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Estimates of Five-Year Return for EV Charging Sites

NEVI Program Management

Wyoming Department of Transportation

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FINAL

Background

As part of the National Electric Vehicle Infrastructure (NEVI) Program, WYDOT has identified seven interstate Gap Segments across the state for the initial build-out of charging infrastructure. These sites are located within one (1) mile of an Alternative Fuel Corridor (AFC) per the NEVI requirements. To comply with other NEVI Program requirements, each site must be equipped with a minimum of four (4) Direct Current Fast Charger (DCFC) ports capable of providing 150 kilowatts (kW) continuous power each (600 kW total). Consistent with the national NEVI Program guidelines, WYDOT is requiring that all applicants provide a matching funds of at least 20% of the total project costs.

Widespread electric vehicle usage is not anticipated by travelers in Wyoming during the next five years and potentially beyond. WYDOT has developed usage estimates for all intersections along designated AFCs in the state, including at the seven locations identified as Gap Segments.

This memo documents the methodology and assumptions that were employed to estimate what an anticipated financial return might be for a private developer interested in applying for NEVI Program funds from WYDOT to build and operate a compliant electric vehicle charging site in Wyoming.

This document is only intended to provide a sketch-level analysis of the financial impact based only upon capital costs, anticipated maintenance costs, operational costs, and revenue generated solely by the use of the charging equipment by travelers. That is, the estimates herein make no attempt to estimate or address other potential sources of revenue that might be associated with these sites, such as secondary revenue from advertising, purchase of food or beverages, etc.

Assumptions

Return-on-investment is a function of costs and revenue, which are in turn based upon a set of assumptions regarding charger usage, the cost of electricity, ability to generate revenue, and other factors. Table 1 summarizes the underlying assumptions for each of the seven locations that were used to generate estimates.

Results

Primarily as a result of the very low usage estimates, all of the seven sites are expected to have a significant revenue shortfall over the five-year period once commissioned. Clearly, additional revenue from sources other than charges administered to the traveling public will be needed. Table 2 summarizes the estimated financial impact for each site as a function of the assumptions/conditions summarized in Table 1. Tables 3-9 provide a detailed breakdown of the results for each of the seven sites, respectively.

Table 1. Assumptions Used in Financial Calculations

	Pine Bluffs	Laramie	Wheatland	Douglas	Buffalo	Sheridan	Sundance
Components of Electricity Costs							
Meter Charge (Monthly Fee)	\$ 34.40	\$ 32.30	\$ 75.00	\$ 32.30	\$ 32.30	\$ 66.00	\$ 200.00
Demand Charge (Monthly \$/kW)	\$ 5.00	\$ 16.89	\$ 10.64	\$ 16.89	\$ 16.89	\$ 11.70	\$ 3.75
Consumption Charge (\$/kWh)	\$ 0.1200	\$ 0.0152	\$ 0.1247	\$ 0.0152	\$ 0.0152	\$ 0.0048	\$ 0.0752
Demand Charge Basis	150 kW	150 kW	150 kW	150 kW	150 kW	150 kW	150 kW
Amount of Electricity Consumed per Charge (kWh)	42.5 kWh	42.5 kWh	42.5 kWh	42.5 kWh	42.5 kWh	42.5 kWh	42.5 kWh
Revenue from End Use							
Per Charge Usage Fee	\$ 0.00	\$ 0.00	\$ 0.00	\$ 0.00	\$ 0.00	\$ 0.00	\$ 0.00
End-Use Cost per kWh	\$ 0.43	\$ 0.43	\$ 0.43	\$ 0.43	\$ 0.43	\$ 0.43	\$ 0.43
Average Number of Charges per Day	1	2	3	2	1	1	1
Capital Expenses and Maintenance Costs							
Capital construction costs for applicant	\$ 221,596	\$ 221,596	\$ 221,596	\$ 221,596	\$ 221,596	\$ 221,596	\$ 221,596
Five-Year Warranty/Insurance Costs	\$ 20,000	\$ 20,000	\$ 20,000	\$ 20,000	\$ 20,000	\$ 20,000	\$ 20,000
Annual Maintenance Costs	\$ 8,000	\$ 8,000	\$ 8,000	\$ 8,000	\$ 8,000	\$ 8,000	\$ 8,000
Discount Rate	7%	7%	7%	7%	7%	7%	7%
Amortization Rate	3%	3%	3%	3%	3%	3%	3%

Table 2. Five-Year Summary of Estimated Applicant Revenues Based Upon Electrical Costs and Revenues from End-Users

	Constant 2023 \$	Discounted 2023 \$
Pine Bluffs	-\$325,310	-\$285,441
Sheridan	-\$376,831	-\$330,648
Sundance	-\$359,182	-\$315,162
Wheatland	-\$329,278	-\$288,922
Laramie	-\$392,006	-\$343,963
Buffalo	-\$424,103	-\$372,126
Douglas	-\$391,845	-\$343,821

Table 3. Five-Year Results for Pine Bluffs

	Constant 2023 \$	Discounted 2023 \$
Total Costs	\$1,245,045	\$1,201,089
Total Non-Electrical Costs	\$1,190,566	\$1,153,286
Total Capital Costs	\$1,107,979	\$1,107,979
of which: Federal Funds	\$886,384	\$886,384
of which: Amortized Developer Funds	\$241,932	\$212,282
Total Electrical Costs	\$54,480	\$47,803
Total Developer Costs	\$358,662	\$314,705
Total Developer Revenue	\$33,352	\$29,264
Total Developer Profit	-\$325,310	-\$285,441

Table 4. Five-Year Results for Sheridan

	Constant 2023 \$	Discounted 2023 \$
Total Costs	\$1,296,567	\$1,246,295
Total Non-Electrical Costs	\$1,190,566	\$1,153,286
Total Capital Costs	\$1,107,979	\$1,107,979
of which: Federal Funds	\$886,384	\$886,384
of which: Amortized Developer Funds	\$241,932	\$212,282
Total Electrical Costs	\$106,001	\$93,010
Total Developer Costs	\$410,183	\$359,912
Total Developer Revenue	\$33,352	\$29,264
Total Developer Profit	-\$376,831	-\$330,648

Table 5. Five-Year Results for Sundance

	Constant 2023 \$	Discounted 2023 \$
Total Costs	\$1,245,566	\$1,201,545
Total Non-Electrical Costs	\$1,190,566	\$1,153,286
Total Capital Costs	\$1,107,979	\$1,107,979
of which: Federal Funds	\$886,384	\$886,384
of which: Amortized Developer Funds	\$241,932	\$212,282
Total Electrical Costs	\$55,000	\$48,259
Total Developer Costs	\$359,182	\$315,162
Total Developer Revenue	\$0	\$0
Total Developer Profit	-\$359,182	-\$315,162

Table 6. Five-Year Results for Wheatland

	Constant 2023 \$	Discounted 2023 \$
Total Costs	\$1,315,717	\$1,263,099
Total Non-Electrical Costs	\$1,190,566	\$1,153,286
Total Capital Costs	\$1,107,979	\$1,107,979
of which: Federal Funds	\$886,384	\$886,384
of which: Amortized Developer Funds	\$241,932	\$212,282
Total Electrical Costs	\$125,151	\$109,813
Total Developer Costs	\$429,333	\$376,715
Total Developer Revenue	\$100,056	\$87,793
Total Developer Profit	-\$329,278	-\$288,922

Table 7. Five-Year Results for Laramie

	Constant 2023 \$	Discounted 2023 \$
Total Costs	\$1,345,094	\$1,288,875
Total Non-Electrical Costs	\$1,190,566	\$1,153,286
Total Capital Costs	\$1,107,979	\$1,107,979
of which: Federal Funds	\$886,384	\$886,384
of which: Amortized Developer Funds	\$241,932	\$212,282
Total Electrical Costs	\$154,528	\$135,589
Total Developer Costs	\$458,710	\$402,492
Total Developer Revenue	\$66,704	\$58,529
Total Developer Profit	-\$392,006	-\$343,963

Table 8. Five-Year Results for Buffalo

	Constant 2023 \$	Discounted 2023 \$
Total Costs	\$1,343,838	\$1,287,774
Total Non-Electrical Costs	\$1,190,566	\$1,153,286
Total Capital Costs	\$1,107,979	\$1,107,979
of which: Federal Funds	\$886,384	\$886,384
of which: Amortized Developer Funds	\$241,932	\$212,282
Total Electrical Costs	\$153,273	\$134,488
Total Developer Costs	\$457,455	\$401,390
Total Developer Revenue	\$33,352	\$29,264
Total Developer Profit	-\$424,103	-\$372,126



Table 9. Five-Year Results for Douglas

	Constant 2023 \$	Discounted 2023 \$
Total Costs	\$1,344,932	\$1,288,734
Total Non-Electrical Costs	\$1,190,566	\$1,153,286
Total Capital Costs	\$1,107,979	\$1,107,979
of which: Federal Funds	\$886,384	\$886,384
of which: Amortized Developer Funds	\$241,932	\$212,282
Total Electrical Costs	\$154,366	\$135,448
Total Developer Costs	\$458,549	\$402,350
Total Developer Revenue	\$66,704	\$58,529
Total Developer Profit	-\$391,845	-\$343,821