

HPWH based on a re-examination of 20 demonstration units two years after installation. It concluded that the HPWH could last 10 years or more (versus an average of 7-11 years for conventional gas-fired and electric water heaters).

No patents arose as a result of the OBCS program. Several related patents were issued decades ago and have now expired. There was simply nothing that arose of a patentable nature.

DOE's support for research and development on the heat pump water heater spanned five years:

1977	-	\$108K
1978	-	\$141K
1979	-	\$330K
1980	-	\$105K
1981	-	\$ 50K

Cooperating utilities contributed approximately 5% of the total costs, through their support for installing, maintaining, and monitoring the demonstration equipment. But, neither the American Refrigeration Institute nor any other trade or professional organization was involved. Though there were some efforts to attract sponsorship from such organizations, none was obtained. There was no industry advisory board, as was observed in other cases such as the supermarket refrigeration R&D program.

Very little R&D is supported by the industry. What R&D is supported is directed toward better maintenance and increased durability rather than improved energy efficiency.

### 5.2.3 Market Penetration

DOE's support of this technology stimulated the growth of a new industry. By the spring of 1980, EUS had established manufacturing facilities in Johnson City, Tennessee. Commercial production of the EUS HPWH began in August 1980 and by the end of 1980, EUS was manufacturing 80 units per month.