Whose E-Waste Is It, Anyway?

E-Cycle Wisconsin Activity

Summary: *Students evaluate different forms of product stewardship to individually determine which method establishes the best framework for handling electronic waste.*

Audience: Grades 9-12
Subjects: **Social Studies**, **Environmental Science**
Time: Two or three 45-minute class periods
Supplies: 1 copy per student of "Whose e-waste?" handout; 3 copies of "Product Stewardship Framework Page"; 9 copies of "Product Stewardship Framework worksheet; whiteboard/chalkboard and markers or chalk

Background

> ***Product stewardship*** *is a principle that requires all the players involved in the lifespan of a product to take responsibility for reducing the product's environmental impact.*

Wisconsin's electronics recycling law (2009 Wisconsin Act 50) banned electronics from landfills and incinerators and set up a program called E-Cycle Wisconsin to help pay for the recycling of electronics. The law takes a *product stewardship* approach to handling e-waste. It is the first product stewardship law in Wisconsin. Many individual companies, including electronics manufacturers, have set up their own product stewardship programs (i.e., Dell, HP, Sony and IBM), but Wisconsin's law sets up a system in which all manufacturers that sell computers, monitors, printers and TVs in Wisconsin must participate.

Half of all U.S. states now have electronics recycling laws, and each takes a slightly different approach. Wisconsin's law uses a Market Share model. Like other Midwestern states, Wisconsin designed a program that needs as little state oversight as possible. To learn more about how E-Cycle Wisconsin works, go to dnr.wi.gov and search "ecycle" to view the program's website.

Introduction: E-waste is a challenge

Ask for a show of hands from students who have any electronics at home – like cell phones, TVs, laptops or computers – that are no longer in use. Most likely, everyone in the room will raise his or her hand, as most people in the U.S. have at least one device around the house that is no longer in use. These unused electronics are often called e-waste, and there is more and more of it every year as our society becomes ever more technology-dependent.

Instruct students to read the handout on e-waste and the challenges that it is posing to governments around the U.S. Working in groups or individually, have them write down answers to the questions at the end of the handout.

When students finish the questions, discuss their answers. Working as a class, list all of the different players in the e-waste system on the board. Players should include: electronics recyclers, electronics collectors/local governments, consumers, and (more subtly) electronics manufacturers. Other potential players include electronics retailers and state governments. Allow students time to argue who should be responsible for paying for the management of e-waste.

Activity

Part I: What is product stewardship?

Once students have an understanding of how many players are involved with e-waste and can describe some of the challenges in managing of this complicated waste stream, introduce the idea of product stewardship by asking students: What does it mean to be a steward of a product? (Give students 2-3 minutes to write down their answers, discuss in small groups, or answer in a large group setting). Who should be a steward of a product – the owner, the manufacturer, the retailer, the local government?

Explain to students that according to the Product Stewardship Institute, product stewardship is "a policy that ensures that all those involved in the life cycle of a product share responsibility for reducing its health and environmental impacts, with producers bearing the primary financial responsibility." By this definition, if you *manufacture* (produce) tablets, product stewardship says that you need to take primary financial responsibility to reduce the tablet's health and environmental impacts. Likewise, if you *sell* a tablet you, too, are responsible for reducing its health and environmental impacts. And if you *buy* a tablet, you should bear some responsibility as well.

Help students understand that product stewardship policies are designed to transfer the burden of caring for certain products from a community as a whole to those who have benefited from the product, like the manufacturer, retailer and user. More specifically in the e-waste case, where once local governments (and therefore all taxpayers) were struggling to cover the costs of handling this complicated waste, under a product stewardship approach only those who directly benefit from the product bear the costs of handling it at the end of its life.

Ask students if they can think of any product stewardship policies currently in place (Possible answers: bottle deposit laws, ink cartridge take-back programs, e-waste laws, mattress recycling programs and more).

To measure student understanding, ask individuals or groups to draw a picture or diagram on the back of the e-waste handout that shows how product stewardship works. Collect these handouts at the end of class to measure student understanding.

Part 2: How does product stewardship work?

Tell students that different states have started using a product stewardship approach to create electronics recycling laws. The idea behind this approach is that if electronics manufacturers are required to pay for the recycling of old and obsolete products, they are given some financial incentives to innovate greener designs that are less toxic and easier to recycle. Or, design aside; they at least help pay to recycle very complicated products instead of putting the burden on taxpayers.

Divide the room into three groups and hand the Product Stewardship Frameworks page and three Framework worksheets to each group. The Product Stewardship Frameworks page broadly describes three approaches taken by states to handle e-waste. Have students review the page in groups and then use the worksheets to discuss whether each approach uses product stewardship and list the pros and cons of each approach.

**Alternatively (to save time), divide the room into three groups and assign one of the Product Stewardship Framework policies to each group. Hand out just one Framework worksheet to each group.

When small-group discussion time is over, have each group describe the approach they found most compelling and why. Have a volunteer from that group write the pros and cons they brainstormed for that approach on the board, allowing others to chime in. Use the answer key to prompt discussion, encourage deeper thought and provide context (which states use this method). If other groups chose a different policy framework, ask them to do the same thing on the board. Once each group has made their case for the best method, ask the class if the methods chosen would work at the national level, or if it is best kept at the state level and why or why not. Do any approaches discussed encourage companies to design greener products?

**If using the shorter version of the activity described above, just have each group describe the framework they were assigned. Write pros and cons on the board as described above, and then discuss as a class which framework you like the best.

Conclusion

Explain to students that Wisconsin passed an electronics recycling law in 2009 that went into effect in 2010. Wisconsin now has a Market Share approach to electronics recycling. So far, Wisconsin's approach has been a success because it has increased the number and distribution of electronics collection points around the state and has reduced the cost that governments and consumers pay to recycle old electronics. The electronics law may serve as a model for how to handle other types of waste in the state, including pharmaceutical, carpet and mattress waste.

Assessment

Have students write a position paper explaining which method they believe is best for managing e-waste and why. The paper should cite and evaluate the opinions of others

and should consider whether the chosen approach would work for other products and explain why or why not.

Further study

Design a debate to determine whether product stewardship is a reasonable policy to manage certain types of waste. Be sure to include different perspectives on product stewardship, including that of manufacturers.

Resources

E-Cycle Wisconsin website, dnr.wi.gov search “ecycle”
Product Stewardship Institute website, www.productstewardship.us

Wisconsin Department of Natural Resources
Bureau of Waste and Materials Management
PO Box 7921, Madison, WI 53707-7921
(608) 266-2111 *DNRWAe-cycling@wisconsin.gov*

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Whose E-Waste Is It, Anyway? Student Handout

Old electronics ready for disposal, often called "e-waste," are a tricky trash category for governments to handle. Many electronics contain toxic materials that can contaminate soil, air and water if they are landfilled or incinerated. Moreover, electronics contain valuable materials that can be reused if they are collected by a responsible recycler. If done properly, it can be very worthwhile to recycle electronics rather than to toss them.

Electronics recycling, or e-cycling, saves energy, labor and valuable materials while protecting the environment. Yet in many cases, properly recycling electronics can cost recyclers more than the collected materials are worth. To cover their costs, electronics recyclers, usually for-profit businesses, often charge people who bring them e-waste.

Many collectors are local governments or non-profit organizations. Community drop-off sites or donation organizations like Goodwill are sometimes charged by recyclers for recycling electronics collected from residents or customers. To cover their own costs, keep taxes low or keep their doors open, these collectors may pass the charge for e-waste recycling on. Residents and customers who are "just trying to do the right thing" by recycling often balk at having to pay a fee. In the absence of laws preventing them from doing so, many people will choose to throw their old electronics in a trash can rather than pay a fee to recycle them.

If governments take steps to protect local waterways, land and air by banning electronics from landfills and incinerators, they risk placing the burden of paying for recycling on local taxpayers. If there are not convenient or inexpensive recycling options, e-waste can end up in roadside ditches, on public lands or in empty parking lots, potentially causing even more environmental harm.

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1. List all of the players involved in the e-waste system – including those not directly mentioned above.

2. How should we, as a society, handle e-waste and other difficult-to-dispose-of, hazardous materials commonly used by households?

3. Who should pay for such items, or in other words, whose responsibility are they?

Product Stewardship Frameworks

ADVANCED RECYCLING FEE: Consumers pay a fee when they purchase an electronic item that will cover the cost of recycling the item at end-of-life. The state takes the fee and distributes it to recyclers.

RETURN SHARE: Consumers place electronics in recycling bins at widely distributed collection centers. The state samples the collection bins to determine how many of each brand is in the bin. The state bills manufacturers based on their share. Manufacturer payments reimburse recycling centers for the electronics they recycled.

MARKET SHARE: The state purchases a market analysis to find out how much (by weight) each manufacturer has sold in the state. The state uses this information to calculate how much (by weight) each manufacturer needs to recycle in the coming year. Manufacturers can recycle this amount on their own or pay a recycler to do it for them. They pay for weight, not for brand name.

Product Stewardship Frameworks Worksheet

Product stewardship: a policy that ensures that all those involved in the life cycle of a product share responsibility for reducing its health and environmental impacts, with producers bearing the primary financial responsibility.
~Product Stewardship Institute

Name of Approach:

Does this approach fit the product stewardship definition above? Why or why not?

List two or three advantages of this approach to handling e-waste:

List two or three problems related to this approach:

Do you think this is a good framework for managing e-waste? Why or why not?

Does this framework encourage greener designs? Why or why not?

Do you think this framework might work for other types of waste? If so, provide examples. If not, explain why not.

Product Stewardship Frameworks Answer Key/Discussion Prompt

Advanced Recycling Fee
Used in California. Advanced Recycling Fee partially uses product stewardship, because consumers bear responsibility for recycling the products they use. However, manufacturers are not involved. It does not encourage changes in design.

Advantages

- recycling is paid for up front by consumers, not at time of disposal
- every electronic device should be covered (not just the ones whose brand owners can be located)
- recyclers know they will be paid for everything they recycle

Problems

- high administration costs (and resulting charges of fraud) as the state government takes the fee from retailers and tries to distribute it appropriately to legitimate collectors and recyclers
- no manufacturer involvement
- consumers often pay the fee years before the device is going to be recycled – if costs of recycling go up in the intervening years, the cost to properly recycle the item will not be covered by the fee the consumer once paid
- state may end up paying for recycling of items that were not purchased in the state

Return Share
Used by many east coast states and Washington and Oregon to some extent. It uses a product stewardship approach. Manufacturers are, at least partially, encouraged to make their products easier to recycle.

Advantages

- manufacturers are billed for what is actually getting recycled, not what they sold
- manufacturers pay primarily for their own products (which may encourage greener design)
- manufacturers bear primary financial responsibility
- changes in costs of recycling should be reflected in charges recyclers assess manufacturers (as opposed to Advanced Recycling Fee)

Problems

- administratively costly to calculate the brand distribution
- everyone pays for “orphans” (products from manufacturers no longer in business)
- hard to budget for manufacturers (don’t know what will be recycled in coming year) and for recyclers, who have to pay up front and wait for reimbursement.

Market Share
Used by many Midwestern states including Minnesota, Illinois, Indiana and Wisconsin. Uses a product stewardship approach but does not encourage greener design.

Advantages

- manufacturers know in advance how much they need to recycle, so they can budget for it
- recyclers and manufacturers work together to set prices, based on current markets
- low administrative costs
- manufacturers bear primary financial responsibility

Problems

- no incentive for manufacturers to re-design product because manufacturers pay for weight, not brand
- as items newly sold get lighter, the weight manufacturers sold in a year does not match the heavier weight of older items coming in for recycling
- if the weight of materials that comes in for recycling is higher than the weight manufacturers are required to pay for, the full cost of recycling is NOT covered