APPENDIX L

THE STUDY OF WHITE GOODS RECYCLING AND DISPOSAL IN MISSOURI - INTRODUCTION AND SUMMARY

Excerpt from

The Study of White Goods Recycling and Disposal in Missouri

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Introduction

White goods (major appliances such as refrigerators, washers, and dryers that are part of the ferrous scrap stream) were recycled at a very high rate throughout the 20th century. The Major Appliance Resource Management Alliance (MARMA) estimates that 60 million new appliances were sold in the U.S in 2000. During that year approximately 41 million appliances were discarded and about 35 million (85%) were recycled.

The State of Missouri had experienced similar recycling success. Missouri's major solid waste management legislation, known as Senate Bill 530, banned white goods from disposal in landfills because they were so easily recycled. The scrap value of major appliances was high enough to sustain a cottage industry of collectors. These collectors picked up and delivered white goods to scrap yards in both rural and urban locals earning a modest income for their work. However, over the past few years the recycling of white goods has become less and less profitable. In fact the disposal/recycling value of many appliances has gone from a positive to a negative value.

In 2001 the Missouri Department of Natural Resources issued a request for proposals to study the problems associated with the recycling of white goods through their Targeted Waste Reduction and Recycling Project funds. That grant was awarded to the Midwest Assistance Program in September 2002.

The purpose of this study is to identify the barriers to recycling white goods and suggest some remedies that could enhance recycling and reduce the illegal dumping of those items.

Preliminary Research

A preliminary investigation was conducted to define the problem stated above and gather information on the subject. An internet search was conducted to determine what research had been conducted and what problems, if any; other states were having with their white goods recycling. The Appliance Recycling Information Center has published a series of eight info bulletins that describe the state of appliance recycling nationally (Appendix 1). The Major Appliance Resource Management Alliance has also published a helpful report entitled "Appliance Recycling in North America – Infrastructure and Challenges" (Appendix 2).

The Center for Design at RMIT University has published a Product Stewardship Guide (Appendix 3) which was useful in contacting organizations interested in appliance recycling.

The Association of Home Appliance Manufacturers tracks trends and provides forecasts for major appliances. The industry shipments of major appliances (Appendix 4) provides detailed information on the number of major appliances shipped from 1991-2002.

Some states and individual communities have web pages that describe the appliance recycling process and/or direct consumers on how to recycle their major appliances. An internet search of surrounding states (Appendix 5) provided information regarding how our neighbors are approaching the problem of appliance recycling.

The regulatory agencies in all neighboring states as well as several others were contacted to determine if they were experiencing problems with reduced recycling and increased illegal dumping of white goods. Each agency contacted expressed concern over the recent problems encountered with the recycling of major appliances but none had any solutions to the dilemma.

Several stakeholders (individuals or businesses directly affected by the recycling or disposal of white goods) were identified and interviewed about the problem. Most indicated that the cost to prepare appliances for recycling was becoming very labor intensive and the prices paid for scrap metal had dropped.

The price history of scrap metal was obtained through *Recycling Today*. The average price of number one heavy melting scrap and an analysis of the recycling metals markets by the U.S Geological Survey are included in Appendix 6.

Survey of Stakeholders

A questionnaire was created based on the preliminary research conducted. The questionnaire was sent to 1707 stakeholders. The distribution and response rate are listed in the table below:

Stakeholder Group	Sent	Returned	Percent
Counties and Municipalities	578	73	12.6%
Major Appliance Repairers	330	16	4.8%
Major Appliance Dealers	305	22	7.2%
Solid Waste Industry	303	30	10.1%
Scrap Metal Dealers	116	7	6.0%
Recycling Centers	75	11	14.7%
TOTAL	**1707**	**159**	**9.3%**

The questionnaire was combined with some brief instructions and a list of meetings scheduled to discuss the results of the survey (Appendix 7). The questionnaire asked three basic questions:

1. What appliances are the most difficult to recycle?
2. What are the barriers to recycling white goods?
3. What are the solutions to overcoming those barriers?

Respondents were told to mark all answers that were applicable. The results for these survey questions were broken down by each group (Appendix 8). The overall sentiment from the stakeholders responding to the survey was:

Problem items: Appliances containing CFC's (refrigerators, freezers, air conditioners) ranked the highest. The obvious problem with these items was the removal of refrigerant form the appliance. On July 14, 1992, EPA published a final rule in the federal register, pursuant to section 609 of the Clean Air Act (Appendix 9). This rule requires the proper evacuation of refrigerant from all refrigeration appliances prior to their disposal or recycling. The rule became effective on January 29, 1998. The fine for non-compliance to this rule has been set at $10,000 per violation and is vigorously enforced by EPA.

Barriers: The greatest barrier in recycling white goods was the low price (45% of respondents) offered by the scrap yards for the appliances. National pricing for #1 heavy melting scrap (Appendix 6) indicates a cyclical price trend. The average national price from January 2000 until December 2001 fell from $121 per ton to $65 per ton. However since that time prices have increased to $115.91 per ton as of February 2003. According to most small scrap haulers the increase in prices has not been passed on to them.

The second greatest concern about barriers to recycling was the inability to find a contractor (43%) to pick up white goods, removing refrigererant was too labor intensive (43%) and customers not willing to pay an extra fee to have their old appliance hauled away (41%).

Solutions: The most mentioned solution was a directory that listed scrap yards, haulers, and certified extractors (62% of respondents). Other solutions that were most mentioned were, better enforcement of illegal dumping (38%), grants to pay for refrigerant extraction equipment (35%), and more buyers for recovered refrigerant (35%).

Statewide Focus Groups

The survey results were presented to ten focus groups held throughout the state between November 5, 2002 and November 22, 2002. Detailed notes from each of those groups are included in the appendix (Appendix 10). Each of the stakeholder groups were represented during these meetings. Each meeting lasted approximately 90 minutes and included valuable discussions of the barriers to, and solution for, more efficient recycling of white goods. A total of 83 persons attended the focus groups

Barriers: All groups were in agreement on the main barrier to recycling. A combination of lower prices for scrap, fear of regulators and fines for non compliance, and an increase in labor to make appliances acceptable for scrapping had driven most "scrappers" out of the industry. Focus group attendees cited the following reasons for each of the above barriers:

Lower Scrap Prices – During the 90's large volumes of "cheap" foreign steel was imported from abroad. This problem was partially corrected in 2001 due to import restrictions on foreign steel. The reduced value of this "cheap" steel caused several steel mills to close. One of those steel mills was located in Kansas City. The closing of that mill caused the local scrap shredder (Galamet) to transport their shredded scrap to mills hundreds of miles away. This added expense caused lower prices paid for scrap in Western and Central Missouri.

Added Regulations – The Federal regulations requiring the removal of refrigerant by certified personnel became effective on January 29, 1988. EPA began to enforce this rule soon thereafter. The announced fine for any violation (improper evacuation of any appliance containing refrigerant) is $10,000. Many of the "scrappers" that picked up white goods in small trucks decided to get out of the business instead of complying with the new regulations. This seemed to be true more in rural areas than in the metropolitan areas.
Many scrap yards now require signed affidavits from haulers bring in white goods (Appendix 11). These affidavits are necessary to protect the scrap yard from liability. However, along with lower prices for the scrap metal, it does decrease the number of individuals or companies that will pick up and haul white goods.

More labor intensive – In addition to removing the refrigerant from appliances, there are often other steps needed to prepare an appliance for recycling. Many scrap yards now require that all motors and compressors be removed from all appliances, both refrigeration and non refrigeration units. The reason for this is more economic than environmental. If motors and compressors are removed the scrap yards can increase profit margins by recycling the motors separately thus increasing profitability. Removal of other items may be required also. Some older units have capacitors with PCB's that must be removed and disposed, draining and the disposal of oil, and the removal of mercury switches on some units.

In general the focus groups felt that lower prices, more regulation, and increased labor to prepare appliances for recycling have had a decisive economic affect on the industry. Throughout the last century white goods had a positive economic disposal value. There was a small group of independent entrepreneurs that could make a meager living out of collecting appliances, possibly repairing some, and taking the remainder to the scrap yard for enough revenue to cover expenses. However, during the past three years the labor and expenses have increased, the revenue has decreased, and the threat of non-compliance has resulted in a negative value for appliances.

This transition from a waste item that had value, to a waste item that is now a liability is the key to the problem. Most citizens still look at white goods as a waste item that is valuable for its scrap value. The reality now is that the old appliance is a liability and like most other waste items, will require a fee to cover transportation and preparation for the scrapping process. The focus groups agreed that the barriers are basically economic and educational.

Solutions: Each focus group had a variety of solutions they felt would increase the recycling of white goods. Summarizing and combining suggestions from all the groups resulted in 14 potential recommendations. These fell into three broad categories.

1. Information and educational assistance
2. Assistance with regulatory issues
3. Economic incentives

The fourteen potential recommendations were discussed with the Missouri DNR staff, industry groups and Solid Waste Management District Planners. The potential recommendations were mailed to all 1701 stakeholders that had received the original survey. The stakeholders were asked to review the potential recommendations and comment on their viability.

Prioritizing the Recommendations:

Another set of statewide meetings were scheduled for April 1, 2003 through April 17, 2003 (Appendix 12). At each meeting attendees were given a handout (Appendix 13) with the fourteen potential recommendations from the earlier meeting along with a ballot to vote for what they felt would be the most effective solutions for better recycling of white goods. A more detailed description of each of the fourteen potential recommendations from the first set of meetings will be provided later in the report. The following is a list of those recommendations in the order that they were presented to each focus group:

1. Combine Appliances and Electronics.
2. Encourage District Collection Programs.
3. License Appliance Haulers
4. Encourage Reuse and Repair
5. Encourage Better End Markets for Scrap Metal
6. Provide Better Information on White Goods Recycling
7. Provide Consumers with Appliance Recycling Information
8. Provide Grants for Extraction Certification and/or Equipment
9. Create a Fee System to Subsidize Recycling and/or Pay for Illegal Dump Clean-ups.
10. Enforcing the Illegal Dumping of Major Appliances
11. Removing the Disposal Ban on White Goods
12. Provide Incentives to Landfills for the Separation and Recycling White Goods
13. Require Manufacturers to Design Appliances for Easier Recycling
14. Assist Small Businesses that Want to Collect White Goods by Streamlining the Regulatory Process.

During the meetings each potential recommendation was discussed with pros and cons listed on a PowerPoint presentation (Appendix 13). At the end of each meeting the attendees were given a ballot (Appendix 13) and asked to "vote" for the recommendations they felt would be most effective tools to increase recycling and discourage the illegal dumping of white goods. The attendees were also told to "vote" for the recommendations that would be least helpful.

A total of 80 persons attended the focus groups. Four attendees chose not to complete the ballot. Seventy six ballots were completed. The ballots were totaled and entered on an Excel spreadsheet (Appendix 14). There were some obvious differences between the metropolitan (St. Louis and Kansas City), mid sized Cities (Columbia and Springfield) and the 6 rural meeting locations.

The priorities based on geographical breakdown were:

Metropolitan areas - St. Louis and Kansas City
1. Provide Better Information on White Goods Recycling
2. Assist Small Businesses that Want to Collect White Goods by Streamlining the Regulatory Process.
3. Provide Consumers with Appliance Recycling Information

Mid Sized Cities – Columbia and Springfield
1. Encourage District Collection Programs.
2. Provide Better Information on White Goods Recycling
3. Provide Grants for Extraction Certification and/or Equipment

Rural Areas
1. Encourage District Collection Programs.
2. Provide Better Information on White Goods Recycling
3. Provide Consumers with Appliance Recycling Information

Both metropolitan areas have a collection system in place and a private company that processes the white goods for shipment. In Kansas City, Scientific Recycling Inc. accepts appliances from the City of Kansas City Missouri. In the St. Louis metropolitan area, Appliance Recyclers, Inc. picks up white goods and bills the resident or the City direct for that service.

Outside of the two metropolitan areas there have been problems finding companies or individuals to pick up white goods, process them sufficiently for recycling, and deliver those appliances to a scrap metal yard. For the past two years Solid Waste Management District's B, C, and D have hosted one day collection programs for their municipalities. However, both Districts are reporting difficulty in finding a contractor to pickup, process, and haul the white goods collected at these events. Solid Waste Management District Q collects white goods on an ongoing basis and prepares them for recycling before delivering them to the local scrap yard.

Recommendations from the Focus Group Meetings

The following recommendations were made by the first set of focus group meetings in November 2002 and prioritized by the by the second set of focus group meetings in April 2003. **The recommendations are listed in the priority order voted by the groups**. The number in parenthesis after the recommendation are the points (either positive or negative) received during the focus group voting. The PROS and CONS were presented to each group and discussed before the voting.

1. Provide Better Information on White Goods Recycling (47 points)

PRO'S

- This was the number one choice from the surveys and focus groups.
- "Knowledge is Power".
- A Target grant could be used to create and maintain a database of haulers, scrap metal buyers, and certified extractors.

CON'S

- Information must be accurate.
- Information might get old and out of date.
- Just having the information will not correct the problem.

An information and education program targeted to both the public and private sectors could be helpful. A majority of respondents (62%) on the survey and virtually all of the attendees at the meetings felt that more information was needed on appliance recycling. Everyone thought an online directory of scrap yards, refrigerant recoverers, regulations, and environmental concerns was a good idea. The information could cover:

- Why proper recycling of major appliances is necessary
- Problems resulting from the illegal dumping of appliances.
- State and federal regulations concerning the extraction of refrigerant as well as the removal of motors, compressors, oil, and capacitors.
- State and local regulations on site restrictions and zoning jurisdictions
- A list of local contractors that will remove refrigerants and other parts.
- A list of scrap yards that will buy appliances.
- A list of contractors that will pick up and transport appliances.
- A list of Solid Waste Management District and DNR personnel that can assist with appliance recycling.

2. Encourage District Collection Programs (37 points)

PRO'S

- It would be more cost effective to collect white goods on a larger scale.
- Targets grants could be created to fund the District collections.
- Districts could combine collections for white goods with other problem items.

CON'S

- Districts would have to be more proactive in dealing with the problem.
- Some Counties and Municipalities have programs in place now.
- More responsibility for District Planners.

Scrap prices could be maximized and the cost to evacuate refrigerant could be lowered if all communities in each of the solid waste management regions would pool their resources and work cooperatively to stage and prepare appliances for recycling in one area. Region B, C, and D currently provide one-day appliance clean-ups for communities in their regions. Region B is also certified to remove refrigerant. Region Q collects white goods from their communities and processes them at their MRF.
DNR could encourage this regional approach by:

- Providing technical support on regulations, operational efficiencies, and markets for scrap metal
- Providing targeted grants for the solid waste management districts to subsidize personnel and/or transportation costs.
- Negotiating a state contract for higher scrap prices.

3. Provide Consumers with Appliance Recycling Information (35 points)

PRO'S

- Informed consumers will make better disposal choices.
- An opportunity to educate the public on solid waste issues.
- This may help retailers take more units in on trade and reduce illegal dumping.

CON'S

- Just having the information will not correct the problem.
- Distributing the brochures to retailers and keeping them in stock would be a problem.
- More paper.

Most attendees thought consumer education and awareness of why appliance recycling is important, and how to recycle their unwanted appliances should be a key component of any recycling plan. The consumer could be educated about the difficulty in recycling appliances and urged to trade their old appliance in when purchasing a new one.
A brochure could be created and distributed to appliance dealers to make consumers aware of the importance of proper appliance handling and recycling. This brochure could be given to customers shopping for new appliances.

4. Provide Grants for Extraction Certification and/or Equipment (29 points)

PRO'S

- Grants could help more people get into the business and increase competition.

CON'S

- Providing grants could not insure that the service would be provided better or more economical.

Target grants could be provided to assist with refrigerant removal Certification and removal equipment. DNR could consider sponsoring classes that teach how to recycle white goods with certification as an end product. Grants for extraction equipment could be given to those that complete the classes.

5. Create a Fee System to Subsidize Recycling and/or Pay for Illegal Dump Clean-ups (25 points).

PRO'S

- An advanced fee could be used to subsidize recycling or clean up illegal dump sites without using existing solid waste funds.
- A $3 dollar fee per appliance would create about 3.3 million dollars per year.
- This could be also be implemented for electronic items.

CON'S

- A fee will be perceived as another tax by consumers.
- Retailers near state borders will be disadvantaged.
- All Fees must be approved by the Legislature.

A small percentage (19%) of those responding to the survey felt that a voluntary trade-in fee was needed. A larger percentage (28%) wanted a mandatory fee that would be collected on the sale of new appliances. Most attendees at the meetings like the fee idea but there were divergent opinions on how to structure such a fee. Two states currently assess an advance disposal fee. These are:

- N. Carolina collects $3 for appliances sold at retail outlets (North Carolina has about 3.2 million households and collected $4,522,528 total in FY 01-02). A report for FY 01-02 is included as Appendix 15.
- S. Carolina collects $2 for each major appliance which is paid by wholesalers.

Based on the number of Missouri households (2.2 million) and the life cycle of each appliance, between 1.1 and 1.5 million major appliances are sold in Missouri each year.

6. Encourage Better End Markets for Scrap Metal (22 points).

PRO'S

- Local markets would reduce transportation costs.
- Local markets might pay higher prices for scrap.
- Market driven approaches are better than subsidy or enforcement programs

CON'S

- Shredders and Steel mills will be difficult to recruit because they require huge financial investments.
- Steel mills must locate close to Ports for international markets.

There are no end markets (mills or foundries) for ferrous scrap in Missouri. All scrap must be transported to mills in other states or to seaports for shipment abroad. The trend in ferrous scrap seems to be more exporting. The United States is still the top producer of steel and also the leading exporter of ferrous scrap. China is the leading importer of ferrous scrap. A small steel mill, particularly in the Kansas City area, could lower transportation costs and raise the prices paid for scrap.

All agreed that a market-driven solution was better than a government induced subsidy program. Several attendees suggested tax credits for the scrap dealers in order to prop up prices and encourage recycling. Any tax changes would need to come from the legislature and that may be difficult during our present economic shortfall.

7. Assist Small Businesses that Want to Collect White Goods by Streamlining the Regulatory Process (19 points).

PRO'S

- DNR cold provide assistance with permits and regulations that would encourage more collections.
- The Environmental Assistance Office (EOA) could be the "Gatekeeper" that would reduce fear of regulatory agencies.

CON'S

- Regulations that frighten potential collectors would still exist.
- "I'm from the government and I'm here to help"?
- Regulations from Federal agencies like EPA and state agencies like MDOT would be difficult to coordinate.

The small business ventures that once collected white goods for scrap have nearly vanished because they do not understand the regulations, or fear the regulators. DNR's Environmental Assistance Office (EAO) could provide assistance to these small businesses in understanding and complying with regulations. The regulations come from a variety of federal and state agencies.

8. Encourage Reuse and Repair (12 points).

PRO'S

- Reuse could be encouraged by the Districts by offering grants to subsidize the removal of non-repairable appliances.
- Information on where to take appliances for repair might be cost-effective.
- Getting repair shops involved with the Solid Waste Management District's would be helpful.

CON'S

- The repair industry does not need any help from DNR or the Districts.

Reuse could be explored. District solid waste funds could be targeted to small neighborhood centers that repair used appliances. The funding could be used to subsidize the recycling of appliances that could not be repaired.

9. Enforcing the Illegal Dumping of Major Appliances (-4 points)

PRO'S

- This received the second highest response on the survey.
- Higher fines and possible jail time might change illegal dumping behavior.
- Better enforcement of zoning or nuisance ordinances might reduce "eyesores".

CON'S

- Law enforcement is not enthusiastic about catching illegal dumpers.
- Illegal dumping is difficult to prosecute.
- All of the focus groups felt enforcement was necessary but not the best solution.

Enforcing illegal dumping with significant fines or jail time was suggested several times in the survey. However it is very difficult to get law enforcement enthusiastic about catching and prosecuting illegal dumpers. Most attendees felt that enforcement of illegal dumping was not a realistic solution to better recycling and could probably move down the priority list. Everyone agreed that incentives are better than enforcement. Occasionally appliances are collected with the intent of recycling but actually become unsightly illegal dumps. Scrap metal yards are strictly regulated by the state but "accumulators" are not and zoning sometimes let them get away with storing metal in ways that is harmful to the environment and ascetically not pleasing. Local zoning laws could be enforced to require better management of appliances.

10. Provide Incentives to Landfills for the Separation and Recycling White Goods (-18 points)

PRO'S

- Removing surcharge would reduce costs.
- Landfills and transfer stations have the resources and equipment to handle white goods.

CON'S

- Landfills and transfer stations may not want to handle white goods.
- White goods would still need to be separated before transport.

Landfills and transfer stations could be given the responsibility for separating and recycling appliances and electronic items. The rules on imposing the state surcharge could be changed to exempt white goods. Several states have similar rules concerning white goods recycling. Nineteen states require landfills to separate white goods for recycling. Three states give landfills the option of recycling or disposing of white goods. Four states require local plans to deal with disposal.

11. Require Manufacturers to Design Appliances for Easier Recycling (-28 points).

PRO'S

- Better design would reduce labor costs to prepare units for recycling.

CON'S

- The reality of getting manufacturers to design better is not high.

Manufacturers could be brought into the process. Major appliances could be designed for recycling with easy disconnects for copper parts and refrigerant. This would reduce the labor needed to get many white goods acceptable for recycling.
This is a product stewardship issue and is similar to the initiatives that are being pursued with electronics manufacturers. The problem is national in scope and the State of Missouri, operating by itself, would have little leverage in requiring design changes.

12. Combine Appliances and Electronics (-41 points).

PRO'S

- Would allow more flexibility in collection and grant request funding.
- Illegal dumping problems are similar.
- A broader audience and easier to educate consumers if both are combined.

CON'S

- Items are too different to be grouped together.
- They go to different markets for recycling.
- Electronics may contain hazardous waste.
- Simply grouping the two together will not solve the problem.

White goods and electronics could be linked together and any solution could involve both types of materials. They are similar and disposal or illegal dumping is a problem for each. Most attendees felt that any solution for white goods could also be adaptable for electronics and office machines. At the present time white goods are banned from landfills but most electronic items are not. White goods and electronics could be collected and recycled under the same target grants.

13. License Appliance Haulers (-44 points).

PRO'S

- This might help in the enforcement of illegal dumping.

CON'S

- This might add a cost factor to collecting white goods.
- More bureaucracy

The state could license appliance haulers and require certification before hauling. Licensing could be similar to that of waste tire haulers. This will require additional regulatory oversight by DNR and enforcement by local law enforcement officers. This may, or may not decrease the amount of illegal dumping.

14. Removing the Disposal Ban on White Goods (-53 points).

PRO'S

- If white goods are not valuable for their metal content they should be allowed in landfills.
- There would not be a problem if the ban was lifted.
- The ban on microwaves was lifted in 2002.

CON'S

- Lifting the ban would send the wrong message.
- Metal recycling will experience price fluctuations in the future but their will always be a value in scrap metal.
- Landfill space is still a valuable commodity in Missouri.

Senate Bill 530 banned all white goods from landfills in 1990. Currently 18 states have similar bans in place. In 2002 an amendment on an unrelated bill was passed which exempted microwave ovens from the white goods ban.
There was virtually no support in the meetings for eliminating the current ban on all white goods. There was some discussion on removing dishwashers from the banned list because newer models have a lower metal content. However, the overwhelming thought from most attendees was to keep the ban on all white goods intact.

Summary of Findings

The amount of recycling and/or illegal dumping of white goods is difficult to calculate. Based on information from surveys and focus meetings, recycling has become much more difficult and illegal dumping is more widespread during the past few years. What is measurable is the cost to prepare major appliances for recycling and their scrap value.

Historically white goods had a positive scrap value. There were several small independents (scrappers) that would pick up appliances at retail stores, repair shops, and residences at no cost and take them to a local scrap yard. Labor and overhead costs were low and scrap prices paid enough to eek out a living. However, during the past two years many of these independent contractors have gotten out of the business. There seems to be three main reasons for this turn of events:

1. **Lower Scrap Pr**ices – During the 90's large volumes of "cheap" foreign steel was imported from abroad. This problem was partially corrected in 2001 due to import restrictions on foreign steel. The reduced value of caused several steel mills to close. One of those steel mills was located in Kansas City. The closing of that mill caused the local scrap shredder (Galamet) to transport their scrap to mills hundreds of miles away. This added expense caused lower prices paid for scrap in Western and Central Missouri.

2. **Added Regulations** – The Federal regulations requiring the removal of refrigerant by certified personnel became effective on January 29, 1988. EPA began to enforce this rule soon thereafter. The announced fine for any violation (improper evacuation of any appliance containing refrigerant) is $10,000. Many of the "scrappers" that picked up white goods in small trucks decided to get out of the business instead of complying with the new regulations. This seemed to be true more in rural areas than in the metropolitan areas. Many scrap yards now require signed affidavits from haulers bring in white goods (Appendix 11). These affidavits are necessary to protect the scrap yard from liability. However, along with lower prices for the scrap metal, it does decrease the number of individuals or companies that will pick up and haul white goods.

3. **More Labor Intensive** – In addition to removing the refrigerant from appliances, there are often other steps needed to prepare an appliance for recycling. Many scrap yards now require that all motors and compressors be removed from all appliances, both refrigeration and non refrigeration units. The reason for this is more economic than environmental. If motors and compressors are removed the scrap yards can increase profit margins by recycling the motors separately thus increasing profitability. Removal of other items may be required also. Some older units have capacitors with PCB's and some units are equipped with mercury switches.

The end result has been a transition from a positive value where white goods were a financial asset to a negative value where white goods are a financial liability.

Urban areas (Kansas City and St. Louis) have experienced price increases from vendors that collect and/or process white goods. The City of Kansas City delivers their white goods to Scientific Recycling and pays $17 per appliance. Other municipalities in the Kansas City area are struggling to find contractors that will collect and process the items. The St. Louis region utilizes Appliance Recyclers in Illinois to collect and process white goods. The price to collect is billed to the municipality or private waste company and the fee varies. In most cases these costs are passed on to the customer.

Rural areas have also seen an increase in the cost to recycle white goods. The City of Cape Girardeau pays a contractor $35 per unit to remove and dispose of refrigeration units. Solid Waste Management Districts that have contracted for one day collection events have seen large increases in the cost to remove and recycle white goods. In fact several Districts have found it difficult to find a contractor to provide this service.

The bottom line is that recycling white goods is more costly now than in the past. In fact,

In most instances it costs more to recycle appliances than the value received from scrapping them.

Conclusion

It is very unlikely that the Department of Natural Resources can do anything to reverse the trend in white goods recycling and create a system that provides a positive scrap value for appliances. Possible solutions that may ease the cost of recycling are:

Information: Most attendees at the focus meetings did not know what was required to get white goods prepared for scrap or who to call for that service. Municipalities, appliance dealers, and the solid waste industry need

an easy to use directory of regulations that pertain to the recycling and disposal of white goods, contractors that will collect and process white goods, and scrap yards that will accept white goods. Private Citizens also need this type of information when they want to discard their old appliances and in most cases they call their municipality or private solid waste hauler for directions.

A hard copy directory is needed by municipal staffs and the solid waste industry for quick reference when they receive calls from residents or customers. However, the information is so fluid a digital database linked to the DNR web site is probably more realistic. This database must be up-to-date and user friendly.

Education: Consumers should be educated about the increasing cost of disposal for old appliances. Most consumers are unaware of the problems associated with the proper disposal of their used appliances. The change from a positive value for these items to a negative value has happened so quickly that many consumers that purchase new appliances are not aware that disposal of that old appliance may cost them more than they anticipated. When consumers find out how costly and difficult it is to dispose of the old appliance they frequently dump them illegally to avoid that cost.

An educational campaign directed at consumers of new appliances should reduce that illegal dumping and justify trade in fees charged by appliance dealers to recycle those units. Some aspects of that educational campaign might be brochures at retail appliance dealers, PSA's, and information on the DNR web site.

Efficient Collection and Processing: Rural municipalities and residents have more difficulty finding contractors to collect and process white goods for recycling. These areas are experiencing high costs and high illegal dumping rates due to the lack of certified contractors that are willing to evacuate refrigerant and process appliances. More certification classes and grants to purchase equipment could lower costs in some rural areas and provide more choices for that service.

A government entity (preferably the Solid Waste Management Districts) could provide an accumulation point where appliances could be processed

and sold for scrap. This accumulation would provide some economy of scale and lower the per-unit cost in rural areas. These accumulations could also be a source for appliances that are still usable and promote repair and reuse of these appliances. In most cases the Solid Waste Management Districts do not have sufficient funds to take on this added burden. Therefore additional funding from the Solid Waste Management Fund would be needed to assist these collections.

More Revenue to Subsidize Recycling: The values of White goods have quickly gone from an asset to a liability. Unless the consumers or government entity want to assume the direct cost for recycling, a subsidy will be required. At the current time the only source of funds for this purpose is the Solid Waste Management Fund. This fund collects approximately two dollars on each ton of waste disposed or transferred in Missouri. Most of this fund is distributed to Solid Waste Management Districts and used to subsidize waste reduction, reuse, recycling, and educational activities. The remainder of the fund is used for state-wide target grants, the Market Development Program, and DNR Administration.

Additional funds could be generated through an advanced disposal fee on new appliances. The State of North Carolina has such a fee in place and has used the funds to subsidize white good recycling and the clean-up of illegal appliance dumps. A three dollar advanced disposal fee (similar to the North Carolina program) on each new major appliance sold in Missouri would generate approximately three million dollars per year. These funds could be used to subsidize appliance recycling or assist in the clean up of illegal dumps containing white goods.

Encourage Better End Markets for Scrap Metal: The price paid for scrap at the local scrap metal yards has dramatically fallen since 2000. Although the national price for metal has risen the local prices remain depressed. This is due in part because of higher transportation costs to shredders and steel mills. The number of steel mills has steadily decreased over the past decade because of the availability of "cheap foreign steel". When the steel mill in Kansas City closed the scrap for steel at local scrap yards declined drastically. There are also only two major shredders (the step between local scrap yards and the steel mill) in Missouri.

The State of Missouri could attempt to recruit more steel mills or scrap shredders to locate in Missouri. The Missouri Market Development Program receives 10% of the total money collected from the Solid Waste Management Fund (about $1 million per year) but has not funded a metal recycling project in ten years. Given the high capital costs involved in building these facilities, it is doubtful that the Market Development Program would have enough grant money to lure a steel mill to Missouri. A shredding operation in Rural Missouri would most likely raise scrap prices locally but the amount of scrap needed to fuel such an operation is probably too low.

The best alternative to building better end markets is to support The Institute of Scrap Recycling (ISRI) and the Steel Recycling Institute's lobbying effort to reduce imported steel.

Assist with Regulatory Compliance: Many small independent scrap haulers have gone out of business because they do not understand the new regulations governing the handling of scrap. There are several concerns including, the improper evacuation of refrigerant (EPA), illegal disposal of oil or capacitors containing PCB's (DNR), or the improper transportation of scrap (DOT). Many small entrepreneurs are overwhelmed with the regulatory barriers and therefore get out of the scrap hauling business or operate illegally.

The Department of Natural Resource's Environmental Assistance Office (EOA) could provide assistance to individuals or small businesses that want to collect, process, and haul white goods. The assistance could be in the form of refrigerant extraction certification, assistance with necessary permits, writing a business plan, assistance with grant writing for equipment, and/or the creation and update of the directory mentioned previously.

In Conclusion, the barriers to white goods recycling are economic. Consumers, the solid waste industry, and the appliance industry are facing costs to recycle (dispose) old appliances that did not exist five years ago. The question for Government is:

- How much of that cost should remain with consumers and business?
- How much could be reduced through good information and educational efforts?
- How much should be subsidized by government programs?