

***ECONOMIC IMPACT OF THE PROPOSED
PIEDMONT CAROLINA LITHIUM
PROJECT***

STUDY PREPARED BY

JOHN E. CONNAUGHTON, PH.D.

LOCATION



PROJECT OUTPUT AND EMPLOYMENT

Piedmont Carolinas Lithium Project Output and Employment by Year

Year	Output	Output/Mining	Output/Aggregation	Output/Refining	Total Employment
2022					
2023	\$6,401,995	6,401,995	0	0	140
2024	\$371,817,103	90,791,250	97,469,713	183,556,140	428
2025	\$604,782,806	90,791,250	187,645,556	326,346,000	428
2026	\$582,079,603	90,791,199	198,027,760	293,260,644	428
2027	\$533,607,785	90,791,250	149,555,891	293,260,644	428

EMPLOYMENT BY FUNCTION

Piedmont Carolina Lithium Project Employment by Function				
Year	Mining	Aggregation	Refining	Total
2022				
2023	140			140
2024	177	131	120	428
2025	177	131	120	428
2026	177	131	120	428
2027	177	131	120	428

COMPENSATION BY FUNCTION

Piedmont Carolina Lithium Project Employee Compensation by Function

Year	Chemical Plant	Aggregation	Mining	Total Labor Compensation	Average Wage
2022					
2023		\$6,889,061	\$2,351,315	\$9,240,376	\$66,003
2024	\$9,716,841	\$6,889,061	\$11,551,912	\$28,157,814	\$65,789
2025	\$9,716,841	\$6,889,061	\$18,767,296	\$35,373,198	\$82,648
2026	\$9,716,841	\$6,889,061	\$18,537,188	\$35,143,090	\$82,110
2027	\$9,716,841	\$6,889,061	\$18,567,647	\$35,173,549	\$82,181

Gaston County average compensation level: \$61, 377

U.S. ELECTRIC VEHICLE SALES

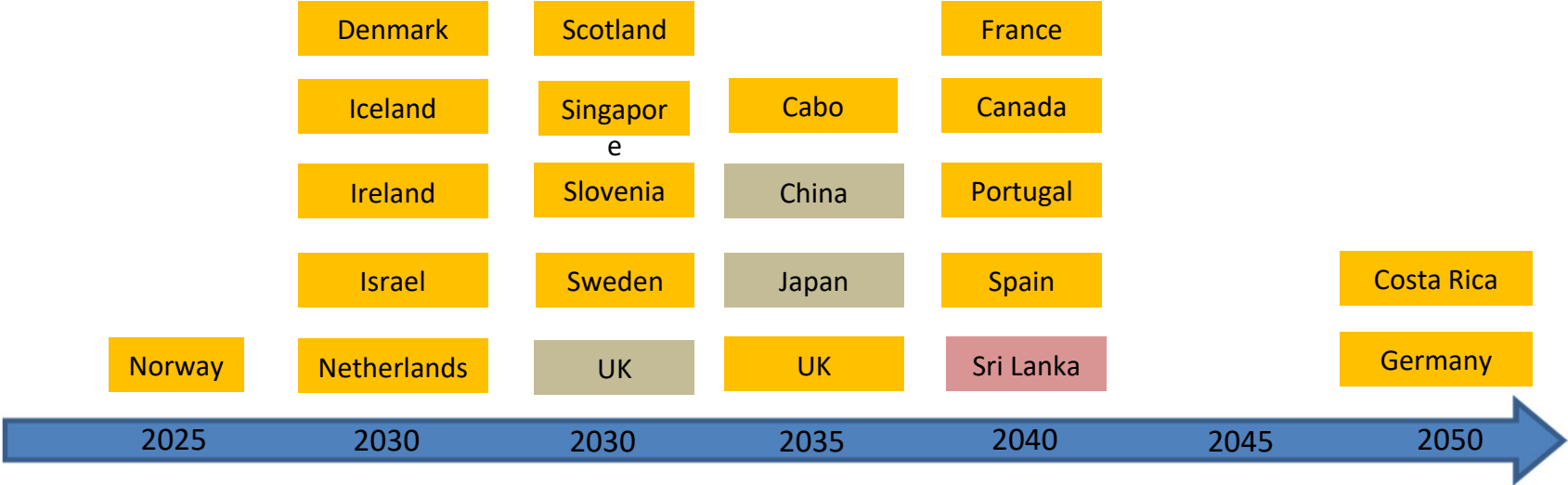
U.S. Annual Electric Vehicle Sales Forecast

Year	U.S. Annual EV Sales	U.S. EV Share of Sales	Total EV in Operation	Tons of Lithium*
2021	526,004	3.39%	2,208,526	5,786
2022	845,050	5.37%	2,996,214	9,296
2023	1,154,210	7.21%	4,049,088	12,696
2024	1,570,315	9.52%	5,628,398	17,273
2025	2,056,320	12.46%	7,610,208	22,620
2026	2,707,825	15.93%	10,215,528	29,786
2027	3,077,825	18.10%	13,169,775	33,856
2028	3,703,925	22.45%	16,718,035	40,743
2029	4,158,875	25.99%	20,692,846	45,748
2030	4,719,375	29.50%	25,193,540	51,913

Source: iHIS Markit/Auto Manufacturers Alliance EV Sales Forecasts – EVAdoption

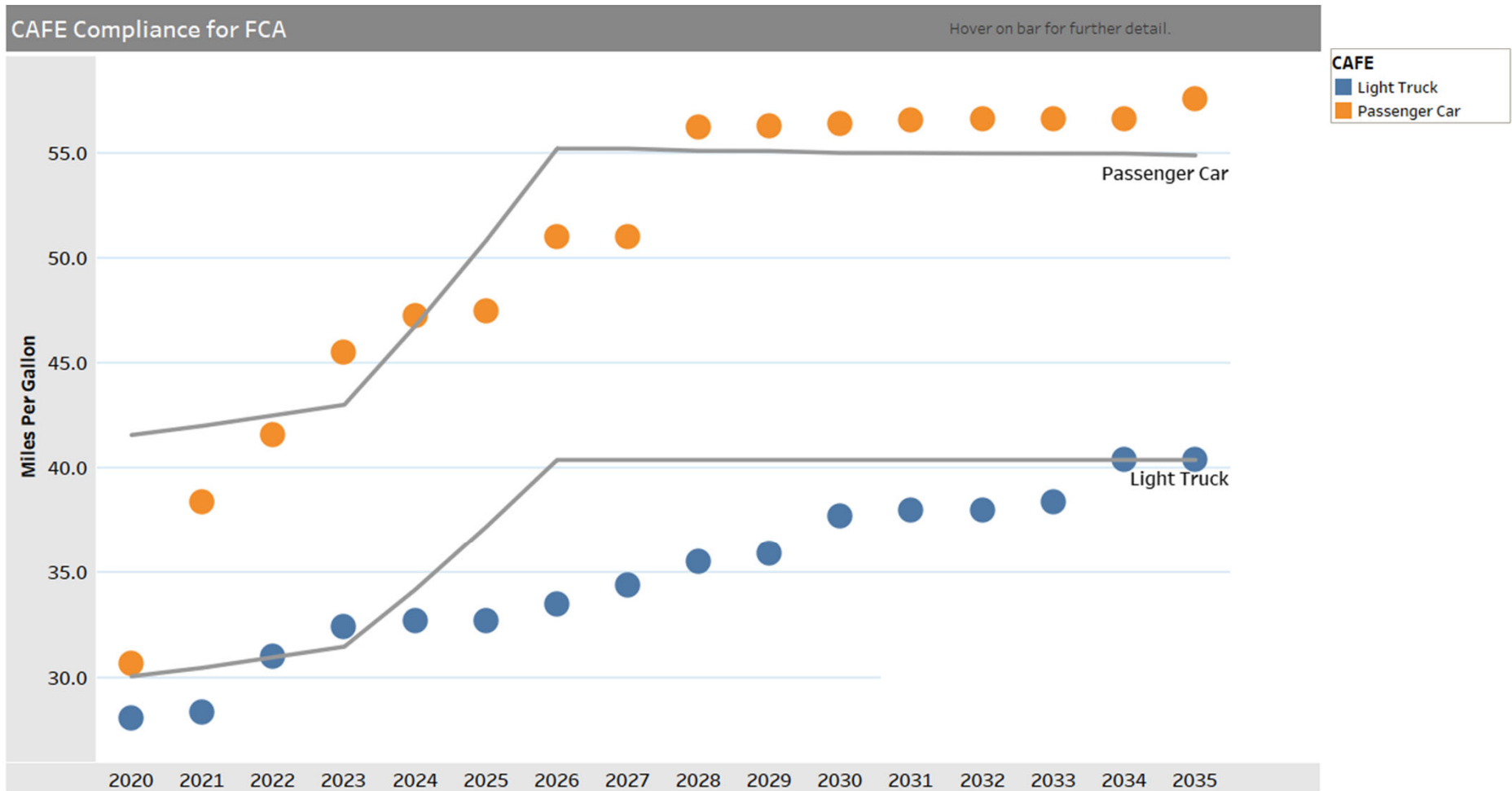
*Multiply the Tons of Lithium numbers above by 6.061 to convert to Lithium Hydroxide volumes

GOVERNMENT EV MANDATES



- 100% Electrified Sales
- 100% ZEV Sales
- 100% ZEV Stock

NEW CAFE STANDARDS



LITHIUM PRODUCTION

Lithium Production and Known Reserves in 2019				
Region	Lithium	Percent of Total	Known Reserves	Percent of Known Reserves
Australia	42,000	48.84%	2,700,000	19.40%
Chile	18,000	20.93%	8,000,000	57.48%
China	7,500	8.72%	1,000,000	7.18%
Argentina	6,400	7.44%	2,000,000	14.37%
Zimbabwe	1,600	1.86%	70,000	0.50%
Portugal	1,200	1.40%	60,000	0.43%
Other	9,300	10.81%	89,000	0.64%
Total	86,000	100.00%	13,919,000	100.00%

Source: USGS Survey 2021

*Multiply the Lithium Metal numbers above by 6.061 to convert to Lithium Hydroxide volumes.

Total Estimated Lithium Hydroxide Volume: 497,002

ECONOMIC IMPACT COMPONENTS

Direct	(first round activity: on-site)
Indirect	(supplier chain activity)
Induced	(unrelated industry activity based on direct and indirect expenditures)
Total	

PIEDMONT LITHIUM OUTPUT IMPACT

Total Piedmont Lithium Project Output Impact				
Year	Direct Effects	Indirect Effects	Induced Effects	Total
2022				
2023	\$6,401,995	\$1,074,806	\$664,973	\$8,141,774
2024	\$371,817,103	\$68,786,604	\$38,031,311	\$478,635,018
2025	\$604,782,806	\$112,848,666	\$61,771,033	\$779,402,505
2026	\$582,079,603	\$107,890,085	\$59,519,060	\$749,488,748
2027	\$533,607,785	\$99,752,338	\$54,484,310	\$687,844,432

PIEDMONT LITHIUM EMPLOYMENT IMPACT

Total Piedmont Lithium Project Employment Impact				
Year	Direct Effects	Indirect Effects	Induced Effects	Total
2022				
2023	140	98	96	334
2024	428	306	317	1,051
2025	428	306	317	1,051
2026	428	306	317	1,051
2027	428	306	317	1,051

PIEDMONT LITHIUM COMPENSATION IMPACT

Total Piedmont Lithium Project Employee Compensation Impact				
Year	Direct Effects	Indirect Effects	Induced Effects	Total
2021				
2022				
2023	9,240,376	2,456,685	1,979,723	13,676,784
2024	28,157,814	7,274,009	5,996,161	41,427,984
2025	35,373,198	9,192,322	7,542,036	52,107,556
2026	35,143,090	9,131,144	7,492,736	51,766,970
2027	35,173,549	9,139,242	7,499,262	51,812,053

SUPPLIER CHAIN OUTPUT IMPACT

Piedmont Lithium Project Top 15 Supplier Chain Industries by Output

Sector	Description	Indirect	Induced	Total
49	Electric power transmission and distribution	30,202,978	1,185,377	31,388,355
43	Electric power generation - Nuclear	17,763,959	697,183	18,461,141
62	Maintenance and repair construction of nonresidential structures	9,736,382	257,657	9,994,039
395	Wholesale trade	4,379,369	1,162,572	5,541,941
471	Waste management and remediation services	3,429,970	245,747	3,675,717
438	Insurance agencies, brokerages, and related activities	3,228,060	300,620	3,528,680
445	Commercial and industrial machinery and equipment rental and leasing	2,606,166	69,452	2,675,618
50	Natural gas distribution	2,449,664	55,767	2,505,431
461	Management of companies and enterprises	2,345,413	69,560	2,414,973
446	Lessors of nonfinancial intangible assets	2,176,634	131,737	2,308,371
433	Monetary authorities and depository credit intermediation	1,822,062	1,338,878	3,160,940
411	Truck transportation	1,763,577	337,897	2,101,474
468	Services to buildings	1,359,789	384,102	1,743,891
448	Accounting, tax preparation, bookkeeping, and payroll services	1,118,672	181,298	1,299,971
440	Real estate	1,084,082	3,831,451	4,915,533
	Other	14,285,560	44,235,013	592,128,358
	Total	99,752,338	54,484,310	687,844,432

SUPPLIER CHAIN EMPLOYMENT IMPACT

Piedmont Lithium Project Top 15 Supplier Chain Industries by Employment				
Sector	Description	Indirect	Induced	Total
62	Maintenance and repair construction of nonresidential structures	65	1	67
468	Services to buildings	27	8	35
438	Insurance agencies, brokerages, and related activities	20	2	22
448	Accounting, tax preparation, bookkeeping, and payroll services	16	2	17
395	Wholesale trade	13	4	16
49	Electric power transmission and distribution	12	1	12
43	Electric power generation - Nuclear	10	0	11
471	Waste management and remediation services	9	1	10
20	Extraction of natural gas and crude petroleum	9	0	9
464	Employment services	8	6	14
461	Management of companies and enterprises	7	0	8
449	Architectural, engineering, and related services	7	0	7
445	Commercial and industrial machinery and equipment rental and leasing	7	0	7
469	Landscape and horticultural services	7	4	11
411	Truck transportation	7	1	8
	Other	84	286	798
	Total	306	317	1,051

CONSTRUCTION OUTPUT IMPACT

Gaston Construction Impact				
Year	Direct	Indirect	Induced	Total
2022	451,893,208	24,531,603	101,794,012	578,218,823
2023	434,922,907	23,610,348	97,971,262	556,504,517
2024	2,876,908	156,177	648,056	3,681,140
2025	16,222,950	880,684	3,654,401	20,758,035
2026	17,927,678	973,227	4,038,411	22,939,316
2027	19,034,018	1,033,286	4,287,626	24,354,930
Total	942,877,669	51,185,324	212,393,768	1,206,456,761

CONSTRUCTION EMPLOYMENT IMPACT

Gaston County Construction Employment Impact				
Year	Direct	Indirect	Induced	Total
2022	199	11	36	246
2023	192	11	34	237
2024	1	0	0	2
2025	7	0	1	9
2026	8	0	1	10
2027	8	0	1	10

ANNUAL TOTAL OUTPUT IMPACT

Total On-Going and Construction Output Impact				
Year	Direct Effects	Indirect Effects	Induced Effects	Total
2022	\$451,893,208	\$24,531,603	\$101,794,012	\$578,218,823
2023	\$441,324,902	\$24,685,155	\$98,636,235	\$564,646,291
2024	\$374,694,011	\$68,942,781	\$38,679,367	\$482,316,159
2025	\$621,005,756	\$113,729,350	\$65,425,434	\$800,160,540
2026	\$600,007,281	\$108,863,312	\$63,557,471	\$772,428,063
2027	\$552,641,803	\$100,785,624	\$58,771,936	\$712,199,363

ANNUAL TOTAL EMPLOYMENT IMPACT

Total On-Going and Construction Employment Impact

Year	Direct Effects	Indirect Effects	Induced Effects	Total
2022	199	11	36	246
2023	332	109	130	571
2024	429	306	317	1,053
2025	435	307	318	1,060
2026	436	307	318	1,061
2027	436	307	318	1,062

CONCLUSIONS

Gaston County Impacts:

- **In 2027, the direct output impact is estimate to be \$533,607,785 in constant 2022 dollars.**
- **In 2027 the total output impact (including supplier chain impacts and induced impacts) is estimated at \$687,844,432 in constant 2022 dollars.**
- **In 2027 the direct employment of the project is estimated to be 348 jobs**
- **In 2027 the total employment impact (including supplier chain impacts and induced impacts) is estimated at 1,051 jobs.**
- **In 2022, the peak construction year, the direct construction job impact is estimated at 199 jobs.**
- **In 2022 the total employment impact of construction (including supplier chain impacts and induced impacts) is estimated at 246 jobs.**
- **The cumulative construction total impact of the 2022 through 2027 construction phase is estimated to be \$1,206,456,761in constant 2022 dollars.**