
A Note on Optimal System Planning

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There are two relatively harmless slips in the interesting and important paper on optimal system planning by Michael Einhorn (1983). Both are associated with the intermediate plant.

Equation (6) should read:

$$K_I = (L_2 - L_1)H_2 + \int_{H_2}^{H_1} L(H) - L_1 dH$$

Similarly, the expression for intermediate generation (page 87) should read:

$$\int_{H_2}^{H_1} L(H) dH - H_1 L(H_1) + L(H_2)H_2$$

Without belaboring the subject, let me note that the specification as it appears in Einhorn's article represents vertical integration. This has a number of pedagogical advantages, as elaborated in Banks (forthcoming), horizontal integration speeds up the process of obtaining the crossover hours. Using Einhorn's symbols, we obtain for total costs:

$$TC = \sum_{j=1}^N B_j(L_{j-1} - L_j) + \sum_{j=1}^N \left\{ b_j \int_{L_j}^{L_{j-1}} H(L) dL \right\}$$

Then, differentiating with respect to L_j we get:

$$H(L_j) = \frac{B_j - B_{j+1}}{b_{j+1} - b_j}$$

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For example,

$$H_1 = \frac{B_1 - B_2}{b_2 - b_1} = H(L_1)$$

REFERENCES

- Banks, Ferdinand, E. (forthcoming). *The Political Economy of Coal*. Lexington, Ma.: D. C. Heath & Co., Lexington Books.
- Einhorn, Michael (1983). Optimal System Planning with Fuel Shortages and Emissions Constraint." *Energy Journal* 4, No. 2 (April).