could produce returns worth several thousand times the value of the original investment.

4.2.6 Barriers to Further Penetration

In spite of the successful development and introduction into the market of solid-state ballasts, their share of the total ballast market is still very small. The major barrier to more rapid penetration is their high initial cost. Manufacturer's costs for solid-state ballasts are about $23 compared to a cost of $10 for standard core coil ballast designs.

Solid-state ballasts reach end users in two ways: (1) as replacements for existing ballasts; or (2) as components of new lighting fixtures. Census Bureau figures published in 1979 and interviews with manufacturers conducted by Johnson et al. (1981) suggested that 60-75% of the solid-state ballasts being manufactured were installed in new lighting fixtures and that 25-40% were replacement ballasts. Recent interviews with industry representatives (Mullins, 1988) suggest that sales are now more evenly divided between new installations and retrofits.

Building owner/occupants typically give attention to energy-saving alternatives only when a ballast needs to be replaced. Because an investment in conservation must compete with other capital investment decisions, a return on investment as high as 15% may be required (Johnson et al., 1981). Returns on solid-state ballasts typically do not meet this criterion. Builders and contractors are more concerned with first costs than life-cycle costs, and are, therefore, even more resistant to installing the more expensive solid-state ballasts than owner/occupants.