

**BEFORE THE NORTH CAROLINA UTILITIES COMMISSION
DOCKET NO. E-7, SUB 1276**

In the Matter of:)
) **DIRECT TESTIMONY OF LANCE**
Application of Duke Energy Carolinas,) **D. KAUFMAN ON BEHALF OF**
LLC For Adjustment of Rates and) **THE NORTH CAROLINA**
Charges Applicable to Electric Service in) **SUSTAINABLE ENERGY**
North Carolina) **ASSOCIATION**
)

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EXHIBIT LIST

Exhibit No. Kaufman 1 – Qualification Statement of Lance D. Kaufman (CV)

1 **I. INTRODUCTION AND SUMMARY**

2 **Q. PLEASE STATE YOUR NAME AND OCCUPATION.**

3 A. My name is Lance D. Kaufman. I am a consultant representing utility customers
4 before state public utility commissions. My witness qualifications can be found at
5 Kaufman Exhibit No. 1.

6 **Q. PLEASE IDENTIFY THE PARTY ON WHOSE BEHALF YOU ARE**
7 **TESTIFYING.**

8 A. I am testifying on behalf of the North Carolina Sustainable Energy Association
9 (“NCSEA”).

10 **Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY?**

11 A. I provide testimony on the following items:

- 12 • Securitization of Coal Plants, and
13 • The 2021 Depreciation Study.

14 **Q. PLEASE SUMMARIZE YOUR RECOMMENDATIONS.**

15 A. I make the following recommendations:

- 16 • Defer 50 percent of the return on rate base associated with subcritical coal plants
17 that are expected to be retired early.
18 • Defer 50 percent of depreciation expense associated with subcritical coal plants
19 that are expected to be retired early.
20 • Base terminal salvage cost of production facilities based on base
21 decommissioning costs.
22 • Modify the net salvage and interim net salvage rates underlying depreciation rates
23 to be consistent with Table 7 of this testimony.

- 1 • Modify the retirement curves underlying depreciation rates to be consistent with
2 the NCSEA recommendations in Table 12 of this testimony.

3 **II. SECURITIZATION OF COAL PLANTS**

4 **Q. PLEASE SUMMARIZE YOUR ISSUE REGARDING THE**
5 **SECURITIZATION OF COAL PLANTS.**

6 A. DEC has requested authority to defer 50 percent of the impact of accelerated
7 depreciation for the sub-critical coal plants.¹ House Bill 951 enables securitization
8 of certain coal generation assets. DEC intends to securitize these assets after the
9 retirement of these plants. I am concerned that DEC's proposal is not a least-cost
10 method of enacting the securitization benefits of HB 951. The primary customer
11 benefit of securitization is to reduce the cost of capital for the associated assets.
12 This benefit is maximized by enacting securitization as early as possible and
13 securitizing the largest amount of capital possible.

14 I recommend that the Commission take steps to ensure that rate payers
15 receive the maximum potential benefit from HB 951. This can be accomplished
16 by deferring 50 percent of DEC's return on rate base associated with subcritical
17 coal-fired electric generating facilities to be retired early and 50 percent of
18 depreciation expense associated with these plants. This will incent DEC to
19 securitize these assets on a timely basis and preserve the net book value available
20 for securitization.

¹ Direct Testimony of Quynh P. Bowman, NCUC Docket No. E-7 Sub 1276, pg. 4 (filed Jan. 19, 2023).

1 **Q. IS IT PERMITTED FOR DEC TO SECURITIZE COAL ASSETS PRIOR**
2 **TO RETIREMENT?**

3 A. Yes, the Commission recently adopted rules related to securitization of coal plant
4 assets.² These rules enable the financing of “coal plant retirement costs” through
5 issuance of a bond. Coal plant retirement costs are defined to include,

6 “Fifty percent (50%) of the remaining net book value of all of a
7 public utility’s subcritical coal-fired electric generating facilities
8 retired early *or to be retired* early to achieve the authorized carbon
9 reduction goals set forth in Section 1 of House Bill 951 that are
10 appropriate for recovery from existing and future retail customers
11 receiving transmission or distribution service from such public
12 utility.”³

13
14 The definition of coal plant retirement costs includes plants to be retired;
15 therefore, securitization can occur even if retirement has not occurred.

16 In its Order Adopting Rule R8-74, the Commission further explained that
17 R8-74 is designed to maintain flexibility⁴ and concluded that,

18 “because rules for review and Commission determination of
19 eligible securitization costs are not included in N.C.G.S. § 62-172,
20 the Commission likewise does not include them in Rule R8-74.
21 Rather, the costs that may be eligible for securitization will be
22 determined in a separate proceeding, [such as] a general rate
23 case....”⁵

24

² See NCUC Rule R8-74, Financing for Costs Associated with the Early Retirement of Subcritical Coal-Fired Generating Facilities; *see also* Order Adopting Rule R8-74, NCUC Docket No. E-100 Sub 177 (issued Apr. 5, 2022).

³ *Id.* at (b)(8)(a) (emphasis added).

⁴ “Rule R8-74 contains the flexibility necessary to include the provisions that were in the Storm Cost Financing Orders along with other beneficial provisions, as the Commission finds reasonable and appropriate. However, locking those provisions in at this time may serve to reduce the Commission’s flexibility in the future.” Order Adopting Rule R8-74, *supra* fn. 2, at pg. 8.

⁵ *Id.* at pg. 7.

1 **Q. WHY IS IT BENEFICIAL FOR SECURITIZATION TO OCCUR AS**
2 **EARLY AS POSSIBLE?**

3 A. The primary benefits of securitization come from reduced cost of equity and tax
4 expense. The carrying cost of securitized assets is reduced from a utility's
5 weighted average cost of capital to the interest rate on a relatively low risk bond.
6 For example, suppose that a utility's authorized pre-tax cost of capital is 10% and
7 the financing cost for the securitized asset is 5%. Each \$1 million securitized by
8 the utility will reduce the annual revenue requirement from \$100,000 to \$50,000,
9 a savings of \$50,000.

10 Early securitization increases these benefits by 1) increasing the total
11 amount financed through securitization and 2) decreasing the number of years that
12 securitized assets are carried at the utilities cost of capital. If a \$1 million asset has
13 a 10 year life, but is retired five years early, the net book value of the asset will
14 only be \$500,000 at retirement. Continuing the assumptions from the prior
15 example, delaying securitization until after retirement reduces the first-year
16 benefit of securitization from \$50,000 to \$25,000. This reflects the impact of a
17 smaller total amount securitized. Furthermore, because the \$500,000 that was
18 ultimately securitized was carried at the utility's cost of capital for the five years
19 prior to retirement, the delay in securitization carries an additional finance cost of
20 \$250,000 over the first five years.

21 **Q. WHAT ARE THE TOTAL BENEFITS OF DEC SECURITIZING EARLY**
22 **RATHER THAN AFTER RETIREMENT?**

23 A. These benefits depend on the terms and ultimate timing of securitization. After
24 making simplifying assumptions, I estimate the benefits of securitizing early to be

1 a savings of approximately \$99 million over ten years. DEC plans to securitize
 2 Allen Units 1&5, Cliffside Unit 5, Marshall Units 1&2.⁶ The 2022 net book value
 3 for these assets is \$521 million. The approximate annual finance and tax savings
 4 if these assets are securitized early is approximately \$11 to 13 million, as shown
 5 in the table below.^{7, 8, 9}

6 **Table 1 Early Securitization Benefits**

Line		Amount (\$000)	
		DEC COC	Staff COC
1	Total Net Book	521,466	521,467
2 = Line 1 * 0.5	Securitized Amount	260,733	260,734
3	Cost of Debt	4.5%	4.0%
4 = Line 2 * Line 3	Securitization Carrying Cost	11,733	10,508
5	Pre Tax Cost of Capital	9.3%	8.2%
6 = Line 2 * Line 5	Rate Based Carrying Cost	24,264	21,405
7 = Line 6 - Line 4	Annual Securitization Savings	12,531	10,898

8 DEC's proposed deferral balances at retirement for these units will be approximately
 9 \$127 million as shown in the table below.

⁶ Direct Testimony of Quynh P. Bowman, *supra* fn. 1, pg. 29.

⁷ Note that these reflect first year savings. If the securitized principle is amortized over the life of the security savings will decrease proportionately in each year.

⁸ DEC cost of capital is calculated from DEC's proposed ROE (10.4%), Direct Testimony of Roger A. Morin, NCUC Docket No. E-7 Sub 1276, pg. 4 (filed Jan. 19, 2023), and DEC's proposed cost of debt (4.50%), Supplemental Direct Testimony of Q. Bowman, NCUC Docket No. E-7 Sub 1276, pg. 3 (filed May 19, 2023).

⁹ Public Staff cost of capital is calculated from filings in the recent DEP rate case. This includes the Public Staff's proposed ROE (9.25%), Direct Testimony of Christopher C. Walters on Behalf of the Public Staff, NCUC Docket No. E-2 Sub 1300, pg. 3 (filed Mar. 27, 2023), and the Public Staff's settlement with DEP and CIGFUR II that included cost of debt (4.03%), DEP, Public Staff, and CIGFUR II's Amended Agreement and Stipulation of Partial Settlement, NCUC Docket No. E-2 Sub 1300, pg. 5 (filed May 2, 2023). *See also* Public Staff's Proposed Order, NCUC Docket No. E-2 Sub 1300, pp. 9-10 (filed June 9, 2023).

1 **Table 2 Post Retirement Securitization Amount**

Retail Share (\$000)	Accelerated Accrual	Non Accelerated Accrual	50% of Accelerated Amount	Retirement Date (Year End)	Years of Accrual Prior to Retirement	Securitized amount
	[A]	[B]	[C] = ([A]-[B])/2	[D]	[E] = [D]-2021*	[F] = [C] * [E]
MARSHALL UNIT 1	22,756	15,136	3,810	2028	7	26,670
MARSHALL UNIT 2	9,879	6,236	1,822	2028	7	12,751
ALLEN	85,913	45,770	20,072	2023	2	40,143
CLIFFSIDE UNIT 5	50,319	26,558	11,881	2025	4	47,522
Total						127,086

2 * Years to retirement is calculated as of the depreciation study date for consistency

3 The annual finance and tax savings if these assets are securitized
 4 consistent with DEC's proposal is \$5.3 to \$6.1 million depending on the assumed
 5 cost of capital, as shown in the table below.

6 **Table 3 Post Retirement Securitization Benefits**

Line		Amount (\$000)	
		DEC COC	Staff COC
1	Securitized Amount	127,086	127,086
2	Cost of Debt	4.5%	4.0%
3 = Line 1 * Line 2	Securitization Carrying Cost	5,719	5,122
4	Pre Tax Cost of Capital	9.3%	8.2%
5 = Line 1 * Line 4	Rate Based Carrying Cost	11,827	10,433
6 = Line 5 - Line 3	Annual Securitization Savings	6,108	5,312

8 These four units retire between 2 to 7 years after January 1, 2022.

9 Assuming for simplicity that all units are securitized in year five, the total net
 10 present value of finance savings is approximately \$71 to \$82 million depending
 11 on the assumed cost of capital, as illustrated in the table below.¹⁰

¹⁰ Note that a number of other simplifying assumptions are made, such as assuming no amortization of the financed amounts and assuming the terminal bond date is the same in both scenarios.

1 **Table 4 Early Securitization Savings (DEC Cost of Capital)**

Year	Securitization Savings (\$000)			
	Early	Post Retirement	Difference	Present Value
2022	12,531	0	12,531	12,531
2023	12,531	0	12,531	11,822
2024	12,531	0	12,531	11,153
2025	12,531	0	12,531	10,521
2026	12,531	0	12,531	9,926
2027	12,531	0	12,531	9,364
2028	12,531	6,108	6,423	4,528
2029	12,531	6,108	6,423	4,272
2030	12,531	6,108	6,423	4,030
2031	12,531	6,108	6,423	3,802
Total			100,881	81,949

2

3 **Table 5 Early Securitization Savings (Public Staff Cost of Capital)**

Year	Securitization Savings (\$000)			
	Early	Post Retirement	Difference	Present Value
2022	10,898	0	10,898	10,898
2023	10,898	0	10,898	10,281
2024	10,898	0	10,898	9,699
2025	10,898	0	10,898	9,150
2026	10,898	0	10,898	8,632
2027	10,898	0	10,898	8,144
2028	10,898	5,312	5,586	3,938
2029	10,898	5,312	5,586	3,715
2030	10,898	5,312	5,586	3,505
2031	10,898	5,312	5,586	3,306
Total			87,732	71,268

4

5

6 **Q. HOW DOES YOUR RECOMMENDATION PRESERVE THE**
7 **CUSTOMER BENEFITS OF EARLY SECURITIZATION?**

8 A. My recommendation has two parts:

- 9 • Defer 50 percent of DEC's return on rate base associated with subcritical coal-
10 fired electric generating facilities to be retired early, and

- 1 • Defer 50 percent of depreciation expense associated with these plants.

2 Deferring 50 percent of DEC’s return on rate base will preserve the Commission’s
3 ability to disallow recovery on any cost of capital expense that exceeds the
4 amounts DEC would have incurred had DEC securitized early. This will
5 incentivize DEC to make prudent management decisions regarding securitization
6 while protecting customers from the costs of any imprudent decisions. Deferring
7 50 percent of depreciation expense will maintain the net book value of these
8 plants at current levels to ensure that when DEC does securitize these assets, the
9 maximum potential securitization will be achieved.

10 **Q. HOW DOES DEFERRING 50 PERCENT OF DEC’S RETURN ON RATE**
11 **BASE FOR APPLICABLE PLANTS PRESERVE THE VALUE OF**
12 **SECURITIZATION?**

- 13 A. The numeric examples above demonstrate that for each year DEC delays
14 securitization, rate payers face an additional year of higher cost of capital. This
15 means that any delay by DEC in securitizing could be viewed as imprudent. The
16 cost to rate payers of delaying securitization is equal to the difference between the
17 pre-tax cost of capital and the financing rate for securitized assets, multiplied by
18 the total amount securitized. It is currently unclear how large the difference in
19 these rates is, thus it is necessary to defer the full amount of return for the
20 expected securitized amount if the Commission wishes to preserve the full value
21 for rate payers.

1 **Q. WHY COULD A DELAY IN SECURITIZATION BE VIEWED AS**
2 **IMPRUDENT?**

3 A. In this testimony I demonstrate that early securitization will reduce total revenue
4 requirement by reducing the capital carrying cost for the securitized amount.

5 There is no offsetting benefit associated with delaying securitization. It is
6 imprudent to incur a cost that provides no benefit.

7 **Q. WHAT IS THE MAXIMUM POTENTIAL AMOUNT THAT COULD BE**
8 **FINANCED THROUGH COAL SECURITIZATION?**

9 A. The maximum amount that can be securitized is half of the current net book value
10 for the applicable plants, or \$261 million.¹¹ As DEC accumulates increasing
11 amounts of depreciation expense, the amount available for securitization could
12 fall below this level.

13 **Q. HOW DOES DEFERRING ONLY 50 PERCENT OF DEPRECIATION**
14 **EXPENSE RETAIN THE MAXIMUM POTENTIAL SECURITIZATION**
15 **AMOUNT?**

16 A. Both the statute and rules regarding securitization provide little guidance on how
17 the net book value of coal plants is determined. Securitization is allowed for 50
18 percent of the net book value of subcritical coal plants. One potential
19 interpretation of this limitation is that net book value is determined at the date of
20 securitization. Under this interpretation, deferring only 50 percent of depreciation
21 expense will not retain the maximum potential securitization amount. This is
22 because deferring 50 percent of depreciation expense would lead to a deferral

¹¹ This is half of the current net book value of \$521 million. Amounts are based on the 2021 depreciation study's report of year end 2021 plant balances. The 2021 depreciation study is used throughout my testimony for consistency; however it is likely that current net book values have changed with subsequent plant additions, retirements, and accumulated depreciation.

1 balance of only \$261 million, and if the plants are fully depreciated at retirement,
2 net book value would be equal to the deferral balance. Thus the amount to be
3 securitized would be half of \$261 million, or \$135.5 million.

4 However, both DEC and the Public Staff appear to interpret the
5 determination of net book value to be more flexible. DEC's proposal seems to
6 imply that 100 percent of deferred depreciation expense can be securitized.¹² For
7 DEC's proposal to be consistent with HB 951, the determination of net book
8 value can be made prior to the securitization process. The Public Staff appear to
9 have a similar interpretation as DEC.¹³ If the Commission agrees that 100 percent
10 of deferred amounts can be securitized, it is sufficient to defer only 50 percent of
11 depreciation expense.

12 **Q. HOW DOES YOUR RECOMMENDED DEFERRAL AMOUNT DIFFER**
13 **FROM DEC'S PROPOSAL?**

14 A. My recommendation is to defer 50% of all depreciation expense for the relevant
15 plants, while DEC's proposal is limited to 50% of the accelerated portion of
16 depreciation expense for the relevant plants. This results in an annual deferral of
17 \$84.4 million rather than \$37.6 million.

18 **Q. CAN THE COMMISSION ONLY ADOPT ONE PART OF YOUR**
19 **RECOMMENDATION?**

20 A. Yes, if the Commission does not find that early securitization is appropriate but
21 agrees that customers should receive securitization benefits for 50 percent of the

¹² Direct Testimony of Quynh P. Bowman, *supra* fn. 1, pg. 47.

¹³ See Amended Agreement and Stipulation of Partial Settlement, *supra* fn. 9, at pg. 5. This stipulation includes a similar deferral mechanism as that proposed by DEC in the current proceeding.

1 current net book value, the Commission could defer 50 percent of depreciation on
2 applicable plants without deferring returns.

3 **Q. DOES YOUR PROPOSAL AFFECT WHEN OR HOW COAL**
4 **RETIREMENT COSTS ARE RECOVERED FROM CUSTOMERS?**

5 A. No, this testimony includes no proposals regarding the recovery of coal retirement
6 costs. Securitization is a finance mechanism, not a rate recovery mechanism.
7 Many rate mechanisms are available to the commission to effectively allocate the
8 cost of coal retirement costs in a manner that is fair and reasonable.

9 **Q. HOW WOULD A DELAY IN ACTUAL RETIREMENT AFFECT YOUR**
10 **PROPOSAL?**

11 A. Under my proposal neither a delay nor acceleration of retirement would affect the
12 net book related securitization amounts. If DEC's proposal is adopted and
13 securitization occurs after retirement, the benefits of securitization would be
14 reduced even further, following the same cost mechanisms outlined in my
15 testimony above.

16 **III. 2021 DEPRECIATION STUDY**

17 **Q. WHAT ISSUES DO YOU RAISE REGARDING THE 2021**
18 **DEPRECIATION STUDY?**

19 A. I raise issues related to the escalation of decommissioning costs, net salvage rates,
20 and survivor curves used to calculate remaining lives for a number of asset
21 accounts.

1 **A. No escalation of decommissioning costs.**

2 **Q. PLEASE SUMMARIZE THIS ISSUE.**

3 A. DEC proposes to escalate estimated plant decommissioning costs.¹⁴ I recommend
4 that decommissioning costs not be escalated when calculating net salvage values.
5 Contrary to DEC's assertion, escalation of decommissioning costs is not
6 necessary to fully recover decommissioning costs. This practice is unnecessary
7 and only serves to unfairly burden current rate payers to the benefit of future rate
8 payers.

9 **Q. WHAT IMPACT DOES ESCALATION HAVE ON DECOMMISSIONING**
10 **COSTS?**

11 A. Escalation increases decommissioning costs from \$330 million to \$548.¹⁵

12 **Q. WHY DO YOU OPPOSE ESCALATION?**

13 A. Escalation of decommissioning costs is not performed in many depreciation
14 studies, including depreciation studies performed by John Spanos and other
15 Gannett Fleming depreciation experts.¹⁶ This is because inflation rates are
16 expected to be much lower than the utility's cost of capital. Decommissioning
17 costs are pre-collected from customers through the net salvage component of
18 depreciation rates. Dollars collected today for decommissioning expense reduce
19 rate base. If these reductions in rate base were tabulated across the remaining life

¹⁴ Direct Testimony of John J. Spanos, NCUC Docket No. E-7 Sub 1276, pg. 15 (filed Jan. 19, 2023).

¹⁵ *Id.* at Ex. 1 pg. 313.

¹⁶ For a recent example in the Southeast, *see* Georgia Power 2022 Rate Case, Appx. Ex. 2—Depreciation Rate Study, Ga. PSC Docket No. 44280 (Document No. 190559, filed June 24, 2022). For a recent example of a depreciation study prepared by John Spanos and Gannett Fleming, *see* PGE Initial Application, Detailed Depreciation Study of Electric Utility Properties, Or. PUC Docket No. UM 2152 (filed Jan. 15, 2021).

1 of each plant, the total avoided return associated with decommissioning dollars
2 collected today would greatly exceed the escalated value of these dollars at the
3 time of decommissioning. Thus, escalation results in an excess assignment of
4 decommissioning costs to current customers.

5 Furthermore, many decommissioning costs are uncertain. Any legally
6 required decommissioning costs are asset retirement obligations and are not
7 collected through depreciation expense. This means that all decommissioning
8 dollars collected through depreciation expense reflect voluntary decommissioning
9 costs. Because of the voluntary nature of these costs, many of these costs will
10 never take.

11 **Q. HOW DOES ESCALATION RESULT IN AN EXCESS ASSIGNMENT OF**
12 **DECOMMISSIONING COSTS TO CURRENT CUSTOMERS?**

13 A. This can be illustrated through a series of calculations. Suppose a plant's
14 decommissioning cost is estimated at \$10,000 in current dollars, the expected
15 inflation rate is 3%, and decommissioning is expected to occur in 10 years. This
16 results in an escalated decommissioning cost of \$13,439.¹⁷ The non-escalated
17 decommissioning costs result in annual collections of \$1,000 while the escalated
18 decommissioning costs result in annual collections of \$1,344.¹⁸

19 If the equitable allocation of decommissioning expense is to collect an
20 equal share of the expected decommissioning expense in each year, it is
21 appropriate to collect the present value of \$1,344 in each year. Because

¹⁷ Calculated as $\$10,000 * 1.03^{10}$

¹⁸ Calculated as the decommissioning cost divided by 10 years.

1 depreciation expense is an offset to rate base, the utility's after tax cost of capital
 2 is an appropriate discount rate to use when calculating the present value. Thus the
 3 fair amount of decommissioning expense to collect in year one is \$518.¹⁹ The
 4 annual collection using non-escalated costs of \$1,000 is much closer to the fair
 5 amount than the escalated cost of \$1,344. If the escalated collection value were
 6 used, then current year customers would overpay for decommissioning expense
 7 by \$1,250 as shown in the table below.

8 **Table 6 Excess Contribution under Escalation of Decommissioning Costs**

<u>Line</u>		<u>Amount</u>
1	Amount Collected in Year 1	\$1,000
2	After Tax Cost of Capital	10%
3 = Line 1 * (1 + Line 2) ^ 10	Avoided After Tax Cost of Capital	\$1,594
4 = Line 1 + Line 3	Total Contribution to Decommissioning Cost	\$2,594
5	Equitable Contribution	\$1,344
6 = Line 4 - Line 5	Excess Contribution	\$1,250

9
 10 **Q. WHAT IS YOUR RECOMMENDATION REGARDING THIS ISSUE?**

11 A. I recommend that net salvage rates be calculated using the original
 12 decommissioning costs rather than escalated decommissioning costs.

13 **B. Net Salvage other than Decommissioning.**

14 **Q. WHAT RECOMMENDATIONS DO YOU HAVE REGARDING NET**
 15 **SALVAGE COSTS OTHER THAN DECOMMISSIONING?**

16 A. I recommend that the 20 year average net salvage cost be used for the following
 17 accounts:

- 18 • Account 31X Steam Production (interim net salvage)
- 19 • Account 34X Other Production (Excluding Solar and Account 343.10)

¹⁹ Calculated as $\$1,344 / 1.10^{10}$

- 1 • Account 356 Overhead Conductors
- 2 • Account 373 Street Lighting
- 3 • Account 390 Structures and Improvements
- 4 • Accounts 392.XX Transportation Equipment
- 5 • Accounts 396.XX Power Operated Equipment

6 I also recommend that 50 percent of the 20-year average interim net salvage cost
 7 be used to calculate net salvage rates for Account 343.10 Other production Prime
 8 Movers (Rotatable Parts).

9 **Q. WHY DO YOU MAKE THESE RECOMMENDATIONS?**

10 A. The 20-year average rate for these accounts is reasonably representative of both
 11 recent net salvage and long-term net salvage as well as trends in net salvage.
 12 Thus, this amount is reasonable to use for a forecast of future net salvage
 13 amounts. The table below compares the 20-year average amount net salvage with
 14 DEC's proposed net salvage rates for these accounts.

15 **Table 7 Comparison of 20-year Average Net Salvage and DEC Proposed Net**
 16 **Salvage**

	<u>20-Year Average</u>	<u>DEC Proposed</u>	<u>NCSEA Proposed</u>
ACCOUNTS 31X	-15%	-18%	-15%
ACCOUNTS 34X (Interim Excluding 343.10)	35%	-23%	35%
ACCOUNTT 343.10 (Interim)	98%	40%	49%
ACCOUNT 356.00	-31%	-40%	-31%
ACCOUNT 373.00	-6%	-10%	-6%
ACCOUNT 390.00	-6%	-10%	-6%
ACCOUNTS 392.XX	12%	10%	12%
ACCOUNTS 396.XX	22%	10%	22%

1 **Q. WHY DO DEC’S RECOMMENDATIONS FOR OTHER PRODUCTION**
2 **ACCOUNTS DIFFER SO MUCH FROM THE ACTUAL DATA?**

3 A. DEC’s recommended interim net salvage rates for non-solar other production
4 accounts is -23 percent for all accounts except 343.10, and 40 percent for account
5 343.10, while historic rates are positive 35 percent and 98 percent respectively.
6 The only explanation that DEC offers for its proposed net salvage rate is that
7 “[t]he interim net salvage estimates were based in part on an analysis of historical
8 interim retirement and net salvage data.”²⁰ The filed study provides no
9 explanation for deviation from the historic data.

10 **Q. WHY DO YOU RECOMMEND ONLY HALF OF THE 20-YEAR**
11 **AVERAGE FOR ACCOUNT 343.10?**

12 A. This account only has four years of historic salvage records.²¹ The historic
13 salvage records predict nearly 100 percent salvage, which would result in little to
14 no depreciation expense for this account. Given the short history and high historic
15 salvage, it is appropriate to select a conservatively low level of salvage for this
16 account.

17 **Q. WHAT ARE THE IMPACTS OF YOUR DECOMMISSIONING AND NET**
18 **SALVAGE RECOMMENDATIONS?**

19 A. Net salvage affects the total amount of dollars that must be collected over the life
20 of an asset. An asset with a cost of \$100 and a net salvage of negative 5 percent
21 must recover \$105 in depreciation over the life of the asset because it will cost \$5
22 to retire the asset. If the forecasted net salvage for that asset is changed from
23 negative 5 percent to positive 10 percent, depreciation expense only needs to

²⁰ Direct Testimony of John J. Spanos, *supra* fn. 14, at Ex. 1 pg. 48.

²¹ Direct Testimony of John J. Spanos, *supra* fn. 14, at Ex. 1 pg. 351.

1 recover \$90 over the life of the asset because \$10 will be recovered at the end of
2 the asset life. The combined impact of my decommissioning and net salvage
3 recommendations reduces annual depreciation expense by approximately \$48.5
4 million.

5 **C. Survivor Curves.**

6 **Q. WHAT RECOMMENDATIONS DO YOU HAVE REGARDING DEC'S**
7 **PROPOSED SURVIVOR CURVES?**

8 A. I recommend that the following alternative survivor curves be used when
9 calculating expected remaining lives:

- 10 • 30 - S3 for Account 344.66 Solar Generators
- 11 • 132 - S6 for Accounts 310, 320, 330, 340, 350, 360, 360.2, 389, and 389.2 Rights
12 of Way
- 13 • 75 - R2.5 for Account 354 Towers and Fixtures
- 14 • 50 - R1.5 for Accounts 368 and 368.10 Line Transformers
- 15 • 65 - R1.5 for Account 369 Services

16 **Q. WHAT IS YOUR ANALYSIS OF ACCOUNT 344.66 SOLAR**
17 **GENERATORS?**

18 A. Solar Generators consists primarily of solar panels installed on or after 2016.
19 Solar panel degradation is the primary cause of retirement in this account.
20 Academic research finds that time to 20 percent degradation is best fit through the
21 use of a Weibull distribution with a shape parameter of 5.3759 and a scale
22 parameter of 32.0597.²² The S3-30 curve is the best fitting IOWA curve for this

²² Joseph Kuitche, *Statistical Lifetime Prediction for Photovoltaic Modules*, AZ ST. UNI.,
https://www1.eere.energy.gov/solar/pdfs/pvrw2010_kuitche.pdf (last accessed July 17, 2023).

1 distribution. This curve also provides a reasonable fit for DEC's actual retirement
2 data. DEC's proposed retirement curve is 20-S2.5 for community generators and
3 25-S2.5 for all other solar generators. These curves result in more than 95 percent
4 and 75 percent of interim retirements at each Solar Facility's end of life
5 respectively. This is an unreasonably high level of expected retirement relative to
6 industry expectations. The DEC curves are also inconsistent with solar panel
7 warranties, which protect customers against degradation of this level.

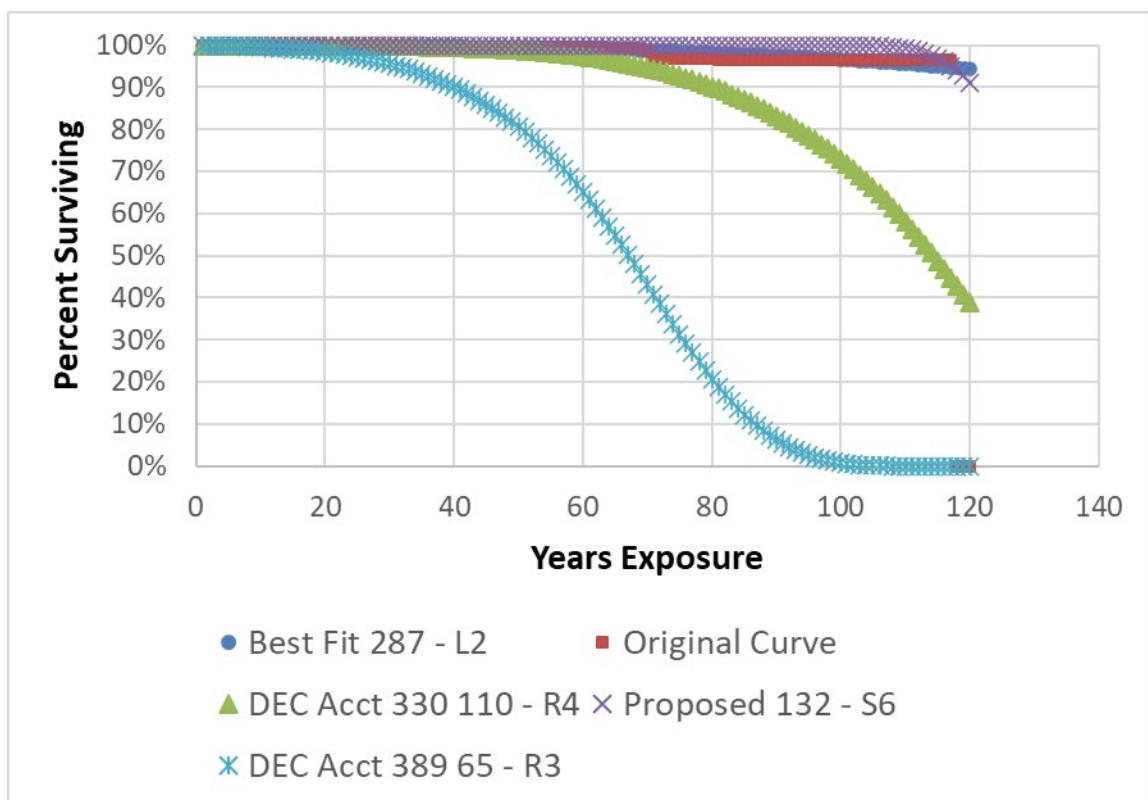
8 **Q. WHAT IS YOUR ANALYSIS OF RIGHTS OF WAY ACCOUNTS?**

9 A. The primary cause of retirement of rights of way is abandonment. Rights of way
10 are rarely if ever abandoned. For example, distribution and transmission rights of
11 way are unlikely to be abandoned after retirement of corresponding distribution
12 and transmission assets because these assets are typically replaced when retired.
13 Furthermore, DEC has a very long history of rights of way accounting records. I
14 recommend that all Rights of way accounts be analyzed together. DEC's records
15 show that 95 percent of rights of way survive to age 115. The low level of historic
16 retirements means that historic data cannot be used to reliably predict the shape of
17 retirements after 115 years of age, but it is reasonable to select a retirement curve
18 that at least has a relatively high survival rate to age 115.

19 The S6 curve with 132-year average results in a conservatively short
20 expected life because it assumes the steepest retirement rate of all well fitting
21 curves. DEC proposes different curves for each Rights of way account, ranging
22 from an average life of 65 years to 110 years. The figure below compares the best
23 fitting curve, my recommended curve, and the range of DEC's proposed curves.

1 All DEC curves greatly overestimate retirements and are inconsistent with
 2 expectations.

3 **Figure 8 Original and Smoothed Curves for Rights of Way Accounts**



4

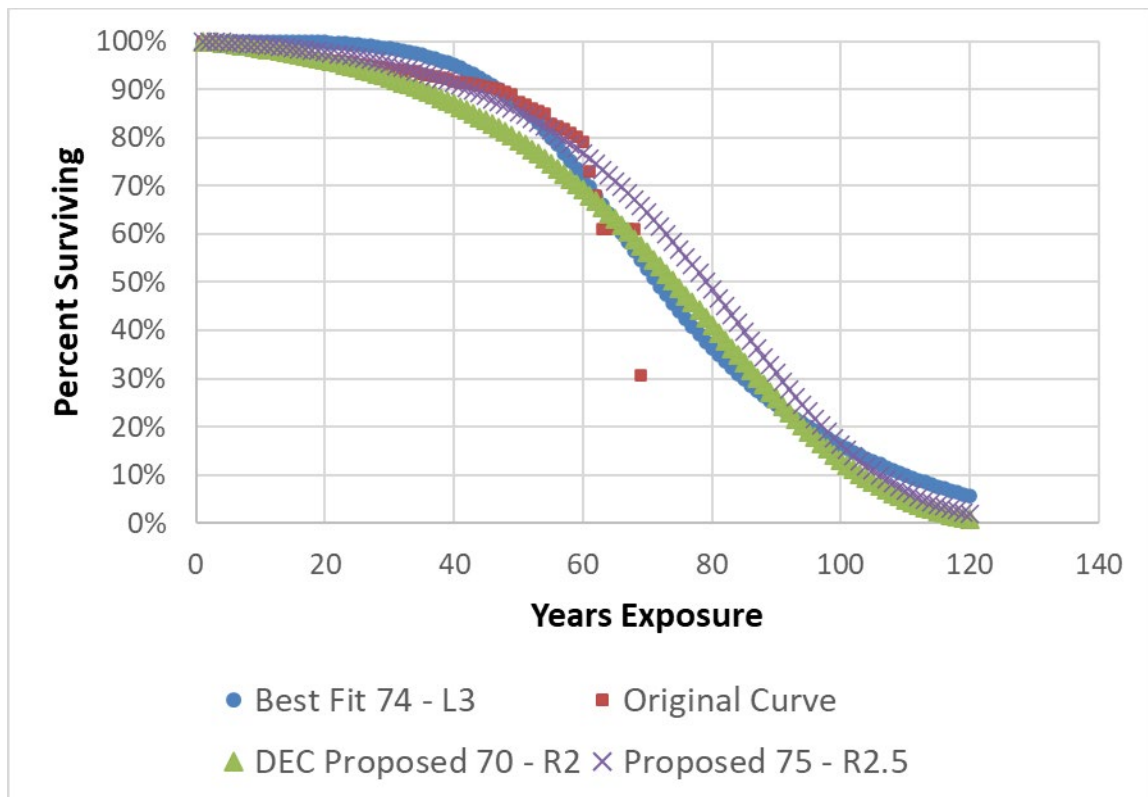
5 **Q. WHAT IS YOUR ANALYSIS OF ACCOUNT 354 TOWERS AND**
 6 **FIXTURES?**

7 A. The historic plant data for account 354 is abnormal after age 60 and, as a result,
 8 does not fit well when modeled with a single retirement distribution. This is
 9 driven by a small number of retirements occurring in age bands where DEC has
 10 relatively low plant balances. When plant balances are relatively low, random
 11 events can have large and non-representative impacts on survivor curves. Due to
 12 the abnormal shape of DEC's historic survivor curve it is necessary to either
 13 select a retirement curve that fits none of the data well but minimizes error across

1 the entire domain of exposure, or to select a curve that fits a portion of exposure
 2 years well but results in excessive error for other portions of exposure years.

3 DEC's proposed survivor curve is the 70-R2 curve. This curve fits well for
 4 ages after 60 years but fits poorly for ages before 60 years. This is an
 5 unreasonable approach because the older ages of DEC's historic survivor curve
 6 represent a less than 0.2 percent of first year exposure and are unlikely to be
 7 representative.²³ I recommend that the 75 -R2.5 curve be selected because it fits
 8 ages 0 through 60 well, and these ages are more reasonably representative of
 9 future retirements.

10 **Figure 9 Original and Smoothed Curves for Account 354 Towers and Fixtures**



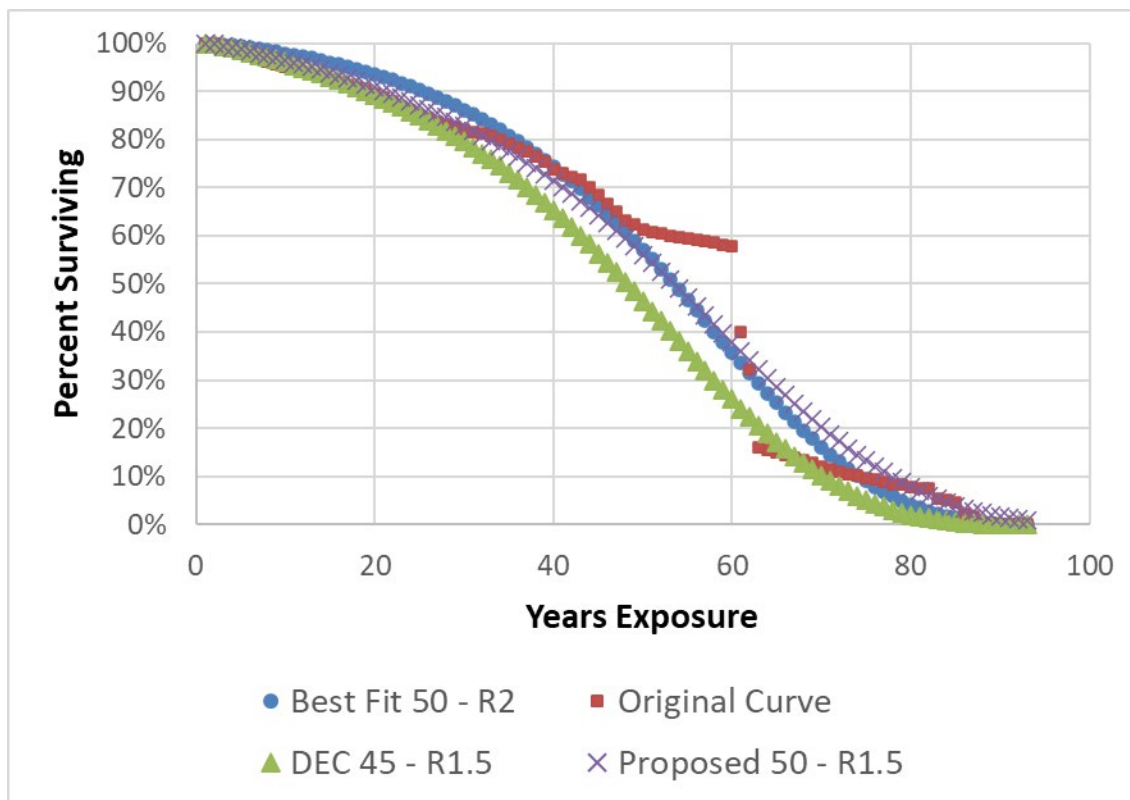
²³ See Direct Testimony of John J. Spanos, *supra* fn. 14, at Ex. 1 pg. 187.

1 **Q. WHAT IS YOUR ANALYSIS OF ACCOUNTS 368 AND 368.10 LINE**
2 **TRANSFORMERS?**

3 A. DEC's line transformer account data is sufficient to generate a complete survivor
4 curve, and thus support heavy reliance on statistical analysis. However, the data
5 show abnormal retirements between ages 50 and 63. The historic survivor curve
6 flattens at age 50 and follows a linear path until age 60, then exhibits a sharp
7 decline to age 63. This abnormal pattern results in the best fitting curve
8 underestimating retirements in early years.

9 DEC proposes the 45-R1.5 retirement curve, which overestimates
10 retirements in nearly all years and results in a relatively poor fit of the data. I
11 recommend the 50-R1.5 retirement curve which fits the data well for ages 0
12 through 50 while still minimizing error in the ages after 50.

1 **Figure 10 Original and Smoothed Curves for Accounts 368 and 368.10 Line**
 2 **Transformers**



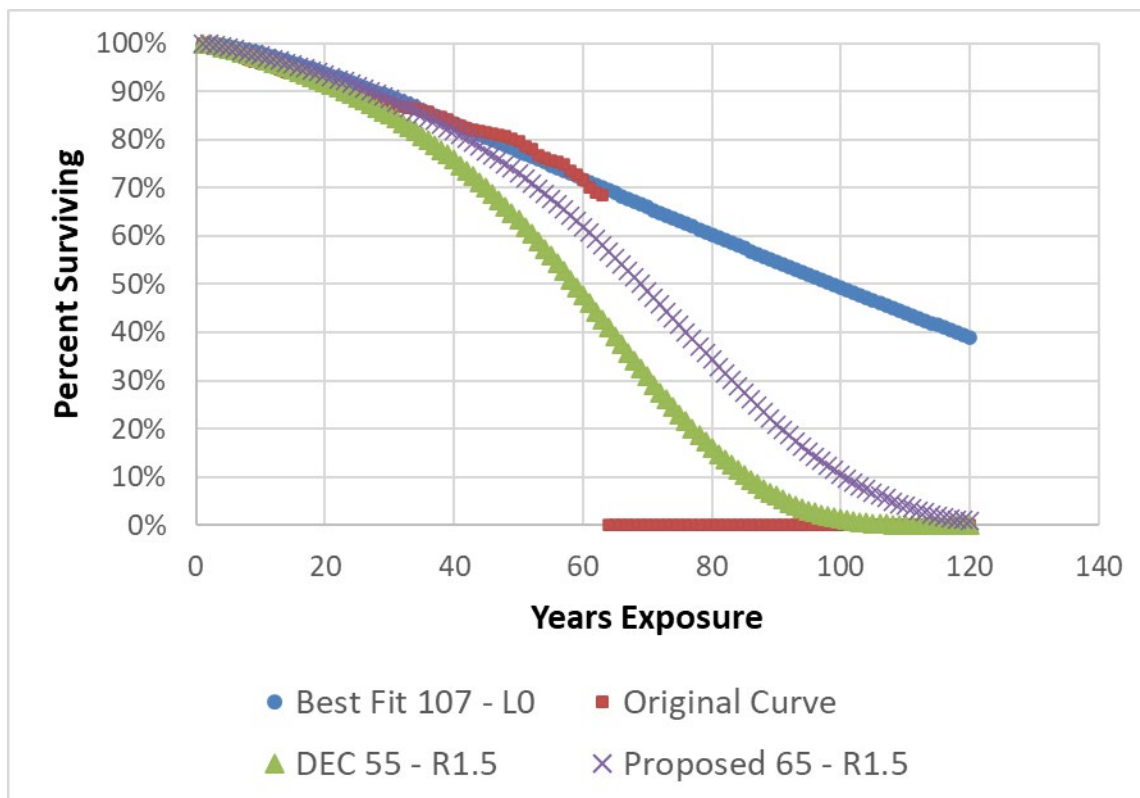
4 **Q. WHAT IS YOUR ANALYSIS OF ACCOUNT 369 SERVICES?**

5 A. DEC's historic plant data for this account is limited to a maximum age of 62
 6 years. The best fitting curve for this account is a 107-L0 curve. However, their
 7 historic data has limited retirement experience and the resulting stub curve may
 8 not be sufficient to accurately estimate the shape associated with older
 9 retirements. Thus, the best fitting curve may not be representative of expected
 10 retirements after age 62.

11 DEC proposes the use of a 55 – R1.5 curve. However, this curve results in
 12 a relatively poor fit after age 20. I recommend the use of a 65 – R1.5 curve
 13 because this curve fits the data well through age 40, results in a similar average

1 age as that proposed by DEC, and only deviates marginally from the historical
 2 data for ages 40 through 62.

3 **Figure 11 Original and Smoothed Curves for Account 369 Services**



4

5 **Q. PLEASE SUMMARIZE THE DIFFERENCE BETWEEN YOUR**
 6 **RECOMMENDATIONS AND DEC'S RECOMMENDATIONS.**

7 A. The table below compares the recommended retirement curves for DEC and
 8 NCSEA

9 **Table 12 Recommended Retirement Curves**

<u>Account</u>	<u>DEC</u>	<u>NCSEA</u>
Account 344.66	Various	30 - S3
Rights of way accounts	Various	132 - S6
Account 354	70 - R2	75 - R2.5
Accounts 368 and 368.10	45 - R1.5	50 - R1.5
Account 369	55 - R1.5	65 - R1.5

10

1 **Q. HAVE YOU CALCULATED THE IMPACT OF YOUR RECOMMENDED**
2 **CHANGES TO SURVIVOR CURVES?**

3 A. No. It is not efficient to calculate rate impacts at this time. I recommend that rate
4 impacts be calculated by DEC's plant accountants after a final determination has
5 been made by the Commission regarding acceptable net salvage rates, survival
6 curves, and account balances.²⁴ If the Commission prefers to have revenue
7 requirement impacts available prior to making a decision in these matters, the
8 Commission could issue a bench request to myself or DEC for such information.

9 **Q. DOES THIS CONCLUDE YOUR OPENING TESTIMONY?**

10 A. Yes

²⁴ While I do not propose any adjustments to plant balances in this testimony, it is likely that one or more accounts will have the balanced disputed by one or more parties in this case.

CURRICULUM VITAE

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EDUCATION:

University of Oregon	Ph.D.	Economics	2008 – 2013
University of Oregon	M.S.	Economics	2006 – 2008
University of Anchorage Alaska	B.B.A.	Economics	2001 – 2004

CERTIFICATIONS:

Certified Depreciation Professional	Society of Depreciation Professionals	2018
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PROFESSIONAL EXPERIENCE:

Consultant	Lance Kaufman Consulting	2014 – Present
Senior Economist	Oregon Public Utility Commission	2015 – 2018
Public Utility Advocate	Alaska Department of Law	2014 – 2015
Senior Economist	Oregon Public Utility Commission	2013 – 2014
Instructor	University of Oregon	2008 – 2012
Research Assistant	University of Alaska Anchorage	2003 – 2008

PROFESSIONAL MEMBERSHIPS:

Society of Depreciation Professionals	2015 – Present
American Economics Association	2017 – Present

RESEARCH, CONSULTING, AND ECONOMETRIC ANALYSIS:

- Davison Van Cleve, PC, Portland, OR 2022
Retained as an expert witness for Alliance of Western Energy Consumers regarding revenue requirement, rate spread, and rate design in Portland General Electric Company Request for a General Rate Revision, Public Utility Commission of Oregon, Docket No. UE 394.
- Davison Van Cleve, PC, Portland, OR 2022
Retained as an expert witness for Alliance of Western Energy Consumers regarding depreciation rates in Portland General Electric Company Detailed Depreciation Study of Electric Utility Properties, Public Utility Commission of Oregon, Docket No. UM 2152.
- Davison Van Cleve, PC, Portland, OR 2022
Retained as an expert witness for Alliance of Western Energy Consumers regarding revenue requirement, rate spread, and rate design in Pacific Power Request for a General Rate Revision, Public Utility Commission of Oregon, Docket No. UE 399.
- Davison Van Cleve, PC, Portland, OR 2022

- Retained as an expert witness for Alliance of Western Energy Consumers regarding revenue requirement, rate spread, and rate design in Puget Sound Energy General Rate Case to Update Base Rates, Washington Utility and Transportation Commission, Docket No. UE-220066, UG-220067, UE-210918.
- Davison Van Cleve, PC, Portland, OR 2022
Retained as an expert witness for Alliance of Western Energy Consumers competitive energy service in AWEC's Investigation into Long-Term Direct Access Programs, Public Utility Commission of Oregon, Docket No. UM 2024.
 - Davison Van Cleve, PC, Portland, OR 2021
Retained as an expert witness for Alliance of Western Energy Consumers competitive energy service in Direct Access Rulemaking, Public Utility Commission of Oregon, Docket No. AR 651.
 - Davison Van Cleve, PC, Portland, OR 2022
Retained as an expert witness for Smart Energy Alliance regarding revenue requirement, rate spread, and rate design in Sierra Pacific General Rate Case to Update Base Rates, Public Utility Commission of Nevada, Docket No. 22-06014.
 - Davison Van Cleve, PC, Portland, OR 2022
Retained as an expert witness for Alliance of Western Energy Consumers regarding revenue requirement, rate spread, and rate design in Avista Corp General Rate Case to Update Base Rates, Washington Utility and Transportation Commission, Docket No. UE-220053 & UG-220054.
 - Georgia Public Service Commission, OR 2022
Retained as an expert witness for Georgia Public Service Commission depreciation rates and decommissioning costs in Georgia Power Company's 2022 General Rate Case, Georgia Public Service Commission, Docket No. 44280.
 - Cable Huston, LLP, Portland, OR 2020
Retained as an expert witness for Alliance of Western Energy Consumers regarding revenue requirement, rate spread and rate design in Cascade Natural Gas Corporation Request for General Rate Revision, Public Utility Commission of Oregon, Docket No. UG 390.
 - Davison Van Cleve, PC, Portland, OR 2020
Retained as an expert witness for Alliance of Western Energy Consumers regarding net power costs in Portland General Electric Company 2021 Annual Power Cost Update Tariff, Public Utility Commission of Oregon, Docket No. UE 377.
 - Davison Van Cleve, PC, Portland, OR 2020
Retained as an expert witness for Alliance of Western Energy Consumers regarding net power costs in Portland General Electric Company 2021 Annual Update Tariff, Public Utility Commission of Oregon, Docket No. UE 381.
 - Davison Van Cleve, PC, Portland, OR 2020
Retained as an expert witness for Alliance of Western Energy Consumers regarding revenue requirement, rate spread and rate design in Nevada Power Company 2021 General Rate Case, Public Utility Commission of Nevada, Docket No. 20-06003
 - Frank & Salahuddin LLC, Denver, Colorado, 2020
Retained as an expert witness for plaintiffs regarding calculation of lost earnings.
 - ba, Denver, Colorado, 2020

- Retained as an expert witness for plaintiffs regarding calculation of lost earnings.
- Level Development Group, LLC, Denver, Colorado, 2020
Develop real estate valuation model for establishing sale price of newly constructed residential housing.
- Hagens Berman Sobol Shapiro LLP, Phoenix, Arizona, 2020
Deposed as an expert witness for plaintiffs re calculation of economic harm due to breach of contract in Jeff Olberg v. Allstate Insurance Company, Case No. C18-0573-JCC, United States District Court, Western District of Washington at Seattle.
- Hagens Berman Sobol Shapiro LLP, Phoenix, Arizona, 2020
Deposed as an expert witness for plaintiffs re calculation of economic harm due to breach of contract in re Cameron Lundquist v. First National Insurance Company of America, Case No. 18-cv-05301-RJB, United States District Court, Western District of Washington at Tacoma.
- Killmer, Lane, and Newman, LLP, Denver, Colorado, 2020
Deposed as expert witness for plaintiff re racial disparities in police use of force re Brandon Washington V. City Of Aurora, Colorado, Case No. 1:19-cv-01160-RM-MEH, United States District Court, District of Colorado.
- Davison Van Cleve, PC, Portland, OR 2020
Retained as an expert witness for Alliance of Western Energy Consumers regarding coal plant pollution control investments, coal plant decommissioning costs, rate spread and rate design re PacifiCorp 2020 Request for a General Rate Revision, Public Utility Commission of Oregon Docket No. UE 374.
- Davison Van Cleve, PC, Portland, OR and Washington Attorney General, 2020
Retained as an expert witness for Packaging Company of America and Washington Public Council regarding decommissioning costs and rate design re PacifiCorp 2020 Request for a General Rate Revision, Washington Utility and Transportation Commission.
- Sanger Law, PC, Portland, OR, 2019
Retained as a consultant for Renewable Energy Coalition and for Northwest & Intermountain Power Producers Coalition to provide analysis of PacifiCorp avoided costs in a Utility PURPA Compliance Filing at the Washington Utility and Transportation Commission Docket, No. UE-190666.
- Sanger Law, PC, Portland, OR, 2019
Retained as a consultant for Northwest & Intermountain Power Producers Coalition to provide analysis of Portland General Electric avoided costs in support of testimony to the Oregon Legislature.
- Powder River Basin Resource Council, Laramie, Wyoming, 2019.
Testified as an expert witness for Powder River Basin Resource Council regarding coal plant closures re PacifiCorp 2019 Integrated Resource Plan, Wyoming Public Service Commission Docket No. 90000-147-XI-19.
- The Law Office of Ralph Lamar, Arvada, CO 2019
Deposed as an expert witness for plaintiffs regarding lost profits of a Farmers insurance agency
- Jester, Gibson & Moore, Denver, CO 2019

- Retained as an expert witness for plaintiffs regarding lost earnings in an ADEA wrongful termination matter.
- Albrechta & Coble, Ltd. Fremont, OH 2019
Retained as an expert witness for plaintiff regarding lost earnings in a race related wrongful termination matter.
 - Conrad Law, PC, Salt Lake City, UT 2019
Retained as an expert witness for Ellis-Hall Consultants, LLC. regarding economic damages in Ellis-Hall Consultants, LLC. et. al. v. George B. Hofmann IV, United States District Court, District of Utah, Central Division.
 - Davison Van Cleve, PC, Portland, OR 2019
Retained as an expert witness for Alliance of Western Energy Consumers regarding net variable power cost calculations in PORTLAND GENERAL ELECTRIC COMPANY, 2020 Annual Power Cost Update Tariff Public Utility Commission of Oregon Docket No. UE 359.
 - Sanger Law, PC, Portland, OR, 2019
Testified as an expert witness for Renewable Energy Coalition and Rocky Mountain Coalition for Renewable Energy regarding Qualified Facility avoided costs in Application of Rocky Mountain Power for a Modification of Avoided Cost Methodology and Reduced Term of PURPA Power Purchase Agreements Public Service Commission of Wyoming Docket No. 20000-545-ET-18
 - Sanger Law, PC, Portland, OR, 2019
Retained as an expert witness for Cafeto Coffee Company regarding the necessity, design, and location of transmission lines in SPRINGFIELD UTILITY BOARD Petition for Certificate of Public Convenience and Necessity Public Utility Commission of Oregon Docket No. PCN 3.
 - Baumgartner Law, LLC, Denver, CO, 2018
Retained as an expert witness for plaintiffs re calculation of economic harm due to injury in re Eric Bowman, v. Top Tier Colorado, LLC., Case No. 18CV31359, United States District Court, District of Colorado.
 - Cohen Milstein Sellers & Toll PLLC, Washington DC, 2018
Retained as an expert witness for plaintiffs re calculation of economic harm due to breach of contract in re Isaac Harris et al. v. Medical Transportation Management, Inc., Civil Action No. 17-1371, United States District Court, District of Columbia.
 - Davison Van Cleve, PC, Portland, OR 2020
Retained as an expert witness for Alliance of Western Energy Consumers regarding depreciation rates in re PacifiCorp Application for Authority to Implement Revised Depreciation Rates, Public Utility Commission of Oregon Docket No. UM 1968.
 - Davison Van Cleve, PC, Salem, OR and Washington Attorney General, OR 2020
Retained as an expert witness for Packaging Company of America and Washington Public Council regarding depreciation rates in re Pacific Power 2018 Depreciation Study, Washington Utility and Transportation Commission, Docket No. UE-180778.
 - Hagens Berman Sobol Shapiro LLP, Phoenix, Arizona, 2018
Deposed as an expert witness for plaintiffs re calculation of economic harm due to breach of contract in re Vicky Maldonado and Carter v. Apple Inc., AppleCare Services

Company, Inc., and Apple CSC, Inc., Case No. 3:16-cv-04067-WHO, United States District Court, District of California.

- Hagens Berman Sobol Shapiro, LLP, Phoenix, Arizona, 2018
Deposed and testified as an expert witness for plaintiffs re calculation of unpaid mileage for truck drivers in re Swift Transportation Co., Inc., Civil Action No. CV2004-001777, Superior Court of the State of Arizona, County of Maricopa.
- Killmer, Lane, and Newman, LLP, Denver, Colorado, 2018
Retained as expert witness for plaintiffs re reasonable attorney fees in re Jeanne Stroup and Ruben Lee, v. United Airlines, Inc., Case No. 15-cv-01389-WYD-STV, United States District Court, District of Colorado.
- Klein and Frank, PC, Denver, Colorado, 2018
Retained as expert witness for plaintiffs re potential jury bias in re Gail Goehrig and Chris Goehrig v. Core Mountain Enterprises, LLC, Case No. 2016CV030004, San Juan County District Court.
- Robert Belluso, Pennsylvania, 2017
Retained as expert witness for plaintiff re lost profit in re Robert Belluso D.O. v Trustees of Charleroi Community Park, PHRC Case No. 201505365, Pennsylvania Human Relations Commission.
- Lowery Parady, LLC, Denver, Colorado, 2017
Analyzed payroll data and calculated unpaid overtime and unpaid hours for plaintiff class action in re Violeta Solis, et al. v. The Circle Group, LLC, et al., Case No. 1:16-cv-01329-RBJ, United States District Court, District of Colorado.
- Sawaya & Miller Law Firm, Denver, Colorado, 2017
Provided data processing and analysis of employment records.
- Financial Scholars Group, Orinda, California, 2017
Provided analysis of risk profile in bundled real estate and personal loans in re Old Republic Insurance Company v. Countrywide Bank et al., Circuit Court of Cook County, Illinois, Chancery Division.
- Financial Scholars Group, Orinda, California, 2017
Provided consultation and analysis of financial market transactions in preparation of settlement claims filings in re Laydon v. Mizuho Bank, Ltd., et al. and Sonterra Capital Master Fund Ltd., et al v. UBS AG et al.
- Clean Energy Action, Boulder, Colorado, 2016 – 2017
Provided consultation on the appropriate discounting methodology used in energy resource planning in the Public Service Company of Colorado application for approval of the 2016 Electric Resource Plan, Proceeding No. 16A-0396E, Public Utilities Commission of the State of Colorado.
- Confidential Client, 2016
Provided analysis and report on the probability that distinct crimes are independent events based on geographical analysis of crime rates.
- Christine Lamb and Kevin James Burns, Denver, Colorado, 2016
Provided data analysis for defendant of the impact of ethnicity on termination decisions in re Aragon et al v. Home Depot USA, Inc., Case No. 1:15-cv- 00466-MCA-KK, United States District Court, District of New Mexico.
- Steptoe & Johnson LLP, Washington, DC, 2015 – 2016

Programmed analysis of internet traffic data for plaintiffs applying a proprietary probability model developed to identify and verify accounts responsible for repeated infringements of asserted copyrights by defendants' internet subscribers in re BMG Rights Management (US) LLC, and Round Hill Music LP v. Cox Enterprises, Inc., et al., Case No. 1:14-cv-1611(LOG/JFA), United States District Court Eastern District of Virginia, Alexandria Division.

- Padilla & Padilla, PLLC, Denver, Colorado, 2014 – 2016
Provided research and analysis for plaintiffs re the impact on minority applicants from use of the AccuPlacer Test by the City and County of Denver, and estimated damages in re Marian G. Kerner et al. v. City and County of Denver, Civil Action No. 11-cv-00256-MSK-KMT, United States District Court, District of Colorado.
- U.S. Equal Employment Opportunity Commission, 2013
Provided statistical analysis of EEOC filings.

OTHER REGULATORY PROCEEDINGS:

- Portland General Electric 2016 Annual Power Cost Variance Docket No. UE 329.
- PacifiCorp 2016 Power Cost Adjustment Mechanism Docket No. UE 327.
- Public Utility Commission of Oregon Staff Investigation into the Treatment of New Facility Direct Access Charges Docket No. UM 1837
- PacifiCorp Oregon Specific Cost Allocation Investigation Docket No. UM 1824.
- PacifiCorp 2018 Transition Adjustment Mechanism Docket No. UE 323.
- Portland General Electric 2018 General Rate Case Docket No. UE 319.
- Avista Corp. 2017 General Rate Case Docket No. UG 325.
- Portland General Electric Affiliated Interest Agreement with Portland General Gas Supply Docket No. UI 376.
- Portland General Electric 2017 Automated Update Tariff Docket No. UE 308
- PacifiCorp 2017 Transition Adjustment Mechanism Docket No. UE 307
- Portland General Electric 2017 Reauthorization of Decoupling Adjustment Docket No. UE 306
- Northwest Natural Gas Investigation of WARM Program Docket No. UM 1750.
- PacifiCorp Investigation into Multi-Jurisdictional Allocation Issues Docket No. UM 1050.
- Idaho Power Company 2015 Power Supply Expense True Up Docket No. UE 305
- Homer Electric Association 2015 Depreciation Study U-15-094
- Submitted prefiled testimony regarding the depreciation study.
- Chugach Electric Association 2015 Rate Case U-15-081
- Developed staff position regarding margin calculations.
- ENSTAR 2014 Rate Case U-14-111
- Submitted prefiled testimony regarding sales forecast.
- Alaska Pacific Environmental Services 2014 Rate Case U-14-114/115/116/117/118
Submitted prefiled testimony regarding cost allocations, cost of service, cost of capital, affiliated interests, and depreciation.
- Alaska Waste 2014 Rate Case U-14-104/105/106/107
Submitted prefiled testimony regarding cost of service study, cost of capital, operating ratio, and affiliated interest real estate contracts.
- Fairbanks Natural Gas 2014 Rate Case U-14-102

- Submitted prefiled testimony regarding cost of service study and forecasting models.
- Avista 2015 Rate Case U-14-104
 - Submitted analysis supporting OPUC Staff settlement positions regarding Avista's sales and load forecast, decoupling mechanisms and interstate cost allocation methodology. Represented Staff in settlement conferences on November 21, November 26, and December 4, 2013.
- Portland General Electric 2015 Rate Case
 - Submitted pre-filed opening testimony addressing PGE's sales forecast, printing and mailing budget forecast, mailing budget, marginal cost study, line extension policy and reactive demand charge. Represented OPUC Staff in settlement conferences on May 20, May 27, and June 12, 2014.
- Portland General Electric 2014 General Rate Case
 - Submitted analysis supporting OPUC Staff settlement positions regarding PGE's sales and load forecast, revenue decoupling mechanism, and cost of service study. Represented OPUC Staff in settlement conferences on May 29, June 3, June 6, July 2, and July 9 of 2013. Submitted testimony in support of partial stipulation, pre-filed opening testimony addressing PGE's decoupling mechanism, and testimony in support of a second partial stipulation.
- PacifiCorp 2014 General Electric Rate Case
 - Submitted analysis supporting OPUC Staff settlement positions regarding PacifiCorp's sales and load forecast and cost of service study. Represented Staff in settlement conferences on June 12 through June 14, 2013.