TFP Ratepayer Impacts

Impact of 0.457% TFP vs. -1.04% TFP

```
# ============================================================
# Revenue Cap Comparison
# ============================================================
#
# PURPOSE
# -------
# Compare two revenue-cap growth scenarios and calculate:
#
# 1. Revenue cap in each year
# 2. Annual revenue-cap differences
# 3. Differences in year-over-year revenue growth
#
# ============================================================

# Starting (Year 1) Revenue Requirement
#source: https://www.dpuc.state.ct.us/dockcurr.nsf/8e6fc37a54110e3e852576190052b
#        64d/77f37bbd90a404ab85258dfd006b184f/$FILE/18028239.pdf/Exhibit%20CLP-
#        ACOS-2.pdf #Table 1
base_revenue = 2_170_752_260

# ------------------------------------------------------------
# ANNUAL GROWTH RATES
# ------------------------------------------------------------
#
## Assumed inflation rate (3%)
#rough assumption guided by historical US data from 2023-2026
#https://www.usinflationcalculator.com/inflation/historical-inflation-rates/
#
## Revenue cap multipliers
# based on equation on "pg. v" here: https://www.dpuc.state.ct.us/dockcurr.nsf/
#                                    8e6fc37a54110e3e852576190052b64d/1555634f73a
#                                    e53a685258cc7007a62fb/$FILE/21-05-15RE01%20P
#                                    FD.pdf
#
# Proposed Growth (-1.04% TFP):
#   3.0% inflation + 1.04% adjustment

proposed_growth_factor = 1.0404


# Alternative Growth (0.457% TFP):
#   3.0% inflation - 0.457% adjustment

alternative_growth_factor = 1.02543


# Number of years in the rate plan
# (Year 1 is the base year)
years = 4

# ============================================================
# STEP 1:
# CALCULATE REVENUE CAPS FOR EACH YEAR
# ============================================================

proposed_revenues = [base_revenue]
alternative_revenues = [base_revenue]

for year in range(2, years + 1):

    proposed_revenues.append(
        proposed_revenues[-1] * proposed_growth_factor
    )

    alternative_revenues.append(
        alternative_revenues[-1] * alternative_growth_factor
    )
```

```python

# ============================================================
# STEP 2:
# DISPLAY REVENUE CAPS BY YEAR
# ============================================================

print("\n================================================")
print("1. REVENUE CAP BY YEAR")
print("================================================")

for year in range(years):

    print(
        f"Year {year + 1}: "
        f"Proposed = ${proposed_revenues[year]:,.0f} | "
        f"Alternative = ${alternative_revenues[year]:,.0f}"
    )

# ============================================================
# STEP 3:
# ANNUAL REVENUE CAP DIFFERENCES
# ============================================================

annual_revenue_differences = []

for year in range(1, years):

    difference = (
        proposed_revenues[year]
        - alternative_revenues[year]
    )

    annual_revenue_differences.append(difference)

print("\n================================================")
print("2. ANNUAL REVENUE CAP DIFFERENCES")
print("================================================")

for year, difference in enumerate(
    annual_revenue_differences,
    start=2
):
    print(f"Year {year}: ${difference:,.0f}")


# ============================================================
# STEP 4:
# YEAR-OVER-YEAR REVENUE GROWTH
# ============================================================
#
# Question Answered:
#
# How much does revenue increase from one year to the next?
#
# ============================================================

proposed_growth_dollars = []
alternative_growth_dollars = []

for year in range(1, years):

    proposed_growth = (
        proposed_revenues[year]
        - proposed_revenues[year - 1]
    )

    alternative_growth = (
        alternative_revenues[year]
        - alternative_revenues[year - 1]
    )

    proposed_growth_dollars.append(
        proposed_growth
    )

    alternative_growth_dollars.append(
        alternative_growth
    )
```

```
146
147 print("\n================================================")
148 print("3. YEAR-OVER-YEAR REVENUE GROWTH")
149 print("================================================")
150
151 for year in range(len(proposed_growth_dollars)):
152
153     print(
154         f"Year {year + 2}: "
155         f"Proposed Increase = "
156         f"${proposed_growth_dollars[year]:,.0f} | "
157         f"Alternative Increase = "
158         f"${alternative_growth_dollars[year]:,.0f}"
159     )
160
161 # ============================================================
162 # STEP 5:
163 # DIFFERENCE IN YEAR-OVER-YEAR GROWTH
164 # ============================================================
165 #
166 # Question Answered:
167 #
168 # How much additional annual revenue growth does the
169 # proposed mechanism provide?
170 #
171 # ============================================================
172
173 growth_differences = []
174
175 for year in range(len(proposed_growth_dollars)):
176
177     growth_difference = (
178         proposed_growth_dollars[year]
179         - alternative_growth_dollars[year]
180     )
181
182     growth_differences.append(
183         growth_difference
184     )
185
186 print("\n================================================")
187 print("5. DIFFERENCE IN YEAR-OVER-YEAR GROWTH")
188 print("================================================")
189
190 for year, difference in enumerate(
191     growth_differences,
192     start=2
193 ):
194     print(
195         f"Year {year}: "
196         f"${difference:,.0f}"
197     )
198
199 # ============================================================
200 # STEP 6:
201 # SUMMARY
202 # ============================================================
203
204 print("\n================================================")
205 print("SUMMARY")
206 print("================================================")
207
208 print(
209     f"Year-4 Revenue Cap Difference: "
210     f"${annual_revenue_differences[-1]:,.0f}"
211 )
212
213 print(
214     f"Year-4 Growth Difference: "
215     f"${growth_differences[-1]:,.0f}"
216 )
217
218 # ============================================================
219 # INTERPRETING RESULTS
220 # ============================================================
221 #
222 # Revenue Cap Difference:
```

```
#    Difference in total allowed revenues in a given year.
#
# Revenue Growth:
#    The annual increase in revenues from one year to
#    the next.
#
# Growth Difference:
#    The portion of annual growth attributable to the
#    differing growth factors (e.g., in this case, the X-factor).
#
# ============================================================
```

```
================================================
1. REVENUE CAP BY YEAR
================================================
Year 1: Proposed = $2,170,752,260 | Alternative = $2,170,752,260
Year 2: Proposed = $2,258,450,651 | Alternative = $2,225,954,490
Year 3: Proposed = $2,349,692,058 | Alternative = $2,282,560,513
Year 4: Proposed = $2,444,619,617 | Alternative = $2,340,606,026

================================================
2. ANNUAL REVENUE CAP DIFFERENCES
================================================
Year 2: $32,496,161
Year 3: $67,131,545
Year 4: $104,013,590

================================================
3. YEAR-OVER-YEAR REVENUE GROWTH
================================================
Year 2: Proposed Increase = $87,698,391 | Alternative Increase = $55,202,230
Year 3: Proposed Increase = $91,241,406 | Alternative Increase = $56,606,023
Year 4: Proposed Increase = $94,927,559 | Alternative Increase = $58,045,514

================================================
5. DIFFERENCE IN YEAR-OVER-YEAR GROWTH
================================================
Year 2: $32,496,161
Year 3: $34,635,384
Year 4: $36,882,045

================================================
SUMMARY
================================================
Year-4 Revenue Cap Difference: $104,013,590
Year-4 Growth Difference: $36,882,045
```

Impact of 0.457% TFP vs. -1.41% TFP

```
# ============================================================
# Revenue Cap Comparison
# ============================================================
#
# PURPOSE
# -------
# Compare two revenue-cap growth scenarios and calculate:
#
# 1. Revenue cap in each year
# 2. Annual revenue-cap differences
# 3. Differences in year-over-year revenue growth
#
# ============================================================

# Starting (Year 1) Revenue Requirement
#source: https://www.dpuc.state.ct.us/dockcurr.nsf/8e6fc37a54110e3e852576190052b
#        64d/77f37bbd90a404ab85258dfd006b184f/$FILE/18028239.pdf/Exhibit%20CLP-
#        ACOS-2.pdf #Table 1
base_revenue = 2_170_752_260

# ------------------------------------------------------------
# ANNUAL GROWTH RATES
# ------------------------------------------------------------
#
## Assumed inflation rate (3%)
#rough assumption guided by historical US data from 2023-2026
#https://www.usinflationcalculator.com/inflation/historical-inflation-rates/
#
```

```
## Revenue cap multipliers
# based on equation on "pg. v" here: https://www.dpuc.state.ct.us/dockcurr.nsf/
#                                    8e6fc37a54110e3e852576190052b64d/1555634f73a
#                                    e53a685258cc7007a62fb/$FILE/21-05-15RE01%20P
#                                    FD.pdf
#
# Proposed Growth (-1.41% TFP):
#   3.0% inflation + 1.41% adjustment

proposed_growth_factor = 1.0441


# Alternative Growth (0.457% TFP):
#   3.0% inflation - 0.457% adjustment

alternative_growth_factor = 1.02543


# Number of years in the rate plan
# (Year 1 is the base year)
years = 4

# ============================================================
# STEP 1:
# CALCULATE REVENUE CAPS FOR EACH YEAR
# ============================================================

proposed_revenues = [base_revenue]
alternative_revenues = [base_revenue]

for year in range(2, years + 1):

    proposed_revenues.append(
        proposed_revenues[-1] * proposed_growth_factor
    )

    alternative_revenues.append(
        alternative_revenues[-1] * alternative_growth_factor
    )

# ============================================================
# STEP 2:
# DISPLAY REVENUE CAPS BY YEAR
# ============================================================

print("\n================================================")
print("1. REVENUE CAP BY YEAR")
print("================================================")

for year in range(years):

    print(
        f"Year {year + 1}: "
        f"Proposed = ${proposed_revenues[year]:,.0f} | "
        f"Alternative = ${alternative_revenues[year]:,.0f}"
    )

# ============================================================
# STEP 3:
# ANNUAL REVENUE CAP DIFFERENCES
# ============================================================

annual_revenue_differences = []

for year in range(1, years):

    difference = (
        proposed_revenues[year]
        - alternative_revenues[year]
    )

    annual_revenue_differences.append(difference)

print("\n================================================")
print("2. ANNUAL REVENUE CAP DIFFERENCES")
print("================================================")

for year, difference in enumerate(
```

```
    annual_revenue_differences,
    start=2
):
    print(f"Year {year}: ${difference:,.0f}")


# ============================================================
# STEP 4:
# YEAR-OVER-YEAR REVENUE GROWTH
# ============================================================
#
# Question Answered:
#
# How much does revenue increase from one year to the next?
#
# ============================================================

proposed_growth_dollars = []
alternative_growth_dollars = []

for year in range(1, years):

    proposed_growth = (
        proposed_revenues[year]
        - proposed_revenues[year - 1]
    )

    alternative_growth = (
        alternative_revenues[year]
        - alternative_revenues[year - 1]
    )

    proposed_growth_dollars.append(
        proposed_growth
    )

    alternative_growth_dollars.append(
        alternative_growth
    )

print("\n================================================")
print("3. YEAR-OVER-YEAR REVENUE GROWTH")
print("================================================")

for year in range(len(proposed_growth_dollars)):

    print(
        f"Year {year + 2}: "
        f"Proposed Increase = "
        f"${proposed_growth_dollars[year]:,.0f} | "
        f"Alternative Increase = "
        f"${alternative_growth_dollars[year]:,.0f}"
    )

# ============================================================
# STEP 5:
# DIFFERENCE IN YEAR-OVER-YEAR GROWTH
# ============================================================
#
# Question Answered:
#
# How much additional annual revenue growth does the
# proposed mechanism provide?
#
# ============================================================

growth_differences = []

for year in range(len(proposed_growth_dollars)):

    growth_difference = (
        proposed_growth_dollars[year]
        - alternative_growth_dollars[year]
    )

    growth_differences.append(
        growth_difference
```

```
    )

print("\n================================================")
print("5. DIFFERENCE IN YEAR-OVER-YEAR GROWTH")
print("================================================")

for year, difference in enumerate(
    growth_differences,
    start=2
):
    print(
        f"Year {year}: "
        f"${difference:,.0f}"
    )

# ============================================================
# STEP 6:
# SUMMARY
# ============================================================

print("\n================================================")
print("SUMMARY")
print("================================================")

print(
    f"Year-4 Revenue Cap Difference: "
    f"${annual_revenue_differences[-1]:,.0f}"
)

print(
    f"Year-4 Growth Difference: "
    f"${growth_differences[-1]:,.0f}"
)

# ============================================================
# INTERPRETING RESULTS
# ============================================================
#
# Revenue Cap Difference:
#    Difference in total allowed revenues in a given year.
#
# Revenue Growth:
#    The annual increase in revenues from one year to
#    the next.
#
# Growth Difference:
#    The portion of annual growth attributable to the
#    differing growth factors (e.g., in this case, the X-factor).
#
# ============================================================
```

```
================================================
1. REVENUE CAP BY YEAR
================================================
Year 1: Proposed = $2,170,752,260 | Alternative = $2,170,752,260
Year 2: Proposed = $2,266,482,435 | Alternative = $2,225,954,490
Year 3: Proposed = $2,366,434,310 | Alternative = $2,282,560,513
Year 4: Proposed = $2,470,794,063 | Alternative = $2,340,606,026

================================================
2. ANNUAL REVENUE CAP DIFFERENCES
================================================
Year 2: $40,527,945
Year 3: $83,873,797
Year 4: $130,188,037

================================================
3. YEAR-OVER-YEAR REVENUE GROWTH
================================================
Year 2: Proposed Increase = $95,730,175 | Alternative Increase = $55,202,230
Year 3: Proposed Increase = $99,951,875 | Alternative Increase = $56,606,023
Year 4: Proposed Increase = $104,359,753 | Alternative Increase = $58,045,514

================================================
5. DIFFERENCE IN YEAR-OVER-YEAR GROWTH
================================================
Year 2: $40,527,945
Year 3: $43,345,853
Year 4: $46,314,239
```

```
================================================
SUMMARY
================================================
Year-4 Revenue Cap Difference: $130,188,037
Year-4 Growth Difference: $46,314,239
```

Impact of 0.678% TFP vs. -1.04% TFP

```python
# ============================================================
# Revenue Cap Comparison
# ============================================================
#
# PURPOSE
# -------
# Compare two revenue-cap growth scenarios and calculate:
#
# 1. Revenue cap in each year
# 2. Annual revenue-cap differences
# 3. Differences in year-over-year revenue growth
#
# ============================================================

# Starting (Year 1) Revenue Requirement
#source: https://www.dpuc.state.ct.us/dockcurr.nsf/8e6fc37a54110e3e852576190052b
#        64d/77f37bbd90a404ab85258dfd006b184f/$FILE/18028239.pdf/Exhibit%20CLP-
#        ACOS-2.pdf #Table 1
base_revenue = 2_170_752_260

# ------------------------------------------------------------
# ANNUAL GROWTH RATES
# ------------------------------------------------------------
#
## Assumed inflation rate (3%)
#rough assumption guided by historical US data from 2023-2026
#https://www.usinflationcalculator.com/inflation/historical-inflation-rates/
#
## Revenue cap multipliers
# based on equation on "pg. v" here: https://www.dpuc.state.ct.us/dockcurr.nsf/
#                                    8e6fc37a54110e3e852576190052b64d/1555634f73a
#                                    e53a685258cc7007a62fb/$FILE/21-05-15RE01%20P
#                                    FD.pdf
#
# Proposed Growth (-1.04% TFP):
#   3.0% inflation + 1.04% adjustment

proposed_growth_factor = 1.0404


# Alternative Growth (0.678% TFP):
#   3.0% inflation - 0.678% adjustment

alternative_growth_factor = 1.02322


# Number of years in the rate plan
# (Year 1 is the base year)
years = 4

# ============================================================
# STEP 1:
# CALCULATE REVENUE CAPS FOR EACH YEAR
# ============================================================

proposed_revenues = [base_revenue]
alternative_revenues = [base_revenue]

for year in range(2, years + 1):

    proposed_revenues.append(
        proposed_revenues[-1] * proposed_growth_factor
    )

    alternative_revenues.append(
        alternative_revenues[-1] * alternative_growth_factor
    )
```

```
    )

# ============================================================
# STEP 2:
# DISPLAY REVENUE CAPS BY YEAR
# ============================================================

print("\n================================================")
print("1. REVENUE CAP BY YEAR")
print("================================================")

for year in range(years):

    print(
        f"Year {year + 1}: "
        f"Proposed = ${proposed_revenues[year]:,.0f} | "
        f"Alternative = ${alternative_revenues[year]:,.0f}"
    )

# ============================================================
# STEP 3:
# ANNUAL REVENUE CAP DIFFERENCES
# ============================================================

annual_revenue_differences = []

for year in range(1, years):

    difference = (
        proposed_revenues[year]
        - alternative_revenues[year]
    )

    annual_revenue_differences.append(difference)

print("\n================================================")
print("2. ANNUAL REVENUE CAP DIFFERENCES")
print("================================================")

for year, difference in enumerate(
    annual_revenue_differences,
    start=2
):
    print(f"Year {year}: ${difference:,.0f}")


# ============================================================
# STEP 4:
# YEAR-OVER-YEAR REVENUE GROWTH
# ============================================================
#
# Question Answered:
#
# How much does revenue increase from one year to the next?
#
# ============================================================

proposed_growth_dollars = []
alternative_growth_dollars = []

for year in range(1, years):

    proposed_growth = (
        proposed_revenues[year]
        - proposed_revenues[year - 1]
    )

    alternative_growth = (
        alternative_revenues[year]
        - alternative_revenues[year - 1]
    )

    proposed_growth_dollars.append(
        proposed_growth
    )

    alternative_growth_dollars.append(
        alternative_growth
```

```
    )

print("\n================================================")
print("3. YEAR-OVER-YEAR REVENUE GROWTH")
print("================================================")

for year in range(len(proposed_growth_dollars)):

    print(
        f"Year {year + 2}: "
        f"Proposed Increase = "
        f"${proposed_growth_dollars[year]:,.0f} | "
        f"Alternative Increase = "
        f"${alternative_growth_dollars[year]:,.0f}"
    )

# ============================================================
# STEP 5:
# DIFFERENCE IN YEAR-OVER-YEAR GROWTH
# ============================================================
#
# Question Answered:
#
# How much additional annual revenue growth does the
# proposed mechanism provide?
#
# ============================================================

growth_differences = []

for year in range(len(proposed_growth_dollars)):

    growth_difference = (
        proposed_growth_dollars[year]
        - alternative_growth_dollars[year]
    )

    growth_differences.append(
        growth_difference
    )

print("\n================================================")
print("5. DIFFERENCE IN YEAR-OVER-YEAR GROWTH")
print("================================================")

for year, difference in enumerate(
    growth_differences,
    start=2
):
    print(
        f"Year {year}: "
        f"${difference:,.0f}"
    )

# ============================================================
# STEP 6:
# SUMMARY
# ============================================================

print("\n================================================")
print("SUMMARY")
print("================================================")

print(
    f"Year-4 Revenue Cap Difference: "
    f"${annual_revenue_differences[-1]:,.0f}"
)

print(
    f"Year-4 Growth Difference: "
    f"${growth_differences[-1]:,.0f}"
)

# ============================================================
# INTERPRETING RESULTS
# ============================================================
#
# Revenue Cap Difference:
```

```
# Revenue Cap Difference:
#    Difference in total allowed revenues in a given year.
#
# Revenue Growth:
#    The annual increase in revenues from one year to
#    the next.
#
# Growth Difference:
#    The portion of annual growth attributable to the
#    differing growth factors (e.g., in this case, the X-factor).
#
# ============================================================
```

```
================================================
1. REVENUE CAP BY YEAR
================================================
Year 1: Proposed = $2,170,752,260 | Alternative = $2,170,752,260
Year 2: Proposed = $2,258,450,651 | Alternative = $2,221,157,127
Year 3: Proposed = $2,349,692,058 | Alternative = $2,272,732,396
Year 4: Proposed = $2,444,619,617 | Alternative = $2,325,505,242

================================================
2. ANNUAL REVENUE CAP DIFFERENCES
================================================
Year 2: $37,293,524
Year 3: $76,959,662
Year 4: $119,114,375

================================================
3. YEAR-OVER-YEAR REVENUE GROWTH
================================================
Year 2: Proposed Increase = $87,698,391 | Alternative Increase = $50,404,867
Year 3: Proposed Increase = $91,241,406 | Alternative Increase = $51,575,269
Year 4: Proposed Increase = $94,927,559 | Alternative Increase = $52,772,846

================================================
5. DIFFERENCE IN YEAR-OVER-YEAR GROWTH
================================================
Year 2: $37,293,524
Year 3: $39,666,138
Year 4: $42,154,713

================================================
SUMMARY
================================================
Year-4 Revenue Cap Difference: $119,114,375
Year-4 Growth Difference: $42,154,713
```

Impact of 0.678% TFP vs. -1.41% TFP

```
# ============================================================
# Revenue Cap Comparison
# ============================================================
#
# PURPOSE
# -------
# Compare two revenue-cap growth scenarios and calculate:
#
# 1. Revenue cap in each year
# 2. Annual revenue-cap differences
# 3. Differences in year-over-year revenue growth
#
# ============================================================

# Starting (Year 1) Revenue Requirement
#source: https://www.dpuc.state.ct.us/dockcurr.nsf/8e6fc37a54110e3e852576190052b
#        64d/77f37bbd90a404ab85258dfd006b184f/$FILE/18028239.pdf/Exhibit%20CLP-
#        ACOS-2.pdf #Table 1
base_revenue = 2_170_752_260

# ------------------------------------------------------------
# ANNUAL GROWTH RATES
# ------------------------------------------------------------
#
## Assumed inflation rate (3%)
#rough assumption guided by historical US data from 2023-2026
#https://www.usinflationcalculator.com/inflation/historical-inflation-rates/
```

```
#
## Revenue cap multipliers
# based on equation on "pg. v" here: https://www.dpuc.state.ct.us/dockcurr.nsf/
#                                    8e6fc37a54110e3e852576190052b64d/1555634f73a
#                                    e53a685258cc7007a62fb/$FILE/21-05-15RE01%20P
#                                    FD.pdf
#
# Proposed Growth (-1.41% TFP):
#   3.0% inflation + 1.41% adjustment

proposed_growth_factor = 1.0441


# Alternative Growth (0.678% TFP):
#   3.0% inflation - 0.678% adjustment

alternative_growth_factor = 1.02322


# Number of years in the rate plan
# (Year 1 is the base year)
years = 4

# ============================================================
# STEP 1:
# CALCULATE REVENUE CAPS FOR EACH YEAR
# ============================================================

proposed_revenues = [base_revenue]
alternative_revenues = [base_revenue]

for year in range(2, years + 1):

    proposed_revenues.append(
        proposed_revenues[-1] * proposed_growth_factor
    )

    alternative_revenues.append(
        alternative_revenues[-1] * alternative_growth_factor
    )

# ============================================================
# STEP 2:
# DISPLAY REVENUE CAPS BY YEAR
# ============================================================

print("\n================================================")
print("1. REVENUE CAP BY YEAR")
print("================================================")

for year in range(years):

    print(
        f"Year {year + 1}: "
        f"Proposed = ${proposed_revenues[year]:,.0f} | "
        f"Alternative = ${alternative_revenues[year]:,.0f}"
    )

# ============================================================
# STEP 3:
# ANNUAL REVENUE CAP DIFFERENCES
# ============================================================

annual_revenue_differences = []

for year in range(1, years):

    difference = (
        proposed_revenues[year]
        - alternative_revenues[year]
    )

    annual_revenue_differences.append(difference)

print("\n================================================")
print("2. ANNUAL REVENUE CAP DIFFERENCES")
print("================================================")
```

```
105
106 for year, difference in enumerate(
107     annual_revenue_differences,
108     start=2
109 ):
110     print(f"Year {year}: ${difference:,.0f}")
111
112
113 # ============================================================
114 # STEP 4:
115 # YEAR-OVER-YEAR REVENUE GROWTH
116 # ============================================================
117 #
118 # Question Answered:
119 #
120 # How much does revenue increase from one year to the next?
121 #
122 # ============================================================
123
124 proposed_growth_dollars = []
125 alternative_growth_dollars = []
126
127 for year in range(1, years):
128
129     proposed_growth = (
130         proposed_revenues[year]
131         - proposed_revenues[year - 1]
132     )
133
134     alternative_growth = (
135         alternative_revenues[year]
136         - alternative_revenues[year - 1]
137     )
138
139     proposed_growth_dollars.append(
140         proposed_growth
141     )
142
143     alternative_growth_dollars.append(
144         alternative_growth
145     )
146
147 print("\n================================================")
148 print("3. YEAR-OVER-YEAR REVENUE GROWTH")
149 print("================================================")
150
151 for year in range(len(proposed_growth_dollars)):
152
153     print(
154         f"Year {year + 2}: "
155         f"Proposed Increase = "
156         f"${proposed_growth_dollars[year]:,.0f} | "
157         f"Alternative Increase = "
158         f"${alternative_growth_dollars[year]:,.0f}"
159     )
160
161 # ============================================================
162 # STEP 5:
163 # DIFFERENCE IN YEAR-OVER-YEAR GROWTH
164 # ============================================================
165 #
166 # Question Answered:
167 #
168 # How much additional annual revenue growth does the
169 # proposed mechanism provide?
170 #
171 # ============================================================
172
173 growth_differences = []
174
175 for year in range(len(proposed_growth_dollars)):
176
177     growth_difference = (
178         proposed_growth_dollars[year]
179         - alternative_growth_dollars[year]
180     )
181
```

```
    growth_differences.append(
        growth_difference
    )

print("\n================================================")
print("5. DIFFERENCE IN YEAR-OVER-YEAR GROWTH")
print("================================================")

for year, difference in enumerate(
    growth_differences,
    start=2
):
    print(
        f"Year {year}: "
        f"${difference:,.0f}"
    )

# ============================================================
# STEP 6:
# SUMMARY
# ============================================================

print("\n================================================")
print("SUMMARY")
print("================================================")

print(
    f"Year-4 Revenue Cap Difference: "
    f"${annual_revenue_differences[-1]:,.0f}"
)

print(
    f"Year-4 Growth Difference: "
    f"${growth_differences[-1]:,.0f}"
)

# ============================================================
# INTERPRETING RESULTS
# ============================================================
#
# Revenue Cap Difference:
#    Difference in total allowed revenues in a given year.
#
# Revenue Growth:
#    The annual increase in revenues from one year to
#    the next.
#
# Growth Difference:
#    The portion of annual growth attributable to the
#    differing growth factors (e.g., in this case, the X-factor).
#
# ============================================================
```

```
================================================
1. REVENUE CAP BY YEAR
================================================
Year 1: Proposed = $2,170,752,260 | Alternative = $2,170,752,260
Year 2: Proposed = $2,266,482,435 | Alternative = $2,221,157,127
Year 3: Proposed = $2,366,434,310 | Alternative = $2,272,732,396
Year 4: Proposed = $2,470,794,063 | Alternative = $2,325,505,242

================================================
2. ANNUAL REVENUE CAP DIFFERENCES
================================================
Year 2: $45,325,307
Year 3: $93,701,914
Year 4: $145,288,821

================================================
3. YEAR-OVER-YEAR REVENUE GROWTH
================================================
Year 2: Proposed Increase = $95,730,175 | Alternative Increase = $50,404,867
Year 3: Proposed Increase = $99,951,875 | Alternative Increase = $51,575,269
Year 4: Proposed Increase = $104,359,753 | Alternative Increase = $52,772,846

================================================
5. DIFFERENCE IN YEAR-OVER-YEAR GROWTH
================================================
```

```
Year 2: $45,325,307
Year 3: $48,376,607
Year 4: $51,586,907

================================================
SUMMARY
================================================
Year-4 Revenue Cap Difference: $145,288,821
Year-4 Growth Difference: $51,586,907
```

OM&A PFP Ratepayer Impacts

Impact of -0.03% vs. 0.675% OM&A PFP

```python
# ============================================================
# Revenue Cap Comparison
# ============================================================
#
# PURPOSE
# -------
# Compare two revenue-cap growth scenarios and calculate:
#
# 1. Revenue cap in each year
# 2. Annual revenue-cap differences
# 3. Differences in year-over-year revenue growth
#
# ============================================================

# Starting (Year 1) Operating Expenses
#source: https://www.dpuc.state.ct.us/dockcurr.nsf/8e6fc37a54110e3e852576190052b
#        64d/77f37bbd90a404ab85258dfd006b184f/$FILE/18028239.pdf/Exhibit%20CLP-A
#        COS-2.pdf #Table 1 line 37, p. 8
base_revenue = 1_394_279_000

# ------------------------------------------------------------
# ANNUAL GROWTH RATES
# ------------------------------------------------------------
#
## Assumed inflation rate (3%)
#rough assumption guided by historical US data from 2023-2026
#https://www.usinflationcalculator.com/inflation/historical-inflation-rates/
#
## Revenue cap multipliers
# based on equation on "pg. v" here: https://www.dpuc.state.ct.us/dockcurr.nsf/
#                                    8e6fc37a54110e3e852576190052b64d/1555634f73a
#                                    e53a685258cc7007a62fb/$FILE/21-05-15RE01%20P
#                                    FD.pdf
#
# Proposed Growth (-0.03% OM&A PFP):
#   3.0% inflation + 0.03% adjustment

proposed_growth_factor = 1.0303


# Alternative Growth (0.675% OM&A PFP):
#   3.0% inflation - 0.675% adjustment

alternative_growth_factor = 1.02325


# Number of years in the rate plan
# (Year 1 is the base year)
years = 4

# ============================================================
# STEP 1:
# CALCULATE REVENUE CAPS FOR EACH YEAR
# ============================================================

proposed_revenues = [base_revenue]
alternative_revenues = [base_revenue]

for year in range(2, years + 1):

```

```
    proposed_revenues.append(
        proposed_revenues[-1] * proposed_growth_factor
    )

    alternative_revenues.append(
        alternative_revenues[-1] * alternative_growth_factor
    )

# ============================================================
# STEP 2:
# DISPLAY REVENUE CAPS BY YEAR
# ============================================================

print("\n================================================")
print("1. REVENUE CAP BY YEAR")
print("================================================")

for year in range(years):

    print(
        f"Year {year + 1}: "
        f"Proposed = ${proposed_revenues[year]:,.0f} | "
        f"Alternative = ${alternative_revenues[year]:,.0f}"
    )

# ============================================================
# STEP 3:
# ANNUAL REVENUE CAP DIFFERENCES
# ============================================================

annual_revenue_differences = []

for year in range(1, years):

    difference = (
        proposed_revenues[year]
        - alternative_revenues[year]
    )

    annual_revenue_differences.append(difference)

print("\n================================================")
print("2. ANNUAL REVENUE CAP DIFFERENCES")
print("================================================")

for year, difference in enumerate(
    annual_revenue_differences,
    start=2
):
    print(f"Year {year}: ${difference:,.0f}")


# ============================================================
# STEP 4:
# YEAR-OVER-YEAR REVENUE GROWTH
# ============================================================
#
# Question Answered:
#
# How much does revenue increase from one year to the next?
#
# ============================================================

proposed_growth_dollars = []
alternative_growth_dollars = []

for year in range(1, years):

    proposed_growth = (
        proposed_revenues[year]
        - proposed_revenues[year - 1]
    )

    alternative_growth = (
        alternative_revenues[year]
        - alternative_revenues[year - 1]
    )

```

```
    proposed_growth_dollars.append(
        proposed_growth
    )

    alternative_growth_dollars.append(
        alternative_growth
    )

print("\n================================================")
print("3. YEAR-OVER-YEAR REVENUE GROWTH")
print("================================================")

for year in range(len(proposed_growth_dollars)):

    print(
        f"Year {year + 2}: "
        f"Proposed Increase = "
        f"${proposed_growth_dollars[year]:,.0f} | "
        f"Alternative Increase = "
        f"${alternative_growth_dollars[year]:,.0f}"
    )

# ============================================================
# STEP 5:
# DIFFERENCE IN YEAR-OVER-YEAR GROWTH
# ============================================================
#
# Question Answered:
#
# How much additional annual revenue growth does the
# proposed mechanism provide?
#
# ============================================================

growth_differences = []

for year in range(len(proposed_growth_dollars)):

    growth_difference = (
        proposed_growth_dollars[year]
        - alternative_growth_dollars[year]
    )

    growth_differences.append(
        growth_difference
    )

print("\n================================================")
print("5. DIFFERENCE IN YEAR-OVER-YEAR GROWTH")
print("================================================")

for year, difference in enumerate(
    growth_differences,
    start=2
):
    print(
        f"Year {year}: "
        f"${difference:,.0f}"
    )

# ============================================================
# STEP 6:
# SUMMARY
# ============================================================

print("\n================================================")
print("SUMMARY")
print("================================================")

print(
    f"Year-4 Revenue Cap Difference: "
    f"${annual_revenue_differences[-1]:,.0f}"
)

print(
    f"Year-4 Growth Difference: "
    f"${growth_differences[-1]:,.0f}"
```

```
)

# ============================================================
# INTERPRETING RESULTS
# ============================================================
#
# Revenue Cap Difference:
#    Difference in total allowed revenues in a given year.
#
# Revenue Growth:
#    The annual increase in revenues from one year to
#    the next.
#
# Growth Difference:
#    The portion of annual growth attributable to the
#    differing growth factors (e.g., in this case, the X-factor).
#
# ============================================================
```

```
================================================
1. REVENUE CAP BY YEAR
================================================
Year 1: Proposed = $1,394,279,000 | Alternative = $1,394,279,000
Year 2: Proposed = $1,436,525,654 | Alternative = $1,426,695,987
Year 3: Proposed = $1,480,052,381 | Alternative = $1,459,866,668
Year 4: Proposed = $1,524,897,968 | Alternative = $1,493,808,568

================================================
2. ANNUAL REVENUE CAP DIFFERENCES
================================================
Year 2: $9,829,667
Year 3: $20,185,713
Year 4: $31,089,400

================================================
3. YEAR-OVER-YEAR REVENUE GROWTH
================================================
Year 2: Proposed Increase = $42,246,654 | Alternative Increase = $32,416,987
Year 3: Proposed Increase = $43,526,727 | Alternative Increase = $33,170,682
Year 4: Proposed Increase = $44,845,587 | Alternative Increase = $33,941,900

================================================
5. DIFFERENCE IN YEAR-OVER-YEAR GROWTH
================================================
Year 2: $9,829,667
Year 3: $10,356,046
Year 4: $10,903,687

================================================
SUMMARY
================================================
Year-4 Revenue Cap Difference: $31,089,400
Year-4 Growth Difference: $10,903,687
```