ET4407 Electronics & the Environment Autumn 2013

Problem 2

Name: Sean Goldrick
ID: 10105751
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Paper Reviewed: Evaluating the sustainability potential of a white goods refurbishment program
Authors: Maurice W. O’Connell, Stewart W. Hickey & Colin Fitzpatrick

Part 1: What are the three most important findings that you can take from this paper?

1. Case study findings:
   By using 27 different user scenarios it was determined that for ‘A’ and ‘B’ rated washing machines re-use would be the preferred EOL strategy from an environmental standpoint (figure 1). It was also found that ‘C’ rated machines, when used at a medium or low intensity, should also be re-used.
   From an economic standpoint, ‘A’, ‘B’, ‘C’ as well as medium/low intensity ‘D’ and even low intensity ‘E’ would be suitable for reuse, although ‘D’ and ‘E’ performed poorly on the environmental side.

   ![Figure 1: Case study environmental results](image-url)
2. **“Job creation potential of reuse and recycling”**
While only small amounts of data are reliable in this area, it has been shown that re-use is more labour intensive than recycling and thus provides more employment. The US EPA has estimated that 10,000 tonnes of material creates 1 job at an incinerator plant, 6 at a landfill, 36 at recycling centres and 28-296 in the re-use industry.
At a refurbishment plant in Northern Ireland it was shown that 16 people were responsible for processing 6395 machines, of which, 4605 were reused.

3. **“Waste represents an under-utilized resource of considerable value”**
While job creation and reduced hardships on low-income households would be a welcome outcome of white waste reuse, on a larger scale a green economy would benefit all. Reuse would help keep valuable resources in circulation instead of them being buried in landfill never to be used again. Should the government provide incentives for reuse it could create new growth of social entrepreneurship and economic development.

**Part 2: What methods are used to determine when appliances should and should not be reused?**

There are two different methods used to determine if a product should be reused or not, these are the economic and environmental factor of re-use. Both take into account the amortization period of the reused product against that of a newly purchased product.

- If the amortization period is sufficiently long (6+ years) then an appliance would be reused.
- If the amortization period is too short then it would be recommended to recycle the appliance.

![Figure 2: Energy amortization in re-use scenarios](image)

From the above graph (figure 2) we can see how there are three options after the first usage phase of the product.
1. Re-use the product (no increase in energy usage for manufacture).
2. Purchase a new product (note the rise in energy due to manufacture).
3. Throw out the product.

The amortization period is the time taken from when the decision is made to change or re-use the product (1 or 2) until the energy usage for purchasing a new product becomes less than that of a reused product (3).

Part 3: How were social issues treated in the paper?

The social benefits of white goods reuse was a large issue in this paper. It was revealed that in 2009 almost 25% of Irish households were in arrears on one or more of the following items: utility bills, rent or mortgage payments, hire purchase agreements or other loans/bills compared with only 10% in 2008. Enforced deprivation (inability to afford basic specific goods or services) also greatly increased from 13.8% in 2008 to 22.5% in 2010. This affects the ability of families to purchase necessary white goods like washing machines (0.6% unable to purchase) or a clothes dryer (6.5% unable to purchase).

Another social benefit from white-goods reuse would be the job creating potential of a national refurbishment scheme. While this potential was previously explained earlier in this report, it should be made clear that there is a growing demand for cheap white goods products, not just in low income households. Survey results have shown 42% of the Irish population and 46% of the UK are willing to buy second hand electronics.

The above points makes it abundantly clear that low cost refurbished white goods would greatly help out those in low-income households, as well as the country as a whole.

References:
http://et4407.files.wordpress.com/2013/10/1-evaluating-the-sustainability-potential-of-a-white-goods-refurbishment-program.pdf