Enbridge Gas Inc.

Application to change its natural gas rates and other charges beginning January 1, 2024

Evidence
of
DUSTIN MADSEN, CPA, CA, CPA (IL, USA), CDP, CRRA

PRESIDENT

EMRYDIA CONSULTING CORPORATION (U.S. AND CANADA)

Sponsored by Industrial Gas Users Association

EMRYDIA

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1 Introduction

Q: State your name and occupation.

A: My name is Dustin M. J. Madsen. I am the President of Emrydia Consulting Corporation (Emrydia). Emrydia is a consulting firm providing services to parties participating in the electric, gas and water utility industry in North America. Emrydia serves a broad range of clients, including but not limited to public advocates, small and large customer groups, regulated and unregulated electric utilities, regulators, and large international corporations that consume and produce electricity and gas. Emrydia provides expert advice and testimony through its group of Canadian and U.S. based consultants in the areas of depreciation, cost of capital, revenue requirement, cost-of-service, incentive-based regulation, planning for and completing the energy transition, income taxes, engineering matters, as well as a variety of broad and narrow regulatory and financial issues. Emrydia also prepares depreciation studies for clients using the proprietary depreciation model created by Mr. Madsen. Emrydia is incorporated in both Canada and the United States. Emrydia's business addresses are as follows:

304 8 Ave SW Suite #620
Calgary, AB T2P 1C1

401 Ryland St. Suite 200-A
Reno, NV 89502

Q: Summarize your educational background and professional experience.

A: I have 20 years of experience in auditing, accounting, and regulated businesses. I received a Bachelor of Commerce, major in accounting, awarded with Great Distinction from the Edwards School of Business at the University of Saskatchewan. I am a Canadian Chartered Professional Accountant and Chartered Accountant registered with CPA Alberta, as well as a US Certified Public Accountant registered with the Illinois Department of Financial and Professional Regulation. I am also a Certified Depreciation Professional with the Society of Depreciation Professionals and a Certified Rate of Return Analyst with the Society of Utility and Regulatory Financial Analysts.

My curriculum vitae is included at the end of this evidence and provides a complete description of my qualifications, regulatory and professional experience. I have provided services in several jurisdictions in Canada and the United States. In Canada, I have provided services in Alberta, British Columbia, Manitoba, the Northwest Territories, New Brunswick, and Ontario. I have provided services to consumer advocates, utilities, regulators, and other interested parties in regulatory applications. For customer groups, I have represented small residential customers, small and medium sized commercial customers, large industrial electric customers, and large industrial gas customers, as well as landowners.

I have testified before the Alberta Utilities Commission on numerous occasions and before the New Brunswick Energy and Utilities Board. I am scheduled to testify in rate cases on a variety of subject matters before the Manitoba Public Utilities Board, and the Ontario Energy Board (OEB) in this case, as well as potentially the British Columbia Utilities Commission and regulators in the United States.

Formerly I was a manager and consultant with two large regulated electric utilities operating in Alberta, Canada. I have testified and presented expert evidence on virtually every aspect of utility revenue requirements, including but not limited to depreciation, cost of capital, capital structure, income taxes, operating costs, capital, prudence issues, deferral accounts, reserve accounts, rate design, accounting and finance issues, incentive-based regulation, and best practices for utilities to minimize costs.

Q: On whose behalf are you testifying in this proceeding?

A: The evidence is sponsored by the Industrial Gas Users Association (IGUA).

Q: Summarize the instructions you received from your client.

A: I was retained by IGUA to prepare expert testimony in relation to depreciation matters in the Enbridge Gas Inc. (Enbridge) 2024-2028 Natural Gas Distribution Rates Application (the Application).

Q: Confirm that you acknowledge your duty to provide opinion evidence that is fair, objective and non-partisan and that your evidence would not change were you to have been retained by another party in this proceeding.

A: Confirmed, please refer to the attached Form A.

2 Executive summary

Q: Summarize the key areas of your testimony.

A: The focus of my testimony is on Enbridge's applied for depreciation expense. Specifically, I comment on the following areas in the sections that follow:

- Use of the Average Life Group (ALG) versus Equal Life Group (ELG) procedure to calculate depreciation expense, including phase-in options available if the proposed use of ELG is approved by the OEB.
- Specific changes to the currently approved average service lives and survivor curves for certain accounts.
- The use of the constant dollar net salvage (CDNS) method for calculating net salvage costs including the discount rate used by Concentric to discount the future net salvage costs.
- Alternative approaches to collecting net salvage costs for the OEB's consideration, including a discussion of the segregated fund option and other alternatives.

Q: Please briefly summarize Enbridge's requests in relation to depreciation expense in this proceeding.

A: Enbridge is seeking approval of an increase in depreciation expense primarily driven by a change in depreciation and net salvage rates of $120.7 million,[1] which is an increase of

[1] EB-2022-0200, Exhibit 4 Operating Expenses Updated, Tab 5, Schedule 1, Attachment 2, Page 8 of 8, PDF page 1308.

15.6% from the depreciation provision calculated using current depreciation rates ($120.7 million/$771.6 million).[2]

To support its revised requested depreciation expense, Enbridge relies on the evidence of Danielle Dreveny, Manager Capital Financial Planning & Analysis contained at Exhibit 4, Tab 5, Schedule 1 and the 2021 Depreciation Study completed by Concentric Energy Advisors (Concentric) at Exhibit 4, Tab 5, Schedule 1, Attachment 1.

As outlined in greater detail within the materials referred to above, Enbridge is seeking approval to align and modify the depreciation parameters used by the previous Enbridge Gas Distribution (EGD) and Union Gas (Union). Alignment and modification of the previous depreciation procedures and methods used by EGD and Union requires the proposal of several changes as summarized in the following table provided by Enbridge:[3]

Table 1 – Enbridge Table 2 Summary of Key Depreciation Parameters

Topic	Approved EGD Methodology	Approved Union Methodology	Proposed Enbridge Gas Methodology
Group Depreciation Procedure (Straight Line Method)	ALG Procedure	Generation Arrangement Procedure	ELG Procedure
Amortization Accounting	n/a	Amortization Accounting for certain assets	Amortization Accounting for certain assets
Net Salvage Methodology	CDNS	Traditional Approach	CDNS

Q: Should the OEB approve Enbridge's requested relief in relation to depreciation expense?

[2] EB-2022-0200, Exhibit 4 Operating Expenses Updated, Tab 5, Schedule 1, Attachment 2, Page 8 of 8, PDF page 1308.
[3] EB-2022-0200, Exhibit 4 Operating Expenses Updated, Tab 5, Schedule 1, Page 5 of 20, PDF page 834.

A: No. I recommend the following adjustments to the applied for depreciation expense and net salvage calculations:

- Use of the ALG procedure combined with the straight-line method and remaining life technique as opposed to the ELG procedure and remaining life technique. The impact of this change is a reduction to depreciation expense of $81.4 million.[4]
- Alternatively, if the ELG procedure is approved, there should be a phase in of the impact given the material change in rates as proposed and the lack of gradualism and moderation of that change.
- I recommend the following revised average service lives and survivor curves:
  - Account 466 – Transmission – Compressor Equipment – 37-R4 curve as compared to 30-R4 recommended by Concentric, which reduces depreciation expense by $9.7 million when the ALG procedure is used to calculate depreciation expense under each Iowa curve (see section 3.1.2.1).
  - Account 473.01 – Services – Metal – 50-L1 curve as compared to 45-S1 recommended by Concentric, which reduces depreciation expense by $5.1 million when the ALG procedure is used to calculate the depreciation expense under each Iowa curve (see section 3.1.2.2).
  - Account 473.02 – Services – Plastic – 60-S3 curve as compared to 55-S3 recommended by Concentric, which reduces depreciation expense by approximately $14.8 million when the ALG procedure is used to calculate the depreciation expense under each Iowa curve (see section 3.1.2.3).
  - Account 475.21 – Mains – Coated and wrapped – 60-R3 curve as compared to the 55-R3 recommended by Concentric, which reduces depreciation

[4] EGI IRR Exhibit I4 2024 Rebasing 2023-03-08, PDF page 814, Exhibit I.4.5-STAFF-170, Attachment 1.

expense by $18.9 million when the ALG procedure is used to calculate the depreciation expense under each Iowa curve (see section 3.1.2.4).

  - Account 475.30 – Mains – Plastic – 70-R2 curve as compared to the 60-R4 recommended by Concentric, which reduces depreciation expense by $26.2 million when the ALG procedure is used to calculate the depreciation expense under each Iowa curve (see section 3.1.2.5).
  - Account 478 – Meters – 25-L1.5 curve as compared to the 15-S2.5 recommended by Concentric, which reduces depreciation expense by approximately $58.7 million when the ALG procedure is used to calculate the depreciation expense under each Iowa curve (see section 3.1.2.6).
  - Account 472.35 – Structures and improvements – Mainway – Consider a potential reclassification of the unrecovered investment to Account 472, and factor in the impact on revenues of including a one-time depreciation charge in the revenue adjustment (see section 3.1.2.7).
  - Account 474 – Regulators – 50-L1 curve (consistent with the curve recommended for Account 473.01) as compared to the 25-SQ recommended by Concentric, which reduces depreciation expense by $34.4 million when the ALG procedure is used to calculate the depreciation expense under each Iowa curve (see section 3.1.3.1).
  - Account 491.01 and 491.02 (post 2023 balances) – 5-SQ curve as compared to the 4-SQ recommended by Concentric. The impact of this recommendation is not material in the current test period (approximately $1.4 million), but could be material in future test periods as the balance in the account increases relative to the short life of the assets.

- I support the use of CDNS to determine the net salvage costs but recommend a revised discount rate of 6.50% which is consistent with Enbridge's weighted average cost of capital. I also recommend the OEB consider revising the inflation rate assumed in the CDNS calculations to align with the assumptions inherent in the starting point to calculating net salvage costs under the Traditional Approach

(see section 3.2.1). Directionally, these proposals reduce the applied for net salvage rates included in the recovery of depreciation expense. The impact of these recommendations is time consuming to quantify as it is subject to the other changes in depreciation parameters I recommend. Therefore, as Enbridge, with the assistance of its expert Concentric, has already modeled the data required to perform these calculations, I recommend the impacts be calculated by Enbridge.

- I have outlined the implications of my net salvage recommendations, other considerations for the OEB, and the pros and cons of using a segregated fund.

3 Depreciation and net salvage expense concepts

Q: Briefly explain the concept of depreciation expense.

A: Depreciation expense is an estimate of the consumption of the economic value of an asset over its expected service life. Assets with an expected service life greater than one year are capitalized and depreciated over the expected life. All other costs are expensed in the period incurred.

Fundamentally, depreciation is an accounting concept that seeks to ensure the future economic values of an asset are consumed over a systematic period.[5] This accounting concept is supported by extensive literature and research on the fundamentals and systems related to depreciation expense. While there are numerous texts that depreciation experts cite and properly rely upon, five of the core texts that address the relevant concepts of concern in the Enbridge Application are as follows:

i. Depreciation Systems by Frank K. Wolf and W. Chester Fitch (*"Depreciation Systems"*).

[5] A systematic period is a period that is reflective of the consumption of the value of the assets over the expected useful life. Generally, this systematic period is on a straight-line basis and thus does not vary significantly from year-to-year.

ii. Iowa Engineering Experiment Station Bulletin 125, "Statistical Analyses of Industrial Property Retirements" by Robley Winfrey.

iii. Iowa Engineering Experiment Station Bulletin 155, "Depreciation of Group Properties" by Robley Winfrey.

iv. Engineering Valuation and Depreciation by Anson Marston, Robley Winfrey, and Jean C. Hempstead.

v. Public Utility Depreciation Practices, Compiled and Edited by Staff Subcommittee on Depreciation of The Finance and Technology Committee of the National Association of Regulatory Utility Commissioners.

My evidence is informed by the concepts contained within the above texts, as well as others, and is also informed by my experience and expertise in Canadian and U.S. accounting standards.

Q: Briefly explain the approach employed by Concentric in its depreciation study and the impact that approach has on the forecast depreciation expense.

A: Depreciation expense for Enbridge is comprised of both a depreciation and net salvage component. Depreciation recovers the original cost of any investment added into utility rate base, such recovery occurring over the expected useful life of the assets. Net salvage recovers the expected future costs to salvage and remove those assets, including any salvage proceeds, such recovery also occurring over the expected useful life of the assets.

As set out in the Concentric 2021 Depreciation Study (Exhibit 4, Tab 5, Schedule 1, Attachment 1), Concentric has proposed the ELG procedure combined with the straight-line method and remaining life technique to determine depreciation and the CDNS method to determine net salvage.

A key component influencing the amount of both depreciation and net salvage expense being recovered are the average service lives and survivor curves which Concentric has

selected for the large investment assets.[6] I briefly explain the process of selecting an average service life and Iowa curve below.

Q: What is an "Iowa curve" and how is it used in calculating depreciation expense?

A. Iowa curves were first developed by Robley Winfrey at the Iowa State University with input and assistance from several others including Edwin Kurtz and Harold Cowles. Much of this work is available as part of the Bulletins 125 and 155 referred to above. Data for each of the Iowa curves is also included in *Depreciation Systems*, though some caution is required as certain of the data points contain errors.

The Iowa curves were based on a comprehensive study of the lives of different types of assets. Based on the study of those lives, a series of curves were developed that provided for a statistical fit to the various lives of the assets studied. There are four classes of curves, including S-curves, L-curves, R-curves, and O-curves. These curves are broadly accepted and tested in North America and have been consistently accepted by regulators for determining a reasonable depreciation expense.

The most used Iowa curves for regulated utility plant are R-curves (right-modal), S-curves (symmetric) and L-curves (left-modal). R-curves tend to be the most used curves for regulated utility plant as they reflect relatively few retirements in the earlier years of the asset's useful life and greater retirements occurring after the average service life of the assets. However, S-curves are also quite common.

The following figures provide illustrations of both the survivor and frequency curves for S-curves, R-curves, and L-curves. The survivor curves should be viewed with the y-axis as the percentage surviving depicted between 0 and 100, and the x-axis as the percentage of

[6] Certain accounts apply amortization accounting as set out in the Concentric 2021 depreciation study at page 4-3. Amortization accounting, which can also be referred to as a square curve (SQ) as in the Concentric report, is typically employed for accounts with a smaller investment balance relative to larger accounts, and where there are numerous assets without distinguishable life characteristics, such as laptops.

the remaining average life. The frequency curves depict the retirement ratio on the y-axis and the percentage of the remaining average life on the x-axis.

A survivor curve illustrates over time the percentage of the assets that are expected to continue to be in service, whereas a frequency curve provides the expected rate of retirement over time. As an example, assume that a 10-year average service life is assumed for an S6 Iowa curve. Once the average service life is selected, that life replaces the x-axis with "100%" becoming the average service life of 10 years. Therefore, using Figure 2 below, the S6 curve would suggest that 100% of the investment would remain in the account through approximately "80%" or 8 years of the asset's life. In other words, no assets would be expected to be retired until approximately year 8, after which point the assets would retire quickly through to "120%" of the remaining life or by 12 years.

The frequency curve reflects the frequency of retirements as shown by the survivor curve. Specifically, looking at Figure 3 for the S6 curve, there are once again few retirements expected until approximately "80%" or year 8 in the above example. At this point the frequency curve peaks very quickly to reflect an increased frequency of retirements from approximately age 8 through to age 12. In summary, the survivor and frequency curves are two different ways of depicting the same information.

The selection of a specific survivor curve (i.e., S6 or R5) is informed by the depreciation expert's judgment regarding the visual and mathematical fit, peer data, and discussions with management and operations staff as I discuss below.

Figure 1 – S-curves – survivor curves

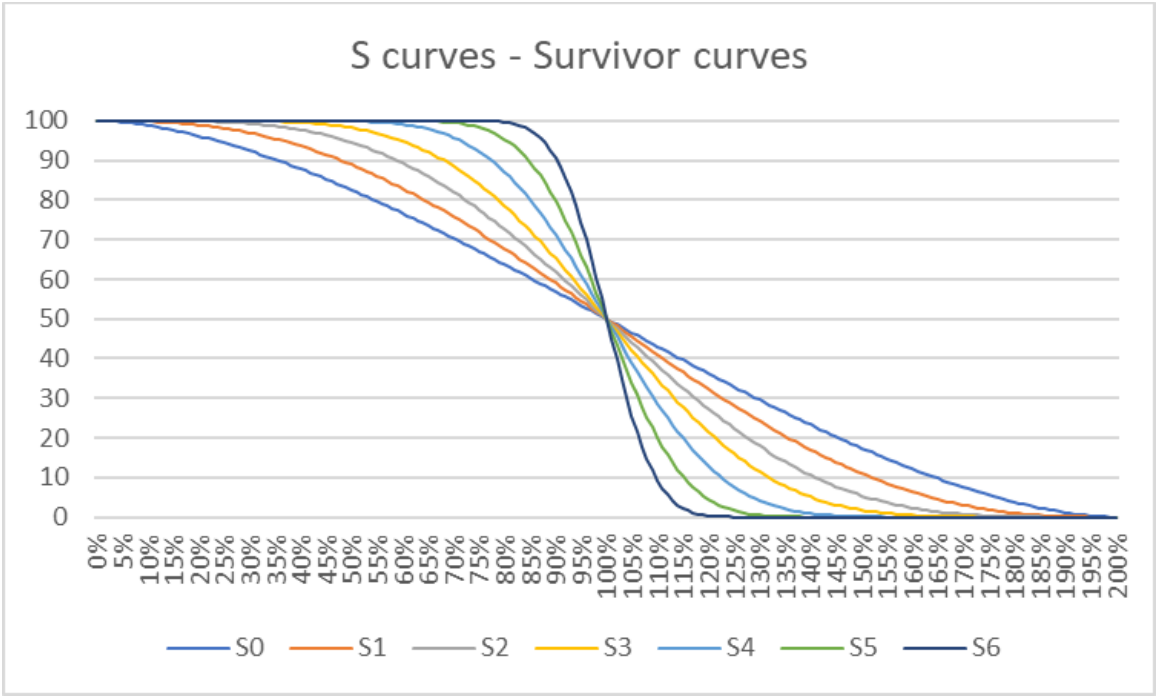


Figure 2 – S-curves – frequency curves

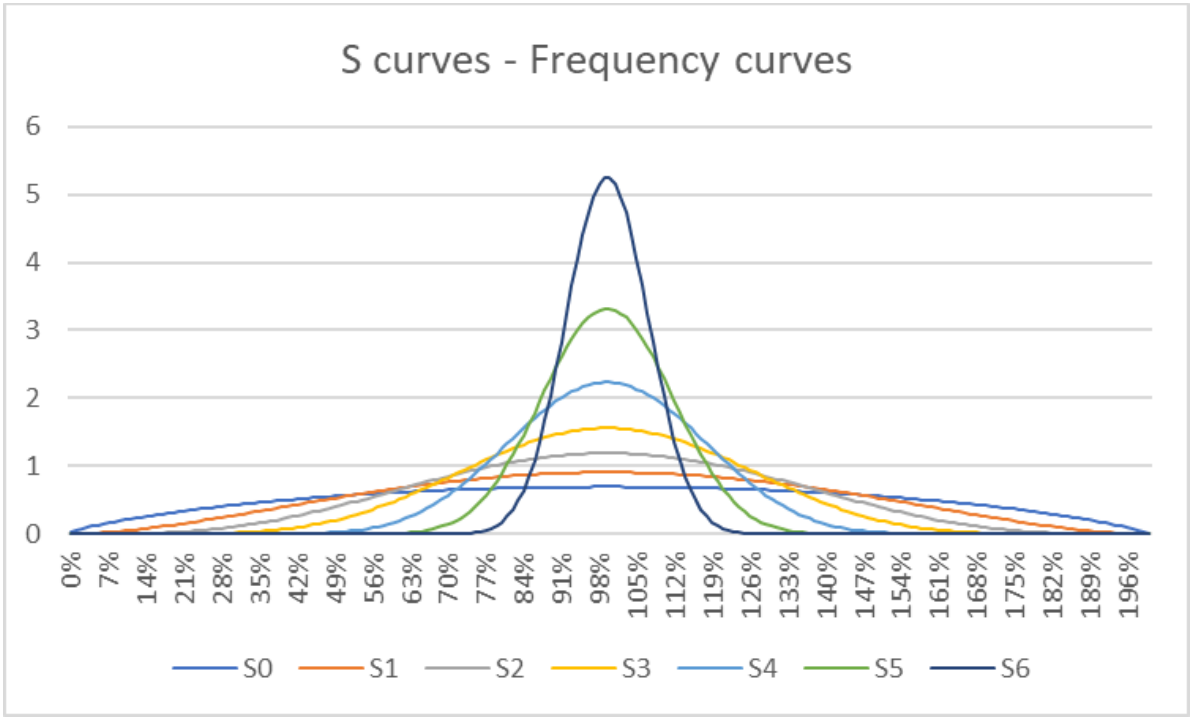


Figure 3 – R-curves – survivor curves

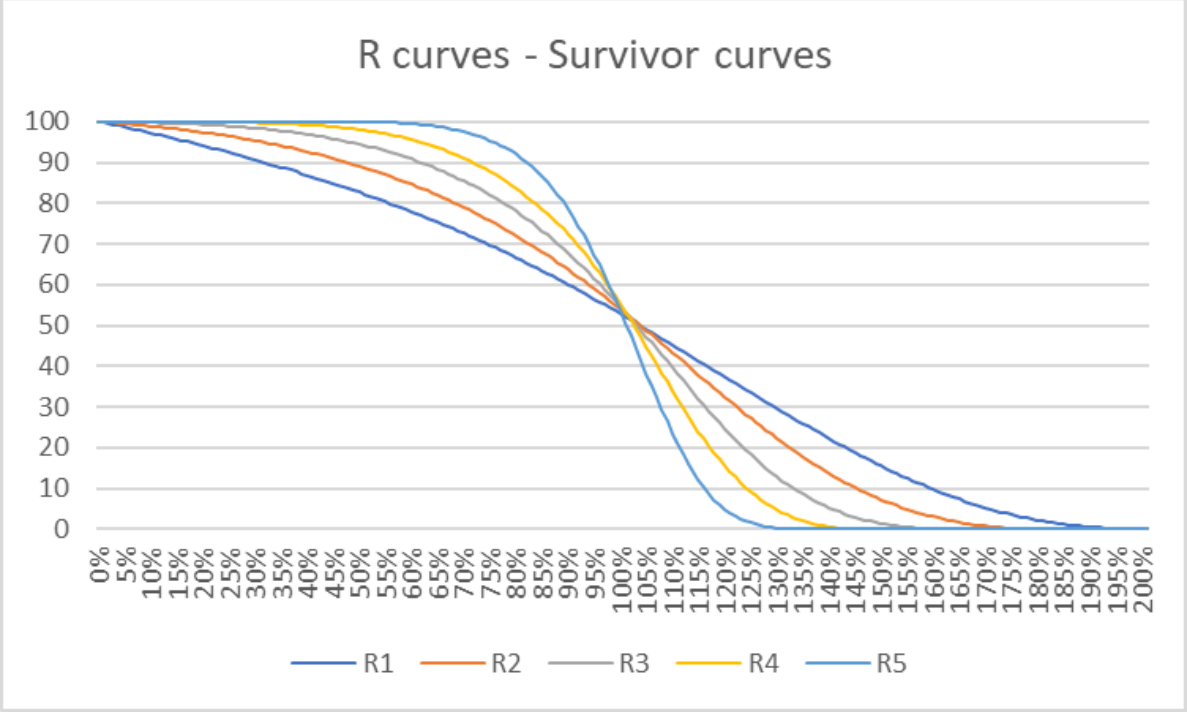


Figure 4 – R-curves – frequency curves

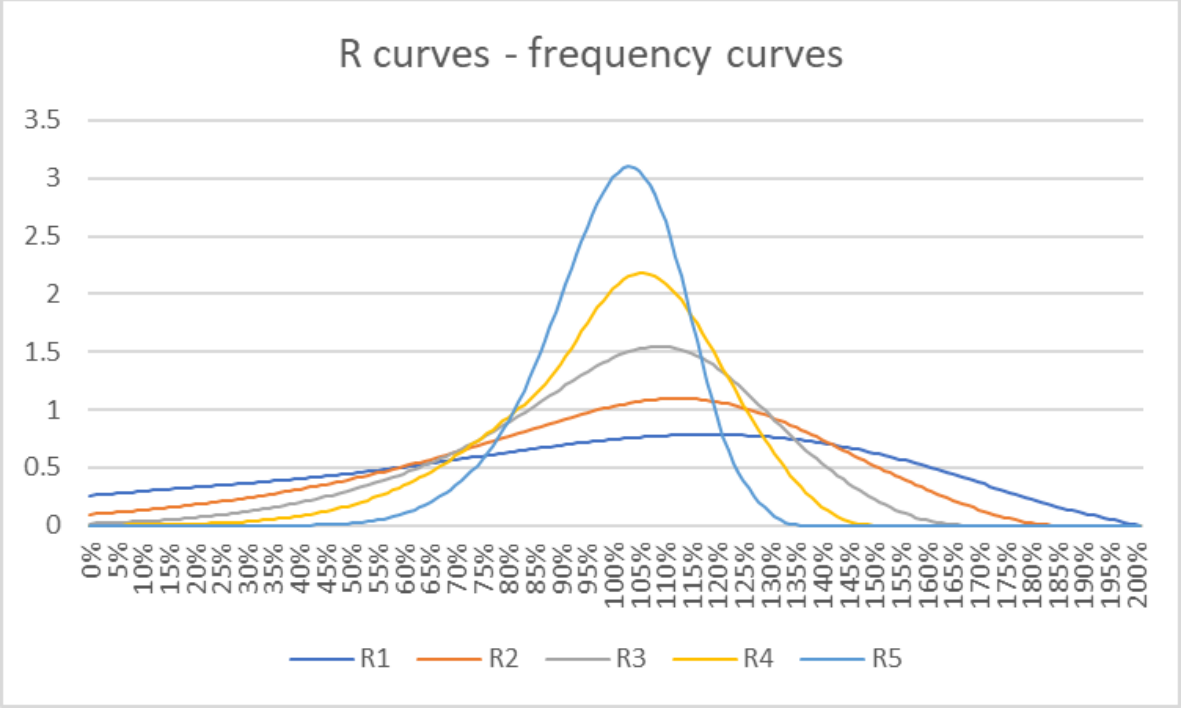


Figure 5 – L-curves – survivor curves

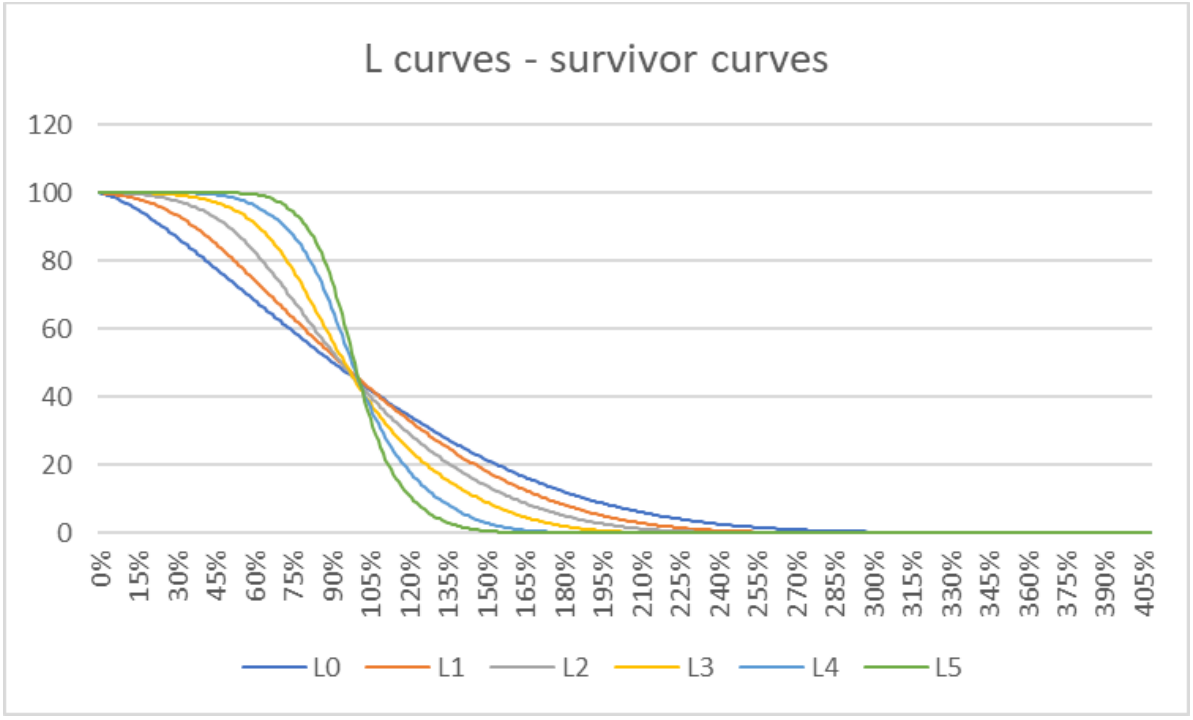
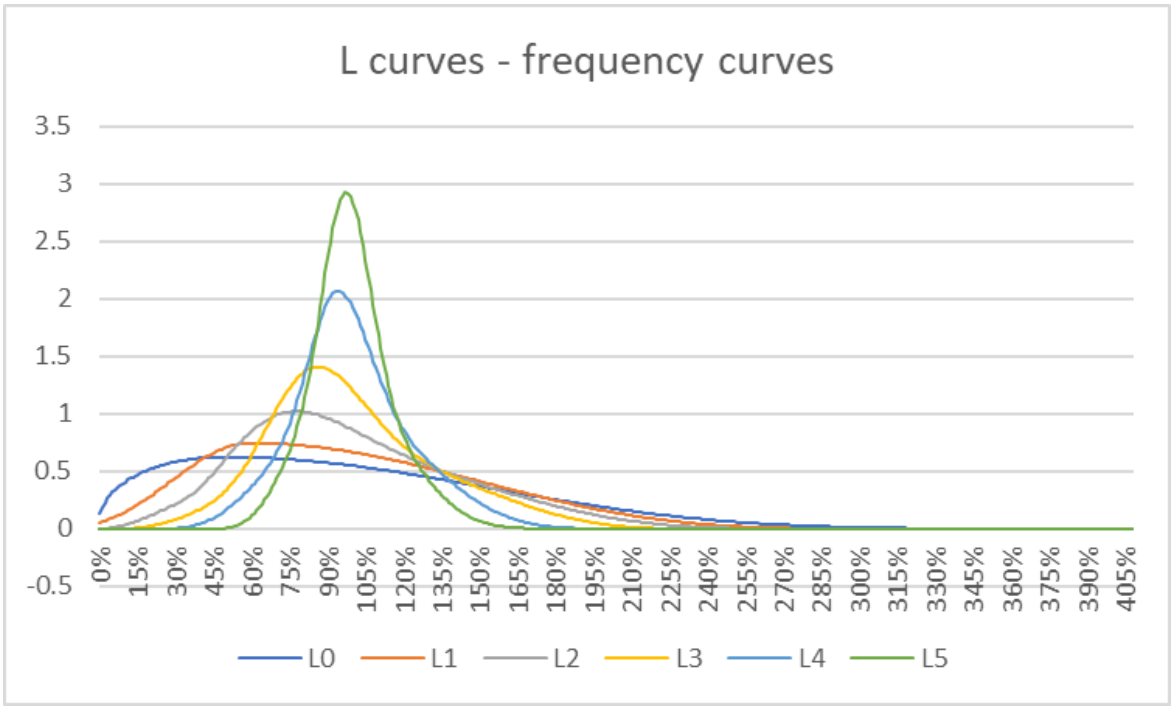


Figure 6 – L-curves – frequency curves



In addition to the above curves, depreciation experts have also calculated and relied upon half-curves such as an R2.5 curve which is calculated by taking the average of the data points for both the R2.0 and R3.0 curves.

Q: Are Iowa curves utilized in both ALG and ELG procedure calculations?

A: Both the ALG and ELG procedures are based on actuarial analysis of mortality patterns to estimate how long an asset will be in use. In Canada, and particularly for regulated utilities, experts tend to rely largely on the Iowa survivor curves to assess the mortality characteristics of assets.

3.1 Depreciation expense for EG

Q: Briefly expand on your primary concerns with Enbridge's applied for depreciation expense.

A: My primary concerns with the applied for depreciation expense are as follows:

- The proposed adoption of the ELG procedure is inconsistent with the principles of gradualism and moderation in the context of depreciation expense.
- Depreciation is an estimate, and no single procedure can be objectively confirmed to be the best in all circumstances.
- While ELG may provide for a more theoretically accurate calculation of depreciation expense, this is only in theory and no depreciation expert can confirm with certainty that ELG will provide for a better recovery of costs over the life of the assets based on perfect future knowledge. Enbridge will continue to modify its depreciation parameters over the life of the assets until the final asset is retired and thus the estimate is a moving target.
- The procedure employed (e.g. ELG versus ALG) can significantly influence the calculated depreciation expense, but for the above reasons, is less critical to the determination of a reasonably representative estimate of depreciation expense. The primary consideration is determining a reasonably accurate estimate of life upfront regardless of the depreciation procedure selected. Given that this process

is subject to significant judgment, the ALG procedure is preferred as it has been used by Enbridge previously, is easily adopted and understood, and provides for a strong and supported estimate of depreciation expense that is more gradual and moderate than Enbridge's proposal.

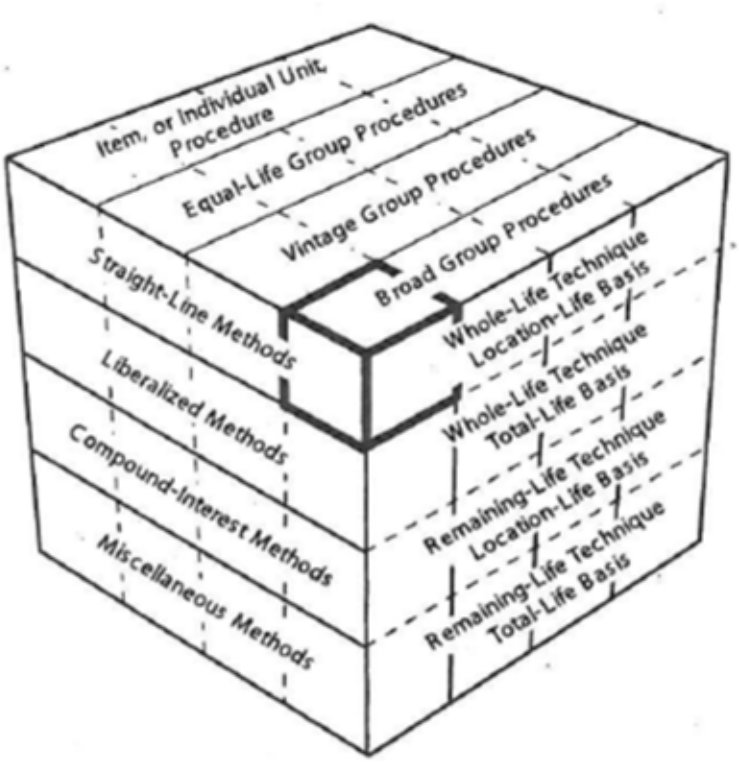
I will expand on each of the above concerns in further detail below.

3.1.1 ELG versus ALG procedures

Q: Please describe the ELG and ALG procedures.

A. Determination of an appropriate approach to depreciation requires significant judgment to be exercised by an expert in the selection of a procedure, a method, and a technique, as these selections from among alternatives, more than one of which may be valid, can materially impact the calculated depreciation expense. The American Gas Association and Edison Electric Institute previously prepared the following figure to illustrate the different procedures, methods and techniques:

Figure 7 – AGA and EEI "Depreciation Cube"



The three shown faces of the cube represent procedures, methods and techniques, respectively. To calculate depreciation expense, at least one procedure, one method, and one technique must be selected.

Procedures are employed to systematically allocate an asset or assets into subgroups. For example, a vehicle would be considered an individual unit group and depreciated accordingly. The use of amortization accounting where all assets retire after a certain period of time is common for utilities and is also employed by Enbridge with certain accounts such as software and hardware. Amortization accounting, which can also be referred to as a square curve (SQ) as in the Concentric report, is typically employed for accounts with a smaller investment balance relative to larger accounts, and where there are numerous assets without distinguishable life characteristics, such as laptops. The amortization period is commonly determined based on the average expected life of the group of assets either based on management and engineering data or other information such as contractual lives for certain assets such as software. Other common procedures employed are the equal life group and average life group methodologies. The ELG and

ALG procedures rely on actuarial analysis to assess whether the observed retirement data aligns with one of the several Iowa curves available to depreciation experts.

The depreciation method determines how the depreciation expense will be allocated over the life of the asset. The simplest and most common example is straight-line depreciation, which provides for an even charge each year. Other methods that accelerate or decelerate the depreciation are more commonly used for tax purposes.

Finally, a technique is selected to determine the specific asset life to be used in the depreciation formula. The two techniques most frequently employed by depreciation experts are the whole life and remaining life technique. The whole life technique calculates depreciation expense over the entire life of the asset from inception to retirement. For example, if an asset went into service in the year 2000 and has a life of 50 years, the depreciation would be calculated by taking the initial investment divided by 50 years. The remaining life technique calculates depreciation expense over the expected remaining life. For example, if an asset went into service in the year 2000, and 20 years had passed, then the remaining life technique would take the existing unamortized balance in the account and depreciate it over the remaining life (i.e., 30 years if unchanged from the initial estimate).

The ALG procedure, sometimes referred to as the Average Service Life procedure (ASL), calculates depreciation expense based on the theoretical average life of the assets based on proposed survivor curves. For example, assume an average life of 10 years for an account and thus an annual depreciation accrual rate of 10%. The same accrual rate would be theoretically applied to each asset in the account regardless of its actual life. The ALG procedure can be applied on either a broad group or vintage group basis. The broad group considers all plant in a single account or subaccount to be one group. For example, all metal pipeline added into service would be considered a single broad group. Vintage group considers the vintage years for each asset in a group. Therefore, metal pipelines would be further separated into vintage years based on the date the asset went into service. The vintage group approach can identify differences in the life characteristics of different vintages (i.e. generations) of assets.

The ELG procedure, also referred to as the Unit Summation procedure, calculates depreciation expense based on a similar approach to ALG, but in theory calculates a different depreciation rate for each subgroup of assets. For example, if an asset lives five years in the group it would be depreciated at a rate of 20%, whereas an asset with a 10-year life would be depreciated at a rate of 10%. Concentric provides a helpful summary of the ALG and ELG procedures in its depreciation study.[7]

A depreciation procedure is selected to provide for a reasonable and systematic allocation of the cost of an asset over time. Regardless of the depreciation procedure selected, the purpose of the exercise is to depreciate the same amount of investment over the expected life of the asset. While the amount charged in any one period may vary by virtue of the procedure selected, the total amount depreciated will not.

In summary, the differences that exist between the ELG and ALG procedures represent the theoretically different approaches to calculating depreciation expense by each procedure. Regardless of the procedure employed, each procedure is ultimately designed to provide a reasonable estimate of the recovery of the investment over its expected life, and thus both procedures are appropriate to use.

Q: Does the ELG procedure provide for a more theoretically accurate calculation of depreciation expense?

A: The ELG procedure provides for a theoretically more accurate calculation of depreciation expense only where simple examples are relied upon. In practice, it is impossible to demonstrate objectively that the ELG procedure will always provide a superior estimate of the actual recovery of an investment as compared to the ALG procedure. For clarity, I am not speaking to whether the ELG procedure provides for a mathematically superior calculation of depreciation expense in theory but whether that mathematical calculation will better fit the actual retirement pattern of the assets than the ALG procedure

[7] Tab 10 – MFR 95 Attachment, PDF pages 31 and 32.

calculations would. This is because the estimate is subject to change over time, as acknowledged by Concentric,[8] and regardless of the procedure selected, future changes will require a rebalancing of the depreciation expense calculated.

As a simple example, Concentric provided the following table in its 2021 depreciation study to illustrate the difference between the ALG and ELG procedures. Concentric's example assumes one plant account with a total cost of $2,000, comprised of two subgroups of assets, each with an original cost of $1,000. The first group has a life of 5 years, while the second group has a life of 15 years.[9]

Average Life Group Procedure				Equal Life Group Procedure			
Year	Accruals ($)	Retirements ($)	Acc. Deprn Balance ($)	Year	Accruals ($)	Retirements ($)	Acc. Deprn Balance ($)
1	200		200	1	267		267
2	200		400	2	267		534
3	200		600	3	267		801
4	200		800	4	267		1,068
5	200	1,000	0	5	267	1,000	335
6	100		100	6	67		402
7	100		200	7	67		469
8	100		300	8	67		536
9	100		400	9	67		603
10	100		500	10	67		670
11	100		600	11	66		736
12	100		700	12	66		802
13	100		800	13	66		868
14	100		900	14	66		934
15	100	1,000	0	15	66	1,000	0

Based on the above simplified example, Concentric concludes:

[8] EGI IRR Exhibit I4 2024 Rebasing 2023-03-08, PDF page 1921, Exhibit I.4.5-IGUA-12d).
[9] EB-2022-0200, Exhibit 4 Operating Expenses Updated, Tab 5, Schedule 1, Attachment 1, , page 3-3, PDF page 864.

> It should be noted from the table that overall, both methods will recover the same original cost, however, there are two key differences. First, using the ALG procedure, after the first 5 years, no depreciation has been collected for the asset remaining in service. Essentially, the concept of depreciation expense matching the assets providing service is not met. With the ELG procedure, this problem is remedied and after the retirement at year 5 of the shorter life asset, an appropriate provision for the first 5 years of service on the longer living asset is accumulated ($67 X 5 years = $335). Under ELG all current users are sharing the cost of all assets in service.[10]

In response to an information request from the IGUA, Concentric confirmed that its statement above was not technically correct.[11] Specifically, while I appreciate that Concentric was attempting to provide a simplified illustration of the depreciation concepts under ALG and ELG, the example incorrectly exaggerates the difference between the two procedures on an asset-by-asset basis. In reality, group depreciation accounting dictates that each asset would be allocated a portion of the depreciation expense under either ALG or ELG. Therefore, by year 5 under the ALG procedure the first asset would not be fully depreciated and instead would have only been charged $500 ($100 * 5 years) of depreciation expense and the difference in the asset net book value on retirement would be recognized as a loss.

As Concentric employs the remaining life technique, the loss would be charged to the accumulated depreciation account for the asset and recovered over the remaining life of the remaining asset. Thus, a portion of the current depreciation expense would have been allocated to the retired asset, and future depreciation expense would be comprised of both

[10] EB-2022-0200, Exhibit 4 Operating Expenses Updated, Tab 5, Schedule 1, Attachment 1, PDF page 864.
[11] EGI IRR Exhibit I4 2024 Rebasing 2023-03-08, PDF page 1921, Exhibit I.4.5-IGUA-12b).

the depreciation of the remaining asset and the depreciation of the loss recognized on the disposal of the first asset.

Regardless of the depreciation procedure employed, neither procedure will perfectly mirror the actual lives of the assets. Therefore, the example provided by Concentric provides an illustration of the theoretical differences between the two procedures, but it operates on the assumption that in year 1 there is a perfect forecast of the lives of each of the assets. If the first asset does not actually retire until year 10 (or year 7, or year 8, or any year beyond year 5), then under the ELG procedure, much more depreciation would have been claimed on the assets with the first asset having been fully depreciated by year 5. This would result in a need to recalculate the depreciation expense and begin amortizing a difference through the remaining life of the assets. Under this example, the difference that would need to be amortized would be greater under ELG than under ALG.

The point is that under both procedures there is a potential for error. This potential for error is acceptable and expected when determining an estimate for depreciation expense.

While the ELG depreciation procedure assumes that each asset is separately depreciated within its equal life group, the actual physical assets owned by Enbridge are not separated into such distinct groups. For example, under the ELG procedure, assets expected to survive 1 year are grouped together within the same vintage and account, and assets that are expected to survive 2 years are similarly grouped and so on.

Enbridge does not separately identify in its accounting records each asset that is included in each category and depreciate those assets based on their specific group and rate. Rather, Enbridge has a single depreciation rate for each account and does not physically identify and tag each asset in its system to group that asset into an equal life group with other like assets. Such an effort would be exceptionally costly, subject to significant judgment, and not likely to be much more accurate relative to a more general approach to depreciating assets.

Even if Enbridge tracked and depreciated each asset separately, aggregated those assets into distinct equal life groups, and finally tracked the depreciation of each group using the rate required by the ELG procedure, there would still be differences between the detailed

depreciation estimate calculated on the actual group of assets and the notional equal life groups. This difference would exist unless the actual depreciation expectation based on physical asset tagging and tracing perfectly matched the selected Iowa curve for the entire life of the assets. This is of course, mathematically impossible.

For this reason, no depreciation estimate will ever be perfect, including any estimate derived using the ELG or ALG procedures. The test that the OEB should employ is whether the result provides for a reasonable estimate of the recovery of the forecast depreciation expense over the expected useful life of the assets.

This test is met by both the ELG and ALG procedures. Concentric's evidence that the ELG procedure is more mathematically accurate, while theoretically true, fails to account for the entire service life of the assets, or that in practice this result may not play out.

In summary, no depreciation expert can conclude definitively that depreciation rates determined under the ELG procedure will provide for a better reflection of the actual service life of the assets over their entire life than an alternative procedure such as ALG. To do so would require perfect knowledge of the future that does not exist. Regardless of whether the ALG or ELG procedure is used in combination with the remaining life technique, each depreciation estimate will be subject to change in the future. Frequent updates to depreciation studies are best practice and to be expected.

Q: Please comment on the justification provided by Concentric to use ELG as opposed to ALG.

A: Regarding the use of the ELG procedure versus ALG, Concentric states:

> The ELG procedure has long been recognized as the most precise procedure by depreciation authorities, and has been advocated in various texts, periodicals and technical papers. Particularly, this procedure received favorable attention in Iowa Bulletin 155 published in 1942 stating:
>
> > "The unit summation procedure of the present worth method is shown to be the only mathematically correct method. It is

> not admitted that more than one correct method exists for applying an average life ratio to property groups when estimating depreciation. Recognition is given, however, to the convenience of the average-life and probable life procedures at the sacrifice of the accuracy in the mathematical calculations."[12]

Concentric confirms, as does Dr. Winfrey in Bulletin 155, that ELG is only "mathematically" more accurate than other procedures. I do not dispute this conclusion, but the mathematical accuracy of the estimate is entirely dependent upon the actual retirement experience for the asset closely approximating the current estimate of the expected useful life and consumption of value. To the extent there is variation between the estimated and actual retirement pattern, which indeed is expected to occur, this estimate will be subject to change, mathematically revised and no longer necessarily true. In practice, the original estimate determined using an ALG procedure may ultimately provide for a more accurate recovery of depreciation expense over the life of the assets.

Concentric also states:

> The use of ELG provides a more equitable distribution of depreciation expense to the current users of the gas system because the provision for depreciation at any given time is based only on the assets in service at that time. Conversely, the ALG grouping procedures results in depreciation accruals that in later years contain an incremental component of depreciation expense to compensate for the lower levels of accruals in early years. This idiosyncrasy of ALG grouping procedures has long been recognized as a deficiency by various authorities on depreciation analysis.[13]

[12] EGI IRR Exhibit I4 2024 Rebasing 2023-03-08, PDF page 1254, Exhibit I.4.5-STAFF-173c).
[13] EGI IRR Exhibit I4 2024 Rebasing 2023-03-08, PDF page 1255, Exhibit I.4.5-STAFF-173c).

I disagree with Concentric that the ALG grouping procedures create a "deficiency" in the calculated depreciation expense. Any deficiency resulting from the application of the ALG procedure would stem from the actual lives of the assets differing from the original estimate. These deficiencies or calculated depreciation differences occur under both procedures for the reasons I note above. The depreciation estimate for a specific account may vary significantly from each depreciation study under either procedure. These variations cause deficiencies in the calculated depreciation reserve relative to the book depreciation reserve. In the case of Enbridge, these deficiencies are trued up through the remaining life technique under either the ALG or ELG procedure. Such differences are common in the study of depreciable assets and certainly do not suggest that one procedure is superior to the other.

Finally, Concentric states:

> Overall, Concentric views that the use of the ELG procedure for this EGI study has two significant advantages as compared to the use of the ALG procedure. Firstly, the use of the ELG procedure was the best available match to the historic procedures approved for Union Gas. Secondly, given the potential changes in use of fossil fuels and the unknown impact of such change on the Enbridge Gas system, the use of the ELG procedure best reduced the future risk of intergenerational inequity.[14]
>
> [Emphasis added]

The underlined text above summarizes the reasons for Concentric's proposed use of the ELG procedure for Enbridge. Regarding the first point, while the ELG procedure may be a better match to the results achieved under the Generation Arrangement procedure previously used by Union Gas, the ALG procedure was also previously used by EGI. As EGI represents the larger portion of the unamortized assets, if past precedent is weighed as

[14] EGI IRR Exhibit I4 2024 Rebasing 2023-03-08, PDF page 1255, Exhibit I.4.5-STAFF-173c).

a relevant factor, then I would suggest the continued use of ALG for all assets is more appropriate.

On the second point, justifying the use of ELG based on the potential impacts of decarbonization is inappropriate given there is no evidence to support an adjustment for this reason. Specifically, Enbridge has provided no evidence to support the use of an economic planning horizon at this time and thus relying on the ELG procedure to move closer towards such a result is similarly not justified.

The ELG procedure does not provide for an "economic life" for the assets. Rather, it mathematically accelerates the collection of depreciation expense. This is only an appropriate result where Concentric or Enbridge can demonstrate that a change in depreciation procedure is warranted on other grounds. In my opinion, insufficient justification to support a change to the ELG procedure has been provided by Enbridge and Concentric at this time.

Q: Does adoption of the ELG procedure in this case result in a gradual and moderate change to the depreciation expense?

A: Enbridge calculates the impact between ELG and ALG depreciation expense as $81.4 million.[15] This change represents a significant portion of the overall increase in depreciation expense of $120.7 million for which Enbridge is seeking approval.[16] The $81.4 million increase resulting from using ELG rather than ALG represents an increase of 10.0% in EGI's depreciation expense ($81.4 million/$810.7 million).[17] A 10.0% increase in depreciation expense is neither gradual nor moderate. This is particularly the case as EGI currently is approved to use the ALG procedure, where Union is on Generation Arrangement, and thus ELG reflects a change to both.

[15] EGI IRR Exhibit I4 2024 Rebasing 2023-03-08, PDF page 814, Exhibit I.4.5-STAFF-170, Attachment 1.
[16] EB-2022-0200, Exhibit 4 Operating Expenses Updated, Tab 5, Schedule 1, Attachment 2, Page 8 of 8, PDF page 1308.
[17] EB-2022-0200, Exhibit 4 Operating Expenses Updated, Tab 5, Schedule 1, Attachment 2, Page 8 of 8, PDF page 1308.

It is commonly accepted amongst depreciation experts that recommended changes to depreciation life estimates should be gradual and moderate. That is, where a life estimate is forecast to change materially based on new data, the accepted practice is to seek, wherever possible, to gradually alter the life estimate to achieve a moderate impact to the calculated depreciation expense estimate over time.

The practice of gradually and moderately adjusting depreciation, which is sometimes referred to as a principle by depreciation experts, is not binding, but it is supported particularly where long-lived assets are being considered. For example, assume a depreciation expert studies a plant account and determines that the account has an average service life of 40 years. Five years later, the same expert studies the same account and based on new retirement data and discussions with management, the depreciation expert concludes the average life for the account is now better reflected as 25 years. It is a matter of judgment whether such a change in the estimate is reasonable or warranted, but caution is encouraged. This is because the expected life, whether 25 or 40 years, is significant and remains an estimate. Altering the life estimate to 25 years immediately may be appropriate, but if the next depreciation study reaffirms the original life estimate of 40 years, or some level in between, then such a sudden change can create significant rate volatility and intergenerational inequities between generations of ratepayers.

Absent evidence of a life shortening for Enbridge's assets, of which there is little, I do not consider an increase in depreciation expense of the amount proposed by Concentric in the 2021 depreciation study to be reasonable. The change proposed by Concentric materially increases the forecast depreciation expense for Enbridge thus significantly altering the amount of depreciation expense paid by the current generation of customers as compared to previous generations and potentially future generations.

I appreciate the change to the ELG procedure being proposed by Concentric, and requested by Enbridge, is a change in depreciation procedure and not a request to alter the service lives in a manner that is not gradual or moderate. In some cases, it may be appropriate to overlook whether the impact of a change in depreciation procedure is gradual or moderate, given that it is expected future changes from the new base would be expected to be consistent going forward if the new depreciation procedure were approved. However, I do

not consider it appropriate to do so in this case as there is not clear or convincing evidence to support the need for a change and thus the change can be likened to a significant life shortening for Enbridge's assets as a result of the change to the ELG procedure.

Q: What are some of the advantages and disadvantages of applying the ALG and ELG procedures for Enbridge?

A: Each of the ALG and ELG procedures has its own advantages and disadvantages. In establishing these, it is important to be mindful that no depreciation expert can conclude definitively that one depreciation procedure will provide for a better and more accurate recovery of depreciation expense over the actual life of the assets. Either the ALG or ELG, procedure, both of which are well accepted depreciation practices, may provide a better estimate for certain individual accounts and overall, after a review of all available data upon the conclusion of the lives of all assets. As already acknowledged, the ELG procedure provides for a better mathematical estimate of depreciation expense in theory, however this is not necessarily the case in practice.

Beyond that, the pros and cons of the ALG procedure are as follows.

- **ALG procedure pros:**
    - **Simplicity** – The ALG procedure is simple to apply and understand. Complex models are not required to understand or perform the individual calculations.
    - **Less potential volatility** – Changes from year-to-year in the retirement data are less likely to influence a change in the ALG procedure unless those changes suggest a change in the average service life. This is because while the survivor curve selection remains important to the ALG procedure, particularly where the remaining life technique is employed, the key variable is the service life estimate.
- **ALG procedure cons:**
    - **Lower cash flows –** Cash flows under the ALG procedure will be weakened as the non-cash depreciation charge is lowered as compared to

the ELG procedure. While depreciation is a non-cash item, its inclusion in rates improves cash revenues, and thus improves overall cash flows where the depreciation expense is increased.

- **Accuracy** – The ALG procedure is less dependent on the selected survivor curve. Therefore, results from the ALG procedure vary less significantly due to the selection of the survivor curve, and thus tweaks or refinements to the amount of depreciation expense charged may not be as easy to implement as under the ELG procedure.

The pros and cons of the ELG procedure are as follows.

- **ELG procedure pros:**
  - **Accuracy** – The ELG procedure is highly dependent on the selected survivor curve, which can significantly or discretely influence the amount of depreciation expense without changing the average service life assumption. For example, shifting a curve from a 15-R2.5 curve to a 15-R2.0 curve may provide for a refined amount of depreciation expense and increase accuracy without needing to change the service life assumption. This permits more variation in the depreciation expense charge than is permitted under the ALG procedure.
  - **Improved cash flows** – The ELG procedure accelerates the collection of depreciation expense, thus improving cash flow metrics in the short-term.
- **ELG procedure cons:**
  - **Variability –** Differences in the selected survivor curve can have significant impact on the depreciation expense in a negative manner as well. Assuming a 15-year average life but selecting either an L0.0, S1.0 or R5.0 Iowa curve can have a material impact on the amount of depreciation expense charged and the timing of that expense despite the consistent use of a 15-year average life. While this can improve accuracy, it can also increase inaccuracy if the curve dose not turn out to be reasonably reflective of the

future retirement pattern for the assets. It can also create significantly greater period to period variability due to simultaneous changes in life estimates and curves.

- **Complexity** – The ELG procedure is a complex procedure to employ, requiring a significant number of detailed calculations which are made easier by complex computer models. Given the current processing power of many PCs and laptops, this is not a significant limiting factor in adopting the ELG procedure. However, the ELG procedure can continue to be difficult for some parties to understand if they are unfamiliar with depreciation procedures, the derivation of Iowa curves, and the importance of retirement data.

Regardless of the procedure selected, there are pros and cons. No single procedure will be perfect, and no single procedure can ensure the forecast depreciation expense will be representative of the actual depreciation expense that should have been charged if perfect knowledge of the life of the assets was available at the time of the forecast.

As a final point, the amount of depreciation expense forecast to be recovered under the ELG procedure increases as compared to the ALG procedure. Some parties may prefer a lower current depreciation expense to permit additional time to refine the estimate over the long lives of the assets. Other parties may prefer an acceleration of the depreciation expense. This permits additional recovery in the near term and addresses other concerns such as those expressed by Concentric and Enbridge regarding the potential need for an economic planning horizon.

As noted earlier, the selection of a reasonable depreciation expense requires an assessment of intergenerational equities or inequities that may be caused by a change in depreciation expense. The total amount of depreciation expense is unchanged over the life of the assets, only the amount collected in each year under the procedures is changed. An assessment of the intergenerational impacts of a change in depreciation expense is a highly subjective exercise, much like determining depreciation expense itself. Concentric confirms that the

ELG procedure will increase depreciation expense for EGI, and eventually result in lower depreciation accruals in the future than the ALG.[18]

Q: Please provide your recommendation in respect of the proper depreciation procedure for Enbridge.

A: I recommend that the OEB direct Enbridge to utilize the ALG procedure for both the EGD and Union assets. I am also supportive of using either the remaining life or whole life technique as appropriate. I note that Concentric confirms that the ALG procedure combined with the remaining life technique remains the most widely used approach in the United States.[19] Both the ALG procedure with the remaining life approach and the ALG procedure with the whole life approach are common in Canada.

Maintaining the ALG procedure for the EGD assets and applying the ALG procedure to the Union assets provides for a continuation of the ALG procedure for a large portion of Enbridge's depreciable asset base. Further, while Enbridge has raised concerns regarding the need to assess a truncation and potential economic life for some of its assets in the future, those concerns are presently speculative. Maintaining the ALG procedure permits a continuation of the status quo for a portion of the asset base, reduces potential intergenerational inequities that may be caused by changing the depreciation procedure, and provides an opportunity for future study of any changes that may be required. Particularly, if there is ultimately a need to implement an economic life for certain asset accounts that effort may be better performed on a case-by-case basis, rather than attempting to partially transition to such a result prematurely and perhaps unnecessarily for all impacted accounts as suggested by Concentric and Enbridge.

As a final point regarding approval of the ALG procedure in the test period, I note in response to IGUA-45, Enbridge calculated the impact of the change from current rates,

[18] EGI IRR Exhibit I4 2024 Rebasing 2023-03-08, PDF page 1921, Exhibit I.4.5-IGUA-12e).
[19] EGI IRR Exhibit I4 2024 Rebasing 2023-03-08, PDF page 1256, Exhibit I.4.5-STAFF-173d).

which are a blend of ALG and Generation Arrangement, to the ALG procedure as being $39.1 million.[20] I address other account specific changes proposed by Concentric in Section 3.1.2 below and provide my recommendations for alternate rates under the ALG procedure where warranted, which recommendations, if adopted, would further reduce this depreciation expense in 2024 rates.

Q: If the ELG procedure is approved by the OEB in this proceeding do you have any other recommendations to address the applied for increase in rates?

A: Yes. As noted earlier, approval of the ELG procedure for the reasons stated by Enbridge and Concentric will result in a material increase in depreciation expense in the test period of $81.4 million.[21] If the OEB approves a transition to the ELG procedure, I recommend a phase-in of the transition over a period of five years. Specifically, I recommend the OEB discount the increase by four fifths in the 2024 test year, three fifths in the 2025 test year and so on. This approach will permit a smoother transition to a new procedure and potentially assist in reducing any volatility and intergenerational inequities that may be caused from a transition to a new procedure.

3.1.2 Recommended changes to applied for lives

Q: Please summarize the process employed by depreciation experts to select a service life and survivor curve for an asset.

A: Both the ALG and ELG procedures rely on the selection of an Iowa curve based on several factors, including but not limited to:

- Visual and mathematical fit of the observed retirement data to the selected survivor curves.

[20] EGI IRR Exhibit I4 2024 Rebasing 2023-03-08, PDF page 2683, Exhibit I.4.5-IGUA-45 Attachment 4.
[21] EGI IRR Exhibit I4 2024 Rebasing 2023-03-08, PDF page 814, Exhibit I.4.5-STAFF-170, Attachment 1.

- Peer data on the average service lives and survivor curves used in other jurisdictions.
- Discussions with management and operational personnel to understand the life characteristics of the assets and other relevant operating, technical and maintenance details that may impact the lives of the assets.

To determine a visual fit to a specific Iowa curve, the expert will review the retirement data for the account against the curve to assess how that data fits against the curve relative to alternatives. Visual fitting is important and can assist in narrowing down the curve type. However, visual fitting also needs to contemplate the underlying retirement data to understand if there is a significant change in exposures, or if the data being fit to the curve is relatively small and thus not representative of the broader retirement data. For this reason, mathematical curve fitting is also important.

Mathematical curve fitting is generally performed by taking the difference between each point of the observed data points from the retirement data and the selected Iowa curve. Concentric defines this process as determining a residual measure as follows:

> The program that is used by Concentric for statistical smooth curve fitting utilizes an internal "goodness-of-fit" criterion known as the Residual Measure. This Residual Measure is based on a least squares solution of the differences between the stub curve (or original data points) and smooth survivor curve which also requires a balancing of the differences above and below the stub curve.
>
> The criterion of goodness-of-fit is the mean square of the differences between the points on the stub and fitted smooth survivor curves. The residual measure, or standard error of estimate, shown in the output format is the square root of this mean square. As such, the lower the Residual Measure the better the statistical fit between the analyzed Iowa curve and the observed data points. Concentric follows the widely used practice of fitting Iowa curves up to one percent of the maximum exposures. This standard practice is utilized to minimize the influence of typically small

> retirements applied to similarly small exposures which may unduly affect the Iowa curve fitting process. However, Concentric will recognize the observed data points beyond the one percent of maximum exposures if it is determined that the additional data is a valid consideration for life recommendation.[22]

Another important exercise is to identify a group of peer utilities that operate assets that are similar in nature to the assets operated by the utility being studied. Once identified, these peers can be used to assess the observed retirement data results. For example, if the retirement data for the account suggests that the best mathematical fit is a 45-S2.0 Iowa curve, but the peers generally have a range of average service lives of between 50 and 80 years and rely on the R family of Iowa curves, then this may suggest additional discussions with management could be warranted to understand whether the retirement data may be misleading. In my opinion, peer analysis is critical as it provides an opportunity to expand the level of data being reviewed to a much larger data set effectively encompassing the data of multiple utilities. I rely on the peer data provided by Concentric to inform my analysis and reproduce those tables below for ease of reference:[23]

[22] EGI IRR Exhibit I4 2024 Rebasing 2023-03-08, PDF page 1945, Exhibit I.4.5-IGUA-15.
[23] EGI IRR Exhibit I4 2024 Rebasing 2023-03-08, PDF page 2765, Exhibit I.4.5-IGUA-26 Attachment 1.

Table 2 – Concentric peer analysis – life and survivor curve

PEER ANALYSIS											
		EGD	UGL	AltaGas	FortisBC	ATCO Gas	Centra Gas	IntraGaz	PNG	Gazifere	Recommend
LOCAL STORAGE PLANT											
442	STRUCTURES AND IMPROVEMEN		2050-200-SC					40-R4			40-55
443.01	HOLDER - STORAGE TANK		2050-200-SC						40-SQ		45-R4
443.02	HOLDER EQUIPMENT		2050-200-SC								55-R4
UNDERGROUND STORAGE PLANT											
451	LAND RIGHTS INTANG	65-R4	45-L4					40-SQ			55-R4
452	STRUCTURES AND IMP	40-R2.5	2040-200-SC					40-R4			40-R3
453	WELLS	50-R2	45-L4					40-R4			45-R2.5
454	WELL EQUIPMENT	55-R2.5						30-R3			40-R2
455	FIELD LINES	60-R4						40-R4			55-R3
456	COMPRESSOR EQUIPI	45-R3	40-R3					30-R3			40-R4
457	REGULATING AND ME	35-R4	35-R3								35-R3
TRANSMISSION PLANT											
461	LAND RIGHTS INTANGIBLE		60-R4	70-R3			75-R4		75-R4		60-R4
462	COMPRESSOR STRUCTURES AND		55-S4		30-S4		50-R5		30-R4		50-S4
463	MEASURING AND REGULATING STRUCTURES AND IMPROVEMENTS										55-S4
464	EQUIPMENT										50-S4
465	MAINS		60-R4	70-R3	65-R4		65-R4		65-R4		60-R4
466	COMPRESSOR EQUIPMENT		35-S3		37-R4				35-R3		30-R4
467	MEASURING AND REGULATING I		45-S1	42-R3	37-R1.5		50-S2.5		35-S2.5		40-R4
DISTRIBUTION PLANT											
471	LAND RIGHTS INTANG	75-R4	60-L2	65-R4		75-SQ	75-R4		75-R4		60-R4
472	STRUCTURES AND IMP	50-R1	40-R0.5		38-R1.5	60-R3	45-R1.5		30-R3		40-50.5
473	SERVICES	45-S1	50-R1.5 (Metal)/55-R3 (Plastic)	55-R3	47-R2	57-R2.5	55-R2.5		50-R4	53-R3.5	45-S1 Metal / 55-S3 Plastic
474	REGULATORS		20-SQ	35-S3	20-S0						25-SQ
475	MAINS - ENVISION	25-SQ									25-SQ
475.21	MAINS - COATED & W	70-R3	55-R4	65-R2	65-R2.5	66-R2.5	65-R4		65-R4	80-R3	55-R3
475.3	MAINS - PLASTIC	70-R4	60-L2	65-R2	65-R2.5	66-R2.5	65-R4		65-R4	80-R3	60-R4
476	COMPANY NGV COM	17-S2.5									17-S2.5
477	MEASURING AND REC	42-R1.5	50-S1	42-R2.5	33-R2	45-R1.5	35-R2		35-R4	30-R4	40-R2
477.01	CUSTOMER M&R EQUIPMENT										35-R3
478	METERS	15-S2.5	25-L1.5	25-R3	18-R4	18-R3	26-S1.5		20-R4	18-R0.5	15-S2.5
GENERAL PLANT											
482	STRUCTURES AND IMPROVEMEN		2045-200-SC	75-R2		44-R2.5	45-R3		30-R3		40-R1.5
483	OFFICE FURNITURE AN	15-SQ	15-SQ	15-SQ	20-SQ	20-SQ	15-SQ	7-SQ	15-SQ	15-SQ	15-SQ
484	TRANSPORTATION EQI	12-L1.5	8-L1.5	7-L1.5	7-L1	12-L2.5	10-R5	6-L3	8-L3	13-R4	12-L2.5
485	HEAVY WORK EQUIPN	18-L1	13-L2	10-L1	13-L0.5	13-L2	20-R5		18-R3	15-S3	17-L1.5
486	TOOLS AND WORK EC	15-SQ	15-SQ	20-SQ	20-SQ	15-SQ	15-SQ	10-SQ	20-SQ	10-SQ	15-SQ
487.7	RENTAL - REFUEL APPL	20-SQ				24-R3					15-SQ
487.8	RENTAL - NGV STATIOI	20-SQ				20-R5					20-SQ
488	COMMUNICATION ST	10-SQ	15-SQ	5-SQ	15-SQ	23-R1			14-SQ	7-S4	10-SQ
490	COMPUTER EQUIPME	5-SQ	4-SQ	3-5-SQ	4-SQ	6-SQ	5-SQ	5-SQ	5-SQ	4-SQ	4-SQ
490.3	COMPUTER EQUIPME	10-SQ									10-SQ
491.01	SOFTWARE ACQUIREC	4-SQ	10-SQ	3-SQ	5-8-SQ	3-10-SQ	5-SQ			4-SQ	4-SQ
491.02	SOFTWARE DEVELOPE	5-SQ		10-SQ	5-8-SQ					4-SQ	4-SQ
491.03	CIS ACQUIRED SOFTV	10-SQ								7-SQ	10-SQ
491.04	WAMS	10-SQ									10-SQ
TOTAL GENERAL PLANT											

Additionally, Concentric provided the following table which summarizes its current recommendations as compared to other recommendations Concentric has provided for similar accounts.[24] I also consider the below evidence to be informative to the selection of a proper life and survivor curve for certain accounts and thus provide the table below for reference.

[24] EGI IRR Exhibit I4 2024 Rebasing 2023-03-08, PDF pages 2767 and 2768, Exhibit I.4.5-IGUA-26 Attachment 2.

Table 3 – Concentric recommendation for other peers – life and survivor curve

CONCENTRIC'S RECOMMENDATIONS									
		EGD	AltaGas	FortisBC	ATCO Gas	Centra Gas	IntraGaz	PNG	Gazifere
LOCAL STORAGE PLANT									
442	STRUCTURES AND IMPROVEMENTS			25-L2			40-R4		
443.01	HOLDER - STORAGE TANK							40-SQ	
443.02	HOLDER EQUIPMENT			40-S4					
UNDERGROUND STORAGE PLANT									
451	LAND RIGHTS INTANGIBLE	65-R4					40-SQ		
452	STRUCTURES AND IMPROVEMENTS	40-R2.5					40-R4		
453	WELLS	50-R2					40-R4		
454	WELL EQUIPMENT	55-R2.5					30-R3		
455	FIELD LINES	60-R4					40-R4		
456	COMPRESSOR EQUIPMENT	45-R3					30-R3		
457	REGULATING AND MEASURING EQUIPMENT	35-R4							
TRANSMISSION PLANT									
461	LAND RIGHTS INTANGIBLE		70-R3			75-R4		75-R4	
462	COMPRESSOR STRUCTURES AND IMPROVEMENTS			30-S4				30-R4	
463	MEASURING AND REGULATING STRUCTURES AND IMPROVEMENTS		47-S3	38-S2		50-R5		39-R4	
464	EQUIPMENT			30-R4		50-R5			
465	MAINS		70-R3	65-R4		65-R4		65-R4	
466	COMPRESSOR EQUIPMENT			37-R4				35-R3	
467	MEASURING AND REGULATING EQUIPMENT		42-R3	37-R1.5		50-S2.5		35-S2.5	
DISTRIBUTION PLANT									
471	LAND RIGHTS INTANGIBLE	75-R4	65-R4		75-SQ	75-R4		75-R4	
472	STRUCTURES AND IMPROVEMENTS	50-R1	44-R3	38-R1.5	60-R3	45-R1.5		30-R3	
473	SERVICES	45-S1	55-R3	47-R2	57-R2.5	55-R2.5		50-R4	53-R3.5
474	REGULATORS		35-S3	20-S0	47-R4	45-R4		40-R4	
475	MAINS - ENVISION	25-SQ							
475.21	MAINS - COATED & WRAPPED	70-R3	65-R2	65-R2.5	66-R2.5	65-R4		65-R4	80-R3
475.3	MAINS - PLASTIC	70-R4	65-R2	65-R2.5	66-R2.5	65-R4		65-R4	80-R3
476	COMPANY NGV COMPRESSOR STATIONS	17-S2.5		7-L0					
477	MEASURING AND REGULATING EQUIPMENT	42-R1.5	42-R2.5	33-R2	45-R1.5	35-R2		35-R4	30-R4
477.01	CUSTOMER M&R EQUIPMENT								
478	METERS	15-S2.5	25-R3	18-R4	18-R3	26-S1.5		20-R4	18-R0.5
GENERAL PLANT									
482	STRUCTURES AND IMPROVEMENTS		75-R2	25-R1.5	44-R2.5	45-R3		30-R3	
483	OFFICE FURNITURE AND EQUIPMENT	15-SQ		20-SQ	20-SQ	15-SQ	7-SQ	15-SQ	15-SQ
484	TRANSPORTATION EQUIPMENT	12-L1.5	7-L1.5	7-L1	12-L2.5	10-R5	6-L3	8-L3	13-R4
485	HEAVY WORK EQUIPMENT	18-L1	10-L1	13-L0.5	13-L2	20-R5		18-R3	15-S3
486	TOOLS AND WORK EQUIPMENT	15-SQ		20-SQ	15-SQ	15-SQ	10-SQ	20-SQ	10-SQ
487.7	RENTAL - REFUEL APPL	20-SQ			20-R5				
487.8	RENTAL - NGV STATIONS	20-SQ		15-SQ	20-R5				
488	COMMUNICATION STRUCTURES AND EQUIPMENT	10-SQ		15-SQ	23-R1			14-SQ	7-S4
490	COMPUTER EQUIPMENT	5-SQ		4-SQ	6-SQ		5-SQ	5-SQ	4-SQ
490.3	COMPUTER EQUIPMENT - WAMS								
491.01	SOFTWARE ACQUIRED INTANGIBLES	4-SQ		5-8-SQ					4-SQ
491.02	SOFTWARE DEVELOPED INTANGIBLES	5-SQ		5-8-SQ					4-SQ
491.03	CIS ACQUIRED SOFTWARE	10-SQ							7-SQ
491.04	WAMS								
TOTAL GENERAL PLANT									

The final piece of information relied upon by a depreciation expert is discussions with management and operational personnel to understand the underlying life characteristics of the account. This is also an important exercise as in some cases the historical assets and retirement patterns may not be indicative of future retirement patterns due to a variety of reasons, including but not limited to:

- Changes in maintenance practices.
- Unusual events in prior years.
- Changes in technology or the resilience of certain assets.
- Changes in other relevant causes of retirement.

Q: Do you agree with the service life and survivor curve estimates recommended by Concentric?

A: I have reviewed all the service life and survivor curve recommendations provided by Concentric and am generally supportive of most of the recommendations. In most cases, Concentric's recommendations appear to align with the underlying retirement data, peer analysis and management discussions. However, in certain accounts where Concentric appears to have exercised significant judgment, I disagree with Concentric's recommendations and outline the reasons for such disagreement below.

Before addressing each individual account, I note that I do have some concern that Concentric's recommendations in this matter tend to err towards shortening lives for high dollar investment accounts. While this is not uniform, I am concerned by an apparent trend. This concern is emphasized by the statements from Concentric supporting its transition to the ELG procedure, including a perceived need to move closer to an economic life for the assets and the results achieved by the economic planning horizon calculated by Concentric. As noted earlier, the useful lives of assets, as well as the selected depreciation procedure, should be based first on the underlying data supporting those recommendations. If an economic life is warranted for consideration due to external factors, that adjustment should be made separately rather than indirectly through life reductions that are not supported by the underlying data, peer analysis or discussions with management.

3.1.2.1 Account 466 – Transmission – Compressor Equipment

Q: Please provide your recommended average service life and survivor curve for account 466.

A: Concentric recommends using a 30-R4 curve for this asset class. For the reasons detailed below, I recommend using a 37-R4 curve for this asset class, which relative to Concentric's recommendation, reduces depreciation expense by $9.7 million assuming use of the ALG procedure as I recommend, or by $12.8 million if the ELG procedure is adopted.

The following table from the Concentric 2021 Depreciation Study summarizes the investment, previously approved curves, applied for curves and net salvage for Account 466:[25]

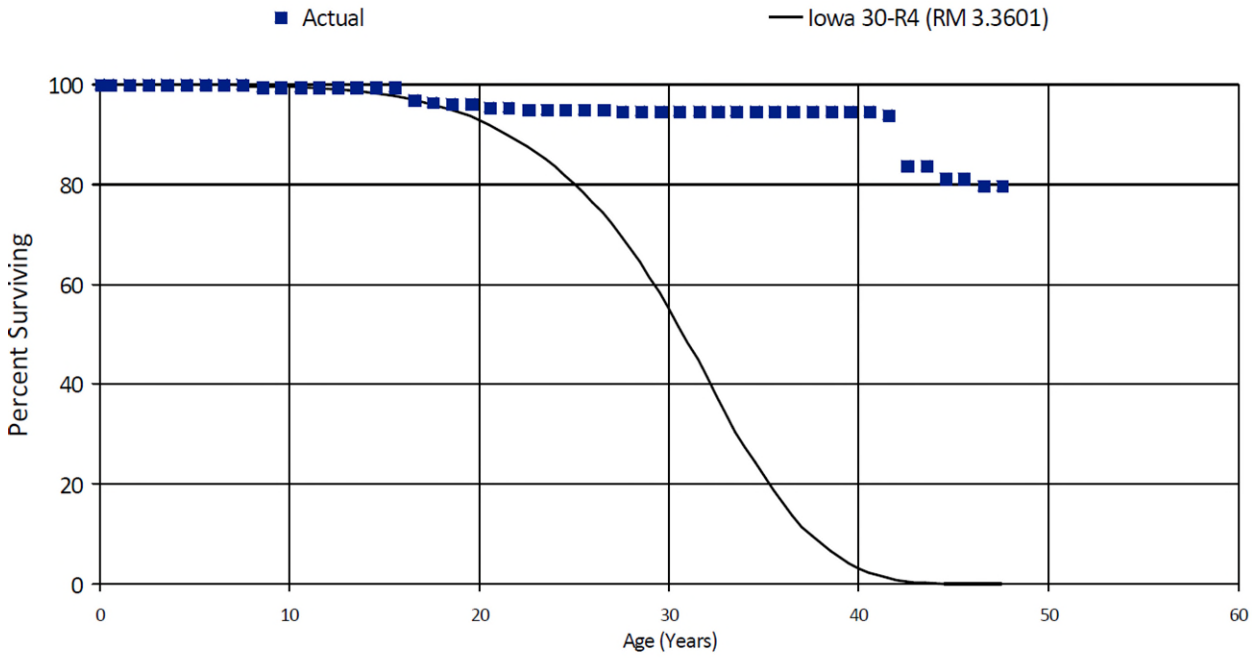
Table 4 – Concentric's summary for Account 466

ACCOUNT 466 – TRANSMISSION - COMPRESSOR EQUIPMENT

Investment $	Investment %	Previously Approved Curves	Concentric Recommended Curve	Previously Approved Salvage	CDNS Recommended Salvage
$1,005,060,039	4.64%	Union: 30-S3 EGD: N/A	30-R4	Union: -5% EGD: N/A	-7%

The following figure represents the Iowa curve recommended by Concentric and the actual observed retirement data for this account:[26]

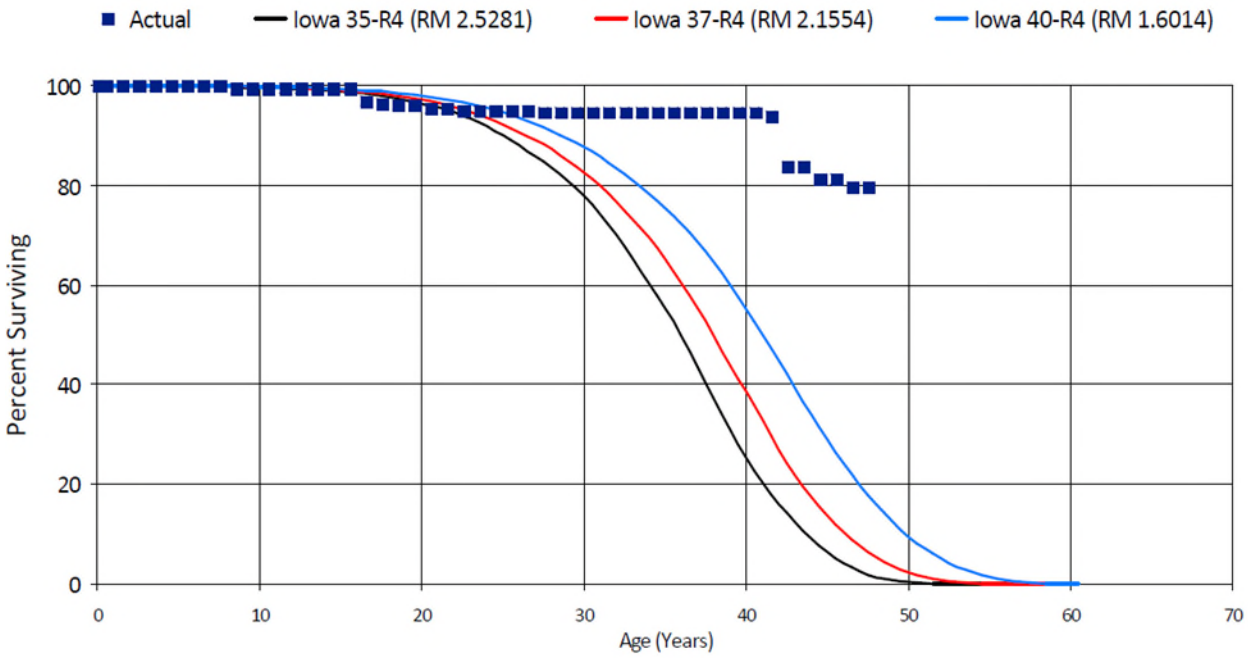
Figure 8 – Concentric recommended Iowa curve for Account 466



[25] EB-2022-0200, Exhibit 4 Operating Expenses Updated, Tab 5, Schedule 1, Attachment 1, PDF page 876.
[26] EB-2022-0200, Exhibit 4 Operating Expenses Updated, Tab 5, Schedule 1, Attachment 1, PDF page 948.

As shown from the figure above, the retirement data for this account shows relatively few retirements before age 40. The figure below represents the alternative Iowa curves Concentric was asked to study in response to an IGUA interrogatory for this account:[27]

Figure 9 – Alternative Iowa curves reviewed for Account 466



In my opinion, the visual fit is superior for 35-R4, 37-R4 and 40-R4, as compared to 30-R4. Specifically, a longer life fits the earlier portion of the retirement history well, while also better fitting the observed retirement data through later years.

The residual measure for the selected 30-R4 curve is 3.3601, which is inferior to the residual measures for a 35-R4, 37-R4 and 40-R4, with the 40-R4 providing the best residual measure of the group of 1.6014.

Regarding the peer analysis, Concentric states for Account 466 that Canadian gas distribution utility peers have a range of lives between 35 and 37 years. In the peer analysis, I noted that the previously approved Union rate is reported as 35-S3 as opposed to

[27] EGI IRR Exhibit I4 2024 Rebasing 2023-03-08, PDF page 1949, Exhibit I.4.5-IGUA-16 Attachment 1.

30-S3 as referenced in the 2021 depreciation study.[28] The inconsistency between the two data points is unclear. In any event, all other peers are between 35 and 37 years, which is consistent with the retirement data observed for Enbridge.

Concentric's primary basis for its recommendation is the significant new investment that caused it to "place less weighting on the actuarial analysis for this account."[29] While it is reasonable to some extent to discount the actuarial analysis when there are significant additions to an account which can alter the life expectations, it is unclear why Concentric has ignored or discounted certain management and peer data.

The change in exposures observed by Concentric at ages 6.5 and 14.5 are relevant, but the impacts are consistent regardless of whether a 35-R4, 37-R4 and 40-R4 is used as the visual curve fit through these ages is not markedly different as shown in Exhibit I.4.5-IGUA-16 Attachment 1.[30]

Regarding management experience maintaining and retiring the assets, Enbridge provides the following explanation for the management of the assets in this account:

> Please see Exhibit 2, Tab 6, Schedule 2, page 180, Table 5.3.4-1 under Maintenance Strategies which outlines the maintenance approach taken to extend the useful life of compression station assets, and Section 5.3.5.1 on pages 182 to 184 which outlines the condition assessment methodology employed. Additionally, please see Section 5.3.5.4.1 on pages 187 to 190 which discusses the compressor modernization strategy that supports decision-making around asset renewal. Characteristics of the asset class are described in Section 5.3.5 on pages 181 to 288. While some smaller components within compressor stations are replaced within a fixed period of time through time-based replacement strategies outlined in Section 5.3.5.4.7 on page 191, replacement of major compression equipment is

[28] EGI IRR Exhibit I4 2024 Rebasing 2023-03-08, PDF page 2765, Exhibit I.4.5-IGUA-26 Attachment 1.
[29] EGI IRR Exhibit I4 2024 Rebasing 2023-03-08, PDF page 1947, Exhibit I.4.5-IGUA-16c).
[30] EGI IRR Exhibit I4 2024 Rebasing 2023-03-08, PDF page 1949, Exhibit I.4.5-IGUA-16 Attachment 1.

> largely driven by discontinuation of Original Equipment Manufacturer (OEM) support and equipment reliability concerns as described in Section 5.3.5.4.1. While each OEM may support their product lines for different lengths of time, prior discussions with the OEM's for several of Enbridge Gas's most critical compressor equipment have suggested availability for equipment support will become limited after 40 years (See. EB-2020-0191, Exhibit C, Tab 2, Schedule 1, page 194, Section 5.5.5.2). However, Enbridge Gas continues to explore opportunities to extend equipment life through modernization of components at overhauls as provided at Exhibit 2, Tab 6, Schedule 2, Section 5.3.5.4.1.[31]

As stated above, the primary driving factor for the life of "most critical compressor equipment" is the Original Equipment Manufacturer (OEM) support, which has been stated to "become limited after 40 years".

In my opinion, the above information in aggregate supports a life greater than the 30-R4 curve recommended by Concentric. Specifically, I consider that a 35-R4 to 40-R4 curve is supported, but I am mindful of ensuring any change is gradual and moderate given Concentric's own observations that there is significant new investment within this account.

For these reasons, I recommend the OEB approve a 37-R4 curve using the ALG procedure. This curve is consistent with the peer data, provides a better visual and mathematical fit to the observed retirement data, and is consistent with the information provided by management for this account suggesting a life of 40 years for most critical compressor equipment. A 37-year average life is also conservative, particularly if the previously approved rate for Union is 35-S3 as opposed to 30-S3. In either case, I continue to consider that the evidence supports a life extension for this account.

[31] EGI IRR Exhibit I4 2024 Rebasing 2023-03-08, PDF pages 1947 and 1948, Exhibit I.4.5-IGUA-16d).

The estimated depreciation expense from using a 37-R4 curve and the ALG procedure is $25.6 million assuming an accrual rate of 2.48%[32] and an investment balance of $1,031.8 million ($1,031.8 million + $0.0 million)[33]. This estimate reflects a $9.7 million reduction as compared to the calculated depreciation expense of $35.3 million[34] using a 30-R4 curve and assuming the ALG procedure, or a $12.8 million reduction as compared to the calculated depreciation expense of $38.4 million[35] using a 30-R4 curve of and assuming the ELG procedure.

3.1.2.2 Account 473.01 – Services – Metal

Q: Please provide your recommended average service life and survivor curve for account 473.01.

A: Concentric recommends using a 45-S1 curve for this asset class. For the reasons detailed below, I recommend using a 50-L1 curve for this asset class, which relative to Concentric's recommendation, reduces depreciation expense by $5.1 million assuming use of the ALG procedure as I recommend, or by $9.6 million if the ELG procedure is adopted.

The following table from the Concentric 2021 Depreciation Study summarizes the investment, previously approved curves, applied for curves and net salvage for Account 473.01:[36]

[32] EGI IRR Exhibit I4 2024 Rebasing 2023-03-08, PDF page 1964, Exhibit I.4.5-IGUA-16, Attachment 2.
[33] EB-2022-0200, Exhibit 4 Operating Expenses Updated, Tab 5, Schedule 1, Attachment 2, PDF page 1303.
[34] EGI IRR Exhibit I4 2024 Rebasing 2023-03-08, PDF page 809, Exhibit I.4.5-STAFF-170, Attachment 1.
[35] EGI IRR Exhibit I4 2024 Rebasing 2023-03-08, PDF page 809, Exhibit I.4.5-STAFF-170, Attachment 1.
[36] EB-2022-0200, Exhibit 4 Operating Expenses Updated, Tab 5, Schedule 1, Attachment 1, PDF page 878.

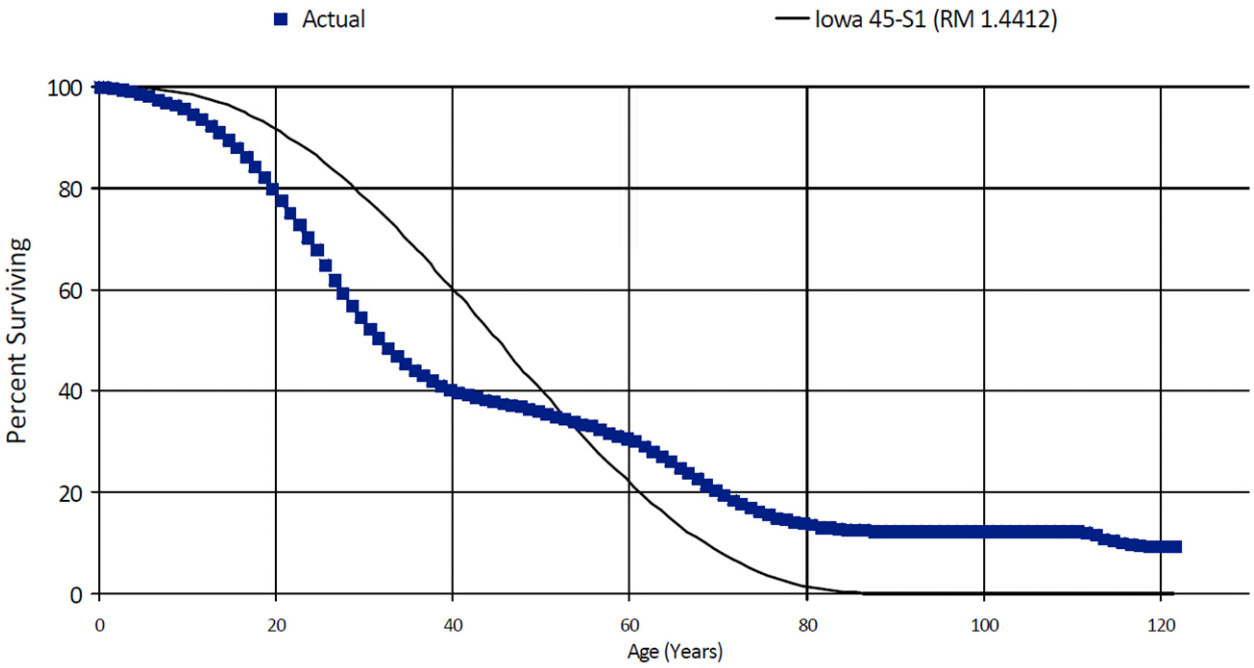
Table 5 – Concentric's summary for Account 473.01

ACCOUNT 473.01 – SERVICES - METAL

Investment $	Investment %	Previously Approved Curves	Concentric Recommended Curve	Previously Approved Salvage	CDNS Recommended Salvage
$549,648,294	2.54%	Union: 50-R1.5 EGD: 45-L1.5	45-S1	Union: -60% EGD: -22%	-32%

The following figure represents the Iowa curve recommended by Concentric and the actual observed retirement data for this account:[37]

Figure 10 – Concentric recommended Iowa curve for Account 473.01

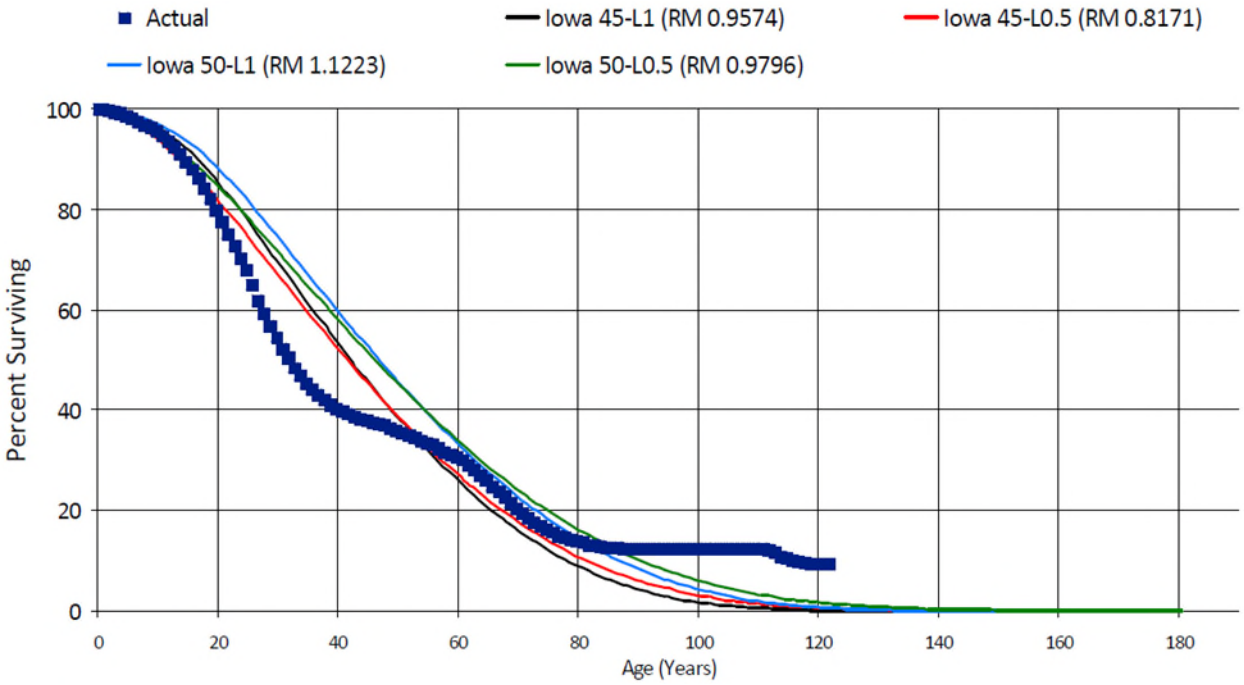


Based on the visual fit of the retirement data to the curve, I observed that an L-type curve may provide for a better visual and mathematical fit to the data. The below figure

[37] EB-2022-0200, Exhibit 4 Operating Expenses Updated, Tab 5, Schedule 1, Attachment 1, PDF page 961.

represents the alternative Iowa curves Concentric was asked to study in response to an IGUA interrogatory for this account using the L-type curve:[38]

Figure 11 – Alternative Iowa curves reviewed for Account 473.01



Not surprisingly, the L-type curve provides for a better visual and mathematical fit to the observed retirement data as shown above. However, from a review of the peer analysis conducted by Concentric no other peer has observed an L-type curve as being appropriate for these types of assets. More specifically, the peers all use an R-type curve varying from an R2 to R4. Considering this trend, I have chosen to place more weight on the peer and management analysis than on the observed retirement data.

The peer analysis provides a life between 47 and 57 years, as compared to the 45-year life recommended by Concentric for this account. Importantly, the 47-to-57-year range applies to both metal and plastic services for the peer companies. Still the data is indicative of a potential life extension for the assets.

[38] EGI IRR Exhibit I4 2024 Rebasing 2023-03-08, PDF page 2194, Exhibit I.4.5-IGUA-18 Attachment 1.

Regarding steel services (Account 473.01) and mains (Account 475.21), Concentric's notes regarding discussion with management do not appear to distinguish between the characteristics of services and mains. In Concentric's notes, Concentric states in respect of "Services & Mains":

> Most services are steel (bare and unprotected or bare and protected (referred to as "vintage steel")). There is an ongoing vintage steel (pre-1970) replacement program – projects are prioritized [sic] it is replaced as it is identified as an area of concern. EGI is working to get ahead of the upcoming wave of retirements for vintage steel. It is being replaced by plastic. Plastic up to 550 kPa. Anything above this is steel. There is 17000 KM of vintage steel – about 5500 KM will be replaced over 20 years.[39]

In response to an IGUA request, Enbridge confirms that the expected operational life for steel services and steel mains is similar:

> Characteristics and expected operational life for steel services are similar to those described for steel mains under Exhibit 2, Tab 6, Schedule 2, pages 85 to 94 Sections 5.2.3.4, 5.2.3.4.1, 5.2.3.4.1.2.1, page 96, and pages 96 to 98, Section 5.2.3.4.2. Approach to maintenance includes corrosion control, cathodic protection surveys, and leak management as described on page 82, Table 5.2.3-2.[40]

The life curve combination for Account 473.01 steel services is proposed to be 45-S1 and the life curve combination for Account 475.21 steel mains is proposed to be 55-R3. This is a significant difference given the statements above that the characteristics and expected operational life are similar for steel services and steel mains. There is limited information available from Concentric or Enbridge to understand the distinction that is being made.

[39] EGI IRR Exhibit I4 2024 Rebasing 2023-03-08, PDF page 991, Exhibit I.4.5-STAFF-171 Attachment 5.
[40] EGI IRR Exhibit I4 2024 Rebasing 2023-03-08, PDF pages 2192 and 2193, Exhibit I.4.5-STAFF-18d).

Accepting the replacement program in place for both steel services and steel mains, the concern I have is that the underlying useful life of the assets remains greater than 45 years for steel services as assumed by Concentric. The same concern applies to steel mains as discussed below which is supported by underlying retirement and peer data for a longer life than 55 years. Further, there is no clear evidence from Enbridge that I am aware of to demonstrate the final retirement date of all steel services or mains.

The replacement program is subject to prioritization based on "area of concern". Based on this program, 11,500 kilometers (17,000 KM total – 5,500 KM replaced in the next 20 years) or approximately two thirds of the steel services and steel mains will be in service beyond 20 years. Importantly, the estimate to remove 5,500 kilometers is only an estimate and may be aggressive or conservative. These estimates do not take into consideration the life of the assets being retired, which will be replaced, if possible, by plastic when they become an "area of concern". Finally, these estimates do not appear to consider that additional metal services or mains may be added to the system where plastic is not an option.

In conclusion, for the above reasons, I do not consider the proposed life and curve combination of 45-S1 to be appropriate. Union was previously approved to use a 50-R1.5 Iowa curve. This curve would be reasonable to continue, aligns more closely with the peer data range and has a residual measure of 1.6183.[41] In particular, I consider an average life of at least 50 years to be appropriate. While I consider a 50-R1.5 curve as previously approved to be reasonable, I also consider that a 50-L1 curve may provide a better fit to the observed retirement data with a residual measure of 1.1223 and a good visual fit to the observed retirement data through age 80.5 as compared to alternative curves. For this reason, I recommend the use of a 50-L1 curve as it relies on the 50-year average service life consistent with peer and management analysis while also fitting the observed retirement data and thus provides a balance. Further, either of these curves will provide

[41] EGI IRR Exhibit I4 2024 Rebasing 2023-03-08, PDF page 937, Exhibit I.4.5-STAFF-171, Attachment 4.

directional consistency with the Concentric recommended curve of 55-R3 for Account 475.21 which is the subject of my further recommendations below where I recommend a 60-R3 curve.

The estimated depreciation expense from using a 50-L1 curve and the ALG procedure is $12.4 million assuming an accrual rate of 2.02%[42] and an investment balance of $611.4 million ($320.6 million + $290.8 million)[43]. This estimate reflects a $5.1 million reduction as compared to the calculated depreciation expense of $17.5 million[44] using a 45-S1 curve and assuming the ALG procedure, or a $9.6 million reduction as compared to the calculated depreciation expense of $22.0 million[45] using a 45-S1 curve and assuming the ELG procedure.

3.1.2.3 Account 473.02 – Services – Plastic

Q: Please provide your recommended average service life and survivor curve for account 473.02.

A: Concentric recommends using a 55-S3 curve for this asset class. For the reasons detailed below, I recommend using a 60-S3 curve for this asset class, which relative to Concentric's recommendation, reduces depreciation expense by $14.8 million assuming use of the ALG procedure as I recommend, or by $25.7 million if the ELG procedure is adopted.

Due to the late adjustment made to Enbridge's application, this account was not addressed through the interrogatory process in detail. In total $3.2 billion of investment related to EGD for this account was previously misclassified to account 473.01, and thus the impact of the proposed change in depreciation expense for this account of $2.7 million did not

[42] EGI IRR Exhibit I4 2024 Rebasing 2023-03-08, PDF page 2216, Exhibit I.4.5-IGUA-18, Attachment 2.
[43] EGI IRR Exhibit I4 2024 Rebasing 2023-03-08, PDF page 810, Exhibit I.4.5-STAFF-170, Attachment 1.
[44] EGI IRR Exhibit I4 2024 Rebasing 2023-03-08, PDF page 810, Exhibit I.4.5-STAFF-170, Attachment 1.
[45] EGI IRR Exhibit I4 2024 Rebasing 2023-03-08, PDF page 810, Exhibit I.4.5-STAFF-170, Attachment 1.

appear significant.[46] Following the update, the variance grows from $2.7 million to $16.9 million.[47]

The following table from the Concentric 2021 Depreciation Study summarizes the investment, previously approved curves, applied for curves and net salvage for Account 473.02:[48]

Table 6 – Concentric's summary for Account 473.02

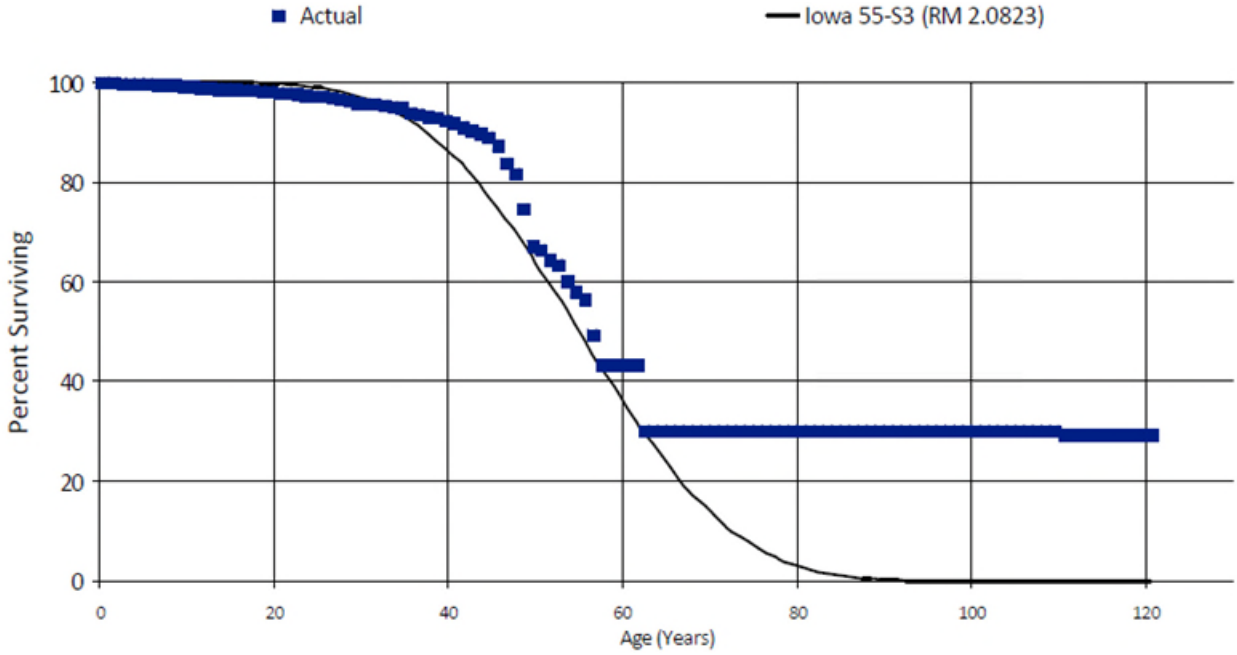
ACCOUNT 473.02 – SERVICES – PLASTIC

Investment $	Investment %	Previously Approved Curves	Concentric Recommended Curve	Previously Approved Salvage	CDNS Recommended Salvage
$4,458,883,264	20.60%	Union: 55-R3 EGD: 45-L1.5	55-S3	Union: -40% EGD: -22%	-26%

The following figure represents the Iowa curve recommended by Concentric and the actual observed retirement data for this account:[49]

[46] EB-2022-0200, Exhibit 4 Operating Expenses, Tab 5, Schedule 1, Attachment 2, PDF page 1290.
[47] EB-2022-0200, Exhibit 4 Operating Expenses Updated, Tab 5, Schedule 1, Attachment 2, PDF page 1304.
[48] EB-2022-0200, Exhibit 4 Operating Expenses Updated, Tab 5, Schedule 1, Attachment 1, PDF page 879.
[49] EB-2022-0200, Exhibit 4 Operating Expenses Updated, Tab 5, Schedule 1, Attachment 1, PDF page 967.

Figure 12 – Concentric recommended Iowa curve for Account 473.02



As depicted above, the selected life curve combination of 55-S3 fits the observed retirement data well through approximately age 35.5. Thereafter, the visual fit to the curve weakens significantly. This is an important account to forecast correctly as it represents one of the largest accounts by investment for Enbridge.

Limited information is provided by Concentric in the management notes on this account which simply state:

> Plastics – There was a capital plan to replace a number of cracked caps in the 2001 era. The ongoing maintenance programs identify any new fittings and pipe, including cracked caps, that require mitigation.[50]

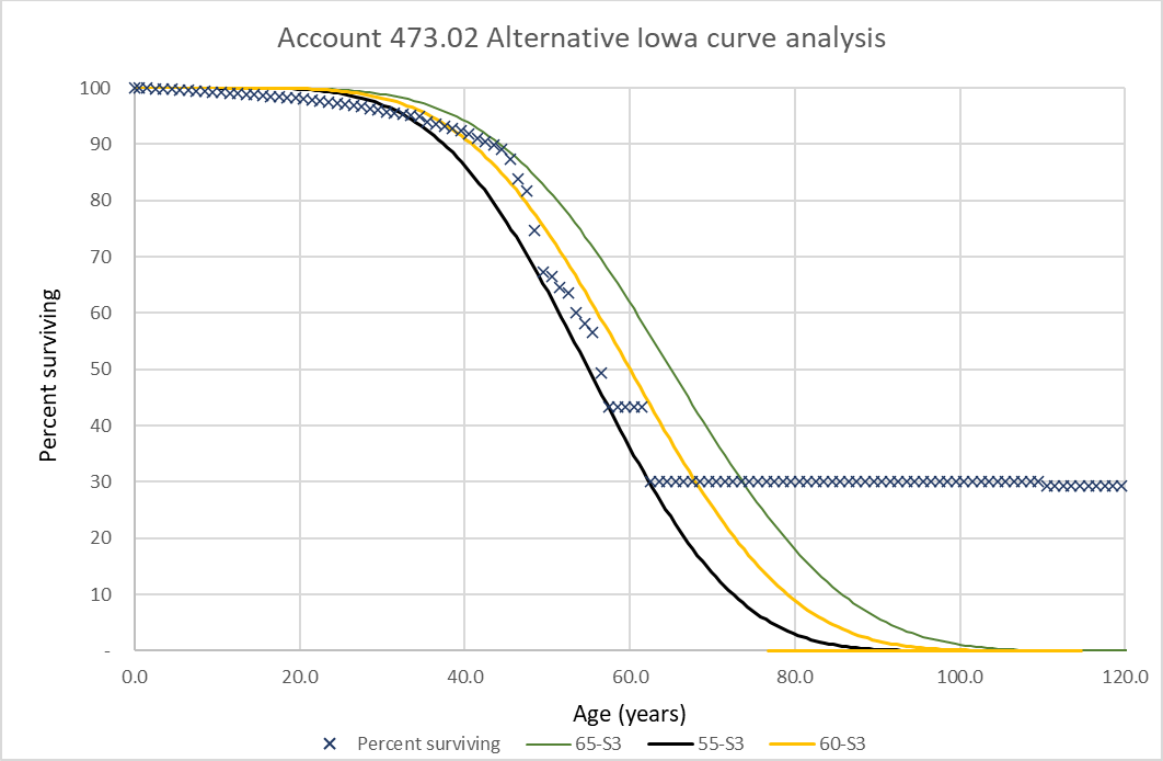
There is an acknowledgement that plastic services and mains are expected to last longer than steel services, given the longer service life (55 years versus 45 years). I can accept this is the case, and it is reflected in the longer recommended service life for plastic mains in Account 475.30 of 60 years. However, it is unclear why plastic services would have a life

[50] EGI IRR Exhibit I4 2024 Rebasing 2023-03-08, PDF page 991, Exhibit I.4.5-STAFF-171 Attachment 5.

that is aligned with steel mains in account 475.21 of 55 years as opposed to one that is more closely aligned with account 475.30 (plastic mains).

The following figure maps the observed retirement data for Account 473.02 against the Concentric recommended 55-S3, as well as a 60-S3 and 65-S3 curve:

Figure 13 – Emrydia developed Iowa curves for Account 473.02



As depicted in the above figure, a 60-S3 life-curve combination provides a better visual fit to the retirement data through age 45.5 and continues to track the observed retirement data as well as a 55-S3 life-curve through age 61.5. The visual fit of the 65-S3 Iowa curve is less superior to the 60-S3 curve. I also considered several other curve fits including a variety of S and R type curves. For example, a 65-R4 curve was observed as having an improved visual fit to the data through approximately age 32.5, but weaker visual fit thereafter. Therefore, while several curve types may be appropriate, I consider the S3 curve to be reasonable in this instance.

In summary, I recommend the use of a 60-S3 curve as opposed to the 55-S3 curve recommended by Concentric. This curve provides for a better visual fit to the observed

retirement data and more closely aligns with the recommended, and my proposed, curve for plastic mains in account 475.30. Given the available peer data is for both steel and plastic services, I have placed less weight on the peer data to guide selection of an appropriate curve. That said, the upper bound of the peer data for Account 473 is 57 years and thus not materially different from my recommended expected service life of 60 years.

The same level of information was not provided for this account as it was not the subject of interrogatories before the reclassification of investment. Further, I did not have access to the detailed Excel based calculations relied upon by Concentric to support the calculation of accumulated depreciation, net book value and other factors. However, using the ALG remaining life tables provided in response STAFF-173, Attachment 2, I estimate that the composite depreciation rate for this account using a 60-S3 curve and the ALG procedure would be approximately 2.16% as compared to 2.47% using a 55-S3 curve and the ALG procedure. Therefore, the estimated depreciation expense from using a 60-S3 curve and the ALG procedure is $108.8 million assuming an accrual rate of 2.16% and an investment balance of $5,036.2 million ($3,180.6 million + $1,855.6 million)[51]. This estimate reflects a $14.8 million reduction as compared to the calculated depreciation expense of $123.6 million[52] using a 55-S3 curve assuming the ALG procedure, or a $27.5 million reduction as compared to the calculated depreciation expense of $136.3 million[53] using a 55-S3 curve and assuming the ELG procedure.

3.1.2.4 Account 475.21 – Mains – Coated & Wrapped

Q: Please provide your recommended average service life and survivor curve for account 475.21.

A: Concentric recommends using a 55-R3 curve for this asset class. For the reasons detailed below, I recommend using a 65-R3 curve for this asset class but acknowledge that use of a

[51] EGI IRR Exhibit I4 2024 Rebasing 2023-03-08, PDF page 810, Exhibit I.4.5-STAFF-170, Attachment 1.
[52] EGI IRR Exhibit I4 2024 Rebasing 2023-03-08, PDF page 810, Exhibit I.4.5-STAFF-170, Attachment 1.
[53] EGI IRR Exhibit I4 2024 Rebasing 2023-03-08, PDF page 810, Exhibit I.4.5-STAFF-170, Attachment 1.

60-R3 curve can also be justified. Use of a 60-R3 curve relative to Concentric's recommendation reduces depreciation expense by $18.9 million assuming use of the ALG procedure as I recommend, or by $36.1 million if the ELG procedure is adopted.

The following table from the Concentric 2021 Depreciation Study summarizes the investment, previously approved curves, applied for curves and net salvage for Account 475.21:[54]

Table 7 – Concentric's summary for Account 475.21

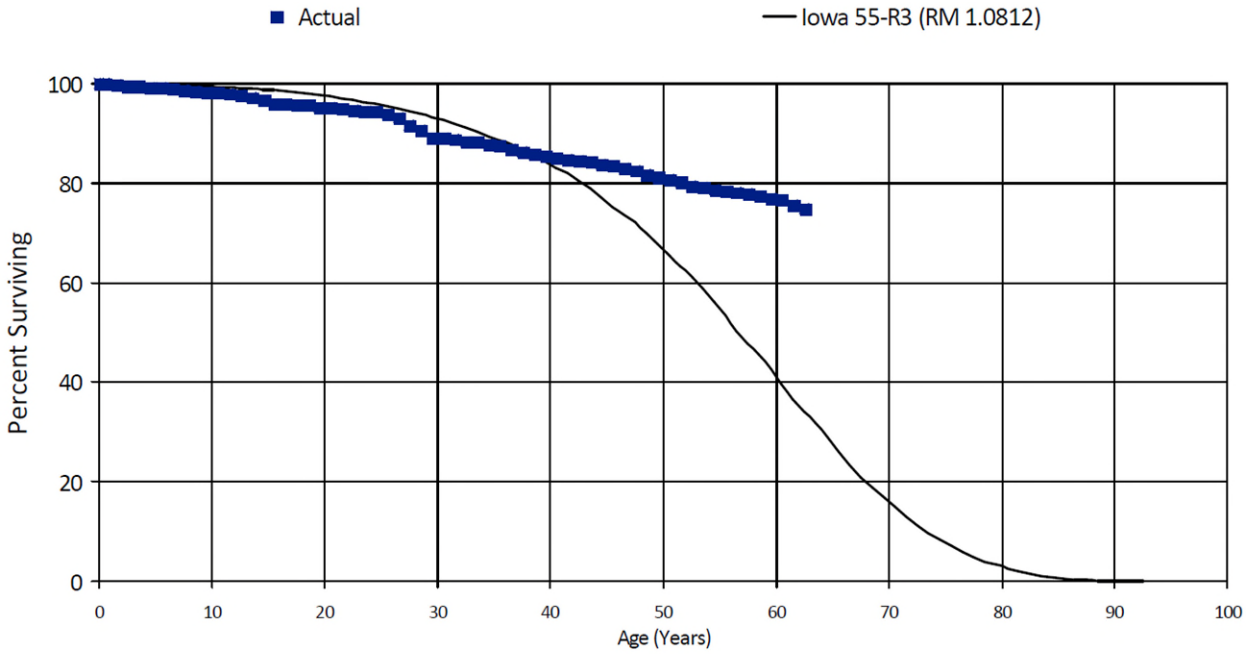
ACCOUNT 475.21 – MAINS – COATED & WRAPPED

Investment $	Investment %	Previously Approved Curves	Concentric Recommended Curve	Previously Approved Salvage	CDNS Recommended Salvage
$3,320,418,328	15.34%	Union: 55-R4 EGD: 61-R3	55-R3	Union: -60% EGD: -51%	-42%

The following figure represents the Iowa curve recommended by Concentric and the actual observed retirement data for this account:[55]

[54] EB-2022-0200, Exhibit 4 Operating Expenses Updated, Tab 5, Schedule 1, Attachment 1, PDF page 880.
[55] EB-2022-0200, Exhibit 4 Operating Expenses Updated, Tab 5, Schedule 1, Attachment 1, PDF page 973.

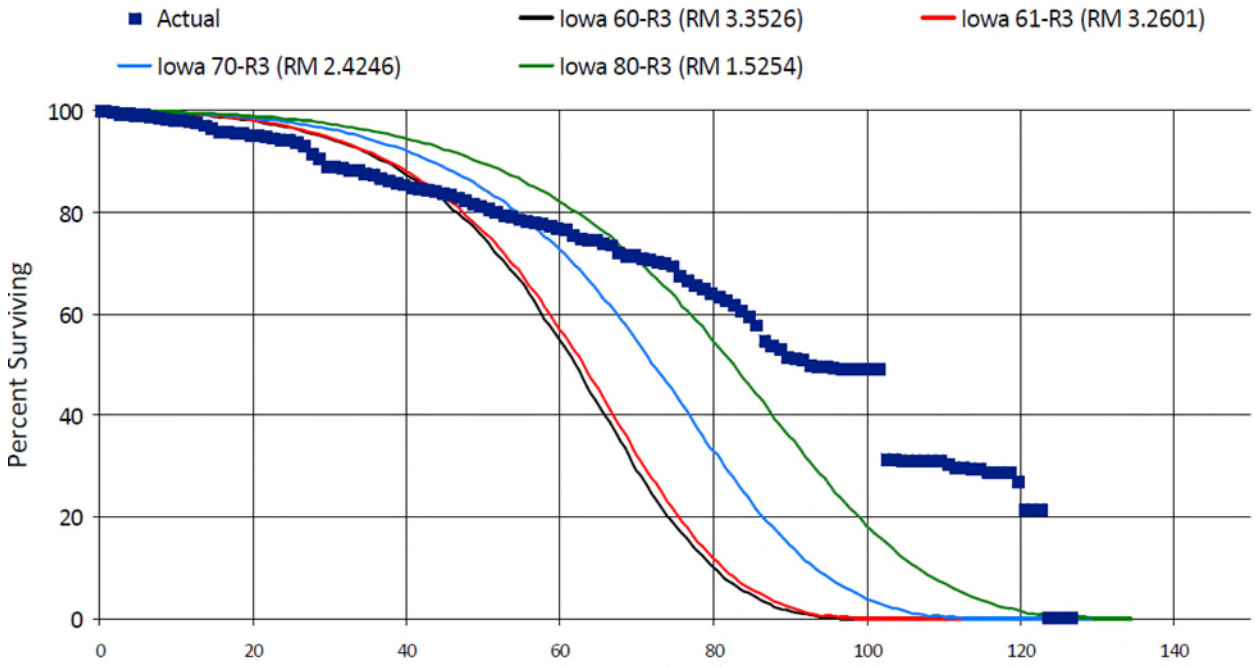
Figure 14 – Concentric recommended Iowa curve for Account 475.21



The 55-R3 Iowa curve selected by Concentric provides a reasonable fit to the observed retirement data through age 40.5. However, several alternatives are available that provide a superior fit. The below figure represents the alternative Iowa curves Concentric was asked to study in response to an IGUA interrogatory for this account:[56]

[56] EGI IRR Exhibit I4 2024 Rebasing 2023-03-08, PDF page 2276, Exhibit I.4.5-IGUA-20 Attachment 1.

Figure 15 – Alternative Iowa curves reviewed for Account 475.21



I address above concerns I have with the impact on the life of the proposed steel services and mains replacement program. Those concerns apply equally to Account 475.21 for steel mains.

The 55-R3 curve represents a highly conservative curve relative to that relied upon by the peer group, which is between 55 and 80 years, with five of the six peers at 65 or 66 years, and the sixth at 80 years per Table 2. I also observed that in Table 2 EGD is listed as having a life of 70-R3, which differs from the 61-R3 life reported in the 2021 depreciation study. In either case, the 55-R3 curve being proposed appears to be the lowest amongst the peers reviewed by a significant margin.

While I accept that there remains a replacement effort underway for steel services and mains, I am aware of no evidence from Enbridge or Concentric that the assets will be retired earlier than their useful life would warrant. Given the industry trend towards a much greater useful life, and despite the weaker mathematical fit of a higher life curve, I recommend the OEB direct the use of a survivor curve between 63-R3 and 65-R3 for account 475.21. The 65-R3 curve is preferred based on the peer data and the 60-R3 curve can be considered as acknowledging some potential acceleration in retirements and thus shortening of the expected life.

Finally, I note that directionally this increase results in a life-curve combination for account 473.01 (steel services) of 55-R3 and for account 475.21 (steel mains) of between 60-R3 and 65-R3. While not entirely consistent with one another, I accept that the observed retirement data provides for some increase in life for mains relative to services, which is likely due to mains being subject to fewer and differing forces of retirements than services, despite having broadly similar operational characteristics.

The estimated depreciation expense from using a 60-R3 curve and the ALG procedure is $98.6 million assuming an accrual rate of 2.46%[57] and an investment balance of $4,008.8 million ($2,163.5 million + $1,845.3 million)[58]. This estimate reflects an $18.9 million reduction as compared to the calculated depreciation expense of $117.5 million[59] using a 55-R3 curve and assuming the ALG procedure, or a $36.1 million reduction as compared to the calculated depreciation expense of $134.7 million[60] using a 55-R3 curve of and assuming the ELG procedure.

3.1.2.5 Account 475.30 – Mains – Plastic

Q: Please provide your recommended average service life and survivor curve for account 475.30.

A: Concentric recommends using a 60-R4 curve for this asset class. For the reasons detailed below, I recommend using a 70-R2 curve for this asset class, which relative to Concentric's recommendation, reduces depreciation expense by $26.2 million assuming use of the ALG procedure as I recommend, or by $33.6 million if the ELG procedure is adopted.

[57] EGI IRR Exhibit I4 2024 Rebasing 2023-03-08, PDF page 2291, Exhibit I.4.5-IGUA-20, Attachment 2
[58] EGI IRR Exhibit I4 2024 Rebasing 2023-03-08, PDF page 811, Exhibit I.4.5-STAFF-170, Attachment 1.
[59] EGI IRR Exhibit I4 2024 Rebasing 2023-03-08, PDF page 811, Exhibit I.4.5-STAFF-170, Attachment 1.
[60] EGI IRR Exhibit I4 2024 Rebasing 2023-03-08, PDF page 811, Exhibit I.4.5-STAFF-170, Attachment 1.

The following table from the Concentric 2021 Depreciation Study summarizes the investment, previously approved curves, applied for curves and net salvage for Account 475.30:[61]

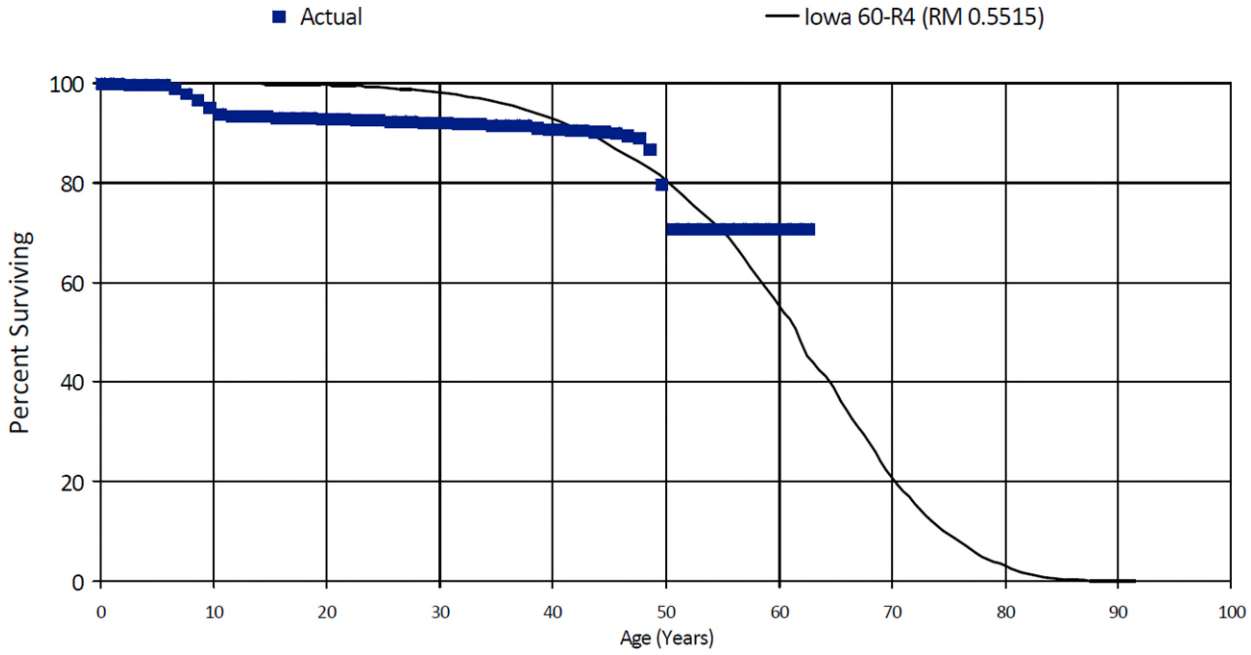
Table 8 – Concentric's summary for Account 475.30

ACCOUNT 475.30 – MAINS – PLASTIC

Investment $	Investment %	Previously Approved Curves	Concentric Recommended Curve	Previously Approved Salvage	CDNS Recommended Salvage
$3,480,106,028	16.08%	Union: 60-L2 EGD: 65-R3	60-R4	Union: -40% EGD: -38%	-38%

The following figure represents the Iowa curve recommended by Concentric and the actual observed retirement data for this account:[62]

Figure 16 – Concentric recommended Iowa curve for Account 475.30

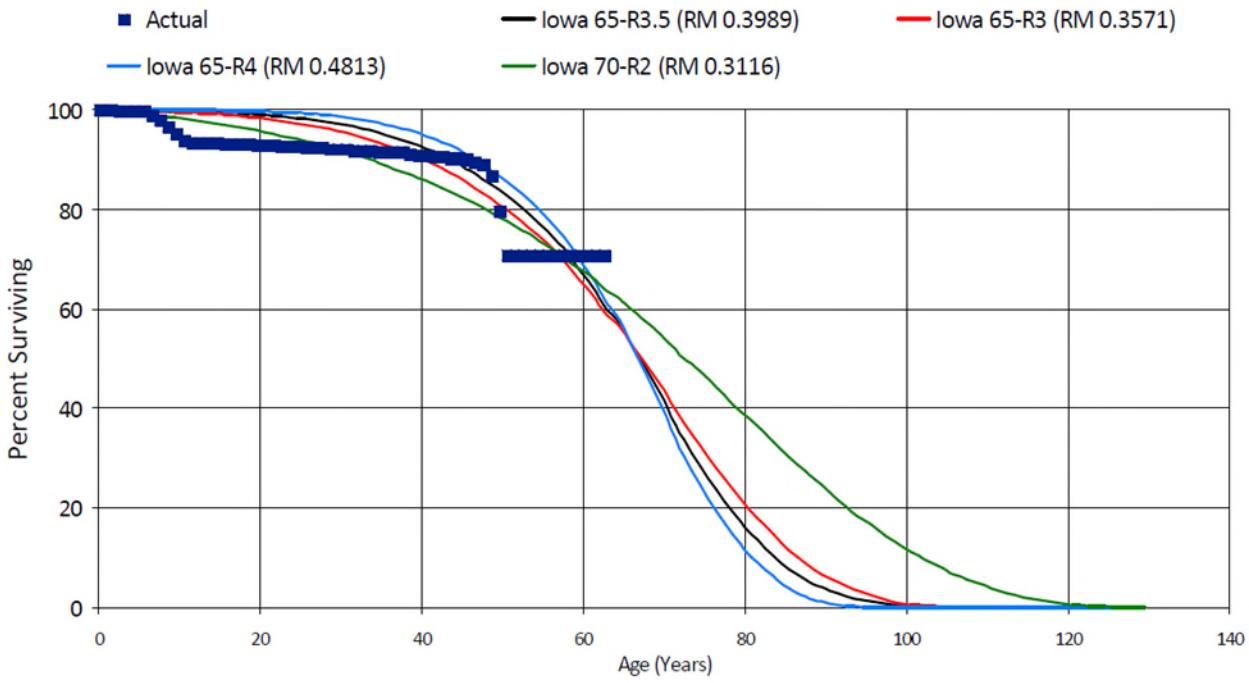


[61] EB-2022-0200, Exhibit 4 Operating Expenses Updated, Tab 5, Schedule 1, Attachment 1, PDF page 881.
[62] EB-2022-0200, Exhibit 4 Operating Expenses Updated, Tab 5, Schedule 1, Attachment 1, PDF page 977.

Like plastic services in account 473.02, the investment in account 475.30 is significant and thus small changes in the depreciation parameters can have a significant impact on depreciation expense.

Based on the observed retirement data, the selected curve has a strong residual measure but a weak visual fit to the observed retirement data through approximately age 9.5 to 37.5. This is partially due to the unusual retirement pattern observed which may not be reflective of the expected retirements or actual expected life for the assets in this account. Finally, the below figure represents the alternative Iowa curves Concentric was asked to study in response to an IGUA interrogatory for this account:[63]

Figure 17 – Alternative Iowa curves reviewed for Account 475.30



Of the curves reviewed, a 70-R2 curve provides the best visual and mathematical fit to the observed retirement data. This is in part due to the curve's superior visual fit to the

[63] EGI IRR Exhibit I4 2024 Rebasing 2023-03-08, PDF page 2340, Exhibit I.4.5-IGUA-21 Attachment 1.

retirement data through approximately age 32.5, as compared to Concentric's recommend 60-R4 curve.

Like plastic services in account 473.02, there is limited management data included by Concentric in its notes on this account. Having reviewed the information provided by management in the application, it does not appear that Enbridge would experience significantly different expected lives for its assets than its peers due to Enbridge's operational practices.

The peer data for this account in Table 2 suggests a range of between 65 and 80 years, with Concentric noting the previous rate for EGD as 70-R4 as compared to 65-R3 reported in the 2021 depreciation study. A 60-year life for this account provides a result that is below any of the peers studied by Concentric or the historical rate used for EGD per Table 2. At the same time, use of 60-year life does not provide a superior visual or mathematical fit to the observed retirement data.

Finally, recommending a life for plastic mains that is below the life for steel mains would be inappropriate for the reasons noted earlier, and is not supported by the peer analysis or retirement data.

For these reasons, I recommend the OEB direct Enbridge to use a 70-R2 curve for Account 475.30. This provides directional comparability to the life I recommend for account 473.02 of 60-S3. While based on a different curve type, the two accounts with these adjustments provide for a result that is aligned with the peer data, consistent with management's expectations for the life of plastic mains and services and aligned with the retirement data.

The estimated depreciation expense from using a 70-R2 curve and the ALG procedure is $69.9 million assuming an accrual rate of 1.82%[64] and an investment balance of $3,839.1 million ($2,738.0 million + $1,101.1 million)[65]. This estimate reflects a $26.2 million

[64] EGI IRR Exhibit I4 2024 Rebasing 2023-03-08, PDF page 2353, Exhibit I.4.5-IGUA-21, Attachment 2
[65] EGI IRR Exhibit I4 2024 Rebasing 2023-03-08, PDF page 811, Exhibit I.4.5-STAFF-170, Attachment 1.

reduction as compared to the calculated depreciation expense of $96.1 million[66] using a 60-R4 curve and assuming the ALG procedure, or a $33.6 million reduction as compared to the calculated depreciation expense of $103.5 million[67] using a 60-R4 curve and assuming the ELG procedure.

3.1.2.6 Account 478 – Meters

Q: Please provide your recommended average service life and survivor curve for account 478.

A: Concentric recommends using a 15-S2.5 curve for this asset class. For the reasons detailed below, I recommend using a 25-L1.5 curve for this asset class, which relative to Concentric's recommendation, which I estimate would reduce depreciation expense by $58.7 million assuming use of the ALG procedure as I recommend, or by $73.8 million if the ELG procedure is adopted.

The following table from the Concentric 2021 Depreciation Study summarizes the investment, previously approved curves, applied for curves and net salvage for Account 478:[68]

Table 9 – Concentric's summary for Account 478

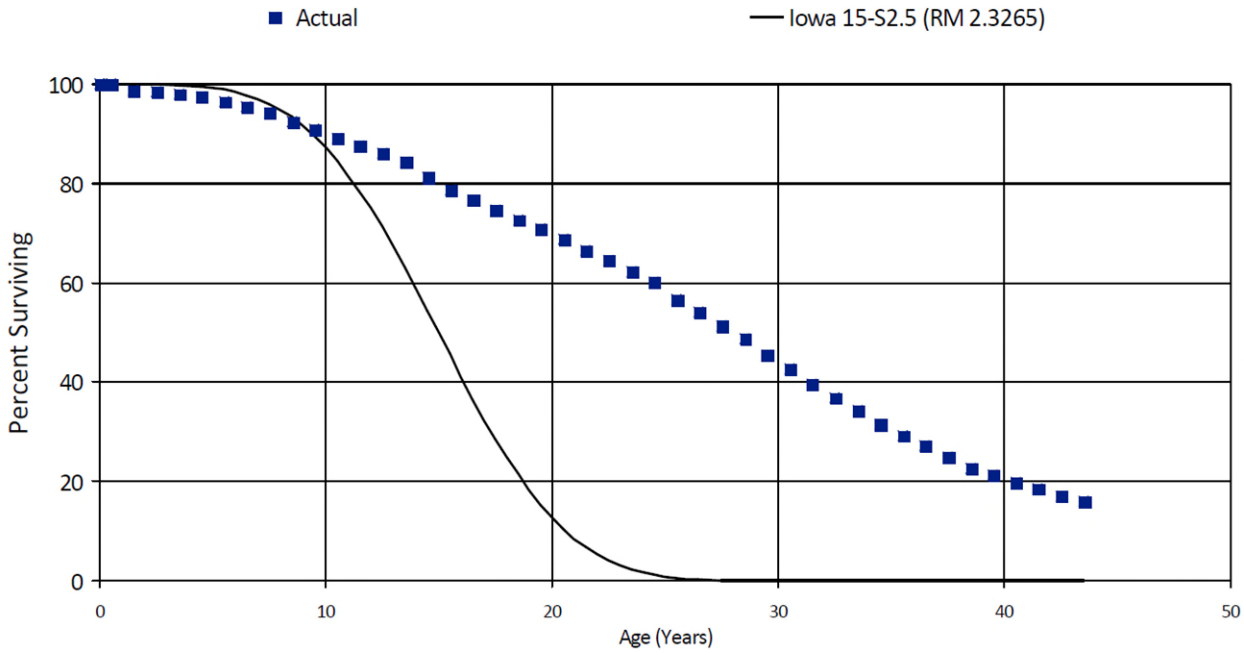
ACCOUNT 478 - METERS

Investment $	Investment %	Previously Approved Curves	Concentric Recommended Curve	Previously Approved Salvage	CDNS Recommended Salvage
$1,020,910,894	4.72%	Union: 25-L1.5 EGD: 15-S2.5	15-S2.5	Union: N/A EGD: +5%	0%

[66] EGI IRR Exhibit I4 2024 Rebasing 2023-03-08, PDF page 811, Exhibit I.4.5-STAFF-170, Attachment 1.
[67] EGI IRR Exhibit I4 2024 Rebasing 2023-03-08, PDF page 811, Exhibit I.4.5-STAFF-170, Attachment 1.
[68] EB-2022-0200, Exhibit 4 Operating Expenses Updated, Tab 5, Schedule 1, Attachment 1, PDF page 882.

The following figure represents the Iowa curve recommended by Concentric and the actual observed retirement data for this account:[69]

Figure 18 – Concentric recommended Iowa curve for Account 478



It is clear from the above retirement data that the selected 15-S2.5 curve is not aligned with the observed retirement data. In response to a Staff interrogatory, Concentric confirmed that it placed minimal weight on the actuarial analysis for this account.

> Concentric notes that the actuarial analysis included for this account includes all historic retirement transactions, resulting in a placement band of 1884 through 2021 and an experience band of 1955 through 2021. In the years since 1884, metering technology has undergone significant changes. As such, minimal weighting was placed on the actuarial analysis completed for this account.

[69] EB-2022-0200, Exhibit 4 Operating Expenses Updated, Tab 5, Schedule 1, Attachment 1, PDF page 990.

> Enbridge Gas is currently investigating an AMI meter replacement program. AMI meters are subject to a differing set of forces of retirement as compared to analogue meters, and as such, it is the experience of Concentric that they generally have a shorter expected life. AMI meters may be retired due to changes in AMI technology (i.e. AMI meters using cellular technology may need to be retired if the underlying cellular technology changes), battery constraints, necessary upgrades to encoder receiver transmitters, and a variety of other technological limitations. As such, it is necessary to assign a shorter average life for Enbridge Gas in order to ensure all technological changes including the use of Ultrasonic meters and the potential conversion to AMI are considered.[70]

I can accept in part that relying on retirement data from 1884 to 2021 for a placement band and 1955 to 2021 as the experience band would result in a retirement pattern that may not be reflective of current technology. However, for this reason, Concentric ought to have considered studying a narrower placement and experience band reflective of more recent retirement experience for new vintages of assets.

Absent that analysis, Concentric appears to place significant weight on an AMI program that Enbridge is "currently investigating". As the AMI program is not yet in place, it appears that Concentric is attempting to attribute the life characteristics of yet to be installed assets on the existing meters account. This approach is not acceptable.

The lives of the existing assets should be reflective of their actual underlying relevant retirement experience, management operating decisions, and peer analysis. The recommended life of 15-S2.5 does not meet these requirements.

The peer analysis suggests lives for account 478 of between 18 and 26 years with an average expected life of approximately 21 years per Table 2. The life of 15 years being

[70] EGI IRR Exhibit I4 2024 Rebasing 2023-03-08, PDF pages 1487 and 1488, Exhibit I.4.5-STAFF-178j).

proposed by Concentric is shorter than the low point of the peer range and much shorter than the average. It is also significantly shorter than the average expected life of the peers.

Regarding the management operational data, Concentric's notes state the following regarding the existing meters:

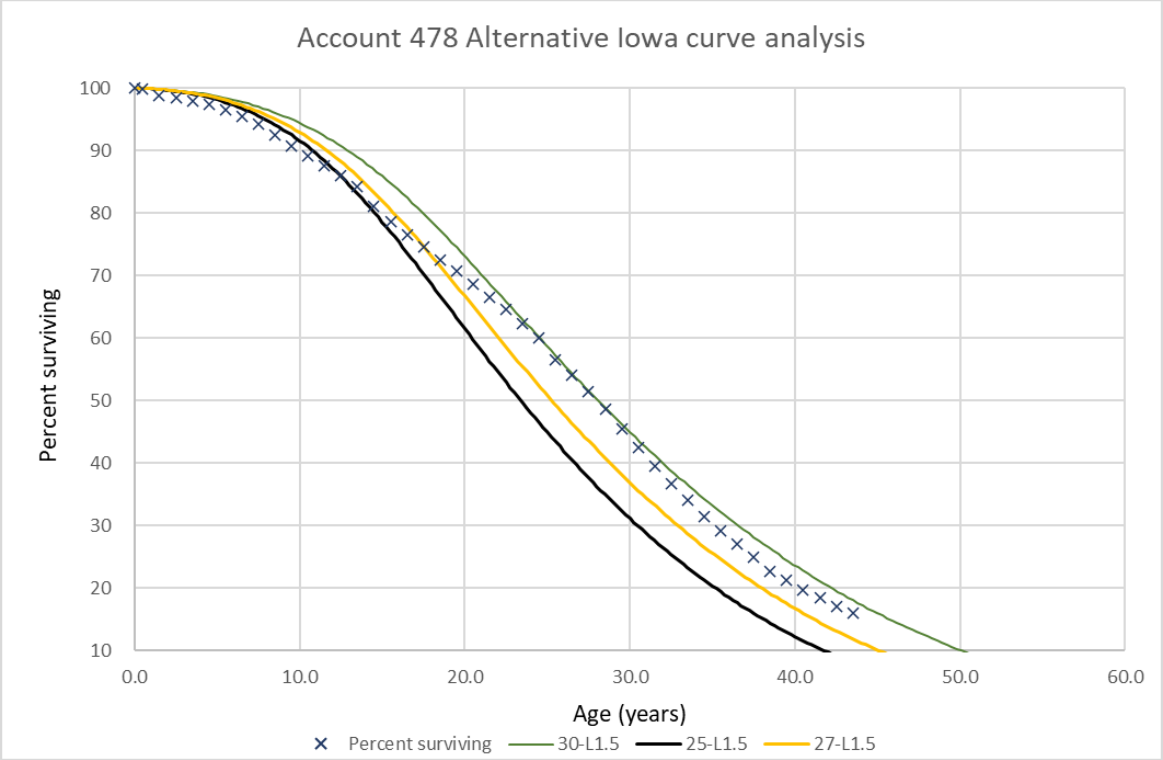
> Meters that are currently in the field should have a life on average of around 25 years. These are diaphragm meters with a max life of around 28 years. The expectation is that meters will pass the 10-year sample (conducted at 9 years), the 8 year sample (conducted at 7 years), and may pass the 6 year sample (conducted at 5 years). This approach to managing the meter population has proven to be successful.[71]

Based on the above evidence, an average life of 15 years as recommended by Concentric appears to be inconsistent with the expected operational life of the assets. Specifically, Enbridge suggests the average expected life to be 25 years. I consider such a life to be reasonable and appropriate absent other evidence. A 25-year life aligns with the peer analysis conducted as well.

Regarding curve type, I reviewed several different curve types in the L-type family of curves which provide for the best fit to the observed retirement data. The following figure depicts a 25-L1.5, 27-L1.5 and 30-L1.5 curve against the observed retirement data for Account 478:

[71] EGI IRR Exhibit I4 2024 Rebasing 2023-03-08, PDF page 981, Exhibit I.4.5-STAFF-171 Attachment 5.

Figure 19 – Emrydia Iowa curve analysis Account 478



As shown above, each curve provides for a reasonable visual fit to the observed retirement data with a 25-L1.5 curve providing a superior fit through age 15.5. Concentric also studied this curve and the residual measure was the best out of the curves studied at 0.5462.[72] Given the statement by Enbridge that the average life for the assets in this account is expected to be 25 years, I recommend the use of a 25-L1.5 curve.

Like other accounts I have reviewed above, and the proposed change to the ELG procedure, if Enbridge determines that evidence of the need for an economic life exists for a certain account, then that evidence is best addressed through a separate adjustment to the life of the account. Adjusting the remaining life of the assets in account 478 for a potential

[72] EGI IRR Exhibit I4 2024 Rebasing 2023-03-08, PDF page 966, Exhibit I.4.5-STAFF-171 Attachment 4.

life shortening that is not yet confirmed for assets that are not yet in service is not appropriate.

Due to time constraints, I did not calculate the impact of using a 25-L1.5 curve. However, the proposed depreciation rate is 8.96%[73] for this account, with an investment of $1,164.5 million ($583.8 million and $580.7 million). I expect the rate calculated using the ALG procedure would be directionally consistent with the rate previously calculated using the generation arrangement procedure for Union of 3.84%.[74] The calculated depreciation expense using this rate is $44.7 million and is consistent with the provision based on the current rates of $42.4 million.[75] Assuming a comparable decrease in the ALG rate, this estimate reflects a $58.7 million reduction as compared to the calculated depreciation expense of $103.4 million[76] using a 15-S2.5 curve assuming the ALG procedure, or a $73.8 million reduction as compared to the calculated depreciation expense of $118.5 million[77] using a 15-S2.5 curve and assuming the ELG procedure.

3.1.2.7 Account 472.35 – Structures and improvements – Mainway

Q: Please provide your recommended average service life and survivor curve for account 472.35.

A: Account 472.35 is somewhat unique from the other accounts I review in this evidence. Concentric is proposing an increase in depreciation related to account 472.35 of $8.6 million, with a proposed rate of 50.48% compared to the current rate of 2.32%.[78] Concentric also reports that there is a truncation date (page 5-2) of 2023 for the Mainway

[73] EGI IRR Exhibit I4 2024 Rebasing 2023-03-08, PDF page 811, Exhibit I.4.5-STAFF-170 Attachment 1.
[74] EGI IRR Exhibit I4 2024 Rebasing 2023-03-08, PDF page 1908, Exhibit I.4.5-EP-83 Attachment 1.
[75] EB-2022-0200, Exhibit 4 Operating Expenses Updated, Tab 5, Schedule 1, Attachment 2, PDF page 1305.
[76] EGI IRR Exhibit I4 2024 Rebasing 2023-03-08, PDF page 811, Exhibit I.4.5-STAFF-170, Attachment 1.
[77] EGI IRR Exhibit I4 2024 Rebasing 2023-03-08, PDF page 811, Exhibit I.4.5-STAFF-170, Attachment 1.
[78] EB-2022-0200, Exhibit 4 Operating Expenses Updated, Tab 5, Schedule 1, Attachment 2, PDF page 1304.

assets.[79] It is the truncation that is accelerating the depreciation expense for Account 472.35.

Enbridge provided an explanation for the truncation and a modification to that truncation "was subsequently updated for budget purposes to 2024."[80] As explained in response to IGUA's request in Exhibit I.4.5-IGUA-17a), c) and e), the retirement date (i.e. truncation date) was updated from 2023 to 2024, the assets are not yet actually retired (forecast is 2024), and the adjustment results in an increase in depreciation from $369,745 in 2023 to $9,075,267 as shown in the table below.[81]

Table 10 – Account 472.35 accrued and forecast depreciation

Table 1
472.35 Accrued Depreciation

Account	Actual Depreciation 2021 LTD	Forecasted Depreciation 2022	Forecasted Depreciation 2023	Forecasted Depreciation 2024
472.35 Structures and Improvements – Mainway	$3,958,252	$369,745	$369,745	$9,075,267

It is not unusual to correct the retirement date of an asset once further and better information is known. However, in this case, the correction is material with approximately 70% of the original cost of the assets being recovered in 2024. It remains unclear from the responses to the information requests when EGI became aware of the truncation date and whether the assets will retire in 2023 as opposed to 2024.

I am also somewhat concerned that the inclusion of this depreciation in 2024 may impact the escalation mechanism and other items applied for by Enbridge in the rebasing period. Specifically, if this depreciation adjustment is approved, it will no longer be reflected in depreciation expense in 2025 and beyond as it is a one-time adjustment. While I have not

[79] EB-2022-0200, Exhibit 4 Operating Expenses Updated, Tab 5, Schedule 1, Attachment 1, PDF page 889.
[80] EGI IRR Exhibit I4 2024 Rebasing 2023-03-08, PDF page 2189, Exhibit I.4.5-IGUA-17a).
[81] EGI IRR Exhibit I4 2024 Rebasing 2023-03-08, PDF page 2189, Exhibit I.4.5-IGUA-17a, c, and e).

studied this issue in detail, I simply raise the concern for the OEB's consideration as I have experienced similar timing issues in other incentive-based rate cases in the past.

Regarding the recovery of the remaining investment in this account, the OEB could consider the options:

1) Direct the costs to be added to another asset class such as account 472.00 – Structures and improvements – other and amortized over a more reasonable period of time or the remaining life of the original assets. A more reasonable period of time could be the five-year period of the current application with an even amount of depreciation expense being reflected over each of the five years from 2024 to 2028. This shorter period would address the retirement of the asset in a more orderly manner, and to some extent avoid intergenerational impacts from the single year recognition of more than 70% of the value of the assets in 2024. This also potentially addresses my concerns regarding any formula-based impacts that could stem from the inclusion of this one-time depreciation charge in the rebasing year.
2) Accept the correction and approve the one-year increase in depreciation expense.

I recommend that the OEB proceed with the first option above for the reasons stated. Separately, I recommend that the OEB direct Enbridge to confirm the retirement date for these assets as being 2024 as opposed to 2023. If the assets retire in 2023, from an accounting perspective the unrecovered investment will need to be addressed in 2023. I cannot comment on whether the OEB should permit the recovery of historical costs incurred in 2023 as a future cost paid for by ratepayers. Arguably, from an accounting perspective, the depreciation rate for the assets in 2023 should also be increased for Enbridge. The dynamics of how this amount flows through future rates to customers versus being a forecast risk to investors is an important dynamic that I consider warrants some consideration by the OEB.

3.1.3 Amortization accounts

Q: Do you have any concerns with Concentric's proposed amortization rates for certain accounts?

A: Yes. I have concerns with Account 474 (Regulators) and the proposed amortization rate for computer software and equipment.

3.1.3.1 Accounts 474 – Regulators

Q: Please outline your concerns and recommendations regarding account 474.

A: As set out below, the issue with the regulators account is that Concentric is recommending transferring $508.4 million ($315.9 million + $192.5 million)[82] of investment from accounts 473.01 and 473.02 to account 474. The previously approved rate in Account 473.01 and 473.02 for the EGD assets was 2.27%.[83] The new rate proposed by Concentric for account 474 is represented by a 25-SQ curve as shown below, which equates to a 4% rate before considering transitional issues.[84] Applying a 25-SQ curve to the transferred assets requires Concentric to calculate a shortfall[85] in the collection of depreciation expense historically for these assets and requires a further true-up, which in combination with the shorter life, materially increases the forecast depreciation expense for these assets.

Table 11 – Concentric's summary for Account 474

ACCOUNT 474.00 – REGULATORS

Investment $	Investment %	Previously Approved Curves	Concentric Recommended Curve	Previously Approved Salvage	CDNS Recommended Salvage
$488,870,931	2.25%	Union: 20-SQ EGD: N/A	25-SQ	Union: 0% EGD: N/A	0%

[82] EGI IRR Exhibit I4 2024 Rebasing 2023-03-08, PDF page 810, Exhibit I.4.5-STAFF-170, Attachment 1.
[83] EB-2022-0200, Exhibit 4 Operating Expenses Updated, Tab 5, Schedule 1, Attachment 2, PDF page 1304.
[84] EB-2022-0200, Exhibit 4 Operating Expenses Updated, Tab 5, Schedule 1, Attachment 1, PDF page 879.
[85] The assets were previously depreciated at 2.27% or other lower rates, and now need to be corrected to accelerate the depreciation expense to recover the investment over a period of 25 years.

Amortization accounting is straight-forward. Specifically, where an amortization rate is selected based on a 25-year life, a 25-SQ curve is applied, and the original investment is amortized evenly at a rate of 4% per year. This rate can change somewhat where previous investment has been under or over recovered and thus the actual rate charged may differ somewhat. For regulators (Account 474), the current rate used by Union is a 5.00% rate (EGD had no previously approved rate) and the proposed rate is 8.86%.[86]

The previously approved Union curve was a 20-SQ, which correctly translates into a 5% rate as noted previously. Concentric's 25-SQ curve rate would result in a 4% rate, all else being equal, but as noted above, Concentric recommends an 8.86% rate. Concentric did not provide a survivor curve or retirement data for this account. In response to a request from IGUA, Concentric provided Exhibit I.4.5-IGUA-19, Attachment 1, and the following explanation for the observed difference:

> The whole life depreciation rate for Account 474 is 4% based on the selection of the Iowa 25-SQ. This account has an accumulated depreciation amount of $59,858,893, compared to the calculated (theoretical) accumulated depreciation amount of $184,821,830. This means that Enbridge Gas is under-accrued by $124,962,937. This is recovered over the remaining life of each vintage in order to ensure that each vintage has been fully accrued at the time of retirement. As such, the true up of the accumulated depreciation variance results in a depreciation rate that is higher than the whole life rate.
>
> The currently approved depreciation rate for this account is based on the whole life rate of 5 percent. This does not allow for the true up of the accumulated depreciation variance. As such, Concentric recommends the

[86] EB-2022-0200, Exhibit 4 Operating Expenses Updated, Tab 5, Schedule 1, Attachment 2, PDF page 1304.

> theoretically correct depreciation rate of 8.86 percent be used for this account.[87]

I accept in part the above explanation. Using the assumed depreciation rate, and the ELG procedure expected life, Concentric has calculated that the amount recovered to date falls short of the amount that is calculated for recovery. This shortfall has been added to the 4% whole life rate to provide for the recovery over the remaining life of the assets of the historically unrecovered investment indicated by the new whole life rate. Mathematically the result makes sense. Practically, the under recovery is due in part to the previous regulators balance for EGD being included in Account 473, as Enbridge explains in the following excerpt from its evidence:

> 26. The second area of alignment is the classification of regulators and meter installations. Historically, EGD rate zone has included regulator and meter installation assets within the distribution services pipe assets (473) asset class for accounting convenience as per the USoA definition below. The Union rate zones included similar assets under the regulator and meter installations (474) asset class. The OEB USoA defines the 473 and 474 accounts as follows:
>
> [Quote omitted]
>
> 27. Enbridge Gas is proposing to align the EGD with the Union rate zones and reclassify the installation of regulators and meters to account 474. Historically the Union rate zones held services and regulators as separate plant accounts due to the difference in the useful lives of the assets. The Union rate zones also retired regulator assets based on amortization accounting. The Union rate zones method is the preferred approach as it

[87] EGI IRR Exhibit I4 2024 Rebasing 2023-03-08, PDF page 2270, Exhibit I.4.5-IGUA-19a).

better aligns the assets with the actual useful life. Table 5 includes the amount proposed to be re-classed from 473 to 474 for EGD.[88]

Concentric's recommended life-curve for account 473.01 and 473.02 is 45-S1 and 55-S3, respectively. I recommend a life-curve for account 473.01 and 473.02 of 50-R1.5 and 60-S3, respectively. The historical lives for these accounts were also much greater than the recommended life for account 474 of 25-SQ. Therefore, it is not surprising that a calculated under recovery of investment would occur from transferring this legacy EGD investment into Account 474.

Having regard for the above, there are two issues to address regarding account 474. First, assuming the transfer of investment is reasonable, how should the shortfall be collected going forward? Second, is the recommended 25-SQ curve appropriate for this account?

Regarding the first question, Concentric estimated the under-accrued amount to be $124.9 million. The amortization of this under accrual is significant to the calculated depreciation rate. An alternative approach to addressing this issue is to amortize the balance consistent with the remaining life in accounts 473.01 and 473.02 proportional to the original amount of the investment included in each account if it is known. This approach maintains a consistent level of depreciation of the investment with the historical rate of depreciation of the investment.

Further, I note that few peers separately track and amortize these assets in Account 474, with only AltaGas (35-S3) and FortisBC (20-S0) reporting a distinct rate.[89] While not confirmed by Concentric, I expect other entities would treat the balances in a similar manner as EGD previously treated those amounts by including the costs in Account 473. Therefore, separate amortization of the balance consistent with the remaining life of the assets in Account 473.01 and 473.02 provides for consistency with the treatment applied by peers.

[88] EB-2022-0200, Exhibit 4 Operating Expenses Updated, Tab 5, Schedule 1, PDF pages 840 and 841.
[89] EGI IRR Exhibit I4 2024 Rebasing 2023-03-08, PDF page 2765, Exhibit I.4.5-IGUA-26 Attachment 1.

Regarding the second question, I note that Concentric and Enbridge have provided limited data to support the selection of a 25-SQ curve. Enbridge concludes that "the Union rate zones method is the preferred approach as it better aligns the assets with the actual useful life."[90] It is unclear how this conclusion was reached by Enbridge. In response to an IGUA request, Enbridge states:

> Please see Exhibit 2, Tab 6, Schedule 2, page 123 under pressure control, page 126 Table 5.2.4-3 under Pressure Control, and pages 154-168 for a description of the function and characteristics, expected operational lives and other considerations relevant to the useful lives of the assets in this account, and page 125, Table 5.2.4-2 and page 150, Table 5.2.5-3 for maintenance strategies.[91]

From a review of Exhibit 2, Tab 6, Schedule 2, at page 126, the average asset age for pressure control assets in Table 5.2.4-3 is 12 years and 20 years for EGD and Union assets, respectively. Similarly, the maximum age for the same assets is 61 and 63 years for EGD and Union, respectively. Regarding condition findings for regulators on page 156 of the cited exhibit Enbridge states:

> Failure history and trending indicates that the wear-out phase for regulators associated with 200 & 400 series meters is unlikely to occur before 30 years of age. The current failure rate is very low relative to the total population. EGI replaces regulators proactively at the time of the meter exchange and before they fail.
>
> [Emphasis added]

I have also reviewed the age distributions for regulator sets and note that many of the assets appear to remain in-service well beyond the 25 years assumed in a 25-SQ curve.

[90] EB-2022-0200, Exhibit 4 Operating Expenses Updated, Tab 5, Schedule 1, PDF pages 840 and 841.
[91] EGI IRR Exhibit I4 2024 Rebasing 2023-03-08, PDF page 2271, Exhibit I.4.5-IGUA-19d).

For all the above reasons, I do not consider there to be sufficient evidence to support the 25-SQ curve rate for Account 474. Further, I do not consider there to be sufficient evidence to support the reclassification of the costs from Account 473.01 and 473.02. Therefore, until additional detailed historical retirement data is available for this account to support a material change in the life of the assets, I recommend that the OEB direct Enbridge to apply the rate approved for Account 473.01.

Applying a single rate to the account is procedurally efficient and less difficult to administer. I also note that there does not appear to be a split of assets between the two 473 accounts. This approach allows the continued tracking of new regulator costs in a separate account while also providing for continuity in the historical rate related to EGD's assets. It will also provide for a separate account to track retirement data to assess whether a rate change is appropriate at a later date.

I recommend a 50-L1 curve for Account 473.01. The estimated depreciation expense from using a 50-L1 curve and the ALG procedure is $10.3 million assuming an accrual rate of 2.02%[92] and an investment balance of $508.4 million ($315.9 million + $192.5 million)[93]. This estimate reflects a $34.4 million reduction as compared to the calculated depreciation expense of $44.7 million[94] using a 25-SQ curve and whether assuming the ALG or the ELG procedure. The calculated depreciation expense is the same under both the ALG and ELG procedures when a square curve is applied as all investment is assumed to retire at the end of the 25-year life.

3.1.3.2 Computer software and equipment – Post 2023

Q: Please outline your concerns and recommendations regarding computer equipment and software.

[92] EGI IRR Exhibit I4 2024 Rebasing 2023-03-08, PDF page 2216, Exhibit I.4.5-IGUA-18, Attachment 2.
[93] EGI IRR Exhibit I4 2024 Rebasing 2023-03-08, PDF page 810, Exhibit I.4.5-STAFF-170, Attachment 1.
[94] EGI IRR Exhibit I4 2024 Rebasing 2023-03-08, PDF page 810, Exhibit I.4.5-STAFF-170, Attachment 1.

A: Concentric has proposed that Account 490 – Computer equipment, Account 491.01 – Software acquired intangibles and Account 491.02 – Software developed intangibles each be broken into two separate accounts with one account reflecting post-2023 investment and the other account including all previous investment.[95]

I am not opposed to this treatment. However, Concentric also recommends a 4-SQ curve for each of the new post-2023 accounts,[96] which results in a 25.00% amortization rate for each account, which is higher than the historical amortization rate for any of the current accounts.[97] A higher amortization rate is not necessarily inappropriate if it is supported. In this case, Enbridge's own evidence and the peer analysis performed by Concentric do not support the proposed shorter future life for these assets.

IGUA asked Enbridge to provide support for the weighted breakdown of its computer equipment and software investments, and in response, Enbridge provided the following schedule, albeit only for software:[98]

[95] EB-2022-0200, Exhibit 4 Operating Expenses Updated, Tab 5, Schedule 1, Attachment 2, PDF page 1307.
[96] EB-2022-0200, Exhibit 4 Operating Expenses Updated, Tab 5, Schedule 1, Attachment 1, PDF page 886.
[97] EB-2022-0200, Exhibit 4 Operating Expenses Updated, Tab 5, Schedule 1, Attachment 2, PDF page 1307.
[98] EGI IRR Exhibit I4 2024 Rebasing 2023-03-08, PDF page 1915, Exhibit I.4.5-IGUA-9d).

Table 12 – Enbridge table 1 summarizing major software asset useful lices and gross book value

Table 1
Major Software Assets

Line No.	Asset	Expected useful life (years) (a)	Gross Book Value ($ million) (b)
1	CIS Replacement	8	9.9
2	Operations Digital system (2019)	8	8.4
3	Extranet Web 2.0 (2018)	2	5.9
4	Extranet Web 3.0 (2019)	2	5.1
5	GIS/GPS Upgrade	2	6.2
6	AWS Program	8	12.2
7	HANA Upgrade	7	14.1
8	WAMS Replacement	3	12.2
9	CIS Integration	8	40.2
10	EAM Software	2	13.6
11	PureConnect Program	2	5.0
12	Dawn Foxboro DCS Upgrade	4	6.6
13	GMAS Upgrade	6	27.0

The weighted average life of the investments listed above can be calculated as follows:

Table 13 – Calculation of weighted average useful life computer software

Asset	Expected useful life (years)	Gross book value ($ million)	Weighted investment ($ million)
CIS replacement	8	9.9	79.2
Operations digital system (2019)	8	8.4	67.2
Extranet Web 2.0 (2018)	2	5.9	11.8
Extranet Web 2.0 (2019)	2	5.1	10.2
GIS/GPS Upgrade	2	6.2	12.4
AWS Program	8	12.2	97.6
HANA Upgrade	7	14.1	98.7
WAMS Replacement	3	12.2	36.6
CIS Integration	8	40.2	321.6
EAM Software	2	13.6	27.2
PureConnect Program	2	5.0	10.0
Dawn Foxboro DCS Upgrade	4	6.6	26.4
GMAS Upgrade	6	27.0	162.0
Total		**166.4**	**960.9**
Weighted useful life			**5.8**

The weighted average service life of the existing software investment is approximately 6 years. I am unaware of compelling evidence that future investments will have a significantly different useful life. I do note that with increased investment in software as a service that some traditional software investment may need to become expensed in the future. However, any remaining investment should maintain a life that is consistent with historical investment absent evidence to the contrary.

The peer data for these accounts suggests a range of lives between 3 and 6 years for computer equipment and 3 and 10 years for computer software. While a 4-SQ curve is within this range, the above evidence suggests that, at least for computer software, a longer life is warranted.

Accordingly, I recommend that Enbridge be directed to use a 5-SQ curve for the post-2023 investment in Account 491.01 and Account 491.02. Given a lack of detail regarding the investment in Account 490, I accept the applied for 4-SQ given its consistency with the peer analysis completed by Concentric.

The estimated impact of the above proposal is not material in the current test period, but may be material in the future as balances accumulate in post-2023 Accounts 491.01 and

491.02. The forecast investment balance for these accounts in 2024 is $28.7 million.[99] Changing the rate on this investment from 25% to 20% results in a reduction in depreciation expense of approximately 5% or $1.4 million ($28.7 million * 5%).

3.2 Net salvage costs

3.2.1 Use of the CDNS method and an appropriate discount rate

Q: Please summarize the methods used by North American regulators to provide for the recovery of salvage costs.

A: Net salvage costs reflect the advance recovery of both positive and negative salvage costs related to assets. Given that the costs to remove assets can represent a material percentage of the original cost of the salvaged assets, it has become common practice to recover those costs over the life of the assets as opposed to recovering the costs in a single period or as part of the future investment in replacement assets.

Concentric provides a summary of the following four methods, including the pros and cons of each method, in its 2021 depreciation study:

i. Pay as you go method.

ii. Traditional method.

iii. Constant dollar net salvage (CDNS) method.

iv. Capitalized as part of replacement assets method.

The summary provided by Concentric, including the stated pros and cons is reasonable. The most used method is the aptly named traditional method. The pay as you go method is used in several jurisdictions in Canada, as is the capitalized as part of replacement assets method. The CDNS method is less common.

[99] EGI IRR Exhibit I4 2024 Rebasing 2023-03-08, PDF page 813, Exhibit I.4.5-STAFF-170, Attachment 1.

Q: Do you agree with Concentric's recommendation to use the CDNS methodology for recovering salvage costs?

A: The CDNS method was approved for use by EGD in EB-2012-0459. Union has followed the traditional method. I am not opposed to the use of the CDNS method for the consolidated assets of both EGD and Union. While the traditional method has many advantages in its practicality and accepted use, the CDNS method remains appropriate. Specifically, the CDNS method provides for an escalation of current salvage costs into the future and then discounts those costs to the current period to calculate the amount of net salvage to be recovered in the period.

Q: Is Concentric's use of a credit adjusted risk free rate to discount the future salvage requirements appropriate?

A: No. In the 2021 depreciation study, Concentric states:

> In order to recognize that the funds collected in current periods will not be expensed until potentially many years into the future, a discount calculation back to present day is required. In this manner, the fact that the utility has received the benefit of the funds as working capital through the inclusion of the requirement into the current period revenue requirements is recognized. Concentric discounted the future requirements by EGI's current credit adjusted risk free (CARF) rate at the time the calculation was completed of 3.78%, rounded to 3.75%. The use of a CARF is consistent with the discount rates mandated by accounting standards for Asset Retirement Obligations (ARO) for financial statement disclosure, and for estimating the discount rate in Securitization calculations. The use of a CARF rate is consistent with the evidence of interveners in the last Incentive Regulation Proceeding and applications made by Group 1

> pipelines to the Canadian Energy Regulator (CER). As such Concentric included a discount rate of 3.75% in the CDNS calculations.[100]

The CDNS method discount rate is not prescribed under IFRS or US GAAP as the CDNS method is not a concept under either IFRS or US GAAP and it is not an asset retirement obligation (ARO). This is confirmed for US GAAP per Concentric.[101] I can also confirm that IAS 37 – Provisions, contingent liabilities and contingent assets under IFRS also does not provide specific guidance on the discount rate to use in the CDNS calculations.

On this point, Concentric further states:

> Confirmed. However, Concentric notes that the mechanics of the obligation are very similar to the CDNS calculations used in this current application. Concentric also notes that the use of an ARO in compliance with USGAAP is contingent upon requirements resulting from legal obligations, whereas the use of recovery of future net salvage costs in depreciation rates do not require a legal obligation for the removal of assets.[102]

I disagree that the mechanics of the IFRS ARO provisions obligation are "very similar" to CDNS calculations. Accounting for AROs is somewhat complex but is distinct from the calculations under the CDNS method. One key difference between the ARO and CDNS calculations is noted by Concentric. Specifically, AROs only reflect legal obligations, and thus any additional constructive or other obligations are not contemplated in the ARO calculations, thus limiting the scope of an ARO calculation.

Even if the ARO calculation was extended to cover all costs and obligations stemming from a utility's obligation to salvage its assets, that ARO calculation remains different from a CDNS calculation for the following reasons:

[100] EB-2022-0200, Exhibit 4 Operating Expenses Updated, Tab 5, Schedule 1, Attachment 1, PDF page 873.
[101] EGI IRR Exhibit I4 2024 Rebasing 2023-03-08, PDF page 1918, Exhibit I.4.5-IGUA-10c).
[102] EGI IRR Exhibit I4 2024 Rebasing 2023-03-08, PDF page 1918, Exhibit I.4.5-IGUA-10d).

i. US GAAP prescribes the discount rate to use in an ARO calculation, which as I discuss below is different from the proper discount rate to use in a CDNS calculation.

ii. An ARO calculation calculates both a distinct ARO asset and a distinct ARO obligation related to the asset amortized, with the obligation accreted over the life of the asset.[103]

I also note that use of a CARF of 3.75% is likely not reflective of the future credit adjusted risk-free rate for Enbridge. Specifically, the current 30-year Canada bond yield closed at 2.949% on March 23, 2023. Based on February and March 2023 updates from Canadian banks the 30-year Government of Canada Bond Yield is forecast to be consistent with the current levels in 2024. The current forecasts are as follow for 2024: RBC Economics (2.85%),[104] TD Economics (2.90%),[105] National Bank of Canada (2.80%),[106] CIBC (average of 2.875%),[107] and Scotiabank (3.00%).[108]

In Exhibit 5, Tab 2, Schedule 1 at page 6 of 11, Enbridge states:

> 12. Enbridge Gas's interest rate spreads have widened during 2022 as GoC benchmark bond rates and market volatility has increased. EGD 10-year spreads during 2011 were approximately 105bps. Enbridge Gas 10-year spreads in January 2022 were approximately 120 bps and by September 2022 were approximately 155bps.

[103] The accounting guidance follows these steps: 1) A future obligation is calculated for the settlement of legal and constructive obligations. 2) The obligation is discounted to the current year. 3) The value as of the current year is set up using the following accounting entry: Dr. ARO asset; Cr. ARO liability. 4) The ARO asset is amortized over the remaining life of the assets to which the obligation relates. 5) The ARO liability is accreted over the remaining life using the same discount rate so that the future obligation equals the future expected cash outflow at the end of the life of the assets.
[104] https://thoughtleadership.rbc.com/wp-content/uploads/rates.pdf
[105] https://economics.td.com/ca-forecast-tables
[106] https://www.nbc.ca/content/dam/bnc/taux-analyses/analyse-eco/mensuel/monthly-fixed-income-monitor.pdf
[107] https://economics.cibccm.com/cds?id=618caf6c-998f-4630-abab-0a843bda2bda&flag=E
[108] https://www.scotiabank.com/ca/en/about/economics/forecast-snapshot.html

Taking the above information at face value, assuming a risk-free rate is reflective of the 30-year GoC bond yield of approximately 3.00% and Enbridge's credit spread is 155 bps per the September 2022 information, this provides for a CARF of 4.55% as compared to the 3.75% assumed.

Even if the CARF is updated to 4.55% it is important to observe that the CARF is not indicative of the actual rate inherent in the financing of net salvage costs. The collection of net salvage costs results in an accumulation of amounts in accumulated depreciation which offsets rate base. Therefore, the effective rate customers earn on the advance payment of net salvage costs is Enbridge's weighted average cost of debt and equity capital (WACC) that would otherwise be issued to finance rate base.

The CDNS method discounts the amount of future salvage costs to be collected. However, if those costs were not deferred and instead were collected all in advance, then the amount would sit as an offset to rate base and compensate customers through the resulting reduction in Enbridge's WACC. Effectively, deferral of the amount of salvage costs collected reduces the amount collected in advance and thus the amount that sits as an offset to rate base, reducing the avoidance of payment of return earned on investment which avoidance would have resulted had the collection of salvage costs not been deferred. Discounting the obligation by any other amount such as the pension rate, historical debt rates or the CARF ignores this relationship between the collection of net salvage costs and the return that customers would effectively receive through the offset to rate base resulting from the advance payment of those costs.

I also observe that during the technical conference on March 27, 2023 Enbridge and its expert acknowledged that the pre-collected net salvage funds are in fact used for working capital and investment purposes. Specifically, Mr. Kennedy states at lines 3 to 12 of page 42 of the final transcript:

> It also recognizes the fact that the company is putting in its pocket today $1.3 billion in dollars of the day that it has got quite potential to do other things with. It has the potential to use that money in its working capital to reduce its credit.

> It has the ability to use that money in a number of ways. It can invest it so it can grow.
>
> The thought is that money today is in the company's hands for an investment it's going to make 69 years hence, or 60 years hence, I'm sorry.

Mr. Kennedy again confirmed at page 42 lines 17 to 25 of the transcript that Enbridge can collect net salvage costs in advance so that it "has that money in its pocket today" to "invest in new capital and earn a return on that." Finally, in Concentric's 2021 Depreciation Study, Concentric states in relation to the mechanics of the CDNS method: "the CDNS method acknowledges cost of capital and discounts to a base year."

This confirmation by Mr. Kennedy appears to agree with my evidence that the net salvage funds are used to finance Enbridge's rate base and earn a return on investment. That return on investment is Enbridge's WACC and is also the opportunity cost that is relevant to customers. Specifically, to the extent customers pay net salvage costs in advance of incurring the actual cost to salvage the assets, then customers receive Enbridge's WACC as compensation for that advance payment.

This recommendation is also supported by accounting principles. While the CDNS method calculations are not addressed in accounting standards, the standards do comment on the regulated rate of return and the appropriate rate to use to discount regulated assets. As an example, while still an Exposure Draft, the updated IFRS 14 – Regulatory Assets and Regulatory Liabilities,[109] states at paragraphs 48 and 49:

> **The discount rate**
>
> **48. An entity shall use the regulatory interest rate for a regulatory asset or regulatory liability as the discount rate for that regulatory asset or regulatory liability, unless the regulatory interest rate for a regulatory asset is insufficient. Paragraphs 50–52 prescribe how to**

[109] https://www.ifrs.org/content/dam/ifrs/project/rate-regulated-activities/published-documents/ed2021-rra.pdf

> **determine whether that rate is sufficient and what discount rate to use if it is insufficient.**
>
> 49. At initial recognition of a regulatory asset or regulatory liability, if the regulatory interest rate is also the discount rate, the present value of the estimated future cash flows equals the sum of the estimated future cash flows excluding the cash flows from regulatory interest. This result also holds in the case of subsequent measurement if the regulatory interest rate is also the discount rate and, in addition, the regulatory interest is recovered or fulfilled in the same period in which it accrues.

While Enbridge follows US GAAP, the IFRS guidance is still informative. Specifically, the exposure draft requires the use of the regulatory interest rate, which is defined as follows:

> The interest rate provided by a regulatory agreement to compensate an entity for the time lag until recovery of a regulatory asset or to charge the entity for the time lag until fulfilment of a regulatory liability.

In the case of Enbridge, the accumulated net salvage liability which builds from the advance collection of net salvage costs is a regulated liability that pays the regulated WACC to customers for the investment. From an accounting perspective this makes sense as the asset or liability is discounted at the rate applicable to the asset or liability. In the case of a regulated asset or liability, discounting the amount by the regulated WACC results in the recognized amount always equaling the discounted amount.

Under US GAAP, specifically Accounting Standards Codification (ASC) 980,[110] which provides guidance for the accounting of regulated operations, this treatment also appears to be implicitly accepted where the recognized amount of any asset or liability is generally the amount approved by the regulator.

Q: What is your recommendation for a more appropriate discount rate?

[110] The guidance is available publicly at the following link: https://asc.fasb.org/Home

A: I recommend that the OEB direct Enbridge to discount the CDNS calculations using the approved WACC for Enbridge. This rate reflects the actual rate paid on the advance collection of salvage costs and aligns with relevant accounting guidance for the discount rate to apply to regulated assets and liabilities. Accordingly, the regulated WACC is the most appropriate rate to use to discount the CDNS calculations.

Assuming the equity ratio of 36% recommended by Dr. Sean Cleary in his evidence for IGUA, a return on equity for 2023 of 9.36%,[111] and deemed long-term debt of 4.88%,[112] the effective WACC would be approximately 6.50%.

I observe that this recommendation will result in a significant decrease in the amount of net salvage collected over the test period as compared to the amount forecast by Enbridge. I discuss the implications of this change and other considerations in respect of net salvage below.

3.2.2 Mechanics of the Concentric CDNS calculation

Q: Are there any further considerations the OEB should weigh in approving Enbridge's proposed CDNS calculations and rates?

A: Yes. In response to Exhibit I.4.5-STAFF-176, Concentric describes the three components of the CDNS method as follows:[113]

- First, a net salvage percentage calculated in accordance with the Traditional method net salvage analysis is prepared. This analysis was included in Section 7 of the Concentric report for each account. The traditional method has an embedded inflation component within the calculation, as the salvage percentage is calculated from dividing the actual

[111] https://www.oeb.ca/regulatory-rules-and-documents/rules-codes-and-requirements/cost-capital-parameter-updates
[112] https://www.oeb.ca/regulatory-rules-and-documents/rules-codes-and-requirements/cost-capital-parameter-updates
[113] EGI IRR Exhibit I4 2024 Rebasing 2023-03-08, PDF page 1459, Exhibit I.4.5-STAFF-176a).

cost of removal (net of gross salvage proceeds), which is expressed in the dollar value as at the time of the retirement transaction, by the original cost dollars which are expressed in the value of the dollar at the time of the original installation of the asset. Therefore, the net salvage percentage has an embedded historic rate of inflation over the period from when the asset was originally installed to the year in which it was removed.

- Second, the above impact of inflation is normalized to put both the original and cost of removal at the same cost base. The CDNS model accomplishes this by first determining a weighted average age of retirement for each account, and then inflating the original cost dollars to the same base as the cost of removal expenditures, and then adjusting the resultant net salvage percentage to an adjusted net salvage rate expressed in the dollars of the study date, resulting in an adjusted salvage rate in a current cost net salvage ratio.

- The future net salvage requirement is multiplying the Adjusted Original Cost by the Adjusted net salvage percentage (all in today's dollars) and then inflating this resultant calculation to the end of the estimated remaining life of the vintage by applying an estimated 2% annual inflation rate, and then discounting this inflated amount back to the study date using a credit adjusted risk free discount rate of 3.75%.[114]

From a review of the detailed CDNS calculations provided in response to Exhibit I.4.5-IGUA-14 Attachment 1, I observe that Concentric calculates the required CDNS net salvage by escalating the net salvage percentage calculated in accordance with the Traditional[115] method. For example, for Account 473.01, Concentric takes the cost of

[114] EGI IRR Exhibit I4 2024 Rebasing 2023-03-08, PDF page 1459, Exhibit I.4.5-STAFF-176a).
[115] The traditional method to collect net salvage costs begins first by calculating an assumed level of salvage costs that will be required in the future. This ratio is stated as a percentage of the original cost of the assets. For example, if the net salvage ratio is -30%, then the ratio assumes that 30% of the original cost of the investment will be

removal estimate of -50% determined using the Traditional method,[116] and includes it as the starting point in the CDNS calculations in IGUA-14 Attachment 1. Concentric then escalates this amount in the column "Future Salvage Requirement" by the assumed inflation rate of 2.00% and then discounts the amount in the "Discounted Salvage Requirement" column. The escalated salvage requirement becomes -91% (cell K126) and the discounted CDNS net salvage recommendation becomes -32%. If the inflation rate is set to 0% to convey that the Traditional method is already a future value, then the revised CDNS net salvage rate becomes -20%.

The issue with this approach is that the net salvage percentage determined using the Traditional Method already assumes that, as Concentric states in its description of the Traditional method above, it "has an embedded inflation component within the calculation". By escalating the amount calculated using the Traditional method, Concentric is effectively escalating the costs twice, once as part of the Traditional method and again in the CDNS calculation which it then discounts using the CARF.

The result of this approach is to overstate the amount of net salvage required under the CDNS method by overstating the required future amount of required salvage costs to be collected. Accordingly, I recommend that the OEB consider directing Enbridge to revise its CDNS calculations to include an escalation rate of 0% for the above reasons. However, this recommendation is subject to my observations in Section 3.2.4 below.

3.2.3 Segregated fund

Q: Please comment on Enbridge's evidence in relation to a segregated fund option for salvage costs.

A: In its evidence, Enbridge outlines the various pros and cons in relation to a segregated fund option. Specifically, Enbridge states:

required to salvage the assets. This percentage is the recovered over the life of the assets and updated as necessary throughout that life.

[116] EB-2022-0200, Exhibit 4 Operating Expenses Updated, Tab 5, Schedule 1, Attachment 1, PDF page 878.

40. Enbridge Gas agrees that there are benefits to establishing a segregated fund for SRC.

a) A fund is a prudent approach to ensuring that money will be available when ultimate abandonment of Enbridge Gas's system is undertaken;

b) If the money in the segregated fund is invested, positive returns on the investment may decrease the amount of SRC to be collected which would benefit ratepayers through lower depreciation rates

c) Establishing a segregated fund would also be a means of preparing for potential future energy transition impacts.

41. However, there are also drawbacks to setting up a segregated fund for SRC:

a) Currently, the net salvage collected is a credit to rate base (recorded as part of accumulated depreciation). Establishing a fund would increase rate base, by eliminating the net salvage amounts collected from accumulated depreciation, which in turn would increase the cost of capital and increase revenue requirement. As an example, if the December 31, 2021, SRC liability balance of $1.5 billion was deposited into a segregated fund, rate base and revenue requirement would increase by $1.5 billion and $93 million respectively. The annual increase in revenue requirement thereafter is estimated to be $3.1 million;

b) Administrative costs required to set up, monitor and maintain the fund, and the administrative burden to access the funds would also increase costs;

c) Tax issues associated with establishing a fund are complex and would require significant legal and tax involvement to resolve;

d) Enbridge Gas has not identified any precedents in which a utility has voluntarily set up a segregated fund for SRC costs; and

e) Enbridge Gas does not expect a large-scale retirement of assets and anticipates that assets will be in use and useful for many years to come.[117]

In general, I agree with the above pros and cons as stated by Enbridge. A segregated fund has pros and cons relative to the status quo. The main positive of a segregated fund is that it provides customers with assurance that funds will be available in the future. The main negative implication of implementing a segregated fund is that it transfers the risk of investing the funds to customers and thus may result in higher or lower costs in the future.

Under the status quo, all anticipated salvage costs will be recovered from the funds collected in advance by Enbridge. The advance payment of those funds will offset rate base and provide a predictable reduction to revenue requirement.

Implementing a segregated fund may provide customers with an opportunity to earn higher returns, but also fixes customers with the risks inherent in the market returning lower returns than the predictable Enbridge WACC. Therefore, the increased certainty of having secured funds available to retire assets comes with the tradeoff of potential increased volatility in the cash flows.

The pros and cons of a segregated fund are likely to be weighed differently by parties to this proceeding with some placing greater weight on the pros as compared to the cons and vice versa. Ultimately, both approaches will provide for a mechanism for recovering salvage costs and should provide for full recovery and funding of future salvage costs.

A key consideration regarding whether a segregated fund should be established is whether there is a clear, material and near-term expectation for a material outflow of salvage costs. At this time, I accept Enbridge's statement that it does not expect a large-scale retirement

[117] EB-2022-0200, Exhibit 4 Operating Expenses Updated, Tab 5, Schedule 1, PDF pages 847 and 848.

of assets. Whether the full value of the liability reflecting presently recovered amounts is transferred to a segregated fund or that amount remains as an offset to rate base, the amount collected to date is unchanged. Therefore, all else being equal, there is no material currently apparent risk to the recoverability of salvage costs related to the future retirement of assets.

However, to increase the transparency of maintaining the status quo, I do have one recommendation. Specifically, if the status quo is maintained then I recommend the OEB direct Enbridge to begin separately tracking and reporting the annual changes in the current net salvage liability. Specifically, the existing balance in the account inclusive of any approved funding to the account and actual costs incurred should be reported as a separate requirement in future rate applications. I note that similar reporting requirements have been established by the Alberta Utilities Commission.

Additionally, during the March 27, 2023 technical conference, several parties, including IGUA, sought to obtain additional clarity on the magnitude of any future obligation related to net salvage costs (see for example, the exchange between IGUA counsel Ian Mondrow and Mr. Kennedy from pages 118 to 128 of the March 27, 2023 final transcript).

In my opinion, there would be significant benefit from Enbridge calculating and reporting the expected future net salvage cost liability based on two assumptions:

i. The applied for net salvage rates.

ii. The five-year average actual experienced net salvage costs for each account.

I consider this information to be of significant value in providing transparency to all parties on the potential magnitude of a future salvage cost obligation. This information would also be of assistance in informing the positions of all parties in relation to net salvage costs in the future. For example, the currently accumulated net salvage liability is $1.6 billion as of

the end of 2022.[118] The total average plant investment in Enbridge's assets as of the 2024 test year is forecast to be $24.9 billion.[119] While many accounts will not require significant amounts of net salvage to be recovered, and other accounts, such as buildings may be sold for positive amounts and thus not increase costs, assuming a -50% net salvage rate on this balance under the traditional method suggests the future salvage cost obligation is in the order of magnitude of $12.5 billion ($24.9 billion * 50%).

This amount is significantly greater than the currently funded amount of $1.6 billion. While the actual future costs could well be materially different than this estimate, reporting similar information over time as better information becomes known will assist all parties in future proceedings. This is particularly the case given Concentric's comments around a potential future review of an economic planning horizon due to potential impacts from an energy transition, which will impact both depreciation and net salvage.

3.2.4 Other considerations related to the collection of net salvage

Q: Do you have any further concerns with regards to Enbridge's applied for net salvage rates?

A: Yes. As set out above, I recommend a reduction to the discount rate and a potential change to the inflation rate used in the CDNS calculations. These recommendations reduce the amount of salvage costs to be recovered. This reduction is supported to some extent by the trend of over recovering net salvage costs in recent years relative to actual costs incurred,[120] as well as what I would characterize as an apparent lack of certainty from Concentric regarding the amount of salvage costs that should be recovered. This uncertainty was apparent in the exchange with Mr. Kennedy and IGUA counsel in the March 27, 2023 technical conference at page 120 lines 3 to 25:

[118] EGI IRR Exhibit I4 2024 Rebasing 2023-03-08, PDF page 1924, Exhibit I.4.5-IGUA-13 Attachment 1.
[119] EGI IRR Exhibit I4 2024 Rebasing 2023-03-08, PDF page 814, Exhibit I.4.5-STAFF-170, Attachment 1.
[120] EGI IRR Exhibit I4 2024 Rebasing 2023-03-08, PDF page 1924, Exhibit I.4.5-IGUA-13 Attachment 1.

> MR. KENNEDY: Again, it is Mr. Kennedy. As we noted, I think in this response, the actual amount of imbalance won't be money for many years out, until we actually spend the money many years out. So it is almost impossible to predict what the imbalance may be.
>
> And so I think I want to go back to the point you alluded to a bit.
>
> It is very easy when you have a band of very high net negative salvage costs in your data, and is that going to be indicative for the next 50 years, 40 years, I can't remember what the remaining life of this account is. But you know, it is a long-term outlook.
>
> It is very easy to overcook your recovery of this, if you will, and get too aggressive and then get into a yo-yo effect where you might say, well, gee, we need a minus 200 percent net negative salvage number.
>
> And so we go there, and then five years from now we go, holy smokes, the trend we saw for a few years was really just a trend for a five- or six-year period and it's slowed down.
>
> And so now we've over -- massively over-recovered. Now you've got a problem the other way. Now you've got refunds. So you get a yo-yo going on.

I agree that the amount of net salvage to be collected in the future is uncertain. However, as it is at this time unclear what judgment Concentric applied to arrive at its recommended net salvage rates as compared to the five-year averages being observed, there is likely some merit in moderating the amount being collected, which my recommendations achieve.

However, with this moderation comes some risk that the amount of net salvage costs collected will be insufficient to recover the future salvage costs incurred, and thus future significant increases in costs will be required. Accordingly, I also recommend that the OEB consider directing Enbridge to conduct a study for its 10 largest property accounts and report on the following at the time of its future rate application:

- The current approach to salvaging the assets, including the approximate unit material and labour costs to salvage assets.
- Alternative approaches available to salvage certain assets, such as abandonment in situ, and the implications such approaches may have on salvage costs.
- Enbridge's best estimate of the future costs to salvage the assets within each account, including the assumptions used to develop those estimates.

While this information will require significant judgment and thus be subject to significant uncertainty it will nevertheless provide parties with a better understanding of the potential magnitude and range of the future costs that may be incurred. The information outlined above will also provide more clarity into the best practices Enbridge may be able to employ to plan for, and perhaps mitigate or avoid a portion of, those costs. The information would also provide an additional data point to assist in developing future net salvage estimates and better inform decisions and recommendations around how current experienced levels of net salvage costs (i.e., -100%, -200%, or greater) may or may not be reflective of the future levels of expected net salvage.

Q: Does this conclude your evidence?

A: Yes.

Dustin Madsen CV

DUSTIN MADSEN CA, CPA, CPA (IL, USA), CDP, CRRA

Tel: 403-869-9294 E-mail: dustin@emrydia.com

Consultant, Regulatory and Financial Reporting December 2011 - Present
Summary of Work for Various Clients Calgary, Alberta

- Preparation of expert testimony in a wide variety of areas including cost-of-service, revenue requirement, income tax, valuation, depreciation, cost of capital, capital expenditures and prudence.
- Hands on experience in the strategic planning, development and coordination of all elements of regulatory proceedings, including preparation of interrogatories, evidence, responding to information requests, oral testimony, and preparation of written argument and reply argument.
- Recognized expertise and detailed knowledge of financial reporting and treasury processes, utility income tax principles, and International Financial Reporting Standards ("IFRS"), including a significant amount of online and face-to-face teaching experience.

Accounting, Finance, Tax and Regulatory Consultant January 2016 – Present
Emrydia Consulting Corporation (owner) Calgary, Alberta

- Preparation of evidence and expert testimony both written and oral on a variety of areas, including cost-of-service, revenue requirement, income tax, valuation, depreciation, and cost of capital. Some examples of oral testimony include:
    - Witness in the New Brunswick Power 2020-21 GRA on all revenue requirement matters and retained in the New Brunswick 2023-24 GRA.
    - Prepared a depreciation study, cost-of-service study and asset valuation for a utility client in Alberta.
    - Filed expert evidence in the Northwest Territories Power Corporation 2022-23 GRA on operating costs, capitalization and depreciation matters.
    - Filed expert evidence in the ATCO Electric 2020-2022 and 2023-2025 GTAs on a variety of matters.
    - Filed expert evidence in the AltaLink 2022-2023 GTA on a variety of matters.
    - Witness in AltaLink's 2019-2021 GTA on matters related to AltaLink's proposed change in salvage collection methodology, the reasonableness of AltaLink's applied for salvage costs, and line clearance mitigation expenditures.
    - Witness in the AESO's Capacity Market Application on various matters pertaining to the AESO's application.
    - Witness in Alberta PowerLine Fort McMurray West 500 kV Project, on matters pertaining to AESO compliance with legislative requirements, and cost concerns related to routing and the competitive procurement process.
    - Witness in ATCO Electric Transmission's 2018-2019 GTA on matters related to deferral and reserve accounts, fixed and variable compensation, operating costs, head office costs, allocated costs, depreciation matters, and other various areas.
    - Witness in the 2018 Generic Cost of Capital ("GCOC") Proceeding on matters relating to generic income tax methods and the recommended capital structure.
    - Witness in ATCO Electric Transmission's 2015-2017 General Tariff Application ("GTA"), on matters relating to regulatory accounts, forecasting accuracy, approach to budgeting, operating costs, income taxes and other financial matters.
- Prepared a comprehensive cost-of-service study for an Alberta based distribution

facility owner.
- Prepared a comprehensive business and succession plan for an Alberta based distribution facility owner.
- Completed a business valuation, including a calculation of the fair market value and replacement cost new less depreciation value of the assets of an Alberta based distribution facility owner.
- Provided advice to various parties in Alberta's regulated and unregulated utility industry on numerous matters including cost-of-service rate design, business issues, hedging, regulated rate option calculation, and other specific matters.

Business Valuation and Accounting/Regulatory Risk Consultant Nov 2015 – January 2016
Berkshire Hathaway Energy Canada Calgary, Alberta

- Advise senior management at Berkshire Hathaway Energy Canada on potential acquisition risks and rewards.
- Evaluate all financial, treasury, regulatory, operational and legal elements of potential acquisitions and coordinate with other senior team members to develop a go/no-go proposal for each potential acquisition.
- Construct and maintain a business valuation model to support calculations of the enterprise value, including development of assumptions around levered/unlevered discount rates, cash flows, terminal values and certain tax assumptions depending upon the ultimate structure of the transaction.

Regulatory Specialist (Consultant) November 2012 – July 2015
AltaLink L.P. Calgary, Alberta

- Drafted or coordinated the drafting of AltaLink's 2012/2013 Deferral Account Application and 2015/2016 GTA, including responses to information requests, updates to the applications and other matters as required.
- Assisted AltaLink, working in conjunction with other Alberta utilities, in the drafting of the 2013 GCOC R&V application and the Utility Asset Disposition (UAD) Appeal. This work included detailed research and analysis into GCOC and UAD matters.
- Actively engaged in the AUC proceeding to assess the AltaLink sale, including responses to information requests and responding to due diligence questions from the sale itself.
- Prepared AltaLink's 2011, 2012, 2013 and 2014 Reports on Operations and Finances in compliance with AUC Rule 005.
- Assisted in the coordination of the 2013/2014 GTA oral hearing, including undertakings, preparation of cross-examination questions and monitoring of oral testimony.
- Prepared the public and confidential rebuttal evidence, responses to additional information requests, and argument/reply argument for the 2013/2014 GTA.
- Acted as AltaLink's lead representative on a variety of key applications filed by other Alberta Utilities, including PBR applications, GCOC, capital tracker applications, GTAs, Deferral Account Applications, and also the AESO's Tariff Application.
- Automated the majority of the Report on Operations model and improved the documentation related to the process, thereby reducing the time required to update the Report on Operations to a matter of a couple weeks rather than a couple months.
- Automated and refined the Hearing Cost and Legal Cost process, including filing of costs with the AUC, reconciliation of costs for accounting purposes, and installation of an improved internal information system for gathering and reporting.
- Continued monitoring of other proceedings and performed all other duties as required by the Vice President, Regulatory Rates and Tariffs.

Manager, Financial Reporting (Contract) April 2012 – October 2012
AltaLink L.P. Calgary, Alberta

- Managed the Financial Reporting group, and performed all duties as required of the Manager, Financial Reporting and any other duties as required.
- Coordinated the implementation of BPC to assist with the consolidation of financial results in SAP.
- Provided technical IFRS input for a variety of projects and Canadian Electricity Association matters.

Consultant, Corporate Finance and Tax February 2012 – April 2012
Enerflex Ltd. Calgary, Alberta

- Assisted with pre-implementation planning for IFRS 9 through 13.
- Reviewed the hedging policy in place at Enerflex to assess ongoing effectiveness and provided feedback on a new treasury management system.
- Reviewed annual financial statements, Management's Discussion and Analysis and the AIF, and provided feedback for changes and improvements to the first quarter financial statements.
- Performed a review of existing accounting policies including embedded derivative review of major contracts, lessee and lessor accounting, segmented reporting, borrowing costs, stock options and more.

Manager, Forecasts and Budgets January 2010 – November 2011
IFRS Project Manager/Sponsor February 2007 – December 2010
Senior Financial Accountant, Financial Reporting February 2007 – March 2010
FortisAlberta Inc. Calgary, Alberta

- Prepared/reviewed monthly, quarterly and annual forecasts and all associated financial analysis for the CFO in comparison to actuals.
- Review of regulatory filings and annual regulatory financial statements submitted to the Alberta Utilities Commission.
- Preparation/review of annual Business Plan for approval by Board of Directors.
- Improvement of monthly and daily treasury forecasts and involvement in debt issuances and responses to due diligence requests.
- Management and review of the monthly tax calculation and development of various tax planning strategies from both a regulatory and financial reporting perspective.
- Assisted in the review of all corporate tax processes and calculation of tax provisions, as well as, design of complex tax planning strategies.
- Responsible for the planning and oversight of the conversion to International Financial Reporting Standards including the review of all policy papers, issues lists, system conversion issues etc.
- Responsible for financial reporting, including the preparation and review of financial statements in accordance with Canadian generally accepted accounting principles, the preparation and review of the MD&A, preparation of the monthly management report, and preparation and review of accounting research and policies.
- Involved in the design, implementation and ongoing improvements of various accounting processes and internal controls within financial reporting, accounts payable, capital assets, inventory, general accounting, treasury, taxation and payroll.
- Provided IFRS transition course for all Finance staff at FortisAlberta.
- Demonstrated effective time management, organization, supervisory and problem solving/analytical skills.

Vice Chair, CEA`s Finance and Accounting Subcommittee May 2011 – December 2011
Member May 2007 – December 2011
Canadian Electrical Association Ottawa, Ontario

- Attended all bi-annual meetings as an active participant involved in presentations at the meetings, organized special purpose conference calls, prepared response letters to both the IASB and AcSB on a variety of topics, and assisted in the special subcommittee on Rate Regulated Accounting.
- Assisted the Chair in the preparation of meeting content, arranging speakers and guest attendees, and other duties as requested.

IFRS Classroom Facilitator June 2009 – November 2011
IASeminars London, England

- Classroom facilitator for IASeminars focusing on IFRS accounting within the Utilities and Energy industries.

Experienced Module Facilitator January 2006 – September 2009
CA School of Business Calgary, Alberta

- Facilitated Modules 1 to 5 multiple times with class sizes between 8 and 20 students.

Senior Auditor September 2003 – February 2007
Deloitte and Touche LLP Saskatoon, Saskatchewan/ Calgary, Alberta

- Performed review, audit, SOX 404 and CSOX work for a variety of large multi-national clients including Petro Canada, Potash Corporation, and Superior Propane, as well as review and audit work for smaller to mid-sized for profit and not-for-profit organizations.
- Completed personal tax returns and assisted in the audit of corporate tax provisions.
- Provided audit and oil and gas accounting training to new and existing staff at Deloitte.

EDUCATION

Certified Rate of Return Analyst
Society of Utility and Regulatory Financial Analysts

Certified Depreciation Professional
Society of Depreciation Professionals

Certified Public Accountant
Illinois Board of Accountancy

Chartered Professional Accountant
Chartered Professional Accountants of Alberta

Chartered Accountant
Institute of Chartered Accountants of Alberta

Bachelor of Commerce, Major in Accounting, with Great Distinction
University of Saskatchewan

Tel: 403-869-9294 E-mail: dustin@emrydia.com

Form A: Acknowledgement of Expert's Duty

Dustin Madsen

Ontario Energy Board

FORM A

IN THE MATTER OF an Application by Enbridge Gas Inc. to change its natural gas rates and other charges beginning January 1, 2024.

ACKNOWLEDGEMENT OF EXPERT'S DUTY

1. My name is Dustin Madsen I live at Calgary (*city)*, in the province (*province/state*) of Alberta.

2. I have been engaged by or on behalf of the Industrial Gas Users Association to provide evidence in relation to the above-noted proceeding before the Ontario Energy Board.

3. I acknowledge that it is my duty to provide evidence in relation to this proceeding as follows:

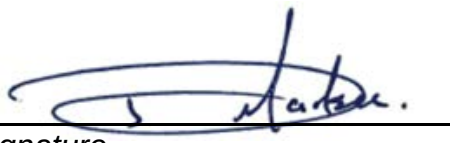
   (a) to provide opinion evidence that is fair, objective and non-partisan;

   (b) to provide opinion evidence that is related only to matters that are within my area of expertise; and

   (c) to provide such additional assistance as the Board may reasonably require, to determine a matter in issue.

4. I acknowledge that the duty referred to above prevails over any obligation which I may owe to any party by whom or on whose behalf I am engaged.

Date April 20, 2023



Signature