Susitna-Watana Hydro Cost of Power

Alaska Energy Authority Compares Estimates to Dr. Colt's Report

The Alaska Energy Authority (AEA) welcomes public interest and discussion of the Susitna-Watana Hydroelectric Project. The project has the potential to have a tremendous impact on Alaska's renewable energy supply, providing 50 percent of the Railbelt's energy needs for more than 100 years--long-term, stable energy for generations of Alaskans.

In a recent discussion paper, Dr. Steve Colt calculates the retail cost of power from Susitna-Watana Hydro during the first year of operation at a much higher rate than the Alaska Energy Authority (AEA). An analysis reveals that almost the entire discrepancy between AEA and Dr. Colt's estimates come from three critical assumptions: capital cost of the project, rate structure and cost of debt.

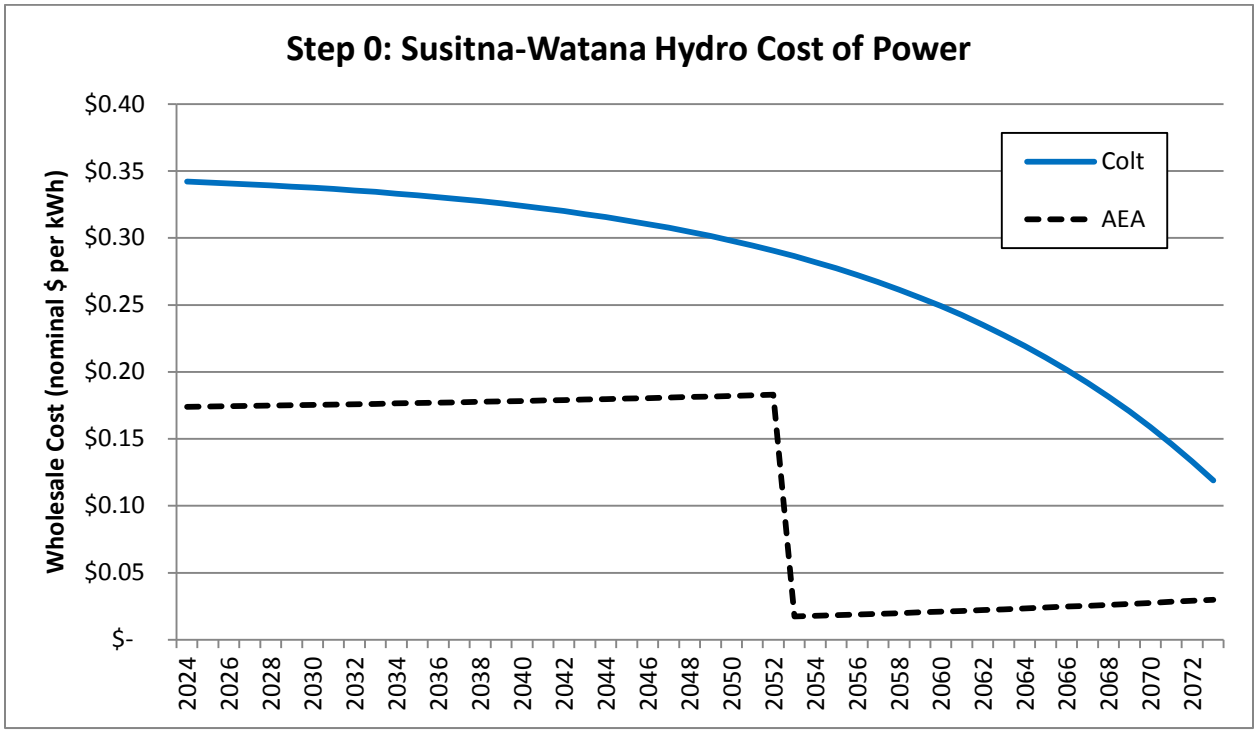
This brief report will outline each of these assumptions and demonstrate why AEA's analysis is more accurate. The report addresses one assumption at a time, walking through three steps to full correction. In order to compare like costs, this paper will focus on the wholesale cost of power from Susitna-Watana Hydro. Dr. Colt estimates this to be $0.34 per kWh (Dr. Colt then adds $0.06 for distribution costs to estimate a retail rate of $0.40).

Summary of Correction Steps

Step		Colt	Step 1	Step 2	Step 3
1	**Capital Costs (millions of $2012)**	$ 5,500	$ 4,763	$ 4,763	$ 4,763
1	**Annual GWh**	2,375	2,800	2,800	2,800
2	**Ratemaking Type**	Utility Hybrid	Utility Hybrid	Cash-Flow	Cash-Flow
2	**Debt/Capital Payback Years**	50	50	30	30
2	**TIER**	1.3	1.3	0	0
2	**Capital Reserve Years**	0	0	1	1
3	**Long Term Debt Rate**	6%	6%	6%	5%
3	**Short Term Debt Rate**	6%	6%	6%	2%

ALASKA ENERGY AUTHORITY
Susitna-Watana Hydro Project • susitnawatana@aidea.org
(907) 771-3000 • Fax (907) 771-3044

Step 0: Comparing the Initial Models

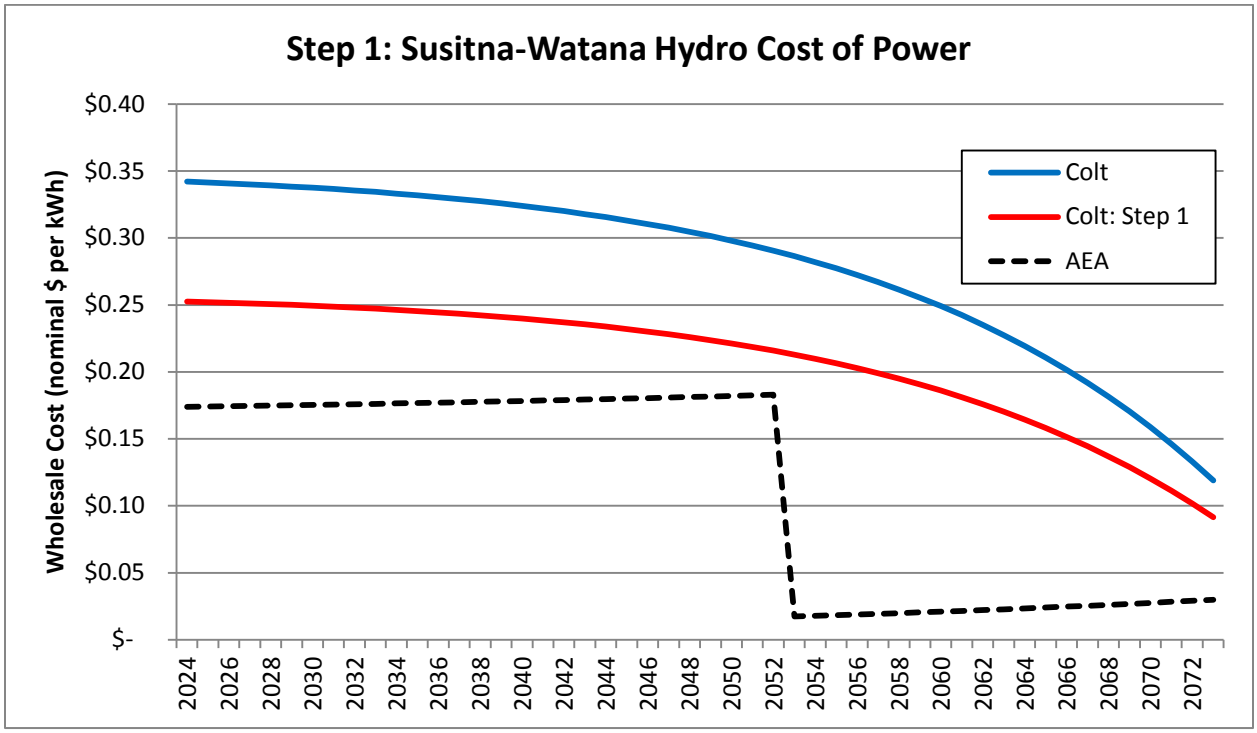


Dr. Colt and AEA each generated cost of power estimates in separate cost models. In order to produce a comparison of wholesale costs for this paper, AEA used Dr. Colt's assumptions in its own model. The results from AEA's model with Dr. Colt's assumptions were verified and produced nearly mathematically equivalent results to Dr. Colt's model. As represented in the above figure, Dr. Colt's expected wholesale price is $0.34 per kWh in the first year of project operation, and AEA's is $0.17. Both costs change over time.

Step 0 consists of the recreation of Dr. Colt's assumptions within AEA's model. In the above figure, Dr. Colt's calculated cost is labeled "Colt" and AEA's is labeled "AEA". This report will compare each successive step to these initial models. The corrected wholesale cost of power will be reflected in each figure.

ALASKA ENERGY AUTHORITY
Susitna-Watana Hydro Project • susitnawatana@aidea.org
(907) 771-3000 • Fax (907) 771-3044

Step 1: Correcting the Capital Costs and Power Output

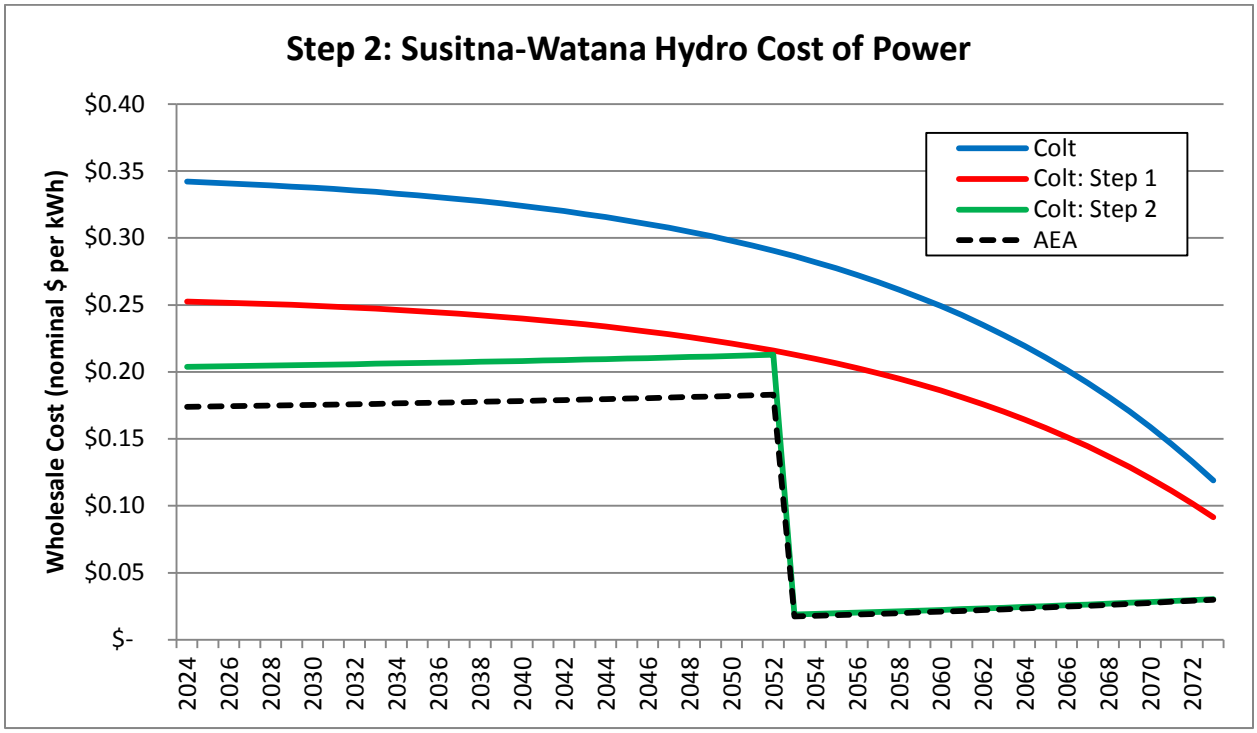


Dr. Colt uses an outdated capital cost estimate and annual power output to calculate the wholesale cost of power. Dr. Colt's analysis includes the cost of transmission upgrades that are necessary regardless of whether Susitna-Watana Hydro is built. The AEA cost estimate includes transmission infrastructure costs required to get the produced power to the Railbelt grid.

- Dr. Colt utilized 2,500,000 MWh for the yearly amount of energy from the project with a 5% loss rate. His net power output estimate is 2,375,000 MWh per year.
- Dr. Colt uses a capital cost of $5.0 billion in 2008 dollars and using his inflation rate of 2.4% it becomes $5.5 billion in 2012 dollars.
- AEA recently updated its project plan to optimize performance of Susitna-Watana Hydro.
    - The project estimated height: 750-feet tall
    - Annual average energy : 2,800,000 MWh
    - Estimated project cost: $4.76 billion and includes transmission infrastructure to the Railbelt Grid.

ALASKA ENERGY AUTHORITY
Susitna-Watana Hydro Project • susitnawatana@aidea.org
(907) 771-3000 • Fax (907) 771-3044

Step 2: Correcting the Rate Structure



Dr. Colt appears to use a hybrid rate structure, combining elements of a regulated utility model and the cash-flow rate structure that AEA would use for Susitna-Watana Hydro.

If Susitna-Watana Hydro was developed by a regulated utility it would be subject to the jurisdiction of the Regulatory Commission of Alaska (RCA). As a state corporation with a public purpose, AEA is not subject to RCA regulation. The RCA determines what costs must be passed on to consumers to guarantee the financial health of the utilities. The RCA will require depreciation of a utility-owned project to be passed onto the consumers as part of an approved rate structure (similar to what is included in Dr. Colt's analysis). Dr. Colt's method for modeling Susitna-Watana Hydro causes the costs to ratepayers to be front-loaded and unrealistically high in the beginning years of the project operation. This scenario is successfully avoided through AEA ownership, similar to the Bradley Lake Hydroelectric Project.

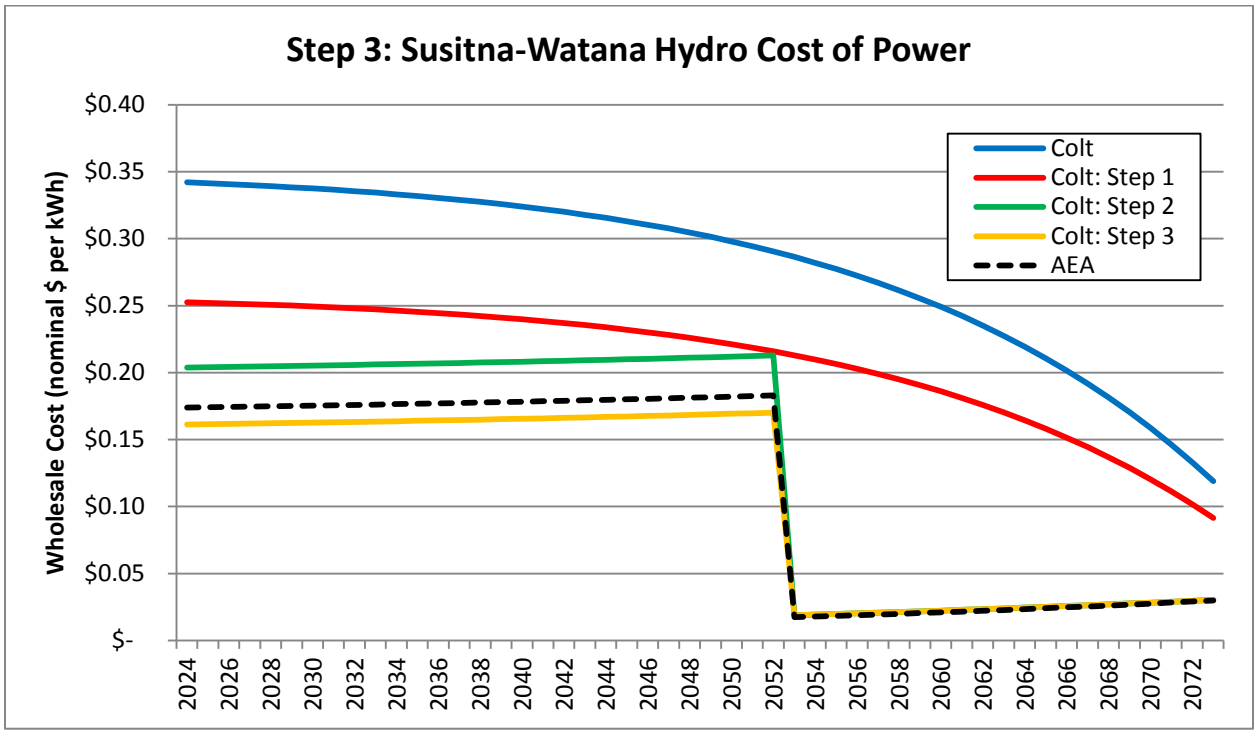
There are many variables that contribute to a final rate structure and finance plan that are not yet determined. The AEA modeling uses preliminary assumptions about rate structure and financing that AEA considers reasonable and includes all costs of the project. The rate structure that AEA uses provides lower cost of power in early years.

- Dr. Colt models the project with a 50-year financial life with straight-line depreciation. This annual depreciation is included in the rate base. AEA uses a more conservative 30-year financial life and does not include depreciation directly in the rate base.

ALASKA ENERGY AUTHORITY
Susitna-Watana Hydro Project • susitnawatana@aidea.org
(907) 771-3000 • Fax (907) 771-3044

- A regulated utility would calculate its interest costs against the remaining capital yet to be depreciated. In his hybrid approach, Dr. Colt calculates the interest costs against the remaining principal on the debt. AEA does not include the cost of capital directly in the rate base.
- AEA uses a cash-flow rate structure to capture project capital costs in the cost of power. The annual principal and interest payments on debt are included directly in the rate base instead of depreciation and interests cost.
- Colt uses a Times Interest Earnings Ratio (TIER) to ensure that the project has sufficient cash flow to make debt payments. A TIER is generally allowed by RCA to rate-regulated cooperative utilities, and often required by their lenders to ensure the overall economic health of the utility. AEA's rate modeling assumes the financing will include one year of capital reserve to ensure sufficient cash flow to make debt payments. AEA's Susitna-Watana model is similar to the financing model used for the AEA-owned Bradley Lake Hydroelectric Project without assuming the same level of State assistance.

Step 3: Correcting the Interest Rate

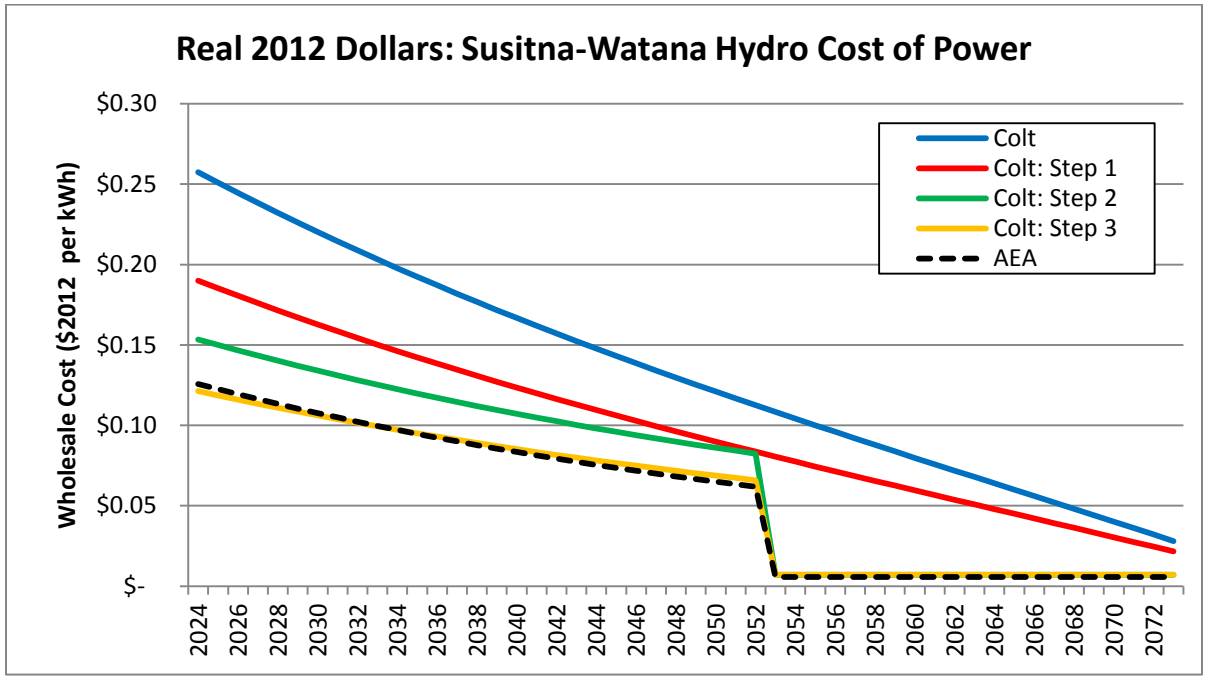


Dr. Colt assumes 6% interest rates for long-term debt and construction financing. A 6% interest rate may be expected if Susitna-Watana Hydro were constructed by a utility. AEA anticipates that it will secure a large portion of Susitna-Watana Hydro financing though sources that offer rates lower than utility bond rates. The estimated long-term interest rate is 5%. AEA also expects that if it obtains construction financing, AEA could secure short-term bridge financing at a 2% rate.

ALASKA ENERGY AUTHORITY
Susitna-Watana Hydro Project • susitnawatana@aidea.org
(907) 771-3000 • Fax (907) 771-3044

Results

When AEA corrects Dr. Colt's cost of power calculation with these three simple steps it results in a cost of power that is very close to its own estimate. There are still a number of assumptions that differ between Dr. Colt's discussion paper and AEA's analysis, each accounting for a small difference in the cost of power. These assumptions include operation and maintenance costs, the timing of capital spent, the treatment of the interest costs during the final year of construction, underwriting costs and the inflation rate.



The future cost of power from the Susitna-Watana Hydro is adjusted for inflation to compare to current power costs. This is done by converting the future costs of power into 2012 dollars using a forecasted inflation rate. Dr. Colt uses a 2.40% interest rate while AEA uses a 2.75% rate; both inflation rates are reasonable forecasts. Adjusting for inflation reveals that the real cost of power from Susitna-Watana Hydro will continue to decrease over time. AEA expects that the average cost of power for the first 50 years of the project will be $0.05 per kWh.

Susitna-Watana Hydro Wholesale Cost of Power ($/kWh)

	Colt	Step 1	Step 2	Step 3	AEA
Year 1 Rate (Nominal)	$ 0.34	$ 0.25	$ 0.20	$ 0.16	$ 0.17
Year 1 Rate ($2012)	$ 0.26	$ 0.19	$ 0.15	$ 0.12	$ 0.13
10 Year Ave Rate ($2012)	$ 0.23	$ 0.17	$ 0.14	$ 0.11	$ 0.11
25 Year Ave Rate ($2012)	$ 0.19	$ 0.14	$ 0.12	$ 0.09	$ 0.09
50 Year Ave Rate ($2012)	$ 0.13	$ 0.10	$ 0.07	$ 0.06	$ 0.05

ALASKA ENERGY AUTHORITY
Susitna-Watana Hydro Project • susitnawatana@aidea.org
(907) 771-3000 • Fax (907) 771-3044

The calculations and analysis performed by AEA assume the state's contributions for design and permitting of the project are capitalized when project financing is secure allowing this initial state investment to be recouped. The analysis presented in this paper does not assume future state grants for construction of the project. While state financial investment to lower the cost of power is anticipated, that policy decision is subject to future legislative appropriation.

The Alaska Energy Authority is a public corporation of the state whose mission is to reduce the cost of energy in Alaska. Susitna-Watana Hydro will provide reliable, renewable energy for Alaska. More information can be found at http://www.akenergyauthority.org and http://susitna-watanahydro.org.

ALASKA ENERGY AUTHORITY
Susitna-Watana Hydro Project • susitnawatana@aidea.org
(907) 771-3000 • Fax (907) 771-3044