

**Improving  
Recycling Efforts  
in  
Arcata**

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## **Can the Concepts of Avoided Costs be Used to Encourage More Recycling?**

Our group will evaluate the costs of recycling and disposal because of energy and natural resource consumption as well as pollution issues. Our goals are to use a sample city (Arcata), to measure the benefits and costs of recycling and garbage. This report will review the waste stream audit of Arcata, compare the costs of recycling to disposal, and compare the amount of virgin materials saved by recycling. We will also review the many different methods Arcata and other communities have tried to reduce our waste stream.

Arcata's recycling center has been through some drastic changes throughout the years. Different methods of collection to improve recycling efficiency have been tried by the City of Arcata. Originally customers brought their reusable materials to the recycling center for redemption. Drop-off bins were introduced to neighborhoods where residents could have an easy method of reducing their trash flow. This increased the amount of recycling. However, in some areas these bins became mini dumps with several residents misusing these facilities. The result was the discontinuation of the drop-off stations.

Legislation for the state of California passed in 1989 mandating that 25% of municipal waste must be diverted from landfills by 1995 and 50% by 2000. This mandate raised concerns of the Arcata Garbage Company that with this reduction there would be insufficient material to support the local family run business. City hall acted fast to incorporate curbside recycling hoping this would create revenue for the Arcata Garbage Company and increase waste stream diversion. In actuality, the cost of recycling increased and the mixing of materials in the compacting garbage trucks caused difficulties for the Arcata Community Recycling Center (ACRC). The amount of recycling dropped for the first time in years. To complicate matters, prices of recyclable materials dropped as well. As of March 1999, the City Council has chosen

to reintroduce the bins and reduce the number of curbside recycling days in half. Every two weeks the trucks will pick up the same amount of material thus reducing costs.

### **Problem Statement**

We believe that not enough people are recycling. This leads us to our problem statement; can the people of Arcata be encouraged to recycle more through the understanding of avoided costs?

### **Objectives**

Our objectives for this project are to meet the 50% source reduction by 2000, increase waste stream audits to every two years to monitor our progress, and improve the efficiency of recycling. We would also like to inform the public of the true costs of landfills and other environmental concerns related to recycling.

### **Alternative Solutions**

One of our alternative methods is to compile a comparison between recycling and disposal. Comparisons are useful for conveying information to the public because they link differing environmental concerns. An example of this would be recycling a certain amount of cans each day will save X amount of energy. Another example is recycling a certain amount of paper will save so many trees. Thus one can see the benefits of recycling in terms of natural resource or energy consumption.

The next alternative is a cost/benefit analysis. This analysis will review the many costs and benefits of recycling and landfills. By using engineering costs, we will show that in actuality it is cheaper to recycle used goods than dispose of them. All too often citizens fail to look at the long-term costs associated with landfills. Issues like the loss of habitat, the concentrations of

poisons in our soils and water, and the expense of landfill upkeep are not addressed by the average person. Many people only recognize the benefits of trash removal from their homes because it is convenient.

Another solution is to conduct more frequent waste audits to monitor waste reduction. Education is also an important tool to encourage more recycling. The goal here is to quantify our improvements and increase awareness. Education is a method of implementing productive change in the community.

Legislation would also meet our objectives by creating laws that favor recycling efforts. The legislation of 1989 had a significant success encouraging recycling. This solution will require the backing of the public and legislative officials. Public participation is dependent, to some degree, on awareness achieved through education.

### **Cost/Benefit Analysis**

Within the method of Cost/Benefit analysis are several sub-methods. These methods use surveys and statistical information to assess benefits that are not marketable. The Contingent Valuation Method, Travel Cost Method, Quantitative Risk Assessment, and Hedonic Regression are the common forms of analysis. The cost portion of a Cost/Benefit analysis can be assessed by calculating what is called the engineering costs. Extraction, production, transportation, labor, etc., are examples of these costs.

For our situation, a Contingent Valuation Method could be appropriate for assessing where a landfill could be placed. It does not help with the benefits of recycling opposed to that of garbage disposal. However, it could be useful in determining a community subsidy of recycling if that were to prove necessary. Travel Cost Method is useful for determining the value the community has for the ACRC by trips taken to the recycling center to buy recycled goods or to

recycle. For the problem at hand it would be more useful to determine the trips to the center specifically for recycling and compare that with the costs of curbside pickup. The Quantitative Risk Assessment can be used to determine hidden health costs of a landfill due to leaching (water pollution), transportation of garbage (air pollution) and, if possible, the health risks due to deforestation, strip mines, and other extractions of resources by using virgin material. Hedonic Regression can be appropriate for this report considering that it is most beneficial for non-market valuation. It would be useful for placing values on the aesthetics of landfills linked with property values around the area. This value can be incorporated in the costs of disposal due to lost aesthetics.

Because of the time and money needed to conduct these Cost/Benefit methods, some methods should be considered over others. The examination of benefits should include the buying of recycled goods and how much it saves in extraction, transport, and manufacturing as opposed to virgin material, as well as efficient energy consumption. The costs will be examined by comparing engineering costs of recycling to that of disposal. The information in this report is for the engineering costs of both recycling and disposal for the Arcata area for the 1997-'98 year.

The City of Arcata spent about \$337,153 for recycling and \$1,618,761 for landfill disposal in the 1997-'98 fiscal year (The City of Arcata, Analysis of City...). These costs do not include general administrative and other source reduction costs. We did not include these costs because of the difficulty in distinguishing between specific garbage and recycling costs such as labor and office supplies. There was no data collected by our group in regards to externalities incurred by the local residents in Arcata.

Some general examples of externalities in the United States are as follows; every new ton of glass produces 27.8 pounds of air pollution, recycling glass will reduce this amount 14% to

20%, and recycling 1 ton of paper saves the atmosphere from 587 pounds of air pollution (Environmental Systems of America, Inc.). These externalities also include groundwater contamination and it is recommended that tests be performed to assess the costs of these externalities in the Arcata area.

By testing ground water around disposal sites as well as computing the cost of health problems as a result of air pollution from transportation, a monetary figure can be established. This amount can inform the public on some of the hidden costs of landfill disposal. Even without assessing the true costs, recycling is cheaper for the city than disposal. However, this information must be tailored in a way that encourages the people of Arcata to recycle more or to be used for legislation.

It is not necessarily true that knowing the hidden costs of disposal will persuade people that recycling is better than disposal. It may not be a matter of cost but one of efficiency and convenience. Take for instance the amount of broken glass per year. The ACRC can not recycle the unsorted, small fragments of glass. Broken glass is a result from poor curbside pickup practices, namely using a compacting garbage truck for pickup and the fact that residents do not have to separate their glass. Arcata also has a very confusing time schedule for their curbside pickup.

It should be noted that in 1990, about 50% of the waste stream composition in Arcata were recyclable material (The City of Arcata, Matrix Management Group). Engineering costs show that recycling costs less than garbage and it seems that investment into more recycling programs would be efficient based on total costs. A waste stream audit should be done every other year to assess whether it is truly efficient to invest in recycling programs.

## Comparisons

Comparisons, an alternate solution, can be used to encourage more recycling. While conducting comparisons of recycling and disposal it is important to address the issue of subsidies. Subsidies can hide the true costs and comparisons of recycling vs. disposal.

There are few incentives for businesses to recycle. The businesses profit from using virgin resources because of subsidies. The government has not forced companies to internalize external costs of recycling and resource extraction. Because of this, the price we pay for our garbage is less than it would otherwise be.

When a person buys virgin materials they do not realize that they have already paid for part of the cost. Their tax dollars have already gone to subsidies and regulated incentives for the extraction of these materials to make these products more cost effective. If you neglect subsidies and regulated incentives, you cannot compare landfill disposal to recycling.

In the eighties subsidies influencing virgin materials increased from 3.5 billion to 6.3 billion and in the nineties it went from 1.3 billion to 4 billion dollars annually. World wide environmental subsidies have been estimated by Worldwatch at 500 billion annually (Roodman). "Obviously, the few and comparatively meager subsidies that the recycled-materials infrastructure receives represents a fair effort to level the competitive playing field. The more companies willing to make the switch to recycling and recyclable materials the easier it will be for the recycling programs."(Natural Resources Defense Council).

Timber is sold from public lands at prices that are below market value. This encourages greater extraction rates from private companies trying to compete. The government in turn provides tax write-offs for timber management and reforestation programs for these private companies. Mining is also subsidized by the government with below market value prices

for the area to be mined. Because of the low costs (due to subsidies) to extract virgin materials, they can be sold on the market for lower prices than recycled goods.

These subsidies do not include the exceptions allowed for the negligence of environmental law. This environmental cost has not been included in the price you pay for the virgin materials. Therefore, virgin materials have a false competitive edge over recycled materials. This has hindered the recycling industry because the recycling market has to overcome the prices of virgin materials, which have been given large incentives for production. It becomes difficult to compare recycling to virgin material because of these subsidies. However, comparisons are useful by showing people what aspects of the environment recycling is linked to.

The average citizen does not know that most virgin materials are given tax breaks and or subsidized with tax dollars. Some are not even aware of the externalities imposed upon them from the extraction of virgin materials. Manufacturing recycled paper results in 74% less air pollution and 35% less water pollution (Environmental Systems of America, Inc.). This lack of knowledge is one of the key components to the lack of recycling.

### **Education**

A fundamental way to encourage recycling is through education. This could be generated through seminars on effective recycling that includes what can be recycled and what can be done with the material. In the past, Arcata had people educated in recycling in different neighborhoods and could supply information for those with questions. This was implemented not only to increase awareness but to also increase communication between neighbors within a community. This program proved to be ineffective and was discontinued due to a lack of interest and participation. Most people already know that glass, aluminum, tin, & plastics are



recyclables; the problem lies with a lack of feasibility. Many people feel that the current system is too difficult because of the expense of the curbside bins and the limited hours the ACRC is open.

The city could implement another mentor program similar to the one described above. It would help people to set up a home organization system of recycled materials. This would show people which items can be recycled and how to keep the bin area organized, which prevents dirty, smelly areas in homes. This type of program is working in Franklin, Louisiana and Sarasota, Florida (Harris). The mentors in these communities are high school students who take a course and become recycling gurus. The students are available to help not only with home recycling methods, but also actively participate in educating local businesses and the public. The yearlong course is designed to meet community service hours that are required in Franklin, LA. The number of people recycling has increased and the communities support the mentor program. Other educational programs could include workshops at local schools, VFW halls, community centers and even local businesses. There are already many materials, such as fliers and websites, which provide information to those interested in recycling. There are very simplified websites that have lists of recyclables and many cities offer web pages where each particular type of material can be recycled.

The curbside program that Arcata now has is ineffective. Last month the City Council approved a new recycling program that provides some positive benefits to the current system. The new system will have neighborhood drop off sites, where an unmanned facility would be set up in shopping centers (Westwood, Greenview, Murphy's, Ray's, etc.). The problems that the city found when they last had the drop off bins was that many community members would use them as dump stations and items such as couches, trash, refrigerators and other non-recyclables

were found there. This is a problem in many cities where the drop-off bins are located. The problem could be solved by routine pick-ups of the recyclables and along with that, maintaining the area. Previously the materials were picked up on a monthly basis. If this was increased to picking up materials on a bi-monthly basis it could keep the area free of unwanted litter. This does pose a cost to the city to pay for labor and the disposal of unwanted items. In Virginia, Minnesota, the profit from the drop off bins goes to local schools (Harper). In many communities, the money generated goes to some type of organization, such as baseball teams, girl scouts, etc. Some communities have found that by donating the money to such organizations, the organizations help to keep the drop off centers clean. In Hanford, CT, school children have decorated the bins and gave them a more communal feeling rather than just a drop off station (City of Hanford). This two-way winning situation is effective in not only increasing recycling but in reaching out to the community and thus, gaining support. A similar program could be effective in Arcata. This solution could encourage the community to recycle more because it will benefit organizations they value (such as CCAT, North Coast Environmental Center, little league teams, schools, girl scouts, etc.). Each organization that could commit to the maintenance of their particular drop-off site would reap the benefits from the recyclables disposed there.

Education is the most important tool in getting information out to the public. Many people have to see the problem in their face to actually react to it. With instruction of the benefits as well as the costs, the community can be shown that recycling is a better option. The more information out there, and the more people who are aware, the faster the information spreads and good habits such as recycling, would increase in a given community.

## Conclusion

Our group has come up with five different solutions that will help us to arrive at the objectives that we stated earlier. Education is our most important solution with the other solutions seen as tools to achieve our objectives.

The most important thing in changing people's habits and views of recycling is to enlighten them as to how much of a problem a lack of recycling is and how easy it can be to solve this problem. We would like to see new strategies for education through youth groups, high school students and community involvement.

Through legislation we can create programs that make recycling easier and more monetarily feasible. The true costs of disposal will help legislation form new policies. City policy could increase recycling receptacles and bins and strategically place them so as to ease the process for the person wanting to recycle. Policies could also be changed so that either an incentive would be offered for good recycling or penalties assessed for the lack of recycling.

Raising the price of trash collection by a significant amount could help encourage more recycling. Raising the price of trash brings across a strong message but is not always effective for several reasons. The price increase may impact lower income families much more than the wealthy if those lower income families dispose of their trash in the proper manner. In fact a raise in trash collection might encourage illegal dumping. The illegal dumping may cost the city more than they would gain from the waste reduction because the additional cleanup costs or regulators would be high.

Penalties could be implemented for the presence of recyclables in the trash. However, there would be added labor costs for monitoring individual household trashcans. Many would be

turned off to recycling because of the monetary fines. Another issue is that the contents of a trashcan are personal property and people could oppose this invasion of their privacy.

In order to monitor the waste stream and thus evaluate an implemented solution, we must have more frequent and precise waste audits. Monitoring will show the progress of a current solution to see if any adjustments need to occur.

Cost/Benefit analysis is a common tool for many companies and agencies to assess whether or not the action to be taken has more benefit than cost. It can be very effective because it quantifies the benefits and costs of a decision. By using this form of analysis, however, true costs are not necessarily shown. This is also difficult because many people have different opinions on what "true" costs are. Nonetheless, cost-benefit analysis can be very helpful because it can show people how much they are benefiting from their actions; through non market values as well as marketable ones.

Using comparisons we have shown how much resources, energy, or other materials people can save by recycling an already used product. We also found it useful to compare communities. By sharing information on recycling tactics with others, we can avoid many pitfalls here in Arcata. This solution builds a bond between neighboring communities, as well as building bonds in our personal communities.

These options each have positive as well as negative aspects. We believe that combining different solutions will give a more positive outcome than only implementing one. With this combination we are hopeful that our objectives could be met within a few years.

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