

PREPARED BY GDS ASSOCIATES, INC.

Grant County PUD

Embedded Cost of Capacity Calculation

Final Report

December 2, 2021



 **GDS Associates, Inc.**
ENGINEERS & CONSULTANTS

TABLE OF CONTENTS

1 EMBEDDED COST OF CAPACITY FOR PRIEST RAPIDS PROJECT 1

2 EMBEDDED COST OF CAPACITY COMPUTATION..... 1

 2.1 Data Sources 1

 2.2 Cost of Capitalization 1

 2.3 Direct Costs 2

 2.4 Allocated Costs..... 3

3 TOTAL COST OF CAPACITY 6

1 Embedded Cost of Capacity for Priest Rapids Project

For certain aspects of ancillary service rate design, Grant County Public Utility District (“GPUD”) needs to determine its marginal cost of capacity. Several approaches can be taken, including market-based or historical cost analyses. To assess a range of methods and cost estimates, GPUD had computations developed by various internal and external experts to evaluate the possible range of outcomes. These included estimating the incremental cost of new generation capacity, computing the short-term opportunity cost, estimating the opportunity cost based on actual prices paid for a share of GPUD’s Priest Rapids Project (“PRP” or “Project”), valuing reserve capacity from an Energy Risk Management Model, and determining the embedded cost of capacity. GPUD requested that GDS Associates, Inc. (“GDS”), a rate consulting firm working as a contractor to GPUD, calculate the embedded cost of capacity of PRP. This report provides a summary of GDS’ analysis and computed embedded cost of capacity.

2 Embedded Cost of Capacity Computation

Three major elements were included in the cost of capacity calculation: the cost of capitalization of the PRP, directly assignable costs, and allocated administrative and general costs. These costs were determined using 2018 historical accounting and engineering information to represent the historical embedded cost of the project¹. The costs are then aggregated and expressed on a dollar per kW-month basis by dividing by the amount of available capacity for the unit in 2018.

2.1 DATA SOURCES

GDS relied on three major data sources to complete the cost of capacity computation. GPUD’s general ledger trial balance for calendar year 2018 was the primary source for financial and accounting information. GPUD’s accounting system tracks plant investment and operating expenses specific to the PRP. GDS also used information from GPUD’s transmission and retail cost of service models.

2.2 COST OF CAPITALIZATION

The cost of capitalization is represented by computing a return on the investment in the Project. The return is based on a weighted average cost of capital that includes both the cost of debt and a return to collect customer funded capitalization. Although GPUD is a public utility with no shareholders, including a return portion in the cost of capital is appropriate, as the utility still capitalizes investment in plant through a combination of debt and cash generated from margins and reflected as equity on the utility’s balance sheet. For the most recently approved transmission rates, GPUD’s Commission approved a weighted average cost of capital of 4.9%, consisting of a cost of debt of 3.5% and a return for customer capitalization of 7.0%.

¹ 2018 is the test year used for GPUD’s most recent transmission cost of service model and their current retail cost of service model. Therefore, 2018 was used here for consistency with the latest models adopted by the utility.

TABLE 1: COMMISSION APPROVED COST OF CAPITAL

Item	Capitalization Ratio	Cost of Capital	Weighted Average Cost of Capital
Long Term Debt	60.0%	3.5%	2.1%
Proprietary Capital	40.0%	7.0%	2.8%
Weighted Average Cost of Capital	100.0%		4.9%

As of December 31, 2018, PRP had plant in service totaling \$1.489 billion, with \$0.420 billion in accumulated depreciation. The net book value of PRP then was \$1.069 billion. Applying the 4.9% rate of return to the net book value equates to a cost of capitalization for PRP of \$52.4 million. This cost represents the average cost to capitalize (cost of debt via interest and cost of equity) the project's net book value based on the 4.9% weighted average cost of capital.

TABLE 2: COST OF CAPITALIZATION OF PRP (TY=2018)

Item	Value
Hydro Plant in Service	\$1,488,621,181
Less: Accumulated Depreciation	\$420,002,378
Net Plant in Service	\$1,068,618,803
Rate of Return on Rate Base	4.90%
Cost of Capitalization	\$52,362,321

2.3 DIRECT COSTS

Costs that can be directly assigned to the Project include operating and maintenance expenses, depreciation expense, and privilege taxes. Operating and maintenance expenses, consisting of labor and material and supplies, are booked in accounts 535 through 545. These costs are aggregated for all hydraulic power generating stations in summary financial statements prepared by GPUD. However, the general ledger does differentiate PRP costs from other stations. The directly assignable operations and maintenance costs for PRP were \$49,199,586 in 2018. Depreciation expense was \$21,827,116 in 2018. Privilege taxes specific to PRP, as determined from the trial balance, were \$1,966,134. Therefore, the aggregate of directly assignable costs was \$72,992,836.

TABLE 3: SUMMARY OF DIRECTLY ASSIGNED O&M COST

Acct	Description	PRP Costs	Non-PRP Costs	Total GPUD
Hydraulic Operations Expense				
535	Op. Supervision & Engineering	\$4,163,930	\$55,313	\$4,219,244
536	Water for Power	\$3,361,162	\$0	\$3,361,162
537	Hydraulic Expenses	\$1,724,320	\$52,444	\$1,776,764
538	Electric Expenses	\$696	\$52,443	\$53,139
539	Misc. Expenses	\$6,618,470	\$0	\$6,618,470
540	Rents	\$127,624	\$0	\$127,624
	Total Operations Expense	\$15,996,202	\$160,200	\$16,156,402
Hydraulic Maintenance Expense				
541	Maint. Supervision & Engineering	\$3,297,122	\$0	\$3,297,122
542	Maint. of Structures	\$78,604	\$0	\$78,604
543	Maint. of Reservoirs, Dams & Waterways	\$2,177,603	\$0	\$2,177,603
544	Maint. of Electric Plant	\$8,270,095	\$508,331	\$8,778,426
545	Maint. of Misc. Hydraulic Plant	\$19,379,960	\$13,949	\$19,393,909
	Total Maintenance Expense	\$33,203,384	\$522,281	\$33,725,664
	Total Direct O&M Expense	\$49,199,586	\$682,480	\$49,882,066

2.4 ALLOCATED COSTS

Costs that are not booked directly to the production, transmission, or distribution functions include customer accounts, customer service and informational, sales, and administrative and general. The customer accounts, customer service, and sales costs are associated with providing retail service and provide no functional support to the production function. Therefore, GDS has excluded allocating any of those costs to production cost of capacity. Administrative and general expenses are incurred in support of utility activities including production, transmission, and distribution. Therefore, it is appropriate to allocate some portion of these overhead costs to the PRP function for determining cost of capacity.

Given that the objective of the analysis is to determine the embedded cost of capacity, which is a cost tied to demand, GDS identified only administrative and general expenses that are classified as demand-related from the retail cost of service model as being eligible for allocation to the PRP cost of capacity.

To determine demand-related administrative and general expenses, GPUD's retail cost of service model relies on principals of classification² as described in the National Association of Regulatory Utility Commissioners' ("NARUC") Cost of Service Manual. Administrative and general expenses are classified based on the aggregated classification of production, transmission, and distribution plant. GPUD's production and transmission plant are classified as 100% demand-related while the distribution plant is apportioned to customer-related, demand-related, and lighting-related³ categories.

Lighting investment is directly assigned based on property records and assigning certain distribution plant accounts to the lighting function. For the remaining distribution plant, a theoretical minimum plant size is constructed to meet the first kWh of electricity demanded. The investment associated with the minimum plant is assigned to customer-related investment. The remaining balance of investment is then assigned to demand-related investment.

As shown in Table 4, given the large investment in production and transmission facilities at GPUD, 93.8% of plant is classified as demand-related. Since administrative and general expenses are classified based on production, transmission, and distribution plant investment, 93.8% of those expenses are also classified as demand-related.

TABLE 4: CLASSIFICATION OF PLANT IN SERVICE

Item	Total	Customer	Demand	Lighting
Production	\$1,488,650,836	\$0	\$1,488,650,836	\$0
Transmission	\$180,822,487	\$0	\$180,822,487	\$0
Distribution	\$609,096,159	\$133,331,962	\$468,656,097	\$7,108,100
Total	\$2,278,569,482	\$133,331,962	\$2,138,129,420	\$7,108,100
Percent	100.0%	5.9%	93.8%	0.3%

GDS includes accounts 920 through 933 in the administrative and general expenses that are to be included in the embedded cost of capacity allocation. In 2018, those accounts totaled \$25.1 million. Of that total, \$23.6 million are demand-related.

² Classification is the step in a cost of service analysis in which functionalized costs are further classified into categories including customer-related, demand-related, energy-related, and other classifications.

³ Lighting-related is investment in conductor and fixtures associated with street and highway lighting and yard and security lighting.

TABLE 5: CLASSIFICATION OF ADMINISTRATIVE AND GENERAL COSTS

Acct	Description	Allocated Demand @ 93.8%	Non-Demand	Total
920	Admin and General Salaries	\$1,639,278	\$107,674	\$1,746,952
921	Office Supplies & Expenses	\$19,493,263	\$1,280,388	\$20,773,651
922	Admin Expenses Transferred – Credit	\$0	\$0	\$0
923	Outside Services Employed	\$1,875,253	\$123,173	\$1,998,426
924	Property Insurance	\$1,004,824	\$66,000	\$1,070,824
925	Injuries and Damages	\$3,568,316	\$234,380	\$3,802,696
926	Employee Pensions & Benefits	(\$5,428,171)	(\$356,542)	(\$5,784,712)
927	Franchise Requirements	\$0	\$0	\$0
928	Regulatory Commission Expenses	\$2,764,115	\$181,557	\$2,945,672
929	Duplicate Charges – Credit	(\$5,945,767)	(\$390,539)	(\$6,336,307)
930	General Advertising Expense	\$4,423,866	\$290,575	\$4,714,441
931	Rents	\$185,717	\$12,199	\$197,916
933	Transportation Expenses	\$0	\$0	\$0
Total		\$23,580,694	\$1,548,865	\$25,129,559

To allocate the demand-related administrative and general costs of \$23.6 million to the PRP, GDS uses an allocator based on net plant in service. PRP represented 57.4% of net plant in service in 2018, accounting for \$1.068 billion of the \$1.862 billion in net plant on the books in that year. Therefore, the allocated demand-related administrative and general expenses for the PRP cost of capacity is \$13.5 million.

TABLE 6: NET PLANT IN SERVICE

Item	Total Utility Plant	Accumulated Depreciation	Net Plant in Service	% of Net Plant in Service
Priest Rapids Project	\$1.489	\$0.420	\$1.069	57.4%
All Non-PRP Plant	\$1.359	\$0.566	\$0.793	42.6%
Total System	\$2.848	\$0.986	\$1.862	100.0%

As shown in Table 6, the allocated administrative and general costs total \$13.5 million. This total is based on allocating demand-related administrative and general expenses to the PRP based on net plant in service of 57.4%.

TABLE 7: SUMMARY OF ALLOCATED COSTS

Item	Total	Allocator (Net Plant)	Allocated Amount
Demand-Related A&G	\$23,580,694	57.39%	\$13,532,074

3 Total Cost of Capacity

Aggregating the cost of capitalization, directly assignable costs, and allocated costs provides a cost of capacity total of \$138.9 million for PRP. In 2018, PRP's average available capacity was 1,415 MW. Therefore, the computed embedded cost of capacity is \$8.18 per kW-month.

TABLE 8: SUMMARY OF EMBEDDED COST OF CAPACITY

Item	Dollars	Avail. Capacity (kW)	Cost (\$/kW-month)
Cost of Capitalization	\$52,362,321	1,415,000	\$3.08
Direct Costs	\$72,992,836	1,415,000	\$4.30
Allocated Costs	\$13,532,074	1,415,000	\$0.80
Total	\$138,887,232	1,415,000	\$8.18

PREPARED BY GDS ASSOCIATES, INC.

Grant County PUD

Embedded Cost of Capacity Calculation

Final Report

December 2, 2021



 **GDS Associates, Inc.**
ENGINEERS & CONSULTANTS