued on the Notes (under the rules governing contingent payment debt instruments). Special rules apply in determining interest accruals for a U.S. holder that purchases the Notes for an amount that differs from the Note's adjusted issue price at the time of the purchase and such holders are urged to consult with their tax advisor.

Special rules apply if one or more contingent payments become fixed prior to maturity. If all remaining contingent payments become fixed substantially contemporaneously, applicable Treasury regulations provide that you should make adjustments to the prior and future interest inclusions in respect of your Notes over the remaining term for the Notes in a reasonable manner. If one or more (but not all) contingent payments become fixed more than six months prior to the relevant payment date, applicable Treasury regulation provide that you should account for the difference between the original projected payments and the fixed payments by making an adjustment equal to the difference between the present value of the amount that is fixed and the projected amount of the contingent payment by discounting each amount from the date the payment is due to the date the payment becomes fixed, using a discount rate equal to the comparable yield on the debt instrument. Additionally, the projected payment schedule is modified prospectively to reflect the fixed amount of the payment. You should consult your tax advisor regarding the application of these rules.

You will recognize gain or loss on the sale or maturity of the Notes in an amount equal to the difference, if any, between the amount of cash you receive at such time and your adjusted basis in the Notes. In general, your adjusted basis in the Notes will equal the amount you paid to acquire the Notes, increased by the amount of interest income you have previously accrued in respect of the Notes (determined without regard to any of the positive or negative adjustments to interest accruals described above) and decreased by the amount of any projected payments in respect of the Notes through the date of the sale or exchange. The rules for determining the adjusted basis for holders who acquire the Notes at a price other than the adjusted issue price are complex, such holders should consult their tax advisors for assistance in determining their adjusted basis in the Notes.

Any gain you recognize on the sale or maturity of the Notes generally will be ordinary interest income. Any loss you recognize at such time will be ordinary loss to the extent of interest you included as income in the current or previous taxable years in respect of the Notes (reduced by the total amount of net negative adjustments previously taken into account as ordinary losses), and thereafter, capital loss. The deductibility of capital losses is limited.

Backup Withholding and Information Reporting. Payments made with respect to the Notes and proceeds from the sale of the Notes may be subject to a backup withholding tax unless, in general, the holder complies with certain procedures or is an exempt recipient. Any amounts so withheld generally will be refunded by the Internal Revenue Service ("IRS") or allowed as a credit against the holder's U.S. federal income tax, provided the holder makes a timely filing of an appropriate tax return or refund claim.

Reports will be made to the IRS and to holders that are not exempted from the reporting requirements.

Non-U.S. Holders. The following discussion applies to non-U.S. holders of the Notes. You are a non-U.S. holder if you are a beneficial owner of a Note and are for U.S. federal income tax purposes a non-resident alien individual, a foreign corporation, or a foreign estate or trust.

Except as discussed below, payments made to a non-U.S. holder, and any gain realized on the sale or maturity of the Notes, generally should be exempt from U.S. federal income and withholding tax, subject to generally applicable exceptions set forth in the rules exempting “portfolio interest” from U.S. withholding tax, provided that (i) the holder complies with applicable certification requirements, which certification may be made on Form W-8BEN or W-8BEN-E (or a substitute or successor form) on which the holder certifies, under penalties of perjury, that the holder is not a U.S. person and provides its name and address, (ii) the payment or gain is not effectively connected with the conduct by the holder of a U.S. trade or business, and (iii) if the holder is a non-resident alien individual, the holder is not present in the U.S. for 183 days or more during the taxable year of the sale or maturity of the Notes. In the case of (ii) above, the holder generally should be subject to U.S. federal income tax with respect to any income or gain in the same manner as if the holder were a U.S. holder and, in the case of a holder that is a corporation, the holder may also be subject to a branch profits tax equal to 30% (or such lower rate provided by an applicable U.S. income tax treaty) of a portion of its earnings and profits for the taxable year that are effectively connected with its conduct of a trade or business in the U.S., subject to certain adjustments. Payments made to a non-U.S. holder may be subject to information reporting and to backup withholding unless the holder complies with applicable certification and identification requirements as to its foreign status.

Under Section 871(m) of the Code, a “dividend equivalent” payment is treated as a dividend from sources within the United States. Such payments generally would be subject to a 30% U.S. withholding tax if paid to a non-U.S. holder. Under U.S. Treasury Department regulations, payments (including deemed payments) with respect to equity-linked instruments (“ELIs”) that are “specified ELIs” may be treated as dividend equivalents if such specified ELIs reference, directly or indirectly, an interest in an “underlying security,” which is generally any interest in an entity taxable as a corporation for U.S. federal income tax purposes if a payment with respect to such interest could give rise to a U.S. source dividend. However, the IRS has issued guidance that states that the U.S. Treasury Department and the IRS intend to amend the effective dates of the U.S. Treasury Department regulations to provide that withholding on dividend equivalent payments will not apply to specified ELIs that are not delta-one instruments and that are issued before January 1, 2025. Royal Bank has determined that non-U.S. holders should not be subject to withholding under Section 871(m) of the Code on payments under the Notes. However, it is possible that the Notes could be treated as deemed reissued for U.S. federal income tax purposes upon the occurrence of certain events affecting the Reference Asset or the Notes (for example, upon the Reference Asset rebalancing), and following such occurrence the Notes could be treated as subject to withholding on dividend equivalent payments. Non-U.S. holders that enter, or have entered, into other transactions in respect of the Reference Asset or the Notes should consult their tax advisors as to the application of the dividend equivalent withholding tax in the context of the Notes and their other transactions. If any payments are treated as dividend equivalents subject to withholding, we (or the applicable withholding agent) would be entitled to withhold taxes without being required to pay any additional amounts with respect to amounts so withheld.

Foreign Account Tax Compliance Act. The Foreign Account Tax Compliance Act (“FATCA”) imposes a 30% U.S. withholding tax on certain U.S. source payments, including interest (and original issue discount), dividends, and other fixed or determinable annual or periodical gain, profits, and income (“Withholdable Payments”), if paid to a foreign financial institution (including amounts paid to a foreign financial institution on behalf of a holder), unless such institution enters into an agreement with the U.S. Treasury Department to collect and provide to the U.S. Treasury Department certain information regarding U.S. financial account holders, including certain account holders that are foreign entities with U.S. owners, with such institution, or otherwise complies with the legislation. In addition, the Notes may constitute a “financial account” for these purposes and, thus, be subject to information reporting requirements pursuant to FATCA. FATCA also generally imposes a withholding tax of 30% on Withholdable Payments made to a non-financial foreign entity unless such entity provides the withholding agent with a certification that it does not have any substantial U.S. owners or a certification identifying the direct and indirect substantial U.S. owners of the entity. Under certain circumstances, a holder may be eligible for refunds or credits of such taxes.

The U.S. Treasury Department has proposed regulations that eliminate the requirement of FATCA withholding on payments of gross proceeds upon the sale or disposition of financial instruments of a type which can produce U.S. source interest or dividends. The U.S. Treasury Department has indicated that taxpayers may rely on these proposed regulations

pending their finalization, and the discussion above assumes the proposed regulations will be finalized in their proposed form with retroactive effect. If we (or the applicable withholding agent) determine withholding is appropriate with respect to the Notes, tax will be withheld at the applicable statutory rate, and we (or the applicable withholding agent) will not pay any additional amounts in respect of such withholding. Therefore, if such withholding applies, any payments on the Notes will be significantly less than what you would have otherwise received. Depending on your circumstances, these amounts withheld may be creditable or refundable to you. Foreign financial institutions and non-financial foreign entities located in jurisdictions that have an intergovernmental agreement with the United States governing FATCA may be subject to different rules. Prospective investors are urged to consult with their own tax advisors regarding the possible implications of FATCA on their investment in the Notes.

SUPPLEMENTAL PLAN OF DISTRIBUTION (CONFLICTS OF INTEREST)

Delivery of the Notes will be made against payment for the Notes on April 28, 2023, which is the third (3rd) business day following the Trade Date (this settlement cycle being referred to as “T+3”). See “Plan of Distribution” in the prospectus dated September 14, 2021. For additional information as to the relationship between us and RBCCM, please see the section “Plan of Distribution—Conflicts of Interest” in the prospectus dated September 14, 2021.

We will deliver the Notes on a date that is greater than two business days following the Trade Date. Under Rule 15c6-1 of the Exchange Act, trades in the secondary market generally are required to settle in two business days, unless the parties to any such trade expressly agree otherwise. Accordingly, purchasers who wish to trade the Notes more than two business days prior to the original issue date will be required to specify alternative settlement arrangements to prevent a failed settlement.

In the initial offering of the Notes, they will be offered to investors at a purchase price equal to par, except with respect to certain accounts as indicated on the cover page of this document. In addition to the underwriting discount set forth on the cover page, we or one of our affiliates may also pay an expected fee to a broker-dealer that is unaffiliated with us for providing certain electronic platform services with respect to this offering.

The value of the Notes shown on your account statement may be based on RBCCM's estimate of the value of the Notes if RBCCM or another of our affiliates were to make a market in the Notes (which it is not obligated to do). That estimate will be based upon the price that RBCCM may pay for the Notes in light of then prevailing market conditions, our creditworthiness and transaction costs. For a period of approximately twelve months after the issue date of the Notes, the value of the Notes that may be shown on your account statement may be higher than RBCCM's estimated value of the Notes at that time. This is because the estimated value of the Notes will not include the underwriting discount or our hedging costs and profits; however, the value of the Notes shown on your account statement during that period may initially be a higher amount, reflecting the addition of RBCCM's underwriting discount and our estimated costs and profits from hedging the Notes. This excess is expected to decrease over time until the end of this period. After this period, if RBCCM repurchases your Notes, it expects to do so at prices that reflect their estimated value.

We may use this pricing supplement in the initial sale of the Notes. In addition, RBCCM or another of our affiliates may use this pricing supplement in a market-making transaction in the Notes after their initial sale. ***Unless we or our agent informs the purchaser otherwise in the confirmation of sale, this pricing supplement is being used in a market-making transaction.***

STRUCTURING THE NOTES

The Notes are our debt securities, the return on which is linked to the performance of the Reference Asset. As is the case for all of our debt securities, including our structured notes, the economic terms of the Notes reflect our actual or perceived creditworthiness at the time of pricing. In addition, because structured notes result in increased operational, funding and liability management costs to us, we typically borrow the funds under these Notes at a rate that is more favorable to us than the rate that we might pay for a conventional fixed or floating rate debt security of comparable maturity. Using this relatively lower implied borrowing rate rather than the secondary market rate, is a factor that reduced the initial estimated value of the Notes at the time their terms were set. Unlike the estimated value that is set forth on the cover page of this pricing supplement, any value of the Notes determined for purposes of a secondary market transaction may be based on a different funding rate, which may result in a lower value for the Notes than if our initial internal funding rate were used.

In order to satisfy our payment obligations under the Notes, we may choose to enter into certain hedging arrangements (which may include call options, put options or other derivatives) on the issue date with RBCCM or one of our other subsidiaries. The terms of these hedging arrangements take into account a number of factors, including our creditworthiness, interest rate movements, the volatility of the Reference Asset, and the tenor of the Notes. The economic terms of the Notes and their initial estimated value depend in part on the terms of these hedging arrangements.

The lower implied borrowing rate is a factor that reduced the economic terms of the Notes to you. The initial offering price of the Notes also reflects the underwriting commission and our estimated hedging costs. These factors resulted in the initial estimated value for the Notes on the Trade Date being less than their public offering price. See “Selected Risk Considerations—The Initial Estimated Value of the Notes Is Less than the Price to the Public” above.

VALIDITY OF THE NOTES

In the opinion of Norton Rose Fulbright Canada LLP, the issue and sale of the Notes has been duly authorized by all necessary corporate action of the Bank in conformity with the Indenture, and when the Notes have been duly executed, authenticated and issued in accordance with the Indenture and delivered against payment therefor, the Notes will be validly issued and, to the extent validity of the Notes is a matter governed by the laws of the Province of Ontario or Québec, or the laws of Canada applicable therein, will be valid obligations of the Bank, subject to equitable remedies which may only be granted at the discretion of a court of competent authority, subject to applicable bankruptcy, to rights to indemnity and contribution under the Notes or the Indenture which may be limited by applicable law, to insolvency and other laws of general application affecting creditors' rights, to limitations under applicable limitations statutes, and to limitations as to the currency in which judgments in Canada may be rendered, as prescribed by the Currency Act (Canada). This opinion is given as of the date hereof and is limited to the laws of the Provinces of Ontario and Québec and the federal laws of Canada applicable thereto. In addition, this opinion is subject to customary assumptions about the Trustee's authorization, execution and delivery of the Indenture and the genuineness of signatures and certain factual matters, all as stated in the letter of such counsel dated September 14, 2021, which has been filed as Exhibit 5.3 to Royal Bank's Form 6-K filed with the SEC dated September 14, 2021.

In the opinion of Ashurst LLP, when the Notes have been duly completed in accordance with the Indenture and issued and sold as contemplated by the prospectus supplement and the prospectus, the Notes will be valid, binding and enforceable obligations of the Bank, entitled to the benefits of the Indenture, subject to applicable bankruptcy, insolvency, fraudulent transfer, reorganization, moratorium and similar laws of general applicability relating to or affecting creditors' rights and subject to general principles of equity, public policy considerations and the discretion of the court before which any suit or proceeding may be brought. This opinion is given as of the date hereof and is limited to the laws of the State of New York. This opinion is subject to customary assumptions about the Trustee's authorization, execution and delivery of the Indenture and the genuineness of signatures and to such counsel's reliance on the Bank and other sources as to certain factual matters, all as stated in the legal opinion dated September 14, 2021, which has been filed as Exhibit 5.4 to the Bank's Form 6-K dated September 14, 2021.