and other additives, constitute about 70% of the PCBs by weight, while metals such as copper, tin, lead, iron and nickel (Ji and Yokoyama, 1997) constitute the remaining 30%. In the metal fraction, copper constitutes approximately 17%, solder is approximately 4%, iron and ferrite are 3%, and nickel is 2% by weight (Ji and Yokoyama, 1997; Veit *et al.*, 2002; Goosey and Kellner, 2003). Precious metals such as gold, silver and platinum are also present in small quantities.

Currently, the main options for the treatment of electronic waste are involved in reuse, remanufacturing, and recycling, as well as incineration and landfilling. In many cases, electronic equipment, which is no longer useful to the original purchaser, still has value for others. In this case, equipment can be resold or donated without any modification. Reuse of end-of-life electronic equipment has first priority on the management of electronic waste since the usable lifespan of equipment is extended on a secondary market, resulting a reducing of the volume of treated waste stream. Remanufacturing is a production-batch process where used products or cores, are disassembled, cleaned, repaired or refurbished, reassembled and tested to produce new or like-new equipments (Williams and shu, 2001)Recycling means the reprocessing in a production of the waste materials for the original purpose or for other purposes. Recycling of electronic waste involves disassembly and/or destruction of the equipment in order to recover materials.

Due to their hazardous material contents, WEEE may cause environmental problems during the waste management phase if it is not properly pre-treated. Many countries have drafted legislation to improve the reuse, recycling and other forms of recovery of such wastes so as to reduce disposal (European Commission, 2000). Recycling of WEEE is an important subject not only from the point of waste treatment but also from the recovery aspect of valuable materials. The US Environmental Protection Agency (EPA) has identified seven major benefits when scrap iron and steel are used instead of virgin materials. Using recycled materials in place of virgin materials results in significant energy savings, reduction in air/water pollution, reduction in consumer wastes generated and so on (ISRI, 2003). The metal content of some WEEE exceeds 45 percent, which is dozen of times, even hundered of times higher than metal content of ordinary mineral. The metal and precious metal contained in WEEE have been an important driving force for WEEE recovery, which can be looked as an expected second exploitable mine. Comparing with traditional mine, this second explotiabe mine is characteristic of higher grade, lower exploitable cost and low processeing cost. Meanwhile, the non-metal contained in WEEE (such as fibre and colophony) can be served as filler to further recovery the energy cost (Nourreddine and Bjorkman, 2004; Realff *et al.*, 1998). Therefore, whether enviormental protection point of view or resource reutilization point of view, it is imperative to do WEEE recovery.

2. WEEE recovery situation in China

With the development of science and progress of society, the discarded electrical products become more and more. Based on the data of national statistical bureau, China has become one of the largest countries of pruduction and consumption of electrical production. The lifetime of electrical products becomes shorter and shorter with the development of science and social. As shown in Figure 1, the lifetime of personal computers (PCs) is set as an example. As shown in Table 1, the calculated numbers of discarded PCs, TV sets, refrigerators, washing machines, and air conditioners in 2007 were 12.68, 44.49, 11.38, 10.83 and 3.23 million units, respectively. In the future, the annual number of obsolete units of PCs and home appliances will increase due to both increasing sales numbers and the decreasing medium lifetime of these items (EEA, 2003; CRAES, 2003).

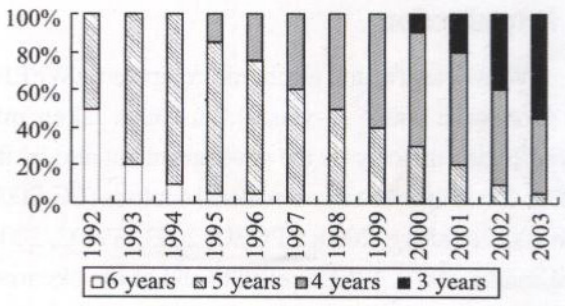

Fig.1. Lifetime distribution for personal computers in China.