ABSTRACT

This paper attempts to quantify the nature of electricity demand in the jurisdiction of PEA and MEA. Demand is categorized as the power demand and energy demand. The estimation period is from 1971 through 1979.

Power demand is related to energy demand through the load factor and the coincidence factor. Demand equations are estimated by customer groups. Since there are 7 customer groups in the MEA jurisdiction and 10 customer groups for PEA, there are estimation problems for power demand since power must be regressed on the energy of each group. Insufficient degrees of freedom and multicollinearity are the main problems in estimation.

Principal components technique is used to estimate the power demand for MEA and PEA customer groups. However, the results are unsatisfactory since there are some wrong signs in the power-energy relationship equations for both MEA and PEA.

Power is thus specified as a function of the average energy price and GDP. The results are satisfactory only for PEA where the equation shows a good fit with all the expected signs. Although the power demand equation for MEA shows a good fit it has a positive price sign which is significant at the .05 level.

Energy demand equations are then estimated for MEA and PEA customer groups. Energy is specified as a function of average energy price and 'income' variables (GDP, imports of electrical appliances and number of customers). Only the residential, medium business and street lighting groups in the MEA jurisdiction have the expected signs. Other groups have the wrong signs although they have high coefficients of determination. Results for PEA are relatively more satisfactory as only the general business and agricultural groups have the wrong signs.

Estimation results for MEA and PEA customers imply that the electricity demand equations may not be appropriate for structural analysis since they contain many wrong signs. More studies must be undertaken to shed more lights on their structure. Nevertheless, they may be used for forecasting purposes since the equations are charaterized by high coefficients of determinations.