

# LA100

ACHIEVING 100% RENEWABLE ENERGY IN LOS ANGELES



## Rate Impact Analysis Presentation

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Los Angeles Department of Water and Power

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# Presentation Overview

## Assumptions

- Costs
- Retail energy load
- Financial modeling

## Reference Case

- 2017 SLTRP resource mix

## Scenario Comparison

- Retail Energy Load
- Fuel Cost
- CO<sub>2</sub> Emissions
- Average rate impacts

## Financial Next Steps



# Objectives of Presentation

We looked at the high-level rate impacts of LA100 scenarios, and how electrification drives retail energy sales and rates.



# Assumptions for Rate Impact Analysis



- NREL resource transformation costs
- LADWP costs to serve customers
- NREL end-use (retails sales) projections for Moderate, High, and Stress scenarios
- NREL projections are higher than LADWP's current forecasted retail sales
- LADWP's current budget for Capital Expenditures and O&M
- LADWP's projected Energy Efficiency costs

# Cost Reconciliation

- Reviewed NREL costs to reconcile with LADWP costs.
- Adjusted budgeted capital and fuel / purchased power expenses to include LA100 estimated costs and avoid double counting.



# Financial Modeling Methodology

- NREL provided constant dollar 5-year cumulative capital cost and O&M estimates at 2025, 2030, 2035, 2040, and 2045 for all scenarios without financing costs
- LADWP formatted cumulative costs into annual expenses and converted into nominal dollar estimates
- LADWP added existing RPS purchase power agreement expenses, debt service, and other on-going budgeted costs
- Executed modeling given the current rate structure and planning criteria metrics
- Financial Model calculated “all-in” system average rates for all customers

# What Is LADWP's Financial Planning Criteria?

As a municipal utility LADWP exists by and for our customers. We work to maintain cost competitive rates by meeting key financial metrics to continue our strong bond credit ratings.

- Full Obligation Ratio – 1.7 minimum
- Minimum Operating Cash – 170 days
- Capitalization Ratio – 68% maximum



# LA100 Scenarios Analyzed

<b>Moderate Load</b>	<b>Scenario 1</b>	<b>SB 100</b>
	<b>Scenario 2</b>	<b>Early &amp; No Biofuels</b>
	<b>Scenario 3</b>	<b>Transmission Focus</b>
	<b>Scenario 4</b>	<b>Limited New Transmission</b>
<b>High Load</b>	<b>Scenario 5</b>	<b>SB 100</b>
	<b>Scenario 6</b>	<b>Early &amp; No Biofuels</b>
	<b>Scenario 7</b>	<b>Transmission Focus</b>
	<b>Scenario 8</b>	<b>Limited New Transmission</b>
<b>Stress Load</b>	<b>Scenario 9</b>	<b>SB 100</b>





# Reference Case: 2017 Strategic Long-Term Resource Plan

Analysis based on expenditures used to prepare preliminary FY 2022 Budget modified with 2017 SLTRP system configuration.

- IPP repowered with natural gas, OTC units repowered, and natural gas units will continue to be used past 2045.

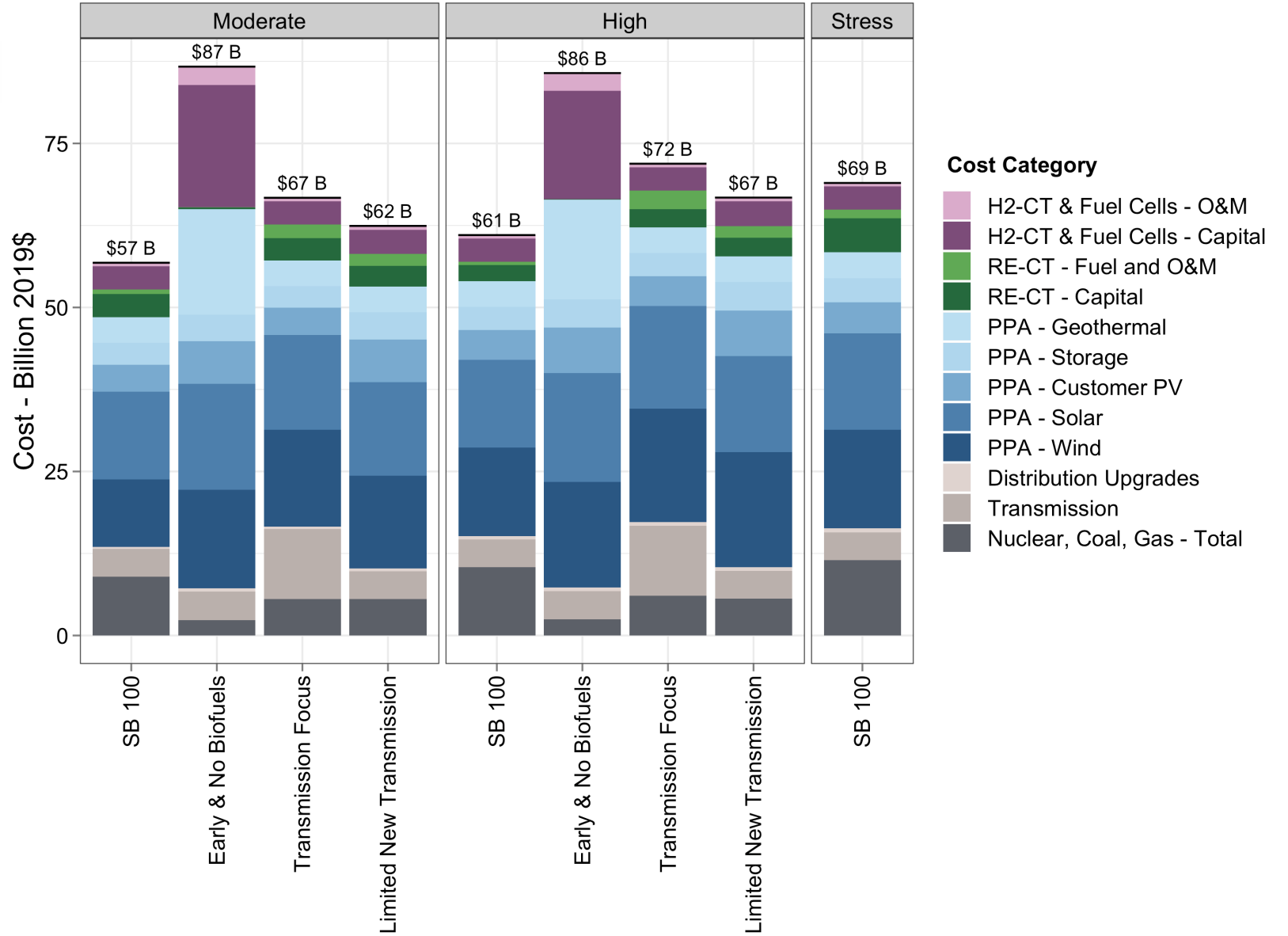
For rate comparison purposes, Reference Case retail sales were modified to reflect higher load forecasts from NREL scenarios.

- Reference Case adjusted to High Load
- Reference Case adjusted to Moderate Load
- Reference Case Low Load, i.e. Reference Case (with DWP's current forecasted retail sales)

NREL's cumulative costs include financing costs through 2045.

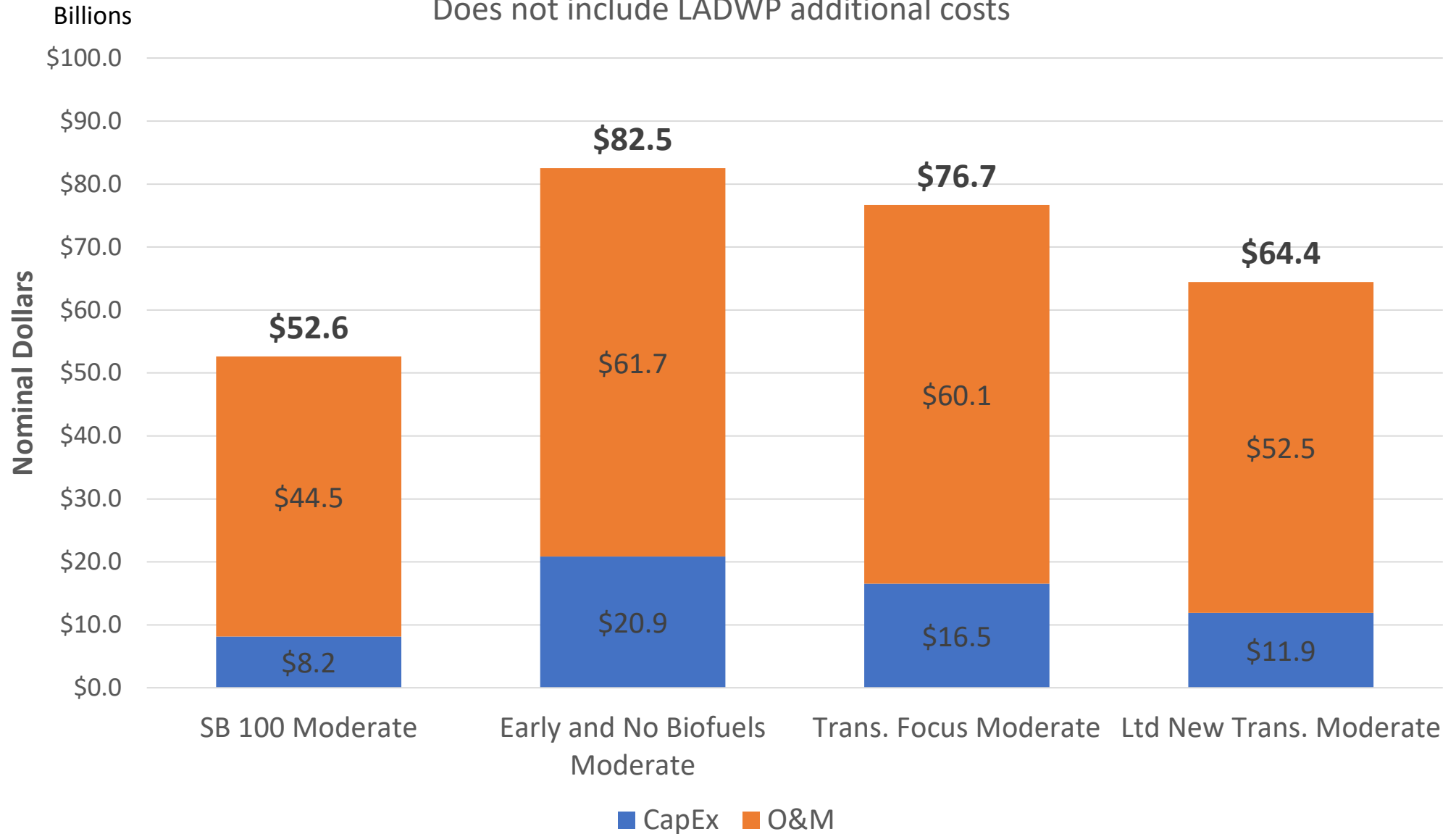
LADWP costs are not included.

NREL Cumulative Costs Through 2045



## LA100 - Estimated Capital and O&M Expenditures for Moderate Load Scenarios FY2021-FY2045

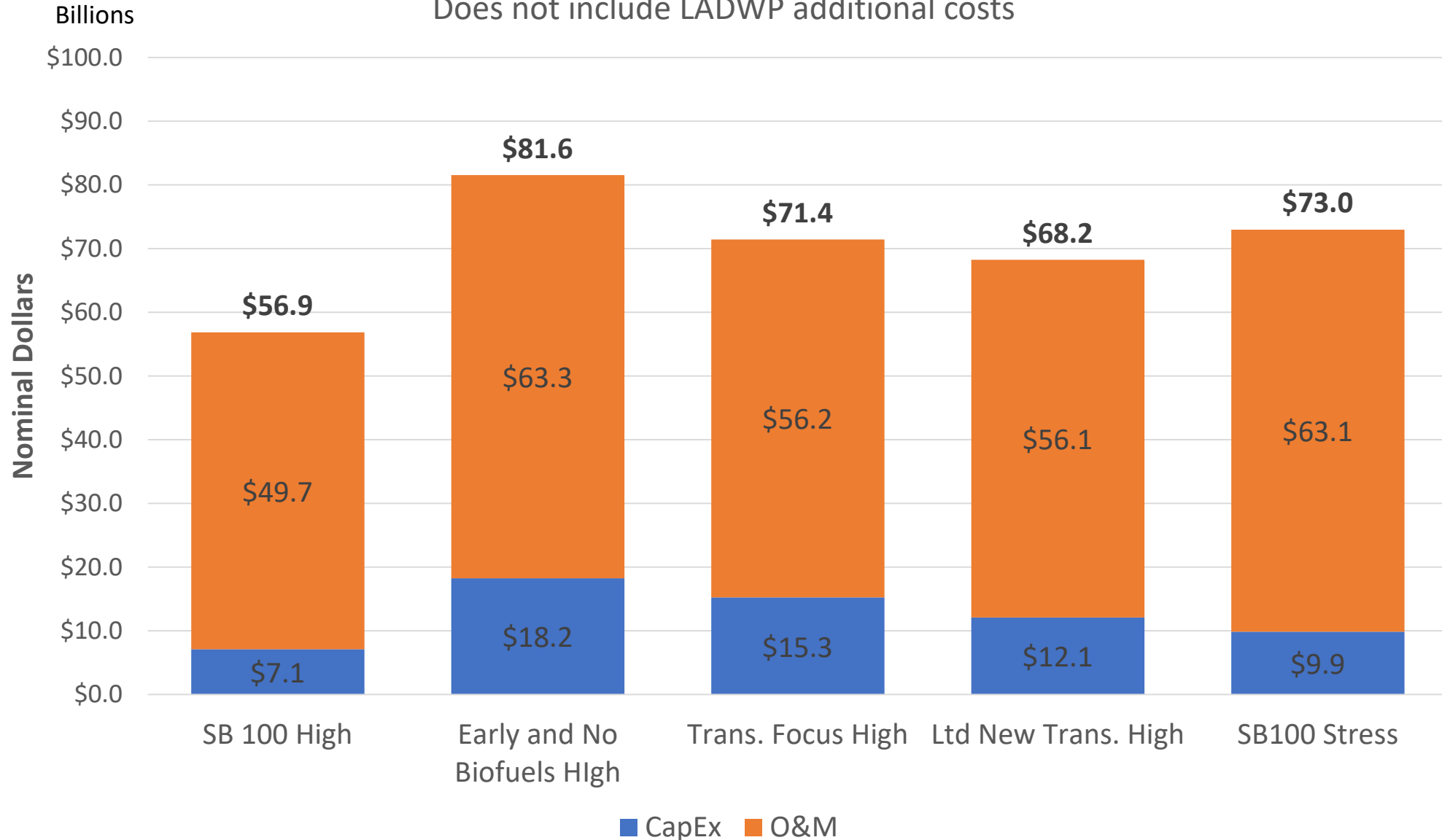
Does not include LADWP additional costs



\*Estimates are NREL costs converted to nominal dollars and do not include financing costs

# LA100 - Estimated Capital and O&M Expenditures for High Load and SB100 Stress Load Scenarios FY2021-FY2045

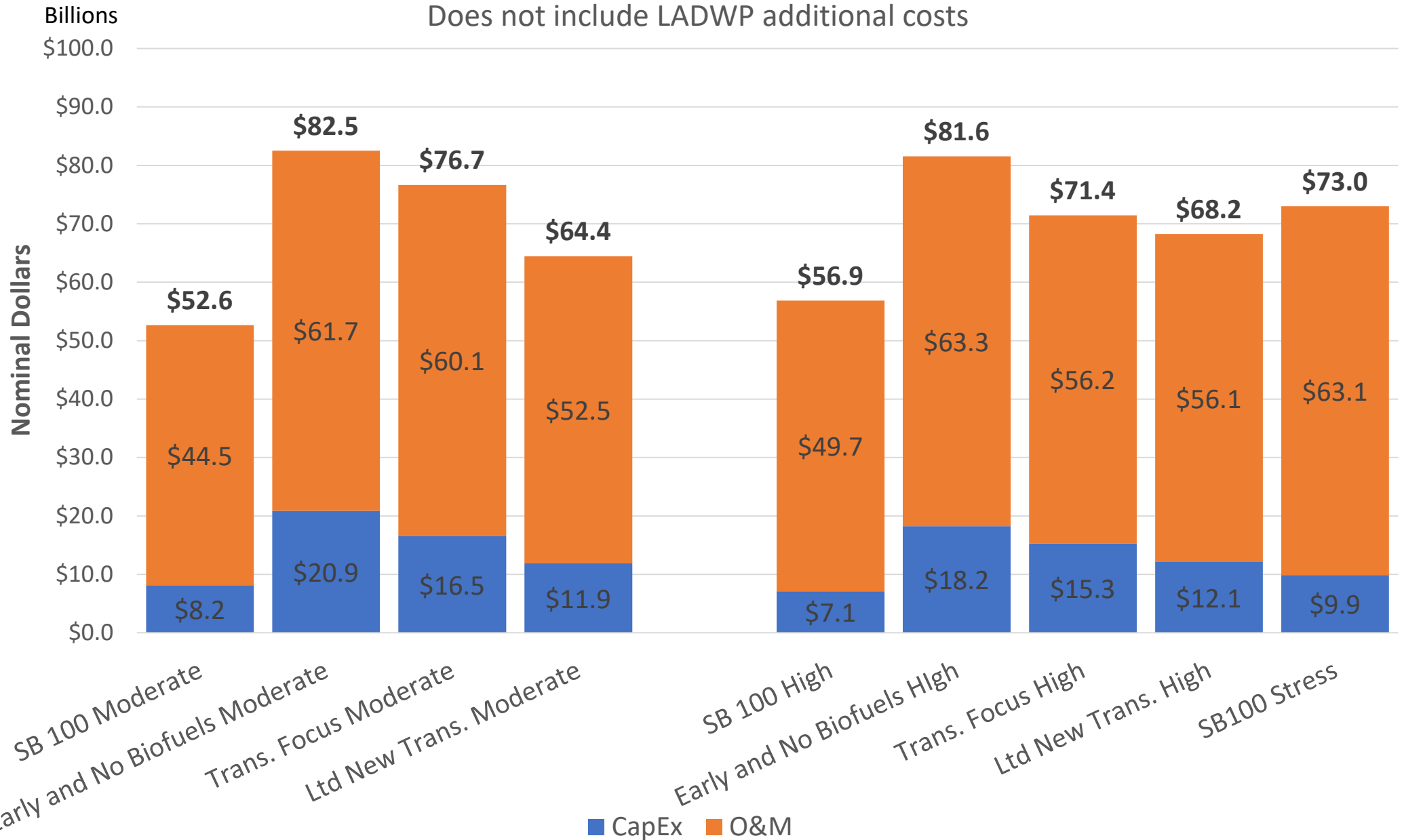
Does not include LADWP additional costs



\*Estimates are NREL costs converted to nominal dollars and do not include financing costs

# LA100 - Estimated Capital and O&M Expenditures for All Scenarios FY2021-FY2045

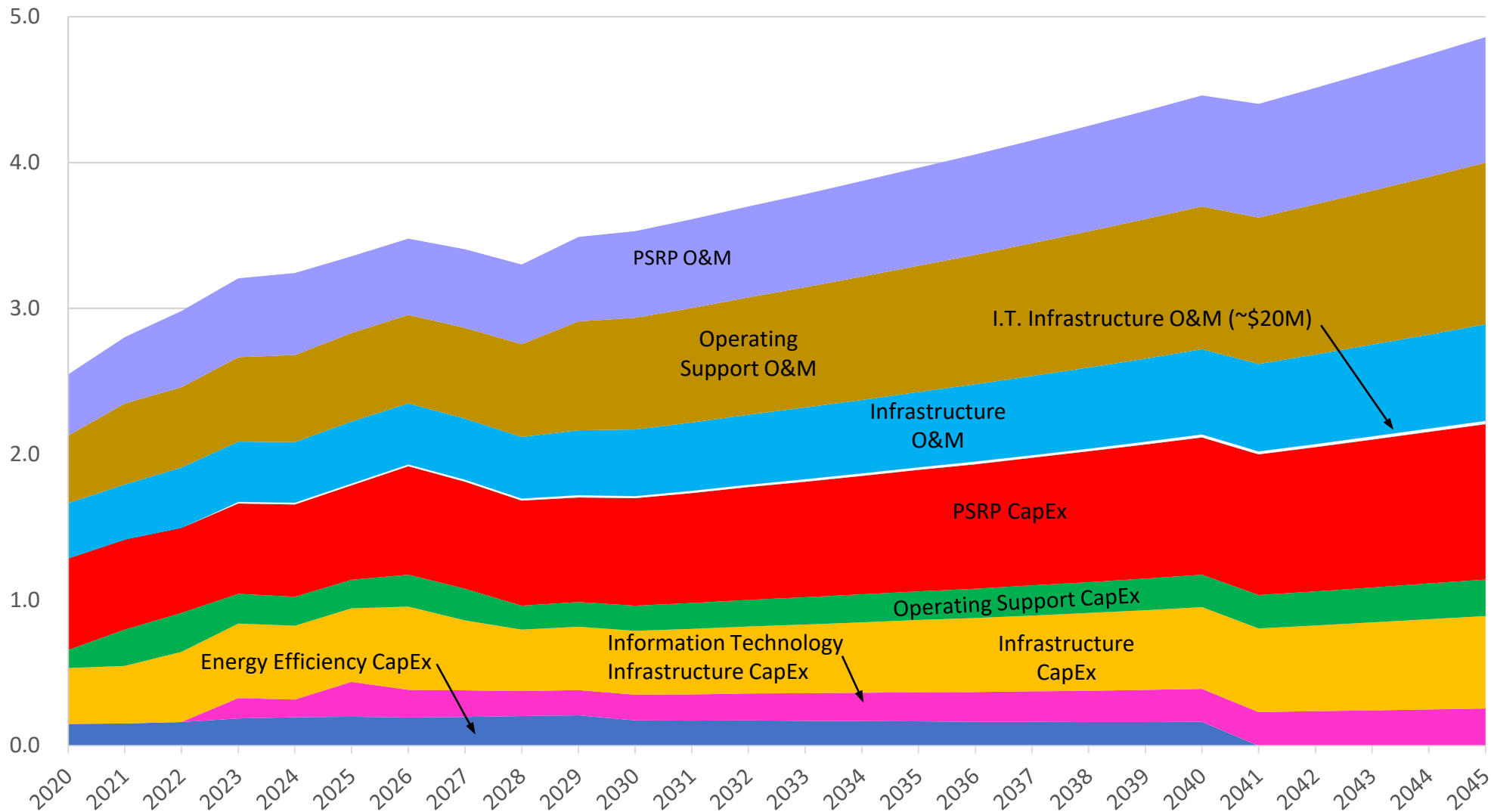
Does not include LADWP additional costs



\*Estimates are NREL costs converted to nominal dollars and do not include financing costs

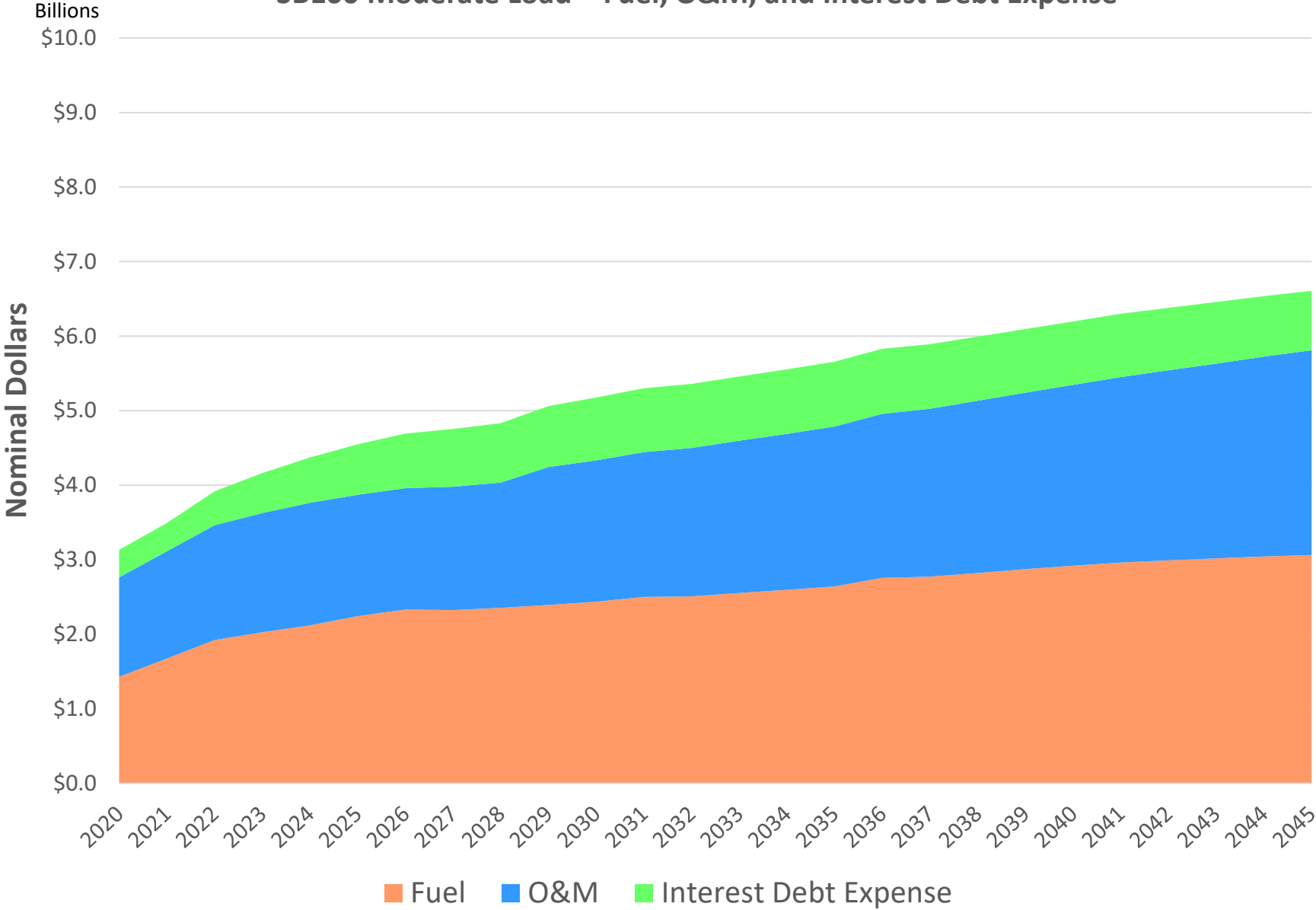
# LADWP Capital and O&M Expenditures Included Across All Scenarios

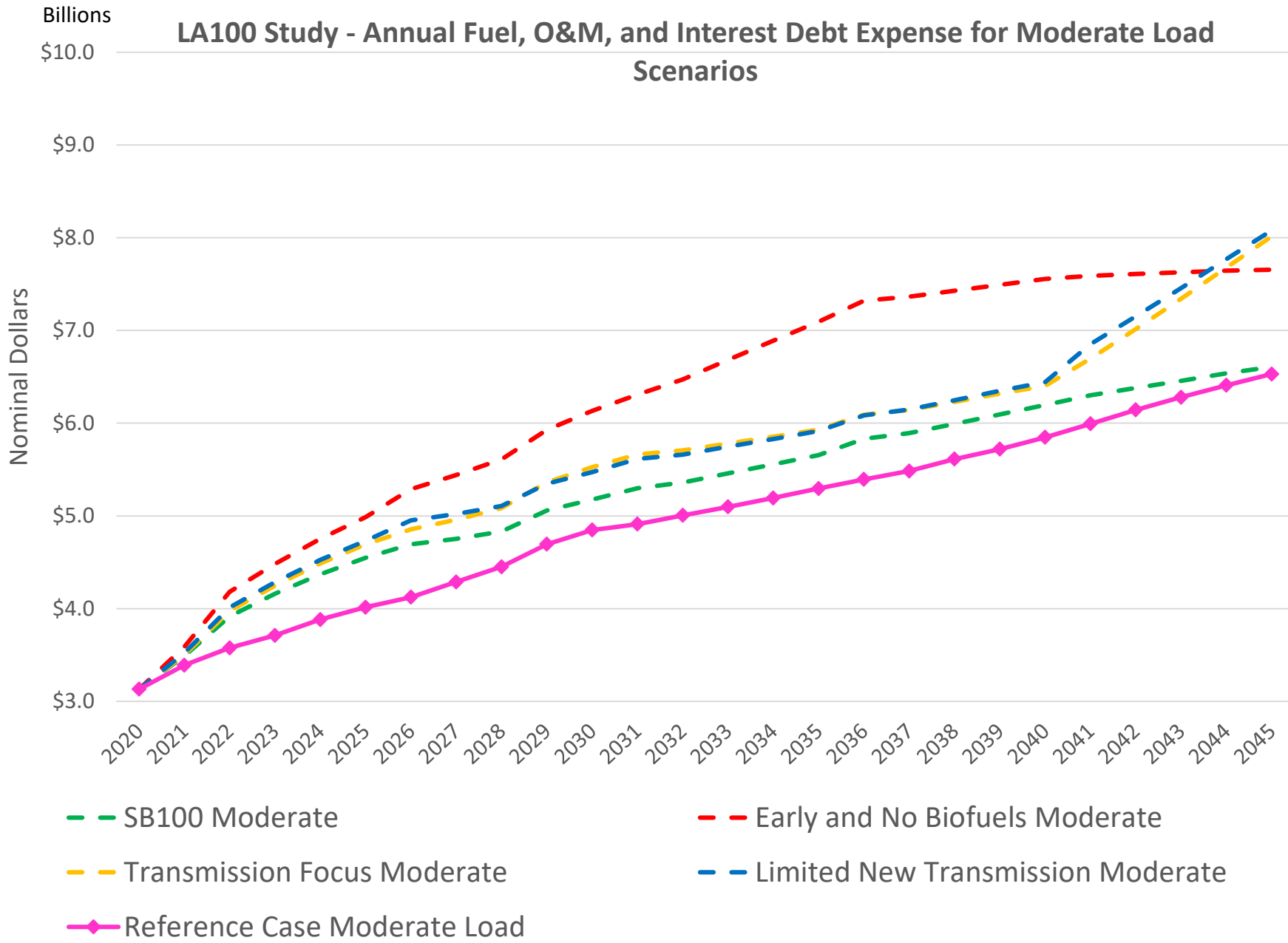
\$ Billions



- EE CapEx
- I.T. Infrastructure CapEx
- Infrastructure CapEx
- Operating Support CapEx
- PSRP CapEx
- I.T. Infrastructure O&M
- Infrastructure O&M
- Operating Support O&M
- PSRP O&M

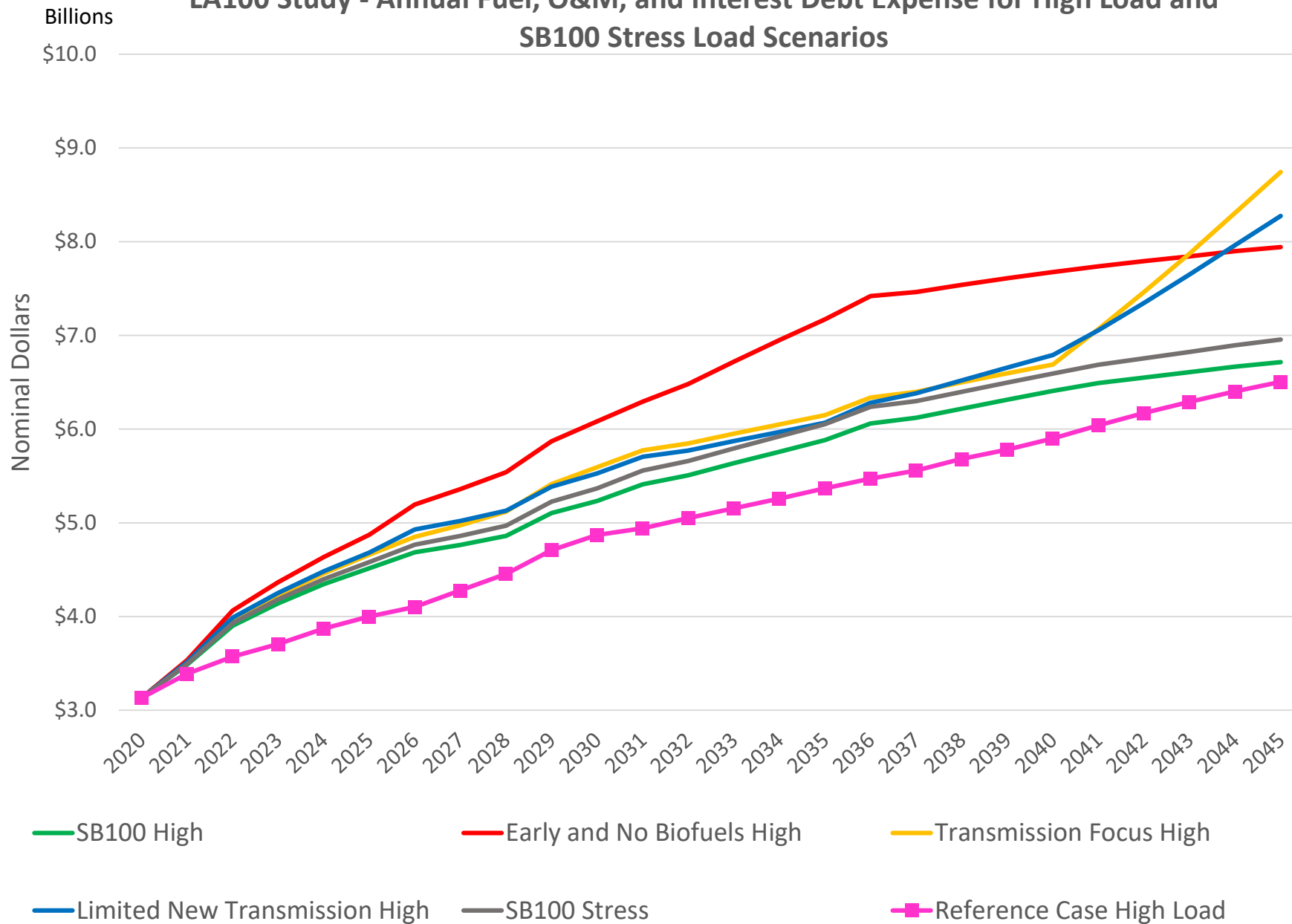
### SB100 Moderate Load – Fuel, O&M, and Interest Debt Expense



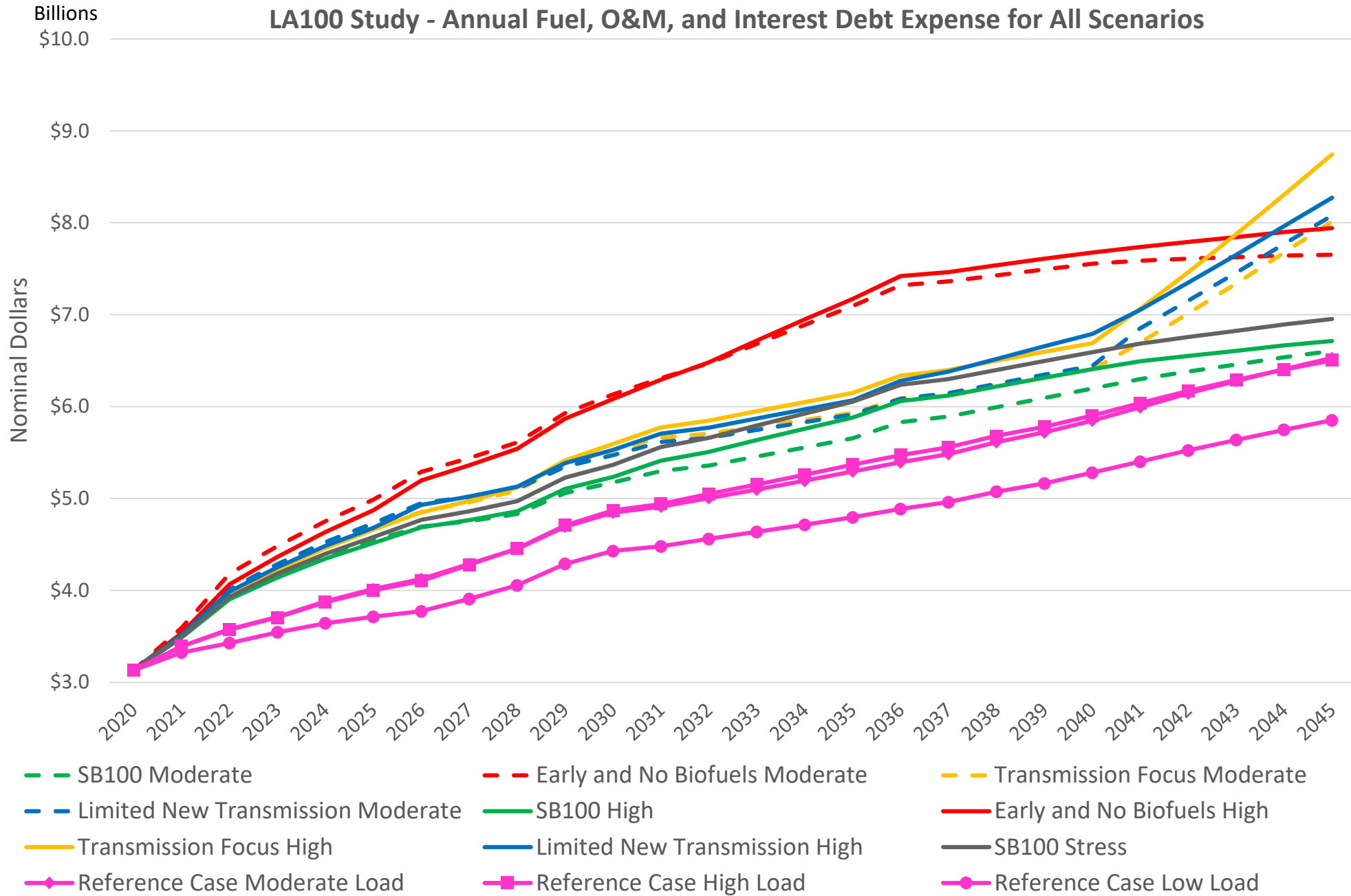




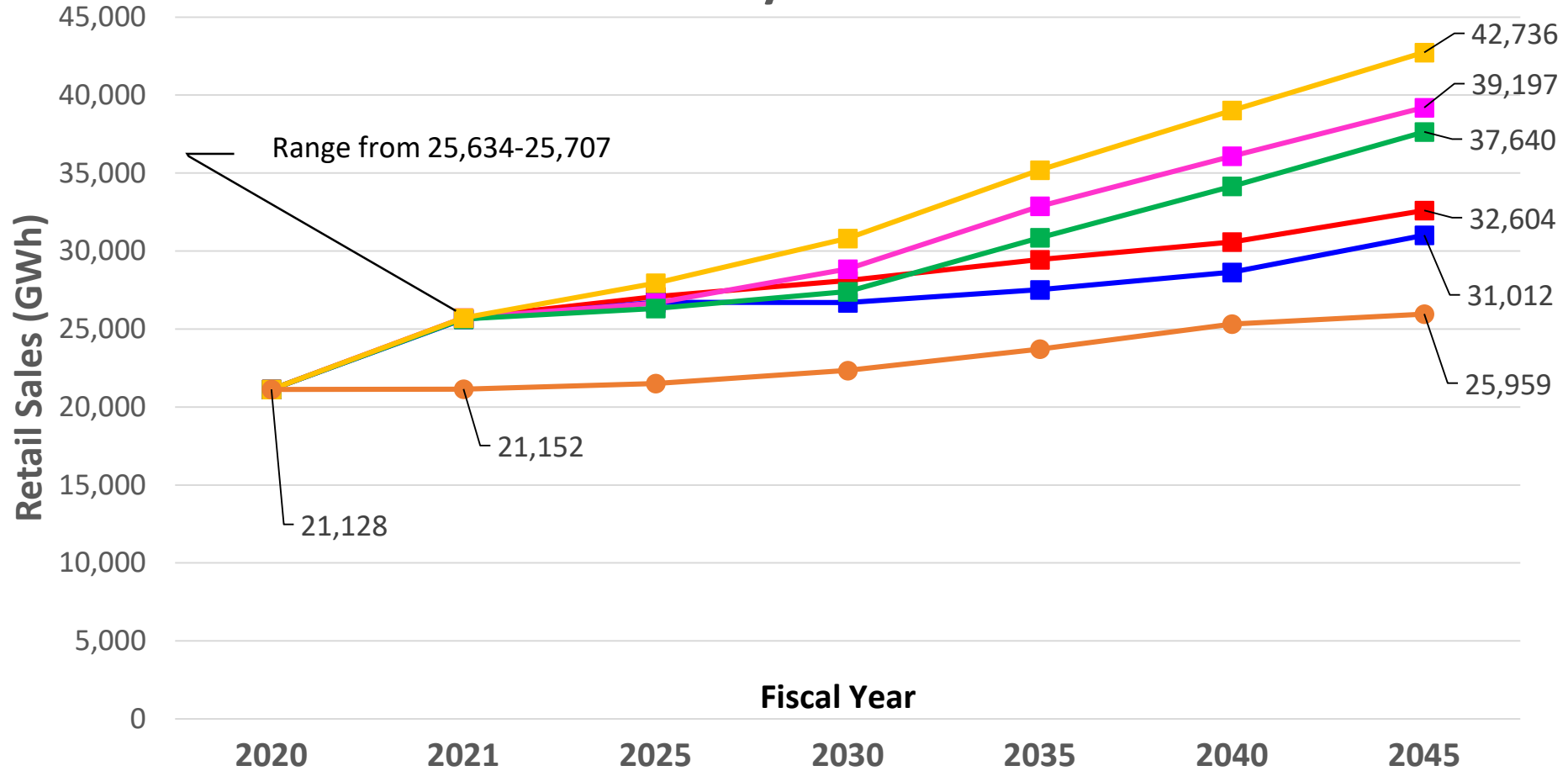
## LA100 Study - Annual Fuel, O&M, and Interest Debt Expense for High Load and SB100 Stress Load Scenarios



# LA100 Study - Annual Fuel, O&M, and Interest Debt Expense for All Scenarios



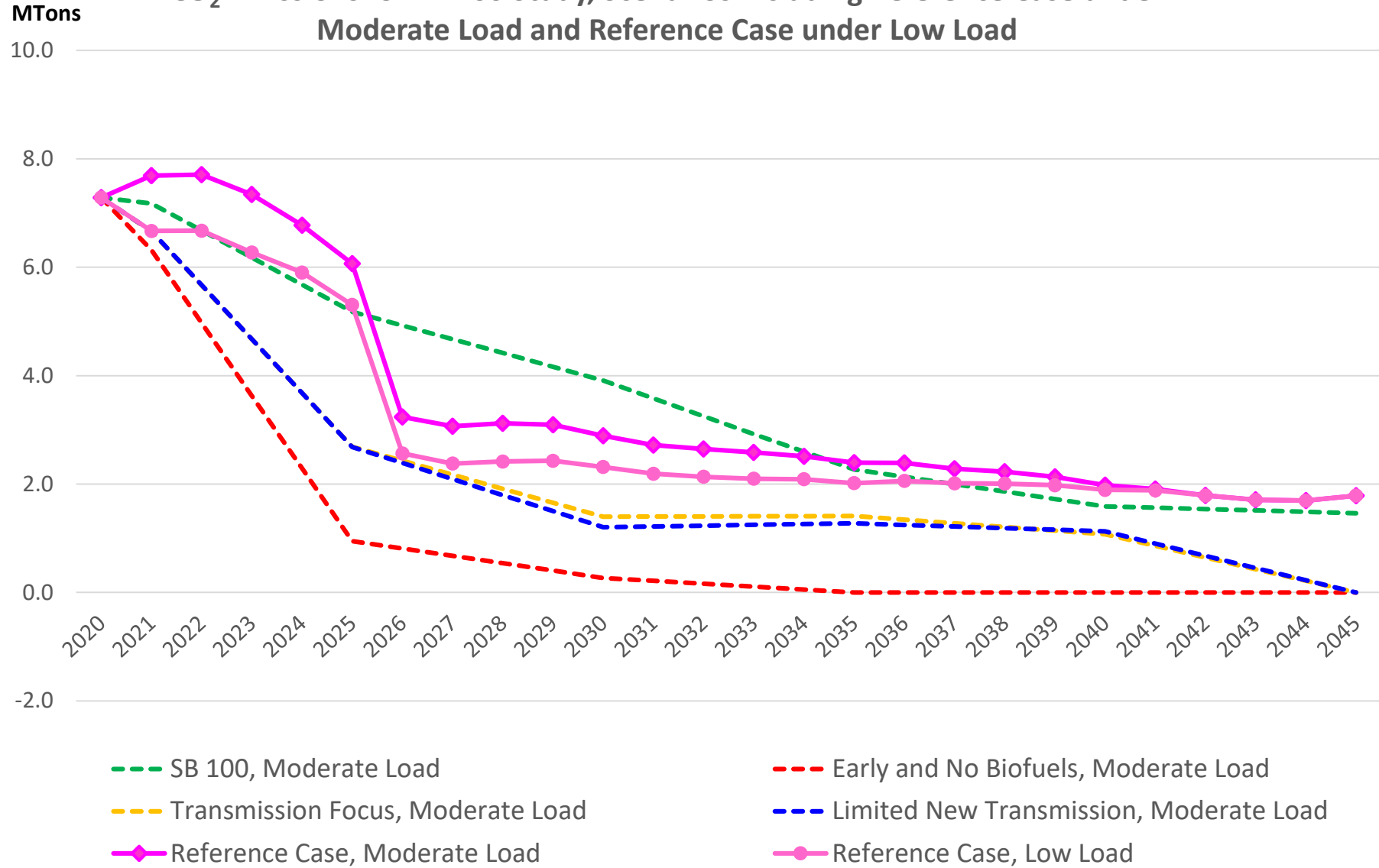
# LA100 Study - Retail Sales



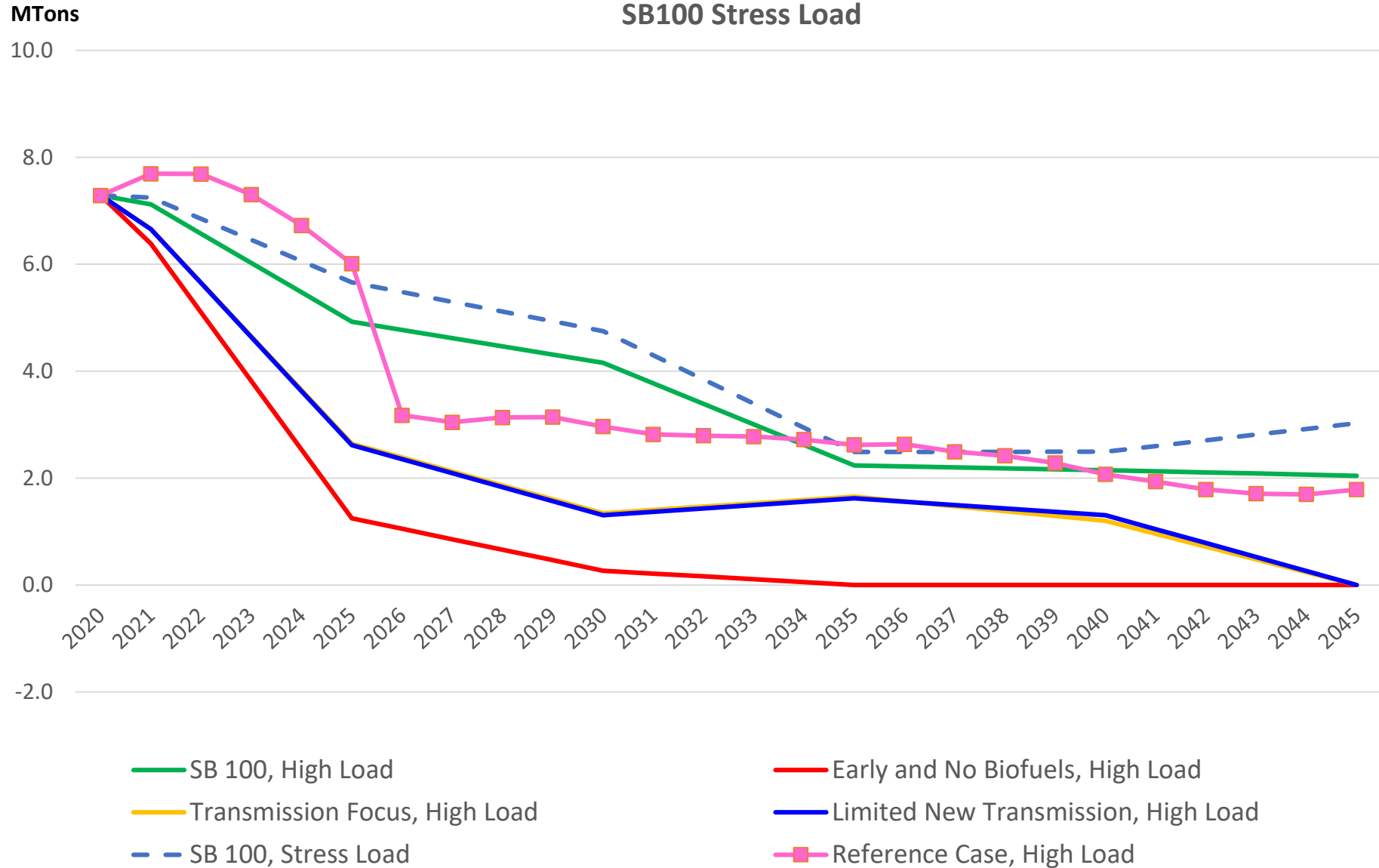
- SB 100, Moderate Load  
Transmission Focus, Moderate Load
- SB 100, High Load  
Transmission Focus, High Load
- SB 100, Stress Load

- Limited New Transmission, Moderate Load  
Early and No Biofuel, Moderate Load
- Limited New Transmission, High Load  
Early and no Biofuel, High Load
- Reference Case, Low Load

## CO<sub>2</sub> Emissions for LA 100 Study, Scenarios including Reference Case under Moderate Load and Reference Case under Low Load



## CO<sub>2</sub> Emissions for LA 100 Study, including Reference Case under High Load and SB100 Stress Load

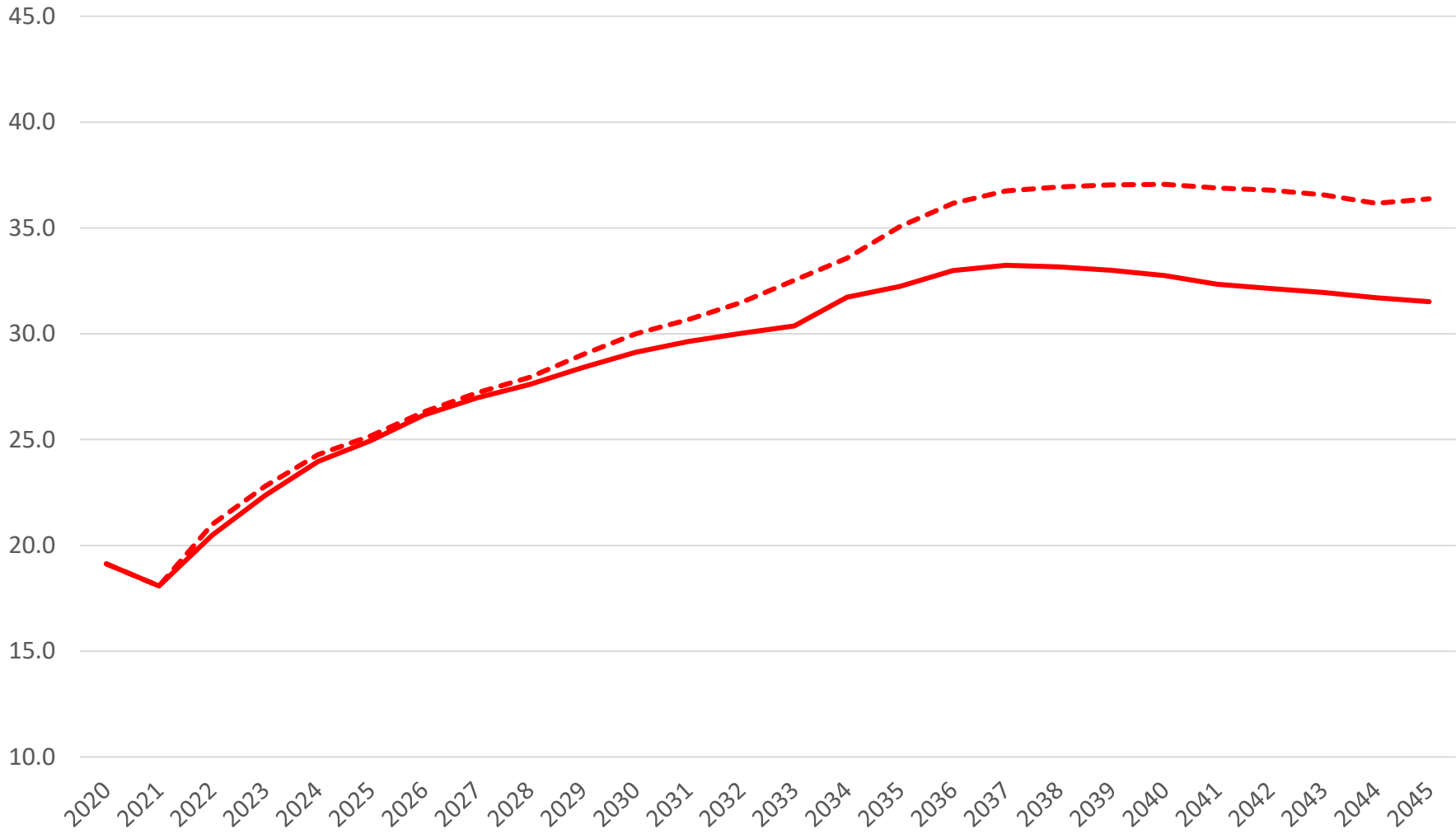


### Retail Rates Comparison for LA100 Study, SB100 Scenarios



Cents/kWh

### Retail Rates Comparison for LA100 Study, Early and No Biofuels Scenarios



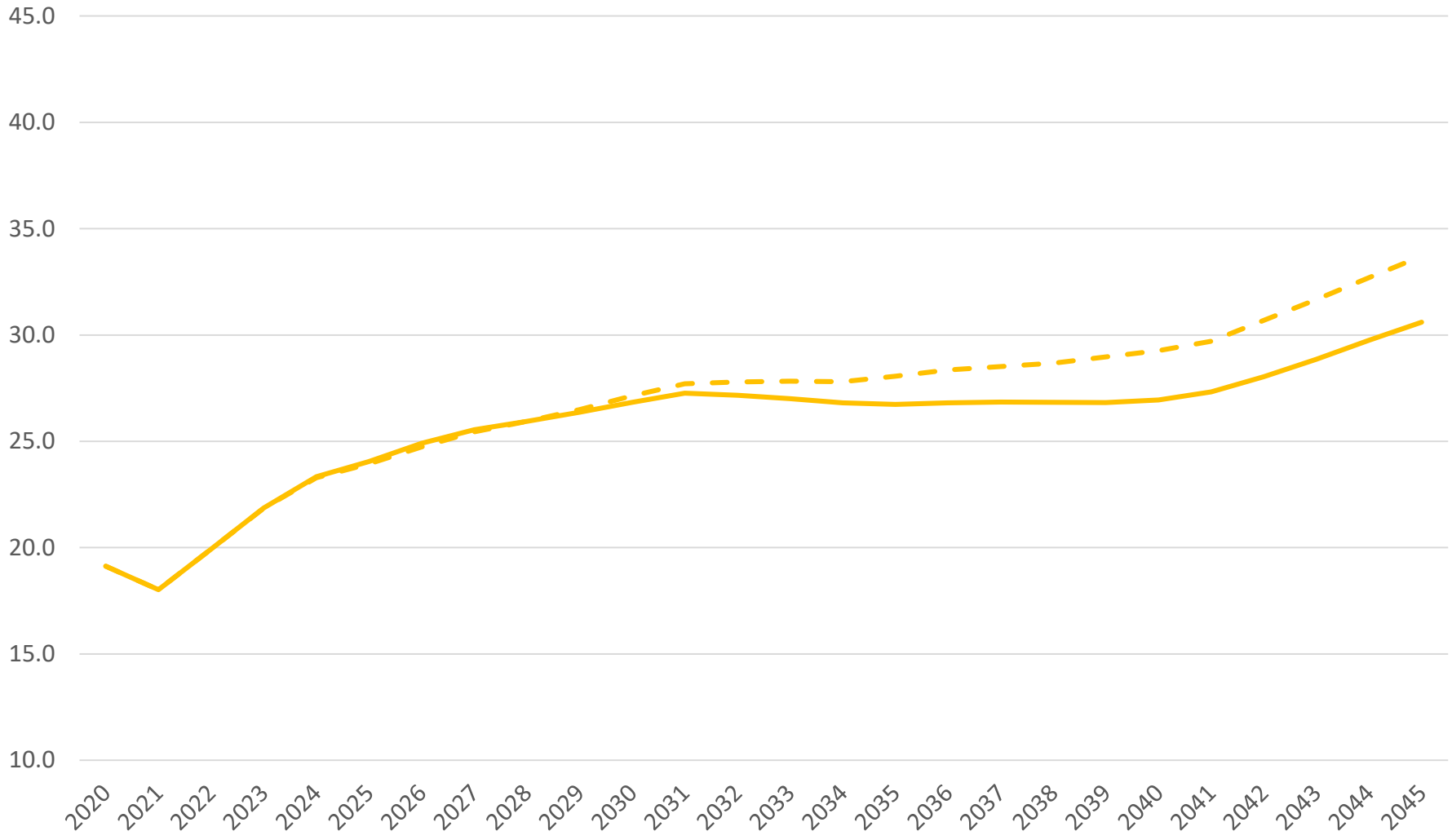
--- Early and No Biofuels, Moderate Load

— Early and No Biofuels, High Load



Cents/kWh

### Retail Rates Comparison for LA100 Study, Transmission Focus Scenarios



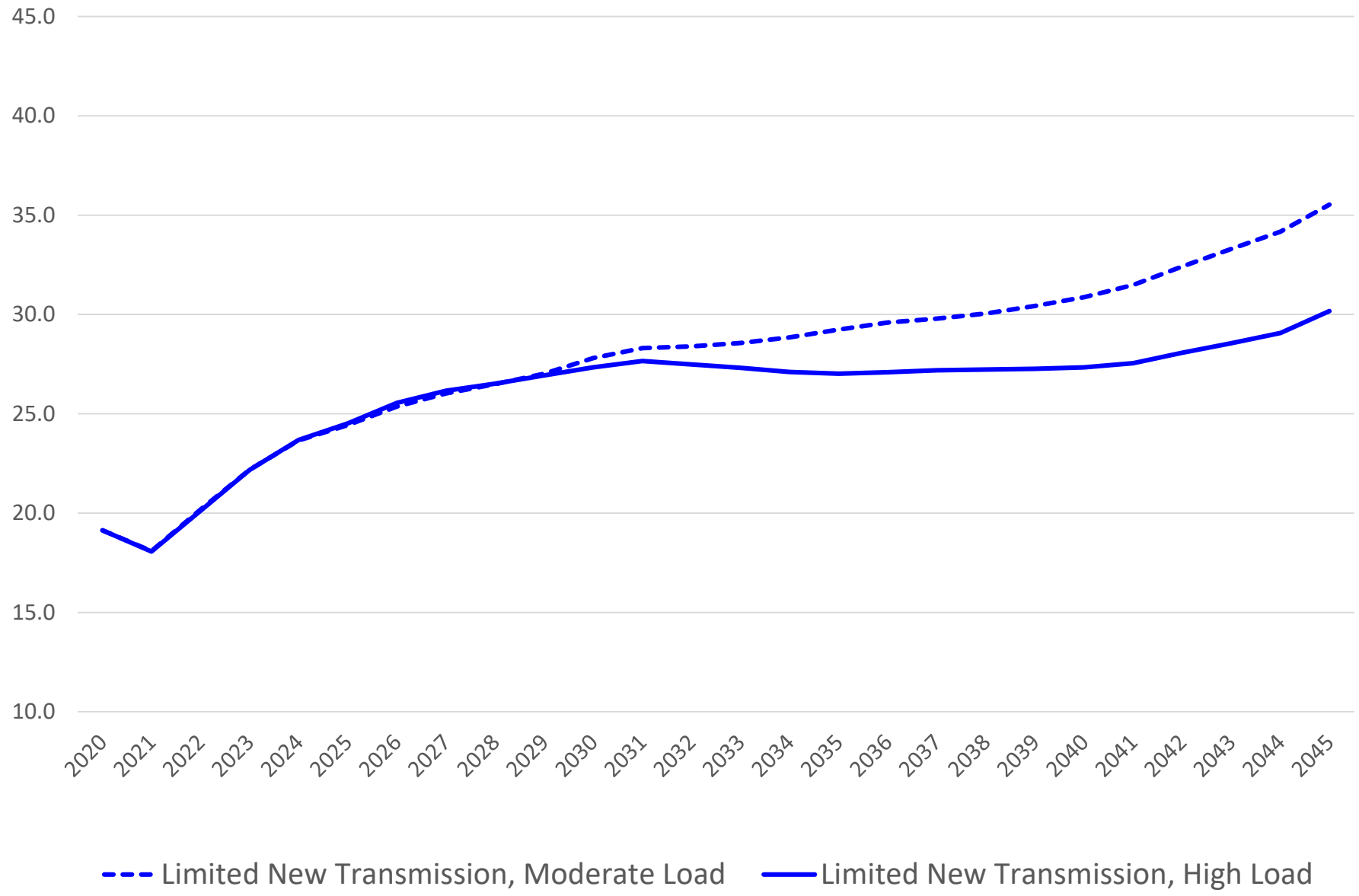
--- Transmission Focus, Moderate Load    — Transmission Focus, High Load



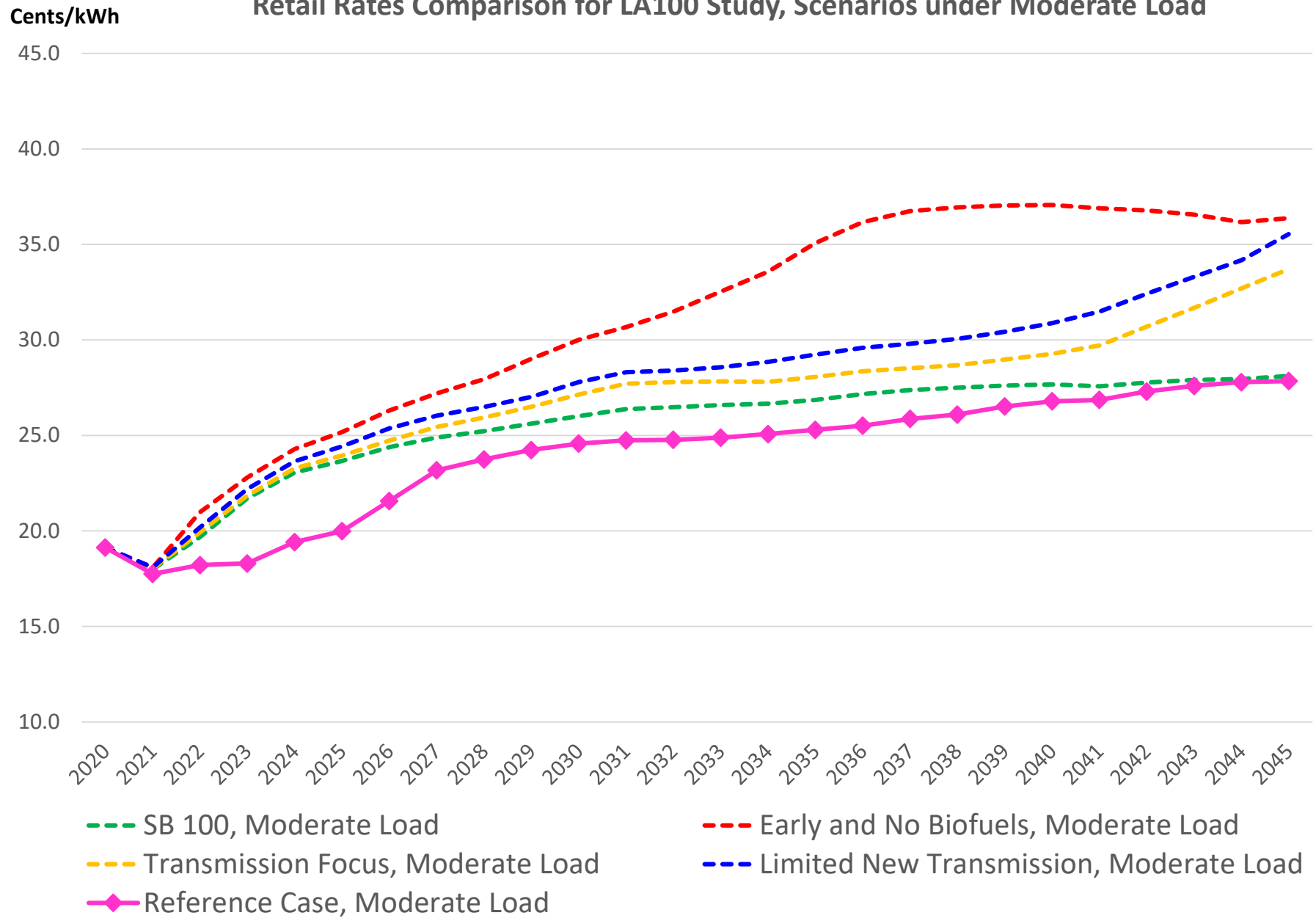


Cents/kWh

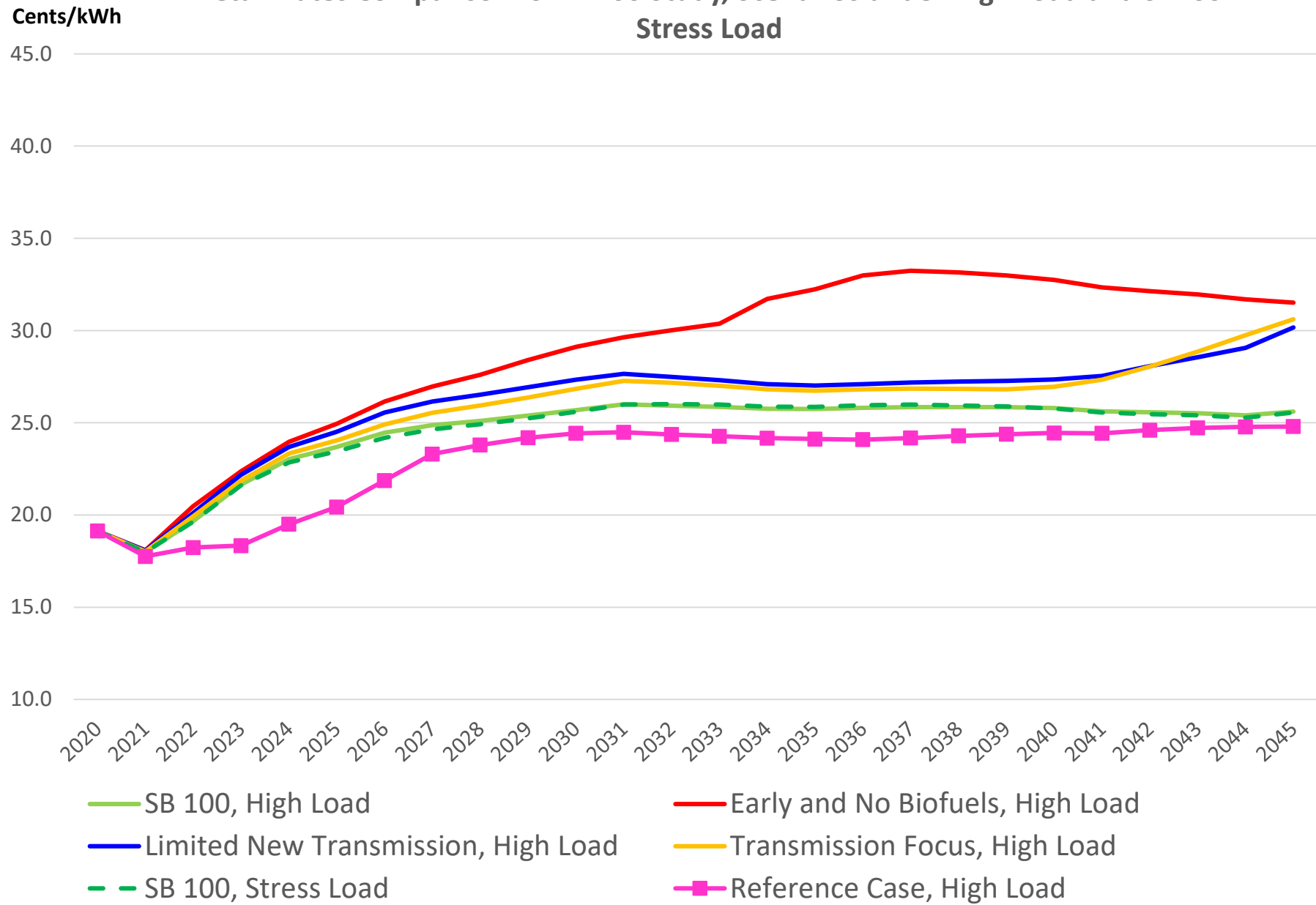
### Retail Rates Comparison for LA100 Study, Limited New Transmission Scenarios



## Retail Rates Comparison for LA100 Study, Scenarios under Moderate Load

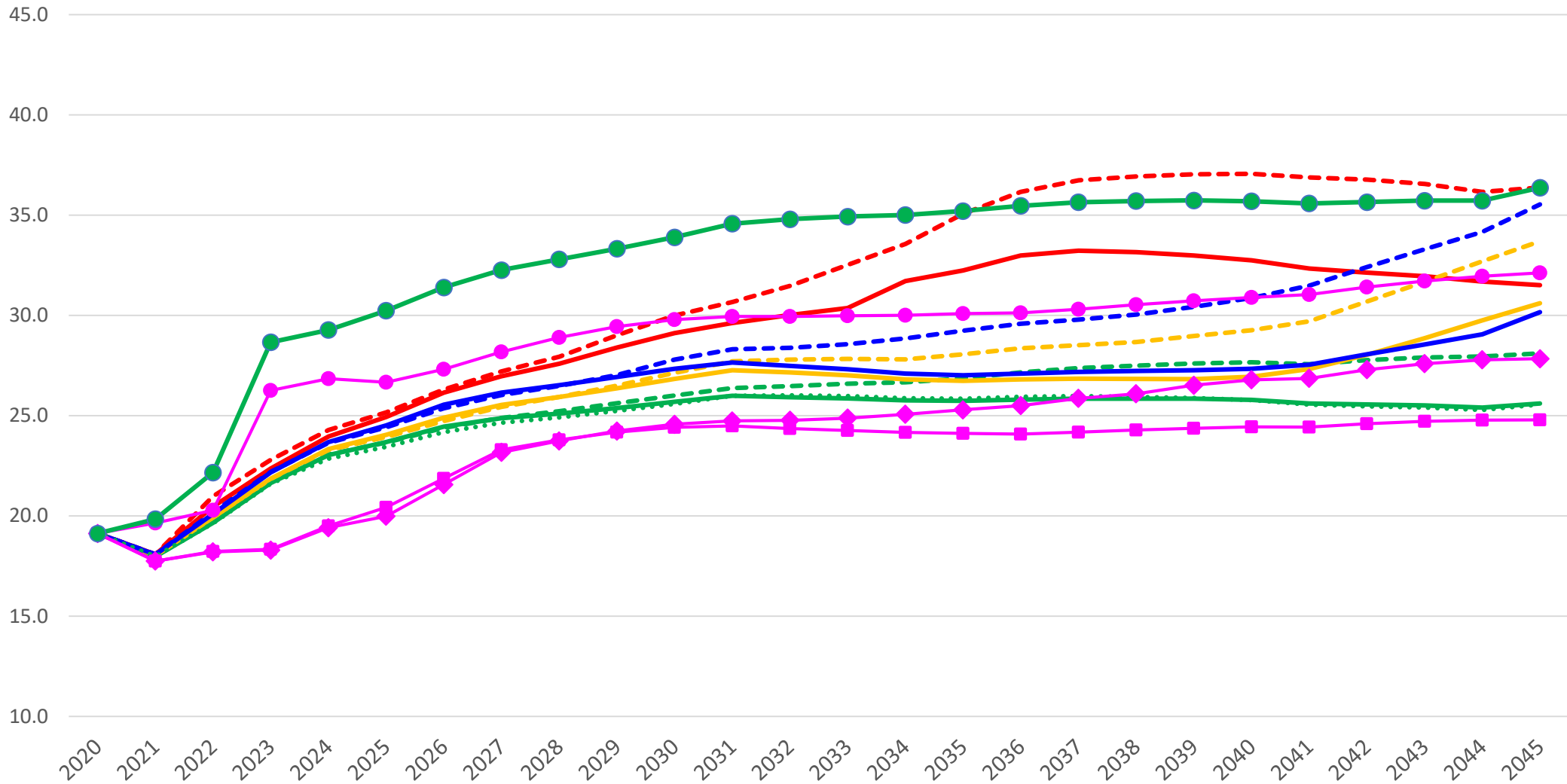


## Retail Rates Comparison for LA100 Study, Scenarios under High Load and SB100 Stress Load



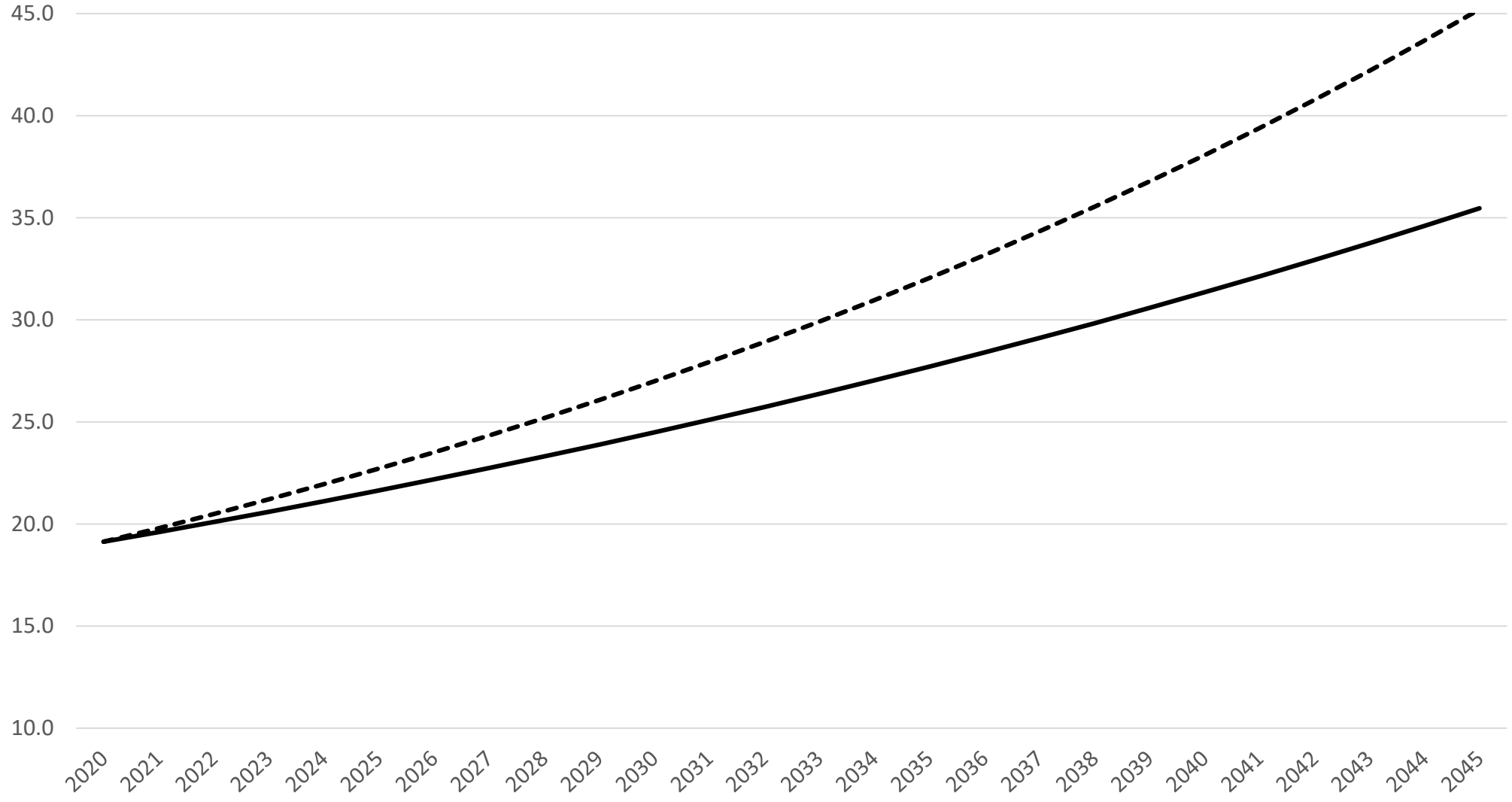
# Retail Rates Comparison for LA100 Study, including Reference Case under different Retail Loads

Cents/kWh



Cents/kWh

### Retail Rates with 2.5% and 3.5% inflation

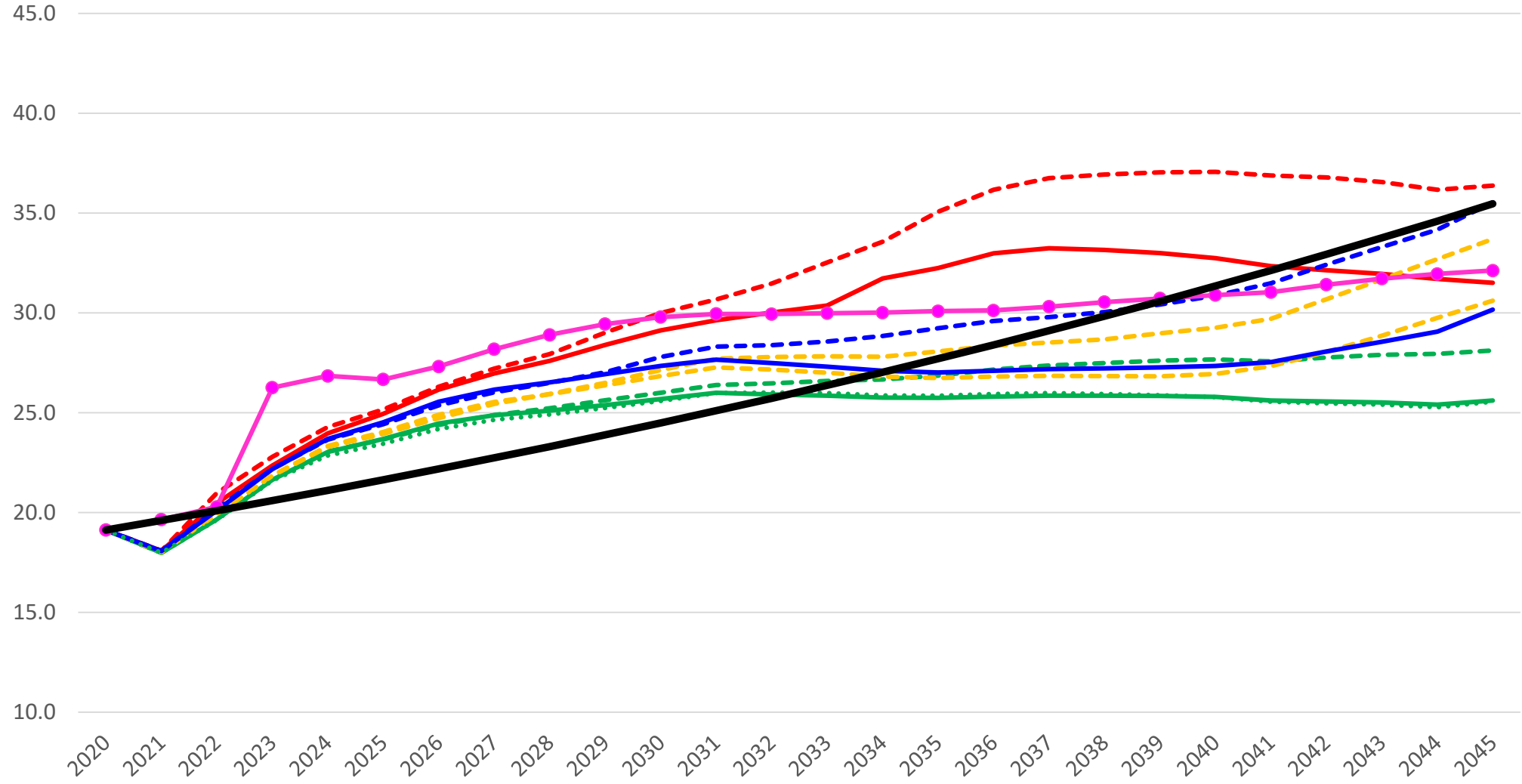


— 2020 Retail Rates with 2.5% Inflation

- - - 2020 Retail Rates with 3.5% Inflation

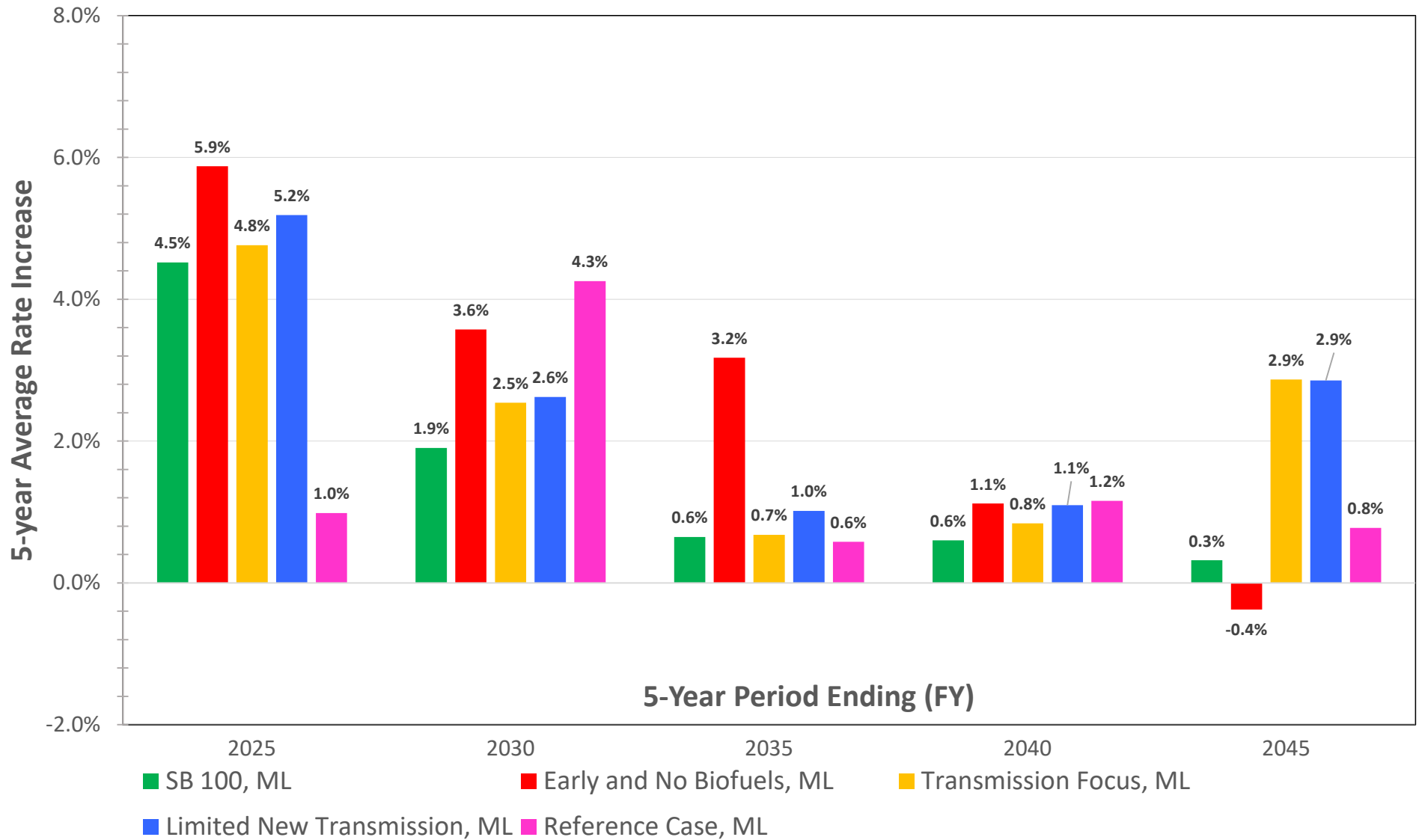
Cents/kWh

### Retail Rates Comparison for LA100 Study

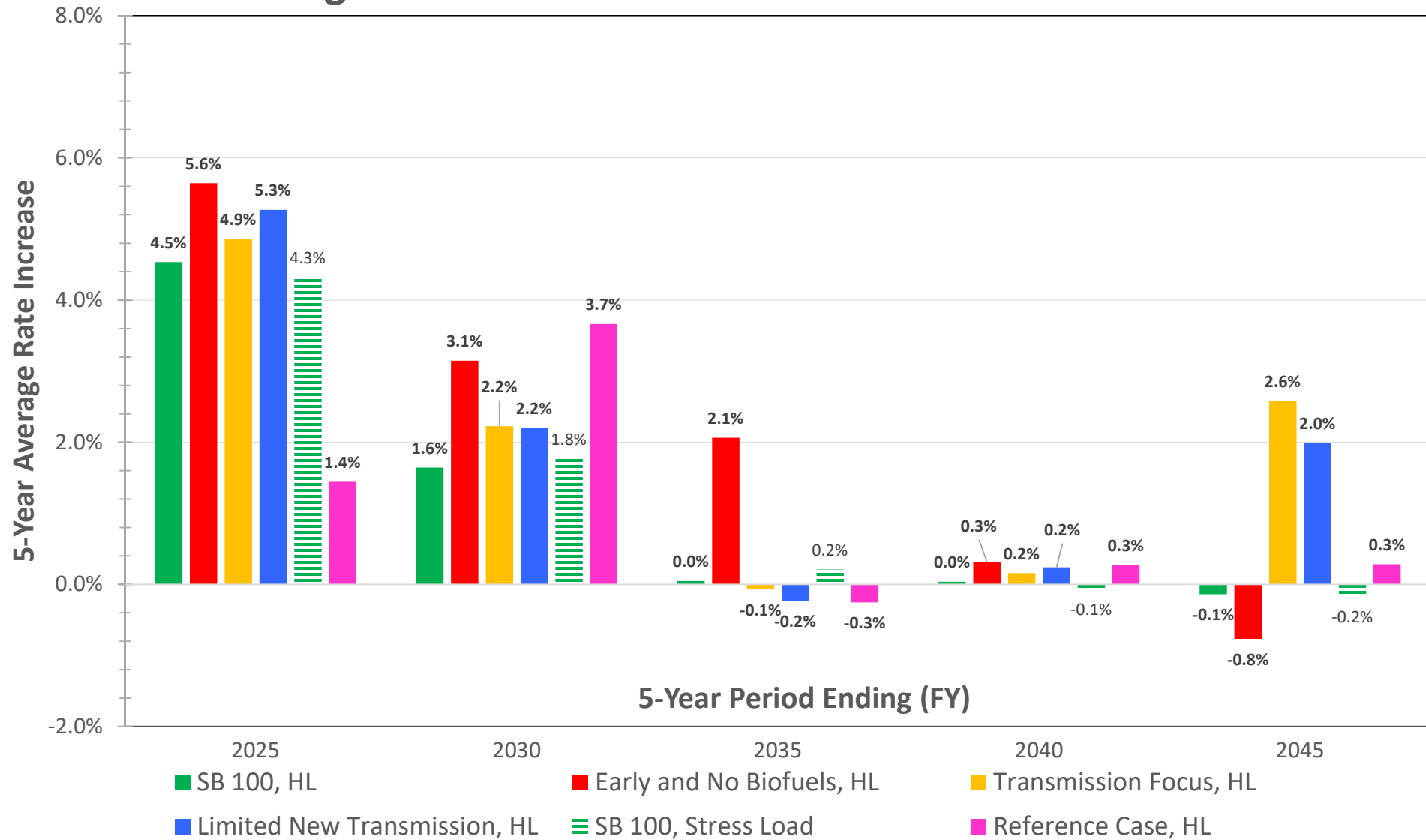


- SB 100, Moderate Load
- SB 100, High Load
- SB 100, Stress Load
- 2020 Retail Rates with 2.5% Inflation
- Early and No Biofuels, Moderate Load
- Early and No Biofuels, High Load
- Transmission Focus, Moderate Load
- Transmission Focus, High Load
- Limited New Transmission, Moderate Load
- Limited New Transmission, High Load
- Reference Case, Low Load

# LA100 - System Average Rate Increase (5-Year Average) Moderate Load Scenarios



# LA100 - System Average Rate Increase (5-Year Average) High Load and SB100 Stress Load Scenarios





# Conclusions

- Early investments will trigger increased rates within the first 10 years but stabilize after that.
- Electrification offers an opportunity to maintain steady system average rates.
- Among all scenarios, rate analysis reveals a range between 25 cts/kWh and 36 cts/kWh in fiscal year 2045.
- SB100 High Load Scenario offers lowest rate in 2045; Early and No Biofuels Moderate Load shows highest rate in 2045.

**In FY 2045, rates for all but one scenario are lower than FY 2020 rate inflated at 2.5% annually.**



# LADWP Rate Impact Analysis Next Steps

- Work with the Office of Public Accountability to review rate impact analysis.
- Continue to refine rate impact analysis as DWP moves forward and evaluates different pathways to 100% renewables.

# LA100 Next Steps to 100%

Pursue “no regrets” actions that will keep us on track to 100% renewables.

- Starting now ensures flexibility to meet environmental justice goals.
- “No regrets” projects will be based on common findings of LA100 scenarios.
- Additional public outreach in April.

Begin new 2021-22 Strategic Long-Term Resource Plan this summer with community and stakeholder input.





# Questions & Discussion

**Thank you for being part of  
L.A.'s Clean Energy Future!**

# APPENDIX

# Scenario Descriptions

Four scenarios each modified with a high and moderate load with one additional scenario (SB100) modified with a stress load.

Scenario	Description
Limited New Transmission	Limited transmission upgrades. Relying on local distributed RPS, biofuel generation and hydrogen generation (2045). Reach 100% RPS by 2030 with RECs usage and reach 100% RPS by 2045 without RECs usage. Nuclear generation <b>dis-allowed</b> after 2045.
Early and No Biofuel	Relying on hydrogen generation by 2035; no biofuel generation allowed. Reach 100% RPS by 2030 with RECs usage and reach 100% RPS by 2035 without RECs usage. Nuclear generation <b>allowed</b> after 2045.
SB 100	Relying on hydrogen and/or biofuel generation; natural gas generation allowed for system loss but not for retail sales Reach 60% RPS by 2030 with RECs usage and reach 100% RPS by 2045 with RECs usage. Nuclear generation <b>allowed</b> after 2045.
Transmission Focus	DC transmission as backbone from Vic to Century, Century to Harbor, Harbor to Haynes and Harbor to Scattergood. Relying on hydrogen generation by 2035; biofuel generation allowed. Reach 100% RPS by 2030 with RECs usage and reach 100% RPS by 2045 without RECs usage. Nuclear generation <b>dis-allowed</b> after 2045.

# Forecasted End-use load (Retail Sales)

End-use load forecast is 26%, 51%, 65% higher for Moderate, High, and Stress Scenarios respectively versus DWP's current forecasted retail sales in 2045.

- NREL forecast
  - NREL End-use Load forecast developed in conjunction with the 2017 SLTRP
  - Weather pattern and study period from 2012
- DWP Reference Case forecast
  - Retail sales forecast updated in 2020
  - Incorporates impact from pandemic
- Rate impact analysis first year reference is Fiscal Year 2020 as starting point.

# Retail Load - Scenario Comparison

## Retail Load (GWh)

Scenario #	Scenario Name	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045
1	SB 100, Moderate Load	21,128	25,705	26,048	26,391	26,734	27,076	27,270	27,479	27,689	27,899	28,109	28,332	28,613	28,894	29,176	29,457	29,645	29,879	30,113	30,347	30,582	30,930	31,348	31,767	32,185	32,604
2	Early and No Biofuels, Moderate Load	21,128	25,634	25,905	26,177	26,448	26,719	26,701	26,699	26,697	26,695	26,693	26,811	26,988	27,165	27,342	27,519	27,707	27,941	28,175	28,409	28,644	29,061	29,549	30,037	30,524	31,012
3	Transmission Focus, Moderate Load	21,128	25,705	26,048	26,391	26,734	27,076	27,270	27,479	27,689	27,899	28,109	28,332	28,613	28,894	29,176	29,457	29,645	29,879	30,113	30,347	30,582	30,930	31,348	31,767	32,185	32,604
4	Limited New Transmission, Moderate Load	21,128	25,634	25,905	26,177	26,448	26,719	26,701	26,699	26,697	26,695	26,693	26,811	26,988	27,165	27,342	27,519	27,707	27,941	28,175	28,409	28,644	29,061	29,549	30,037	30,524	31,012
5	SB 100, High Load	21,128	25,707	25,947	26,187	26,427	26,667	26,738	27,267	27,795	28,324	28,853	29,376	30,251	31,125	32,000	32,875	33,639	34,251	34,864	35,477	36,089	36,853	37,439	38,025	38,611	39,197
6	Early and No Biofuels, High Load	21,128	25,639	25,810	25,981	26,153	26,324	26,173	26,479	26,786	27,092	27,399	27,809	28,572	29,334	30,096	30,859	31,639	32,268	32,897	33,526	34,154	34,994	35,655	36,317	36,979	37,640
7	Transmission Focus, High Load	21,128	25,707	25,947	26,187	26,427	26,667	26,738	27,267	27,795	28,324	28,853	29,376	30,251	31,125	32,000	32,875	33,639	34,251	34,864	35,477	36,089	36,853	37,439	38,025	38,611	39,197
8	Limited New Transmission, High Load	21,128	25,639	25,810	25,981	26,153	26,324	26,173	26,479	26,786	27,092	27,399	27,809	28,572	29,334	30,096	30,859	31,639	32,268	32,897	33,526	34,154	34,994	35,655	36,317	36,979	37,640
9	SB 100, Stress Load	21,128	25,707	26,266	26,825	27,384	27,943	28,320	28,944	29,568	30,192	30,817	31,422	32,366	33,310	34,254	35,198	36,045	36,789	37,532	38,275	39,018	39,929	40,630	41,332	42,034	42,736
	Reference Case, Moderate Load	21,128	25,705	26,048	26,391	26,734	27,076	27,270	27,479	27,689	27,899	28,109	28,332	28,613	28,894	29,176	29,457	29,645	29,879	30,113	30,347	30,582	30,930	31,348	31,767	32,185	32,604
	Reference Case, High Load	21,128	25,707	25,947	26,187	26,427	26,667	26,738	27,267	27,795	28,324	28,853	29,376	30,251	31,125	32,000	32,875	33,639	34,251	34,864	35,477	36,089	36,853	37,439	38,025	38,611	39,197
	Reference Case, Low Load	21,128	21,275	21,152	21,286	21,359	21,514	21,569	21,572	21,725	22,056	22,348	22,638	22,926	23,216	23,481	23,722	24,114	24,407	24,683	24,953	25,320	25,447	25,574	25,702	25,830	25,959
	SB 100, Low Load	21,128	21,275	21,152	21,286	21,359	21,514	21,569	21,572	21,725	22,056	22,348	22,638	22,926	23,216	23,481	23,722	24,114	24,407	24,683	24,953	25,320	25,447	25,574	25,702	25,830	25,959





# Fuel Cost – Scenario Comparison

## Fuel Cost (\$M)

Scenario #	Scenario Name	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045
1	SB 100, Moderate Load	1,433	1,683	1,932	2,036	2,128	2,254	2,339	2,333	2,365	2,398	2,441	2,504	2,512	2,559	2,602	2,645	2,762	2,776	2,828	2,878	2,924	2,968	2,997	3,022	3,051	3,069
2	Early and No Biofuels, Moderate Load	1,433	1,784	2,202	2,371	2,527	2,716	2,958	3,039	3,157	3,276	3,404	3,472	3,456	3,480	3,500	3,521	3,611	3,599	3,627	3,652	3,674	3,674	3,676	3,675	3,678	3,671
3	Transmission Focus, Moderate Load	1,433	1,697	1,992	2,126	2,249	2,405	2,489	2,482	2,512	2,544	2,584	2,628	2,618	2,648	2,674	2,701	2,812	2,820	2,866	2,911	2,952	3,179	3,399	3,626	3,863	4,099
4	Limited New Transmission, Moderate Load	1,433	1,716	2,032	2,168	2,291	2,448	2,604	2,597	2,629	2,662	2,703	2,775	2,763	2,791	2,815	2,841	2,950	2,957	3,003	3,047	3,088	3,421	3,619	3,822	4,034	4,243
5	SB 100, High Load	1,433	1,680	1,921	2,020	2,107	2,228	2,335	2,343	2,391	2,441	2,500	2,623	2,681	2,777	2,869	2,962	3,110	3,140	3,209	3,277	3,342	3,396	3,431	3,463	3,497	3,521
6	Early and No Biofuels, High Load	1,433	1,728	2,089	2,257	2,412	2,600	2,861	2,951	3,079	3,208	3,345	3,443	3,444	3,484	3,522	3,561	3,689	3,706	3,761	3,815	3,866	3,909	3,952	3,992	4,036	4,070
7	Transmission Focus, High Load	1,433	1,695	1,982	2,110	2,227	2,376	2,488	2,500	2,551	2,602	2,663	2,754	2,780	2,846	2,909	2,973	3,128	3,166	3,242	3,316	3,387	3,720	4,047	4,385	4,739	5,097
8	Limited New Transmission, High Load	1,433	1,708	2,007	2,135	2,251	2,399	2,583	2,595	2,646	2,697	2,757	2,865	2,877	2,927	2,975	3,024	3,186	3,237	3,326	3,413	3,498	3,692	3,892	4,096	4,310	4,520
9	SB 100, Stress Load	1,433	1,684	1,941	2,051	2,148	2,280	2,404	2,427	2,489	2,552	2,626	2,767	2,835	2,941	3,042	3,143	3,300	3,337	3,412	3,485	3,555	3,623	3,671	3,717	3,766	3,804
	Reference Case, Moderate Load	1,433	1,593	1,647	1,671	1,729	1,811	1,843	1,886	1,930	1,927	1,999	2,017	2,069	2,115	2,164	2,216	2,265	2,306	2,384	2,437	2,513	2,603	2,704	2,793	2,874	2,945
	Reference Case, High Load	1,433	1,593	1,644	1,664	1,718	1,795	1,822	1,878	1,934	1,944	2,029	2,061	2,137	2,209	2,285	2,364	2,438	2,498	2,594	2,665	2,759	2,869	2,979	3,075	3,163	3,242
	Reference Case, Low Load	1,433	1,524	1,483	1,499	1,532	1,598	1,618	1,652	1,692	1,691	1,762	1,781	1,831	1,875	1,920	1,969	2,024	2,066	2,145	2,198	2,278	2,357	2,445	2,520	2,588	2,646
	SB 100, Low Load	1,433	1,616	1,770	1,864	1,927	2,034	2,138	2,134	2,176	2,224	2,278	2,402	2,440	2,515	2,581	2,647	2,782	2,794	2,845	2,893	2,944	2,972	2,994	3,014	3,037	3,049

Fuel Costs consist of fuel and purchased power expenses



# CO<sub>2</sub> Emissions – Scenario Comparison

## Emissions (Mtons)

Scenario #	Scenario Name	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	
1	SB 100, Moderate Load	7.3	7.2	6.7	6.2	5.7	5.2	4.9	4.7	4.4	4.2	3.9	3.6	3.3	2.9	2.6	2.3	2.1	2.0	1.9	1.7	1.6	1.6	1.5	1.5	1.5	1.5	
2	Early and No Biofuels, Moderate Load	7.3	6.3	5.0	3.6	2.3	0.9	0.8	0.7	0.5	0.4	0.3	0.2	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3	Transmission Focus, Moderate Load	7.3	6.7	5.7	4.7	3.7	2.7	2.4	2.2	1.9	1.7	1.4	1.4	1.4	1.4	1.4	1.4	1.3	1.3	1.2	1.1	1.1	0.9	0.6	0.4	0.2	0.0	
4	Limited New Transmission, Moderate Load	7.3	6.7	5.7	4.7	3.7	2.7	2.4	2.1	1.8	1.5	1.2	1.2	1.2	1.2	1.3	1.3	1.2	1.2	1.2	1.2	1.1	0.9	0.7	0.5	0.2	0.0	
5	SB 100, High Load	7.3	7.1	6.6	6.0	5.5	4.9	4.8	4.6	4.5	4.3	4.2	3.8	3.4	3.0	2.6	2.2	2.2	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.0	
6	Early and No Biofuels, High Load	7.3	6.4	5.1	3.8	2.5	1.2	1.1	0.9	0.7	0.5	0.3	0.2	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
7	Transmission Focus, High Load	7.3	6.7	5.7	4.7	3.6	2.6	2.4	2.1	1.9	1.6	1.3	1.4	1.5	1.5	1.6	1.7	1.6	1.5	1.4	1.3	1.2	1.0	0.7	0.5	0.2	0.0	
8	Limited New Transmission, High Load	7.3	6.7	5.6	4.6	3.6	2.6	2.4	2.1	1.8	1.6	1.3	1.4	1.4	1.5	1.6	1.6	1.6	1.5	1.4	1.4	1.3	1.0	0.8	0.5	0.3	0.0	
9	SB 100, Stress Load	7.3	7.2	6.8	6.5	6.1	5.7	5.5	5.3	5.1	4.9	4.7	4.3	3.8	3.4	2.9	2.5	2.5	2.5	2.5	2.5	2.5	2.6	2.7	2.8	2.9	3.0	
	Reference Case, Moderate Load	7.3	7.7	7.7	7.3	6.8	6.1	3.2	3.1	3.1	3.1	2.9	2.7	2.6	2.6	2.5	2.4	2.4	2.3	2.2	2.1	2.0	1.9	1.8	1.7	1.7	1.8	
	Reference Case, High Load	7.3	7.7	7.7	7.3	6.7	6.0	3.2	3.0	3.1	3.1	3.0	2.8	2.8	2.8	2.7	2.6	2.6	2.5	2.4	2.3	2.1	1.9	1.8	1.7	1.7	1.8	
	Reference Case, Low Load	7.3	6.7	6.7	6.3	5.9	5.3	2.6	2.4	2.4	2.4	2.3	2.2	2.1	2.1	2.1	2.0	2.1	2.0	2.0	2.0	1.9	1.9	1.8	1.7	1.7	1.8	
	SB 100, Low Load	7.3	6.2	5.8	5.3	5.1	4.8	4.7	4.4	4.2	4.0	3.9	3.5	3.0	2.5	2.1	1.7	1.8	1.9	2.0	2.1	2.3	2.5	2.7	2.8	2.9	3.0	



# System Average Rate – Scenario Comparison

## System Retail Rates (cts/kWh)

Scenario #	Scenario Name	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045
1	SB 100, Moderate Load	19.1	18.0	19.7	21.7	23.1	23.7	24.4	24.9	25.2	25.6	26.0	26.4	26.5	26.6	26.7	26.9	27.2	27.4	27.5	27.6	27.7	27.6	27.8	27.9	27.9	28.1
2	Early and No Biofuels, Moderate Load	19.1	18.1	21.0	22.8	24.3	25.2	26.3	27.2	27.9	29.0	30.0	30.7	31.5	32.5	33.6	35.1	36.2	36.7	36.9	37.0	37.1	36.9	36.8	36.6	36.2	36.4
3	Transmission Focus, Moderate Load	19.1	18.0	19.9	21.9	23.3	23.9	24.7	25.4	25.9	26.5	27.1	27.7	27.8	27.8	27.8	28.1	28.4	28.5	28.7	29.0	29.3	29.7	30.7	31.7	32.7	33.7
4	Limited New Transmission, Moderate Load	19.1	18.1	20.2	22.2	23.7	24.4	25.4	26.0	26.5	27.0	27.8	28.3	28.4	28.6	28.9	29.2	29.6	29.8	30.0	30.4	30.9	31.5	32.4	33.3	34.2	35.5
5	SB 100, High Load	19.1	18.0	19.7	21.6	23.0	23.7	24.5	24.9	25.1	25.4	25.7	26.0	25.9	25.9	25.8	25.7	25.8	25.9	25.9	25.8	25.8	25.6	25.6	25.5	25.4	25.6
6	Early and No Biofuels, High Load	19.1	18.1	20.5	22.4	24.0	24.9	26.2	27.0	27.6	28.4	29.1	29.6	30.0	30.4	31.7	32.2	33.0	33.2	33.2	33.0	32.7	32.3	32.1	32.0	31.7	31.5
7	Transmission Focus, High Load	19.1	18.0	19.9	21.9	23.3	24.0	24.9	25.5	25.9	26.4	26.8	27.3	27.2	27.0	26.8	26.7	26.8	26.9	26.8	26.8	27.0	27.3	28.0	28.9	29.8	30.6
8	Limited New Transmission, High Load	19.1	18.1	20.1	22.2	23.7	24.5	25.6	26.2	26.5	26.9	27.3	27.7	27.5	27.3	27.1	27.0	27.1	27.2	27.2	27.3	27.3	27.5	28.1	28.6	29.1	30.2
9	SB 100, Stress Load	19.1	18.0	19.6	21.6	22.9	23.4	24.2	24.6	24.9	25.2	25.6	26.0	26.0	26.0	25.9	25.9	25.9	26.0	25.9	25.9	25.8	25.6	25.5	25.4	25.3	25.6
	Reference Case, Moderate Load	19.1	17.8	18.2	18.3	19.4	20.0	21.6	23.2	23.7	24.2	24.6	24.7	24.8	24.9	25.1	25.3	25.5	25.9	26.1	26.5	26.8	26.9	27.3	27.6	27.8	27.8
	Reference Case, High Load	19.1	17.8	18.2	18.3	19.5	20.4	21.9	23.3	23.8	24.2	24.4	24.5	24.4	24.3	24.2	24.1	24.1	24.2	24.3	24.4	24.4	24.4	24.6	24.7	24.8	24.8
	Reference Case, Low Load	19.1	19.6	20.3	26.3	26.8	26.7	27.3	28.2	28.9	29.4	29.8	29.9	29.9	30.0	30.0	30.1	30.1	30.3	30.5	30.7	30.9	31.0	31.4	31.7	32.0	32.1
	SB 100, Low Load	19.1	19.8	22.2	28.7	29.3	30.2	31.4	32.3	32.8	33.3	33.9	34.6	34.8	34.9	35.0	35.2	35.5	35.6	35.7	35.7	35.7	35.6	35.7	35.7	35.7	36.4
	2020 Retail Rates with 2.5% Inflation	19.1	19.6	20.1	20.6	21.1	21.6	22.2	22.7	23.3	23.9	24.5	25.1	25.7	26.4	27.0	27.7	28.4	29.1	29.8	30.6	31.3	32.1	32.9	33.8	34.6	35.5
	2020 Retail Rates with 3.5% Inflation	19.1	19.8	20.5	21.2	22.0	22.7	23.5	24.3	25.2	26.1	27.0	27.9	28.9	29.9	31.0	32.0	33.2	34.3	35.5	36.8	38.1	39.4	40.8	42.2	43.7	45.2



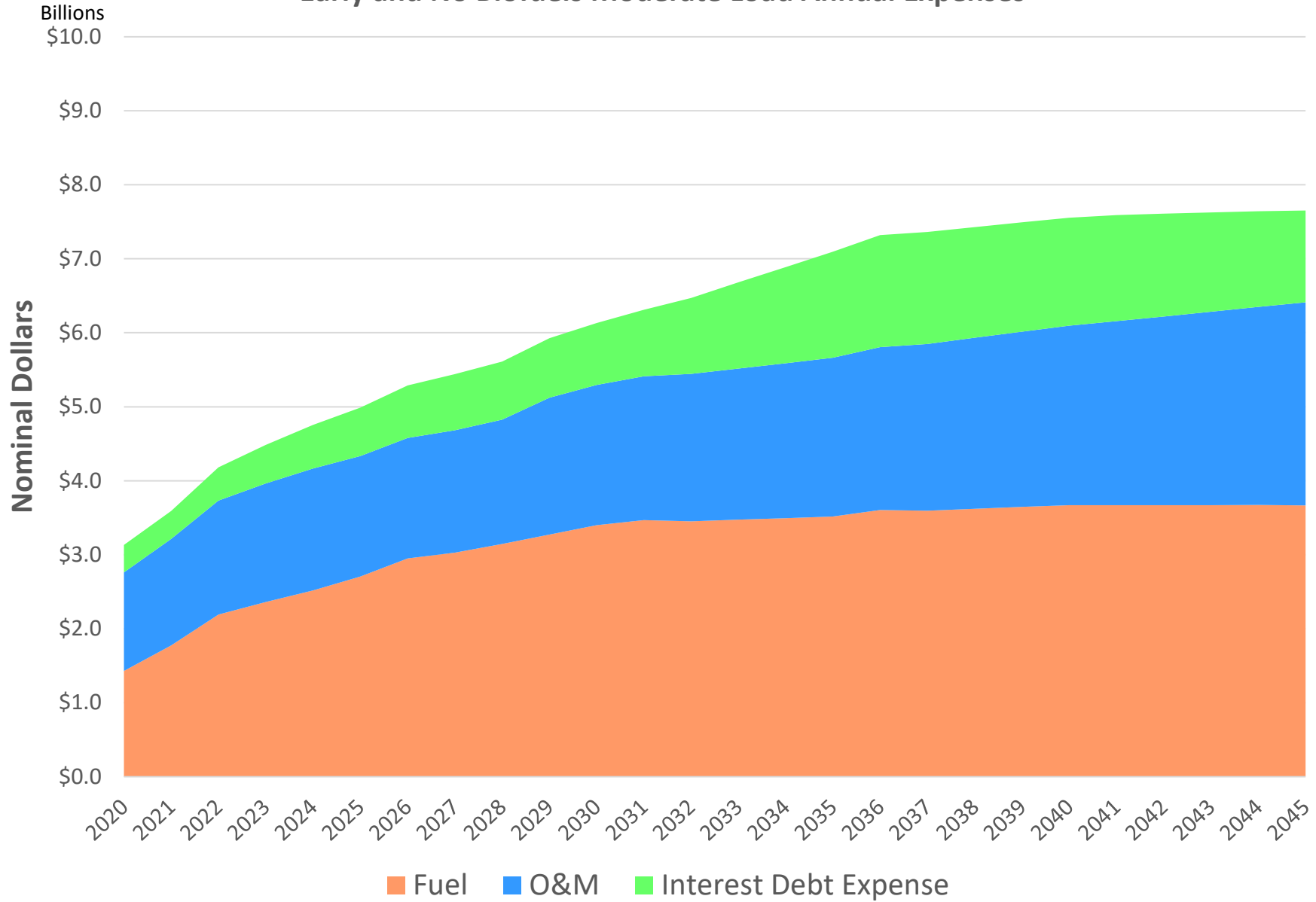
# LA100 - System Average Rate Percent Increase Year over Year

Retail Rate increase Year Over Year (cts/kWh)

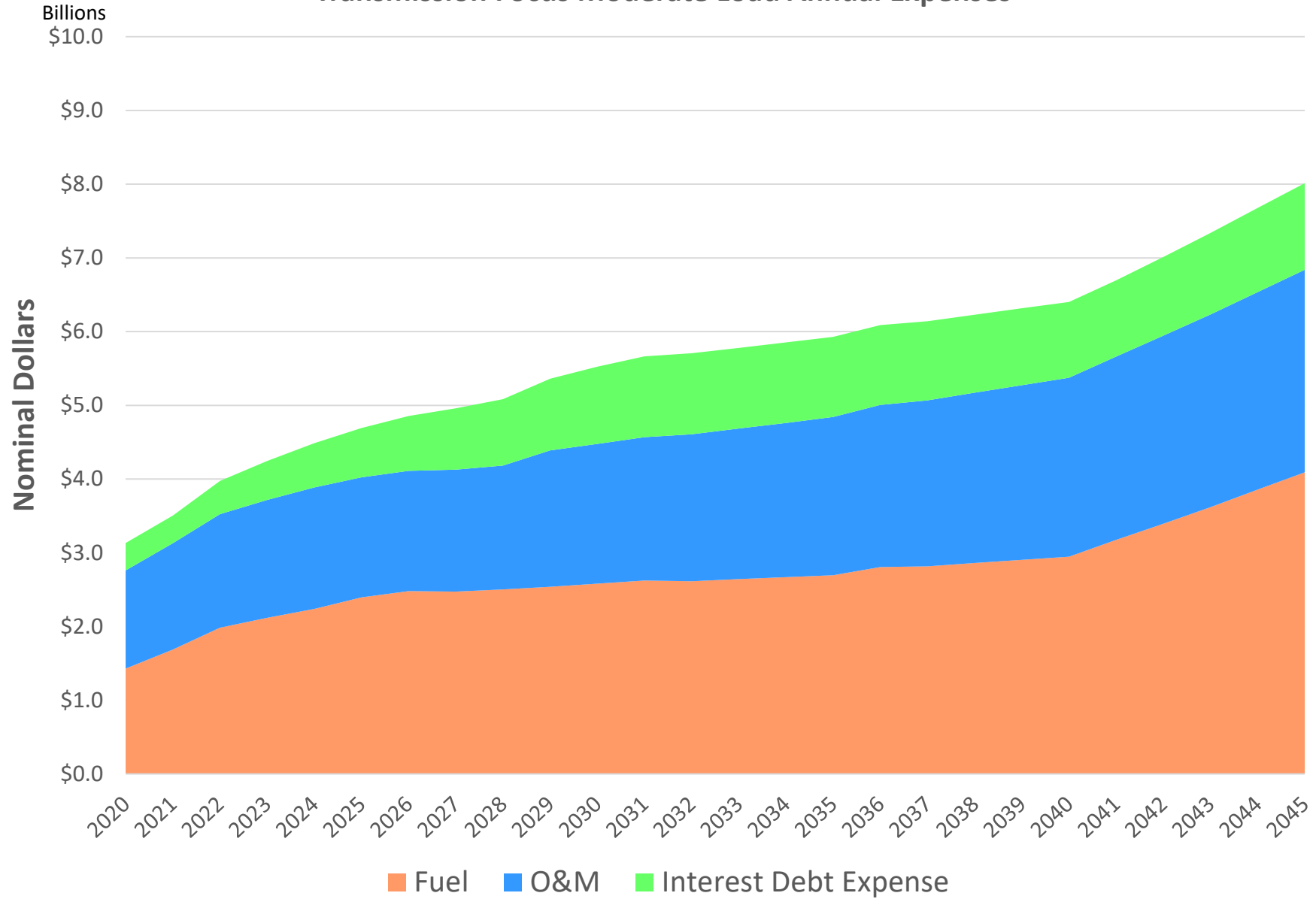
Scenario #	Scenario Name	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045
1	SB 100, Moderate Load	-6.0%	9.4%	10.3%	6.2%	2.6%	3.1%	2.0%	1.3%	1.6%	1.5%	1.5%	0.4%	0.4%	0.3%	0.7%	1.1%	0.8%	0.4%	0.4%	0.2%	-0.4%	0.7%	0.5%	0.2%	0.6%	
2	Early and No Biofuels, Moderate Load	-5.5%	16.0%	8.7%	6.5%	3.6%	4.5%	3.4%	2.7%	3.8%	3.4%	2.2%	2.6%	3.3%	3.2%	4.5%	3.1%	1.6%	0.5%	0.3%	0.1%	-0.5%	-0.3%	-0.6%	-1.1%	0.6%	
3	Transmission Focus, Moderate Load	-5.8%	10.6%	9.6%	6.6%	2.8%	3.3%	2.9%	2.0%	2.1%	2.4%	2.1%	0.3%	0.1%	-0.1%	0.9%	1.1%	0.6%	0.6%	1.0%	1.0%	1.5%	3.3%	3.2%	3.2%	3.1%	
4	Limited New Transmission, Moderate Load	-5.4%	11.6%	10.0%	6.6%	3.3%	3.9%	2.6%	1.8%	2.0%	2.9%	1.8%	0.3%	0.6%	1.0%	1.3%	1.2%	0.7%	0.9%	1.2%	1.5%	2.0%	3.0%	2.7%	2.6%	4.0%	
5	SB 100, High Load	-6.0%	9.3%	10.1%	6.4%	2.8%	3.3%	1.7%	0.9%	1.1%	1.2%	1.2%	-0.3%	-0.2%	-0.4%	-0.1%	0.2%	0.2%	0.0%	0.0%	-0.2%	-0.7%	-0.2%	-0.2%	-0.4%	0.8%	
6	Early and No Biofuels, High Load	-5.5%	13.2%	9.2%	7.2%	4.1%	4.9%	3.1%	2.3%	2.9%	2.5%	1.8%	1.3%	1.2%	4.4%	1.6%	2.3%	0.7%	-0.2%	-0.5%	-0.7%	-1.2%	-0.6%	-0.6%	-0.8%	-0.6%	
7	Transmission Focus, High Load	-5.8%	10.6%	9.7%	6.8%	3.0%	3.6%	2.6%	1.5%	1.7%	1.8%	1.6%	-0.4%	-0.6%	-0.7%	-0.3%	0.3%	0.2%	-0.1%	-0.1%	0.5%	1.4%	2.6%	2.9%	3.1%	2.9%	
8	Limited New Transmission, High Load	-5.5%	11.3%	10.3%	6.8%	3.5%	4.2%	2.4%	1.4%	1.6%	1.5%	1.2%	-0.6%	-0.6%	-0.8%	-0.3%	0.3%	0.3%	0.1%	0.1%	0.3%	0.7%	1.9%	1.7%	1.8%	3.8%	
9	SB 100, Stress Load	-6.0%	9.2%	10.0%	5.8%	2.6%	3.1%	1.9%	1.1%	1.3%	1.4%	1.6%	0.1%	-0.1%	-0.4%	-0.1%	0.3%	0.2%	-0.2%	-0.2%	-0.4%	-0.9%	-0.3%	-0.2%	-0.5%	1.1%	
	Reference Case, Moderate Load	-7.2%	2.6%	0.5%	6.1%	2.9%	7.9%	7.5%	2.5%	2.1%	1.4%	0.7%	0.1%	0.4%	0.8%	0.9%	0.8%	1.4%	0.9%	1.6%	1.0%	0.3%	1.6%	1.1%	0.7%	0.2%	
	Reference Case, High Load	-7.2%	2.7%	0.6%	6.3%	4.8%	7.0%	6.6%	2.1%	1.7%	1.0%	0.3%	-0.5%	-0.4%	-0.4%	-0.2%	-0.1%	0.4%	0.5%	0.4%	0.3%	-0.1%	0.7%	0.5%	0.2%	0.1%	
	Reference Case, Low Load	2.7%	3.3%	29.4%	2.2%	-0.7%	2.4%	3.2%	2.6%	1.9%	1.2%	0.5%	0.0%	0.1%	0.1%	0.3%	0.1%	0.6%	0.8%	0.6%	0.6%	0.5%	1.2%	0.9%	0.7%	0.5%	
	SB 100, Low Load	3.7%	11.7%	29.3%	2.1%	3.3%	3.8%	2.8%	1.7%	1.6%	1.7%	2.0%	0.6%	0.4%	0.2%	0.6%	0.7%	0.5%	0.2%	0.1%	-0.1%	-0.3%	0.2%	0.2%	0.0%	1.8%	
	2020 Retail Rates with 2.5% Inflation	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	
	2020 Retail Rates with 3.5% Inflation	3.5%	3.5%	3.5%	3.5%	3.5%	3.5%	3.5%	3.5%	3.5%	3.5%	3.5%	3.5%	3.5%	3.5%	3.5%	3.5%	3.5%	3.5%	3.5%	3.5%	3.5%	3.5%	3.5%	3.5%	3.5%	



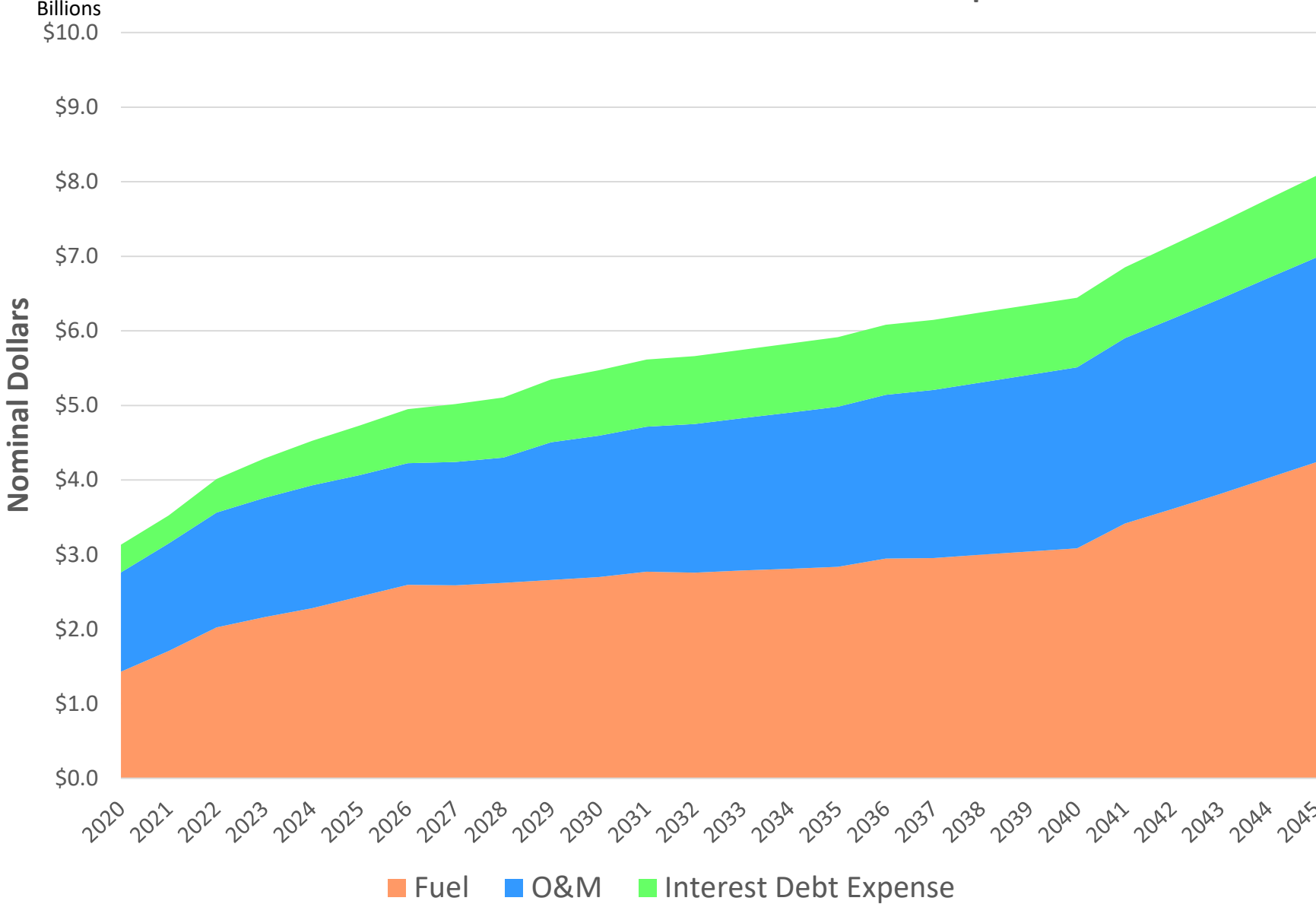
### Early and No Biofuels Moderate Load Annual Expenses



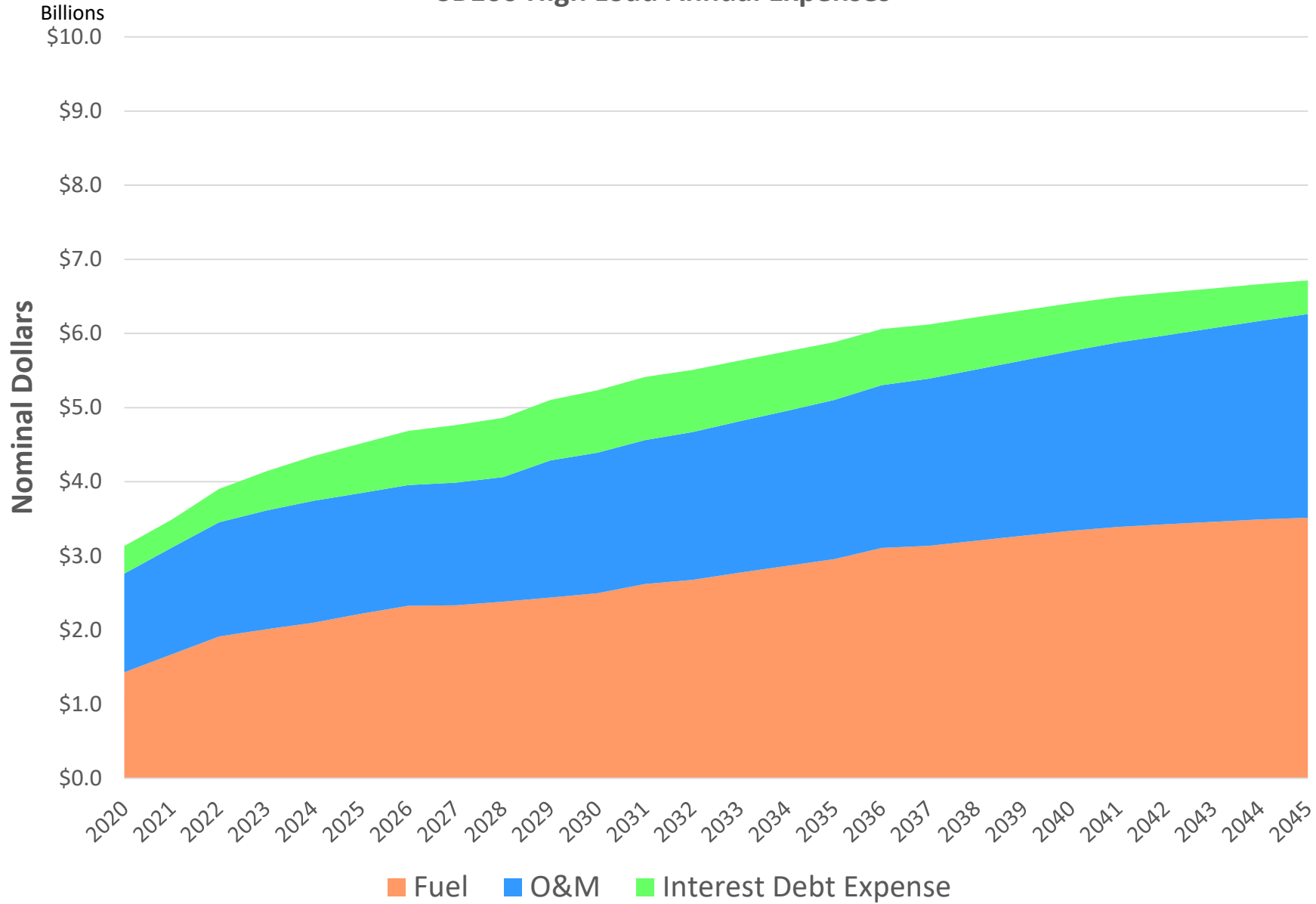
### Transmission Focus Moderate Load Annual Expenses



### Limited New Transmission Moderate Load Annual Expenses

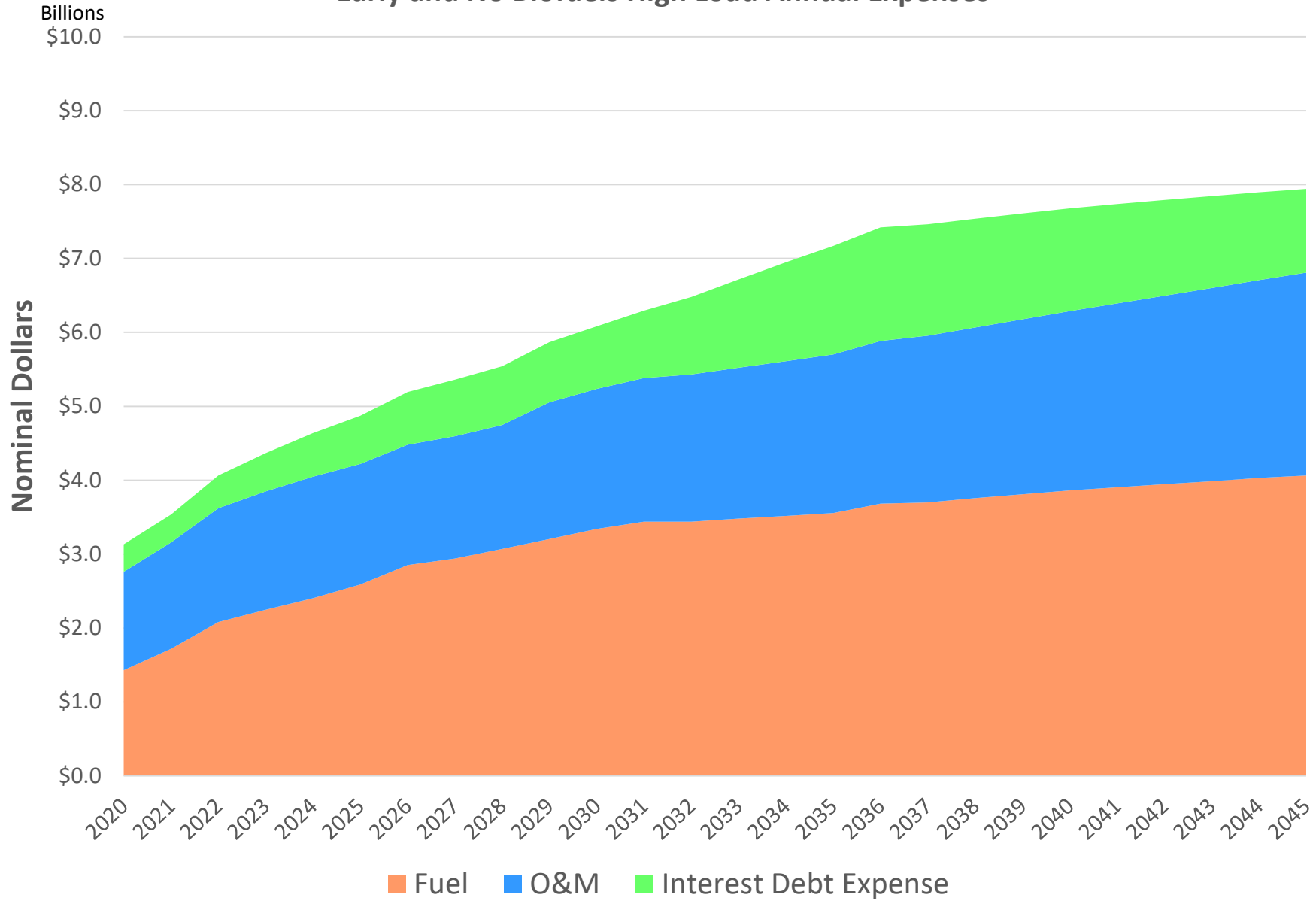


# SB100 High Load Annual Expenses

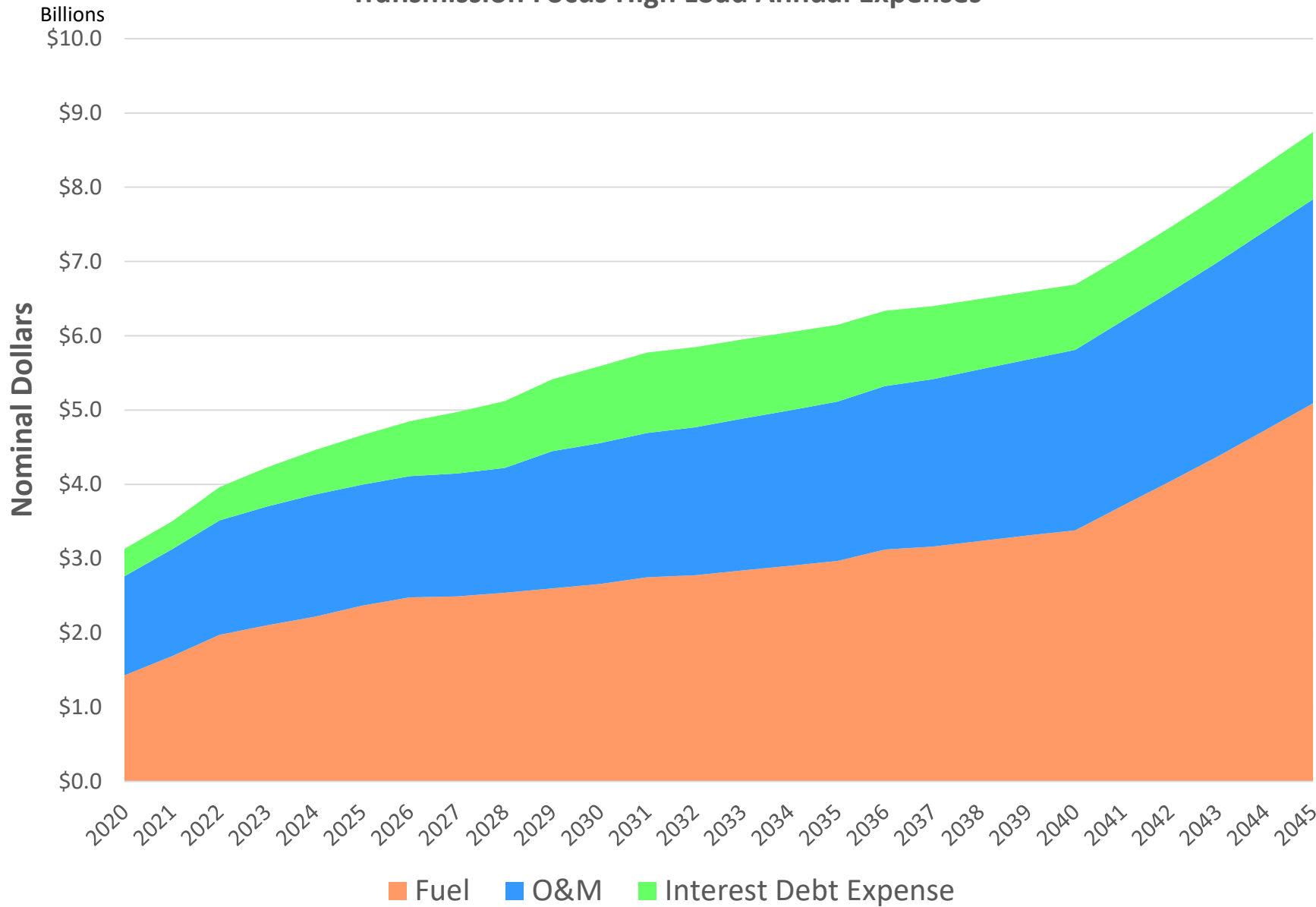




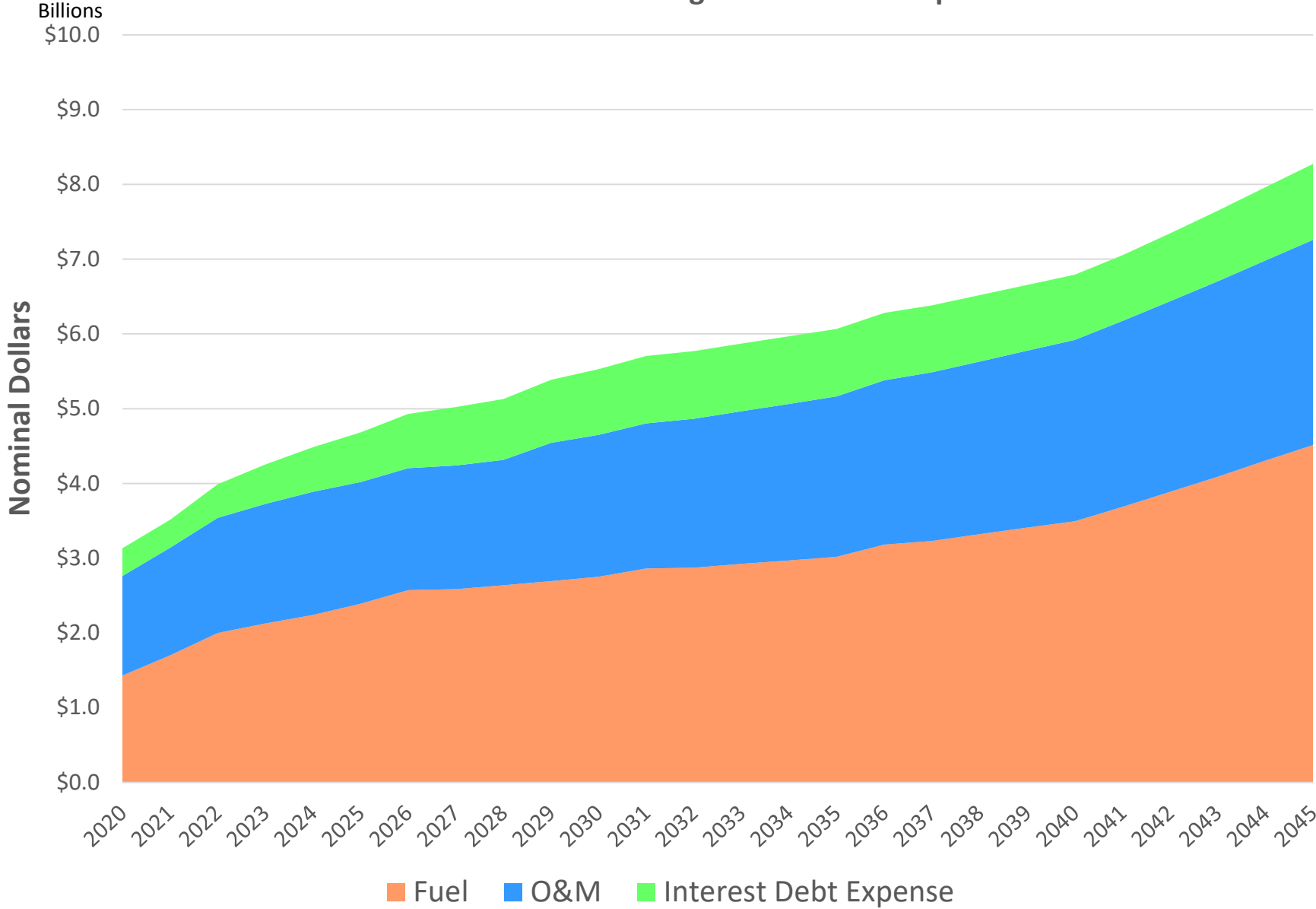
### Early and No Biofuels High Load Annual Expenses



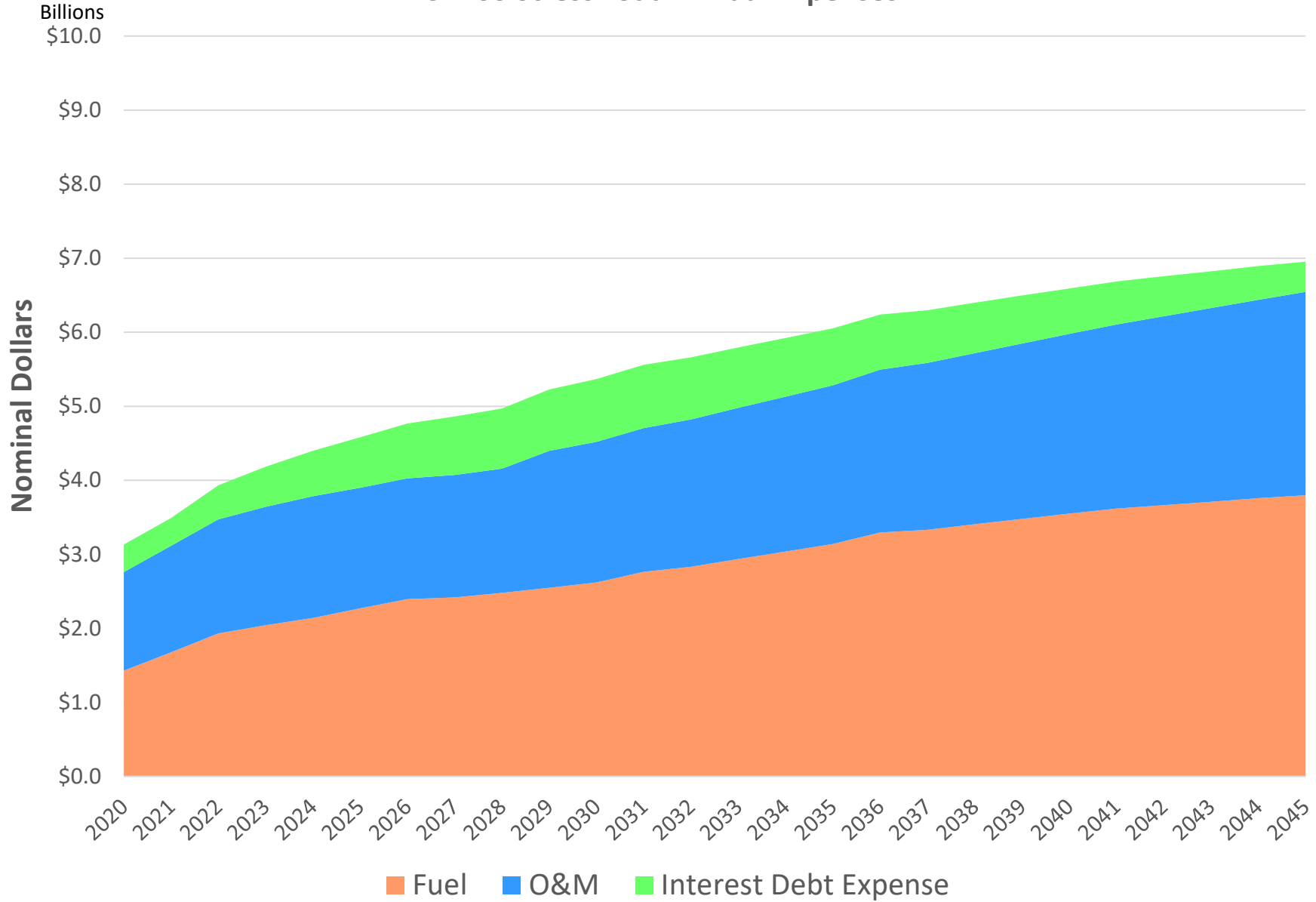
### Transmission Focus High Load Annual Expenses



### Limited New Transmission High Load Annual Expenses



# SB100 Stress Load Annual Expenses



# Reference Case Low Load Annual Expenses

