Cal Poly Humboldt
Schatz Energy Research Center

North Coast Offshore Wind Transmission Infrastructure Ratepayer Cost Impact Analysis

This analysis was conducted by Tanner Etherton and Arne Jacobson of the Schatz Energy Research Center and the California Sea Grant Extension Program. This report was published by the Schatz Energy Research Center in February 2026.

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Acknowledgments

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Contents

I. Executive Summary

This analysis estimates the cost to California electricity customers from the two proposed transmission projects approved by the California Independent System Operator (CAISO), which would deliver offshore wind power from the Humboldt Wind Energy Area to the onshore electrical grid while also providing other resiliency and resource diversification benefits to the bulk electric system. The projects include (1) a new 500 kV substation in the Humboldt Bay region (new Humboldt substation) with a 500 kV line to the Collinsville substation, and (2) a 500 kV line from the new Humboldt substation to the Fern Road substation ("Humboldt transmission projects"). Current planning involves having both of these projects come online by the end of 2034.

The cost of California's high-voltage transmission system for the area managed by CAISO, which includes the Humboldt transmission projects, is covered by a system-wide High Voltage Access Charge (HVAC). The HVAC is a flat per megawatt-hour (MWh) fee placed on ratepayers for electricity consumed from the grid. In this case, "cost" refers to the approved expenditures to develop, operate, and finance the two Humboldt transmission projects. This is reflected in the transmission owner's annual Transmission Revenue Requirements (TRR) – the total amount the Federal Energy Regulatory Commission (FERC) authorizes the project sponsor to recover each year over the life of the projects.

As the selected project sponsor for both projects, California Grid Holdings LLC – a subsidiary of Viridon Holdings LLC (herein referred to as "Viridon") – has committed to a capital cost cap at $1,701 million for the combined projects[1], and a cap on its annual TRRs for each year, for a total lifetime TRR for the combined projects of $5,181 million

[1] California Independent System Operator, *New Humboldt 500 kV Substation, with 500/115 kV Transformer, and a 500 kV Line to Collinsville [HVDC Operated as AC] Project: Project Sponsor Selection Report*, June 2, 2025, https://stakeholdercenter.caiso.com/InitiativeDocuments/New-Humboldt-Collinsville-500-kV-Line-And-Substation-project-Project-Sponsor-Selection-Report.pdf; and *New Humboldt to Fern Road 500 kV Line Project: Project Sponsor Selection Report*, June 2, 2025, https://stakeholdercenter.caiso.com/InitiativeDocuments/New-Humboldt-Fern-Road-500kV-Line-Approved-Project-Sponsor-Selection-Report.pdf.

in 2025 dollars[2]. Capital cost caps and annual TRR caps provide protection to ratepayers, as the future rates approved by FERC will be conditioned on the commitments Viridon made to the CAISO.

a. Findings

This analysis found that Viridon's recoverable costs, when spread across all customers on the CAISO grid over the expected 50-year project lifetime, result in an estimated **real average cost to ratepayers of $0.28/MWh**, or **approximately $1.68 per year for the average California household**[3] **in 2025 dollars.** Figure 1 (below) shows how the cost impact to ratepayers is estimated to change over time – steadily decreasing in terms of both real and nominal cost. Based on the analysis, ratepayer costs will peak in 2035 at $0.75/MWh ($4.52/year for the average household) before declining steadily to $0.03/MWh ($0.18/year for the average household) by 2083.

[2] Nominal values were converted to 2025 dollars using a 2.5% annual inflation rate.

[3] Average household electricity consumption was derived from the forecasted residential load and the total number of households in the California Energy Commission's Energy Demand 2024 – 2040 Forecast (Download link: CEDU 2024 Baseline Forecast - Total State (.xlsx)). Average household load from 2040 – 2084 was assumed to be constant for the purpose of this analysis.

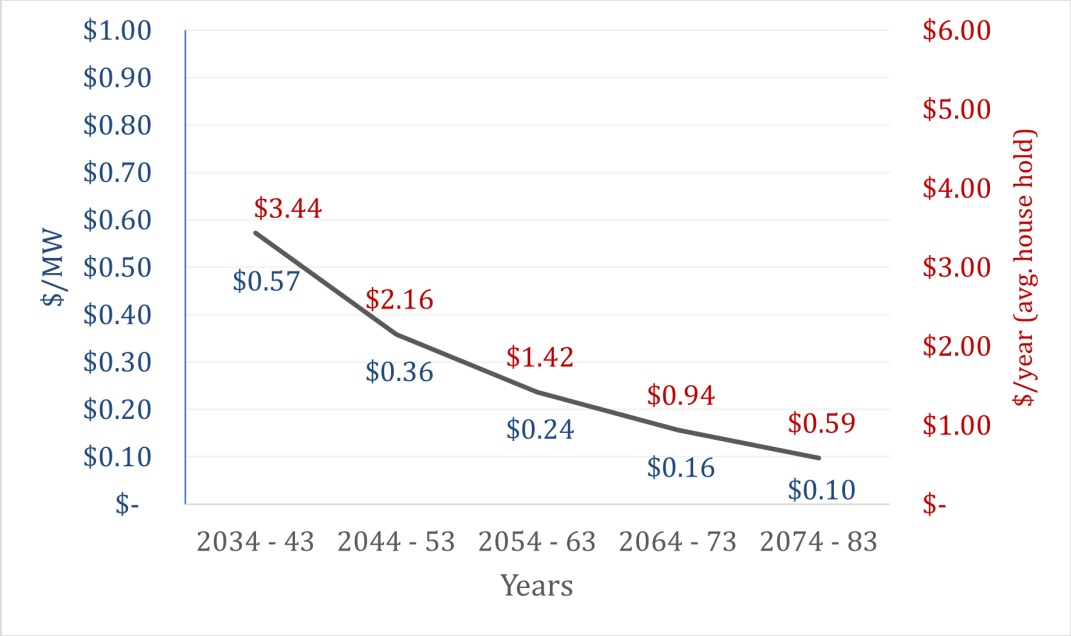

Figure 1: Ratepayer impact over time in 2025 dollars (10-year rolling averages)

Applying the HVAC framework through a wider lens we can assume the cost to Humboldt County and the North Coast Region is proportional to the amount of energy they consume. In this case, the total cost of the Humboldt transmission projects to ratepayers in Humboldt County, which accounted for only 0.27% of California's energy consumption in 2022[4], would average approximately $153,000 per year (peak $410,000/yr). Whereas ratepayers in the broader North Coast region, accounting for 0.74% of state electricity consumption, would average approximately $420,000 per year (peak $1.12 million/yr). So, while these areas stand to potentially benefit economically from OSW development, they will share in less than a percent of the total cost burden of the Humboldt transmission projects.

Even under extreme scenarios — halving the state's electricity demand, doubling household consumption, or doubling project costs — peak ratepayers' costs would still remain under $9 per year for the average household.

[4] California Energy Commission. A*GG_CONSUMPTION_ELEC_COUNTY_TBL_MONTHLY.xlsx* [Data set]. *Energy consumption data files*, 2026. https://www.energy.ca.gov/files/energy-consumption-data-files

While these projects represent a modest investment for California ratepayers, appearing as a small, declining charge to electricity bills over the next 50 years, they would enable integration of offshore wind power on the North Coast, offering regional economic benefits, and allowing the State to advance toward its renewable energy goals.

II. Introduction

This document outlines the methodology and findings of a ratepayer cost impact analysis associated with two major transmission projects – proposed in the California Independent System Operator (CAISO) 2023-2024 Transmission Plan – to support offshore wind energy development in the Humboldt Wind Energy Area.

The CAISO formally approved its 2023–2024 Transmission Plan on May 23, 2024, which included two major policy-driven transmission projects to support offshore wind (OSW) development: a **new Humboldt 500 kV substation, with a 500 kV line to Collinsville**, and a **new Humboldt to Fern Road 500 kV line (the "Humboldt transmission projects")**.

Project 1:

- **Description:** New Humboldt 500 kV substation + 500 kV single circuit line to Collinsville
- **CAISO estimated transmission line miles:** 260 miles
- **CAISO estimated cost:** $1,913 - 2,740 million

Project 2:

- **Description:** Humboldt to Fern Road 500 kV single circuit line
- **CAISO estimated transmission line miles:** 140 miles
- **CAISO estimated cost:** $980 - $1,400 million

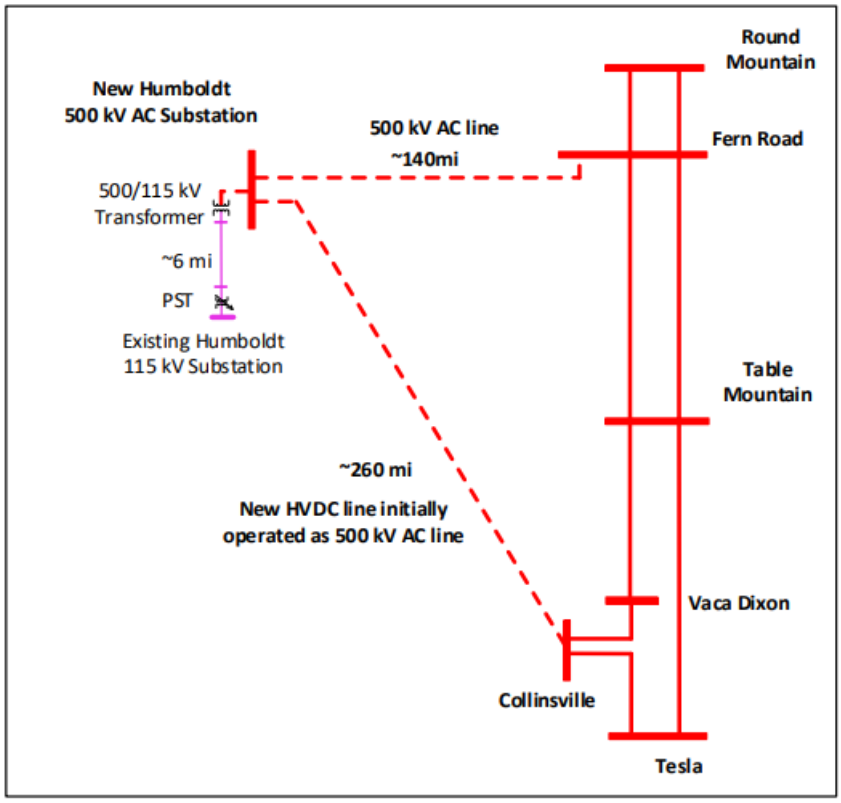

Figure 2: Overall Plan to Interconnect Humboldt 500 kV to the CAISO System[5]

The two projects were designated as eligible for competitive solicitation under CAISO's Federal Energy Regulatory Commission (FERC) approved transmission planning and project sponsor selection process.

In June 2024, CAISO initiated Phase 3 of the Transmission Planning Process by opening a competitive solicitation window for the Humboldt transmission projects.

On May 16, 2025, CAISO announced Viridon, operating through its subsidiary California Grid Holdings LLC, as the approved project sponsor for both of the Humboldt transmission projects.

[5] California Independent System Operator. *Appendix I: Description and Functional Specifications for Transmission Facilities Eligible for Competitive Solicitation*. *2023–2024 Transmission Plan*, 23 May 2024. https://www.caiso.com/documents/appendix-i-board-approved-2023-2024-transmission-plan.pdf

On June 2, 2025, CAISO released detailed Project Sponsor Selection Reports for the Humboldt transmission projects. These selection reports summarized the evaluation framework and scoring methodology used to assess proposals, and the justification for selecting Viridon as the projects' sponsor.[6]

Details regarding Viridon's cost containment measures, including caps on: the capital cost of the projects, guaranteed return on equity (ROE), and its annual Transmission Revenue Requirement (TRR) - the amount of revenue needed each year to pay back recoverable costs - over the lifetime of the project (2034 – 2084), can be found in Section 3.12.1 in either report. As part of its bid, Viridon proposed lowering the cap on its capital cost for the Humboldt to Fern Road project if it was selected to implement both transmission projects, citing the cost savings resulting from combined development.[7] Viridon's cost details for the two projects, with and without cost reductions, are detailed in Table 1, below.

Table 1: Viridon's cost containment summary

Project	Capital cost cap w/o reductions	Total cost reduction for combined projects	Capital cost cap	Nominal life-time cost	Real life-time cost (2025$)
Humboldt - Collinsville	$1,165,390,844	$0	$1,165,390,844	$7,106,619,918	$3,578,939,177
Humboldt - Fern Road	$684,440,523	($148,583,723)	$535,856,800	$3,144,873	$1,602,076,042
Total	**$1,849,831,367**	**($148,583,723)**	**$1,701,247,644**	**$10,251,493,523**	**$5,181,015,219**

Under the combined development scenario, which was approved, Viridon's total cost cap was reduced to approximately $149 million to $1.70 billion, making the capital cost

[6] California Independent System Operator (CAISO). *2023-2024 Transmission planning process.* https://stakeholdercenter.caiso.com/RecurringStakeholderProcesses/2023-2024-Transmission-planning-process

[7] California Independent System Operator, *New Humboldt 500 kV Substation, with 500/115 kV Transformer, and a 500 kV Line to Collinsville [HVDC Operated as AC] Project: Project Sponsor Selection Report*, June 2, 2025, https://stakeholdercenter.caiso.com/InitiativeDocuments/New-Humboldt-Collinsville-500-kV-Line-And-Substation-project-Project-Sponsor-Selection-Report.pdf; and *New Humboldt to Fern Road 500 kV Line Project: Project Sponsor Selection Report*, June 2, 2025, https://stakeholdercenter.caiso.com/InitiativeDocuments/New-Humboldt-Fern-Road-500kV-Line-Approved-Project-Sponsor-Selection-Report.pdf.

of the Humboldt transmission projects 41% lower ($1.19 billion) than the lower limit of CAISO's original cost estimate ($2.89 billion).

III. Ratepayer Cost Impacts

a. High Voltage Transmission Access Charge

Transmission projects within the CAISO Balancing Authority Area (BAA) are funded through the Transmission Access Charge (TAC), which includes a High Voltage Access Charge (HVAC), and a Low Voltage Access Charge (LVAC). The HVAC is used for transmission facilities operated at 200 kV or higher, such as the two proposed Humboldt transmission projects, and is charged to all ratepayers in the CAISO Balancing Authority Area.

The HVAC is determined annually by taking the combined annual Transmission Revenue Requirement (TRR) in dollars of all participating HV transmission owners and dividing it by the forecasted annual Gross Load (MWh) for the entire CAISO BAA. This yields a flat HVAC rate in dollars/MWh to recover the costs for major transmission infrastructure.

The Gross Load is the total amount of energy delivered to end users within the CAISO BAA, and is the basis on which the HVAC is calculated to recover TRRs. TRRs reflect the total amount that a transmission owner is authorized to collect in a given year to recover costs associated with providing their transmission services. This includes the costs of constructing, operating, and maintaining the physical infrastructure, as well as the costs of capital for financing the projects. TRRs are determined through transmission owner rate case proceedings filed with the Federal Energy Regulatory Commission (FERC).[8]

[8] California Public Utilities Commission, "Electric Transmission Rates and FERC Proceedings," last modified 2025, accessed July 7, 2025, https://www.cpuc.ca.gov/industries-and-topics/electrical-energy/electric-costs/electric-transmission-rates-and-ferc-proceedings.

For example, in 2025, the forecasted gross load across the CAISO BAA was **203,190,473 MWh**, and Transmission Owners had a combined TRR of **$2,835,014,501**. As such, the HVAC rate for this year was set at **$13.95/MWh**.[9]

b. Findings

In its project bids, Viridon provided CAISO with capped TRRs for each year from 2034 – 2084 (Available in Section 3.12.1 of both project sponsor selection reports)[10]. Dividing the annual TRR by the forecasted gross load for each year results in an estimated annual cost per MWh, or TAC rate, for the combined projects. Applying this TAC rate to the annual electricity consumption of an average California household demonstrates the potential cost impacts of this infrastructure on individual ratepayers. Assumptions around annual Gross Load and household electricity consumption are explained in Section 2(c), and the annual inputs and outputs for this analysis can be found in Appendix A.

Based on this analysis, the estimated average TAC rate for the combined projects over the 50-year period is approximately $0.55/MWh in nominal terms, which translates to a nominal annual increase of $3.47 for the average California household. Adjusting for inflation at 2.5%, the real average cost drops to **$0.28/MWh**, or an average increase of **$1.68 for the average household per year**.

However, because Viridon's total TRR declines by approximately 2% every year, a single average does not capture the actual impact over time. The highest per-MWh cost occurs in **2035 ($0.75/MWh, $4.52 per average household)**, while the lowest occurs in

[9] California Independent System Operator, *High Voltage Access Charge Rates Effective January 1, 2025*, updated March 26, 2025, https://www.caiso.com/documents/high-voltage-access-charge-rates-effective-jan-01-2025.pdf.

[10] California Independent System Operator, *New Humboldt 500 kV Substation, with 500/115 kV Transformer, and a 500 kV Line to Collinsville [HVDC Operated as AC] Project: Project Sponsor Selection Report*, June 2, 2025, https://stakeholdercenter.caiso.com/InitiativeDocuments/New-Humboldt-Collinsville-500-kV-Line-And-Substation-project-Project-Sponsor-Selection-Report.pdf; and *New Humboldt to Fern Road 500 kV Line Project: Project Sponsor Selection Report*, June 2, 2025, https://stakeholdercenter.caiso.com/InitiativeDocuments/New-Humboldt-Fern-Road-500kV-Line-Approved-Project-Sponsor-Selection-Report.pdf.

2083 ($0.03/MWh, $0.18 per average household). Figure 3, below, uses 10-year rolling averages to show how both per-MWh and household-level costs decline over the life of the Humboldt transmission projects.

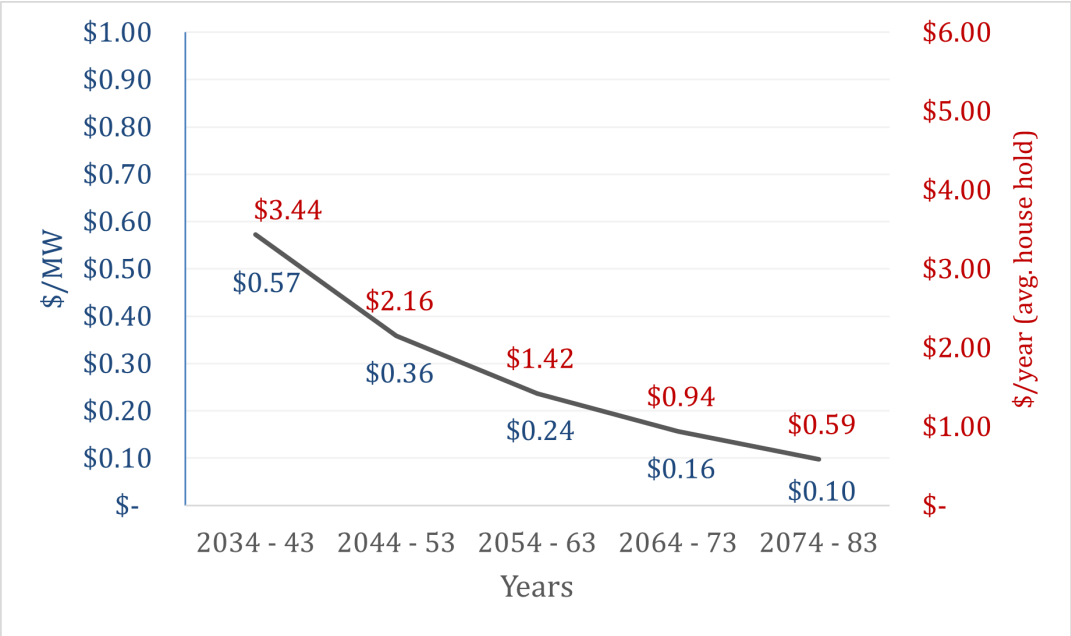

Figure 3: Ratepayer impact over time in 2025 dollars (10-year rolling averages)

According to data from the U.S. Energy Information Administration,[11] the average **residential** retail price of electricity in California in 2024 was 31.86 cents/kWh or $318.60/MWh. An increase of $0.75/MWh (peak cost), is only a **0.24% increase** in the price of electricity relative to the average 2024 residential retail price. For **commercial businesses**, which had a lower average price of electricity in 2024 at $250.90/MWh, this impact is still only a **0.30% increase** in the price of electricity. As such, the cost burden of this additional transmission infrastructure on individual ratepayers in California appears to be negligible.

[11] U.S. Energy Information Administration. (2025, July). *State Energy Profile Data – California.* https://www.eia.gov/state/data.php?sid=CA

Furthermore, Humboldt County and the broader North Coast region accounted for only 0.27% and 0.74% of California's total energy consumption in 2022[12], respectively. Assuming this ratio of consumption remains constant, then the average cost for **Humboldt County** over the 50-year period is estimated to be approximately **$153k/year**, with a high of approximately **$410k in 2035**, gradually decreasing to a low of **$44k in 2083**. For the **North Coast region**, which for this analysis includes Humboldt, Del Norte, Lake, Mendocino, and Trinity counties, the average cost is estimated to be approximately **$420k/year**, with a high of approximately **$1,128k in 2035**, and a low of approximately **$120k in 2083.**

So, while Humboldt, and the North Coast as a whole, stand to potentially benefit economically from the proposed transmission infrastructure and associated offshore wind development —including jobs, increased energy resilience, and access to renewable energy—they would bear only a fraction of a percent of the total monetary cost, with minimal cost impacts to individual ratepayers.

IV. Sensitivity Analysis

This analysis relies on three primary factors: Annual Revenue Requirements (ARRs), Gross Load, and residential electricity consumption. While the analysis draws from the best available data, actual values may differ over time. Each assumption is explained below, along with an evaluation of how deviations from these assumptions could affect results.

a. Gross Load and Household Consumption[13]

For this analysis, Gross Load and average household electricity consumption are based on data forecasts from the California Energy Commission's 2024 Integrated Energy

[12] California Energy Commission. A*GG_CONSUMPTION_ELEC_COUNTY_TBL_MONTHLY.xlsx* [Data set]. *Energy consumption data files*, 2026. https://www.energy.ca.gov/files/energy-consumption-data-files

[13] Gross Load through is based on the forecasted load for the CAISO BAA from the California Energy Commission's Energy Demand 2024 - 2040 Forecast (Download link: CED 2024 Planning Forecast LSE and BAA Tables (.xlsx)). Estimated average household load was determined using forecasted residential load also from the California

Policy Report, which are available through 2040. When assessing cost impacts from 2040 to 2084, the 2040 forecast load values were held constant. While actual load and residential consumption will change over this period, that data is unavailable and, given the relatively small scale of cost impacts, unlikely to materially affect the conclusions of this analysis.

With ARRs being a fixed amount set by Viridon, changes in annual Gross load have an inversely proportional impact on the cost per unit ($/MWh). That is, with any increase in total electricity consumption, driven by factors such as electrification and economic growth, the $/MWh goes down as the combined projects' ARR is distributed over a larger volume of energy.

For example, if Gross Load for 2035 was 50% lower than forecasted by the CEC, but average household consumption remained the same, then the real annual cost for the average California household that year would be under $9.

However, Gross Load and household electricity consumption are intrinsically linked, with the residential sector making up approximately 30% of electricity usage across the state. Accordingly, available forecasts indicate continued, though slowing, growth in both statewide and residential electricity usage at a relatively similar rate. From 2039 to 2040, Gross Load is forecasted to increase by 1.75%, and residential electricity consumption by 1.41%. So, the ratio of household electricity consumption to Gross Load is likely to remain relatively stable, or even decrease over time. Because the level of Gross Load and consumption was held constant after 2040, the cost impact findings from this analysis are more likely conservative than overstated.

And while individual energy consumption may vary significantly by region and household, even in high-usage scenarios, the cost burden would still be minimal. Similar

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Energy Commission's Energy Demand 2024 – 2040 Forecast (Download link: CEDU 2024 Baseline Forecast - Total State (.xlsx)), divided by the estimated number of households according to data from the Finance Department and used by the CEC in their 2024 IEPR proceedings (Download Link: CEC Presentation - LD Demand Forecast Inputs, Assumptions & Scenarios, pp. 6 (.pdf).

to the previous example, a household using twice the annual average would still never pay above$9 per year.

b. Annual Revenue Requirements

While CAISO requires that an approved project sponsor must agree to honor its binding cost containment measures or cost caps included in its proposal,[14] and Viridon indicated it would not recover more than the revenue requirement cap in place for a given year, it also indicated that several exclusions were not subject to the cost cap and cost containment provisions. These exclusions include: changes in CAISO project requirements, interconnection costs, permitting delays, uncontrollable events, and other excluded costs.[15] These exclusions protect Viridon from risks that are unforeseeable or outside its control, but do not automatically allow recovery and are subject to future Federal Energy Regulatory Commission (FERC) approval.

While there is no way to determine the expected cost of exclusions for the two projects, the analysis, again, shows relatively small consequences to ratepayers in even the most extreme situations. In a recent filing with FERC, DCR Transmission, L.L.C. requested $300 million above its binding cost cap, or just over double its agreed-upon costs. [16]

This appears to be a very uncommon situation, with CAISO urging FERC to deny the request. If, however, it was the case that Viridon's capital cost cap was doubled, the relative impact on ratepayers would still be minimal. Assuming that cost was distributed

[14] California Independent System Operator. (2025). *CAISO Tariff, Section 24: Comprehensive Transmission Planning Process* (pp. 103–106). https://www.caiso.com/documents/section-24-comprehensive-transmission-planning-process-as-of-jun-25-2025.pdf

[15] California Independent System Operator, *New Humboldt 500 kV Substation, with 500/115 kV Transformer, and a 500 kV Line to Collinsville [HVDC Operated as AC] Project: Project Sponsor Selection Report*, June 2, 2025, (pp. 100-101). https://stakeholdercenter.caiso.com/InitiativeDocuments/New-Humboldt-Collinsville-500-kV-Line-And-Substation-project-Project-Sponsor-Selection-Report.pdf

[16] California Independent System Operator Corporation. (2023, July 21). *Motion to intervene and comments in Docket No. ER23-2309-000. https://www.caiso.com/documents/jul21-2023-intervention-comments-dcrtransmissionllc-er23-2309.pdf*

across the cost containment period, as was originally done, then the cost-per MWh for any given year would be doubled. In such a case, with all other factors fixed, the annual cost for the average California household would again never exceed $9 per year.

c. Results

With all other factors held constant, Figure 4 illustrates how ratepayer cost impacts would change over time if any of the following occurred: (1) Gross Load declined by 50%, (2) average annual household electricity usage doubled, or (3) the combined project cost was doubled. Each scenario results in a doubling of the per-MWh TAC rate for the combined projects.

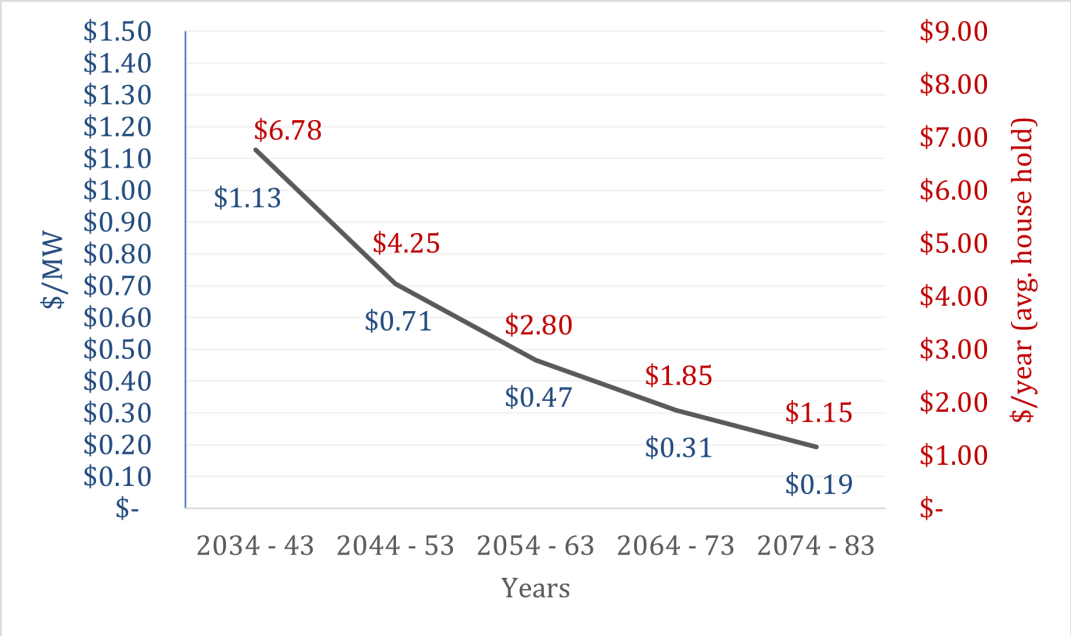

Figure 4: Ratepayer impact over time in 2025 dollars (10-year rolling averages) with doubled project costs

While these scenarios represent highly conservative stress tests, the resulting impacts on ratepayers remain small, and the financial burden of offshore wind transmission investment is modest for California ratepayers.

Appendix A: Estimated Ratepayer Impact by Year

Year	ARR cap Collinsville[17]	ARR cap Fern Road	Total w/ combined cap reductions	Estimated Gross Load (MWh)[18]	Estimated avg. household load (MWh/ Year) [19]	Real cost (2025$/MW)[20]	Annual cost per avg. household[21] (2025$)
2034	$126,791,462	$58,720,415	$185,511,877	319,301,524	6.02	$0.47	$2.80
2035	$217,996,967	$100,641,447	$318,638,414	331,487,906	6.06	$0.75	$4.52
2036	$212,889,712	$98,181,536	$311,071,248	341,068,283	6.12	$0.70	$4.18
2037	$208,091,845	$95,874,687	$303,966,532	349,771,537	6.18	$0.65	$3.89
2038	$207,156,174	$93,710,775	$300,866,949	357,459,058	6.24	$0.61	$3.67
2039	$199,286,722	$93,634,735	$292,921,457	364,582,527	6.30	$0.57	$3.42
2040	$195,045,105	$89,570,818	$284,615,923	370,963,971	6.36	$0.53	$3.19
2041	$190,872,399	$87,480,134	$278,352,533	370,963,971	6.36	$0.51	$3.04
2042	$186,824,997	$85,394,578	$272,219,575	370,963,971	6.36	$0.48	$2.90
2043	$186,720,597	$83,303,157	$270,023,754	370,963,971	6.36	$0.47	$2.81
2044	$178,554,867	$83,430,062	$261,984,929	370,963,971	6.36	$0.44	$2.66
2045	$174,287,875	$79,114,920	$253,402,795	370,963,971	6.36	$0.42	$2.51
2046	$170,028,897	$76,991,935	$247,020,832	370,963,971	6.36	$0.40	$2.39
2047	$165,754,883	$74,875,636	$240,630,519	370,963,971	6.36	$0.38	$2.27
2048	$165,859,406	$72,753,086	$238,612,492	370,963,971	6.36	$0.36	$2.19
2049	$157,751,101	$73,365,689	$231,116,790	370,963,971	6.36	$0.34	$2.07
2050	$155,100,254	$69,598,702	$224,698,956	370,963,971	6.36	$0.33	$1.97

[17] Annual revenue requirements were inputted directly from Section 3.12.1 of the two Selection Evaluation Reports: California Independent System Operator Corporation, *New Humboldt 500 kV Substation, with 500/115 kV Transformer, and a 500 kV Line to Collinsville [HVDC Operated as AC] Project: Project Sponsor Selection Report*, June 2, 2025, https://stakeholdercenter.caiso.com/InitiativeDocuments/AppendixI-BOARDAPPROVED_2023-2024_TransmissionPlan.pdf; and *New Humboldt to Fern Road 500 kV Line Project: Project Sponsor Selection Report*, June 2, 2025.

[18] Gross Load through 2040 is based on the forecasted load for the CAISO BAA from the California Energy Commission's Energy Demand 2024 - 2040 Forecast (Download link: CED 2024 Planning Forecast LSE and BAA Tables (.xlsx)). Gross Load from 2040 – 2084 was held constant.

[19] Estimated average household load through 2040 was determined using forecasted residential load and total number of household from the California Energy Commission's Energy Demand 2024 – 2040 Forecast (Download link: CEDU 2024 Baseline Forecast - Total State (.xlsx)). Household load from 2040 – 2084 was held constant.

[20] Real cost assumes a 2.5% inflation rate

[21] Actual Household annual electricity consumption can vary greatly by household and region

Year	ARR cap Collinsville[17]	ARR cap Fern Road	Total w/ combined cap reductions	Estimated Gross Load (MWh)[18]	Estimated avg. household load (MWh/ Year) [19]	Real cost (2025$/MW)[20]	Annual cost per avg. household[21] (2025$)
2051	$153,025,224	$68,539,455	$221,564,679	370,963,971	6.36	$0.31	$1.89
2052	$151,112,218	$67,490,244	$218,602,462	370,963,971	6.36	$0.30	$1.82
2053	$154,067,549	$66,436,748	$220,504,297	370,963,971	6.36	$0.30	$1.79
2054	$147,096,087	$68,116,995	$215,213,082	370,963,971	6.36	$0.28	$1.71
2055	$144,928,849	$64,331,595	$209,260,444	370,963,971	6.36	$0.27	$1.62
2056	$142,775,953	$63,246,709	$206,022,662	370,963,971	6.36	$0.26	$1.55
2057	$140,609,864	$62,171,855	$202,781,719	370,963,971	6.36	$0.25	$1.49
2058	$143,839,907	$61,091,107	$204,931,014	370,963,971	6.36	$0.24	$1.47
2059	$136,271,048	$63,042,576	$199,313,624	370,963,971	6.36	$0.23	$1.40
2060	$134,033,410	$58,929,801	$192,963,211	370,963,971	6.36	$0.22	$1.32
2061	$131,813,198	$57,813,893	$189,627,091	370,963,971	6.36	$0.21	$1.26
2062	$129,794,699	$56,709,972	$186,504,671	370,963,971	6.36	$0.20	$1.21
2063	$133,782,087	$55,600,363	$189,382,450	370,963,971	6.36	$0.20	$1.20
2064	$125,541,391	$57,855,864	$183,397,255	370,963,971	6.36	$0.19	$1.14
2065	$123,218,584	$53,383,920	$176,602,504	370,963,971	6.36	$0.18	$1.07
2066	$120,917,908	$52,237,863	$173,155,771	370,963,971	6.36	$0.17	$1.02
2067	$119,802,142	$51,105,959	$170,908,101	370,963,971	6.36	$0.16	$0.98
2068	$125,468,647	$50,447,270	$175,915,917	370,963,971	6.36	$0.16	$0.99
2069	$116,441,381	$53,555,194	$169,996,575	370,963,971	6.36	$0.15	$0.93
2070	$113,985,383	$48,659,856	$162,645,239	370,963,971	6.36	$0.14	$0.87
2071	$111,558,949	$47,457,103	$159,016,052	370,963,971	6.36	$0.14	$0.83
2072	$109,123,035	$46,272,377	$155,395,412	370,963,971	6.36	$0.13	$0.79
2073	$114,063,686	$45,083,782	$159,147,468	370,963,971	6.36	$0.13	$0.79
2074	$104,261,583	$48,040,339	$152,301,922	370,963,971	6.36	$0.12	$0.74
2075	$101,747,697	$42,717,460	$144,465,157	370,963,971	6.36	$0.11	$0.68
2076	$99,264,480	$41,490,454	$140,754,934	370,963,971	6.36	$0.11	$0.65
2077	$97,064,906	$40,282,593	$137,347,499	370,963,971	6.36	$0.10	$0.62
2078	$103,099,619	$39,069,736	$142,169,355	370,963,971	6.36	$0.10	$0.62
2079	$92,418,904	$42,455,708	$134,874,612	370,963,971	6.36	$0.10	$0.58
2080	$89,827,694	$36,656,128	$126,483,822	370,963,971	6.36	$0.09	$0.53
2081	$87,273,582	$35,401,808	$122,675,390	370,963,971	6.36	$0.08	$0.50
2082	$84,715,925	$34,169,591	$118,885,516	370,963,971	6.36	$0.08	$0.47
2083	$91,255,062	$32,935,521	$124,190,583	370,963,971	6.36	$0.08	$0.48
2084	$33,406,004	$15,431,454	$48,837,458	370,963,971	6.36	$0.03	$0.18
Total	**$7,106,619,918**	**$3,144,873,605**	**$10,251,493,523**			$14.24	$85.65
Average	**$139,345,488.59**	**$75,574,538.37**	**$201,009,676.92**			**$0.28**	**$1.68**

Appendix B: Average Household Electricity Consumption in California[22]

Year	Forecasted Total Residential Load (GWh)	Forecasted Total No. of Households (Ths.)	Average Annual Household Load (MWh)
2034	88,940	14,783	6.02
2035	90,074	14,862	6.06
2036	91,469	14,942	6.12
2037	92,857	15,023	6.18
2038	94,193	15,092	6.24
2039	95,548	15,161	6.30
2040	96,896	15,231	6.36

[22] Estimated average household load through 2040 was determined using forecasted residential load and total number of household from the California Energy Commission's Energy Demand 2024 – 2040 Forecast (Download link: CEDU 2024 Baseline Forecast - Total State (.xlsx)). Household load from 2040 – 2084 was held constant.