

The Comparison of Waste Home Appliances Recycling System in Japan, Korea, and Taiwan — From an Extended Producer Responsibility (EPR) Perspective—

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Although Japan, Korea, and Taiwan are all East Asian countries, there are marked differences in the recycling policies, motivations, and methodologies of each country. One reflection of differences is the approaches each country has taken toward the OECD proposal for Extended Producer Responsibility (EPR).

I consider the relationship of local governments and producers for Japan, Korea, and Taiwan from the perspective of EPR. First, I provide an outline of the establishment of waste home appliances (WHA) recycling systems. And then, consider the responsibility of related subjects. Lastly, I prepare the differences of EPR concept of each country.

Keywords: Japan, Korea, Taiwan, Extended Producer Responsibility

Introduction

According to the OECD, EPR is a desirable and required method to overcome escalating waste treatment cost of local governments by shifting the burden from local governments to private industry. The increase in the total amount of waste and the cost of local government waste treatment due to lack of landfill space and increased collection/carrying cost has become a problem of emergency proportions. It is critical that landfill waste be reduced as soon as possible and this requires that responsibility of producers will be extended from on products to on the treatment of residual waste. This is the essence of EPR of OECD.

Each country puts a different level of emphasis and shape on producer responsibility, and therefore each country exhibits a different level of government and local government responsibility. In this paper, I describe the background for establishment of recycling policies and the differences in the range and form of responsibility for each related subject.

This study will make it clear that backgrounds of each countries why they started to do WHA recycling, that how about changes of WHA recycling system, and that responsibility of each subjects in three countries.

Experiment/Modeling

In Japan, estimated by the Ministry of International Trade and Industry (MITI), there are 18 million units of WHA. The Ministry of Public Welfare indicated that the most important reasons of starting to WHA recycling is the lack of landfill space and the waste treatment cost of local government. In addition, there is another reason. It is to raise recycling business, indicated by MITI.

In 1998, the WHA recycling law was announced, and acted on April 1st, 2001. Before the law acted (Figure.1), consumers and seller had no responsibility. Take-back by seller is only service, not responsibility. But local governments had collecting and treatment responsibility conforming to the Waste management law. But after the law acted (Figure.2), each subjects become to have some

more responsibilities. At first, consumers have to hand over WHA to sellers or local governments. This is the responsibility of consumers. Sellers have to take-back WHA from consumers and to hand over it to stockyards designated by producers. This is responsibility if seller. Once sellers bring to WHA to stockyards, the responsibility for WHA moves to producers.

The producer responsibility is to take back WHA from stockyards and treat WHA. So responsibility for WHA is shared responsibility. This concept is near to the concept of OECD.

In Korea, the Act for Promotion of Resource Saving and Reutilization was acted in 1992. The purpose is to reduce waste. In this law, Deposit-refund system was adopted to make producers direct reduce waste and recycling. WHA is one of the objects. Estimated by Electronic Industries Association of Korea (EIAK), in Korea, there are about 1.2-1.5 million units of WHA.

At first, the deposit fee was 30W/kg. But the refund rate was very low, so the deposit fee was raised to 38W/kg. Moreover, in January 2001, the fee was raised to TV 75W/kg, washing machine and air conditioner 100W/kg, and refrigerator 140W/kg.

In this system(Figure.3), producer had only to pay deposit to government. And if some objects do treatment and recycling, government pays refund to the objects. The source of refund is deposit fee from producers. Under this system, local government had taken back WHA about 49% of all WHA. Sellers had taken back about 44%. And used home appliances sellers had taken back about 5-10%.

When sellers take back WHA, deposit-refund system is adopted. Sellers hand over WHA to Samsung Recycling Plant and 5 private WHA special treatment plants. These 6 subjects can get refund if they are admitted by government about their treatment and recycling. But producer couldn't get all the refund with some reason and so on. So, the refund ration is very low (Table.1).

There is a guess that the government uses deposit-refund system not for reducing waste and going on recycling by producers. Because, deposit-refund system was introduced before the concept of EPR is announced

by OECD. If deposit-refund system was introduced before OECD announced EPR with being conscious about EPR, it will indicate that Korean system is very advanced. But in fact, Korean deposit-refund system can't be seen to be conscious about EPR. Because, if actual purpose of deposit-refund system is reducing waste and going on recycling by producers, the government was expected to coordinate for constructing treatment and recycling by producers. For example, the government will make system to gather WHA to producers. But the government didn't do any coordination. On the contrary, the government raised deposit fee. So, there is an opinion that the real purpose of deposit-refund system is to collect budget of government. A producer said, there was no example deposit fee that was paid used for WHA recycling system.

In case of taking back by local government, consumers had to pay fee about 4,000W-15,000W. Each local government decides the fee. The WHA is brought to 5 private WHA special treatment plants (same as the case of sellers taking back) and KORECO's plant (KORECO is a recycling firm under EPA). But KORECO's plant was closed from the reason of Soccer World Cup in 2002. The plant falls on the arena. Now the plant was sold to Association of Electronics Environment (AEE; isolated from EIAK), under constructing in another place.

For producers, amount of deposit is hard to pay. The amount (per year) is nearly equal to half amount of constructing new recycling plants. So big 3 producers (Samsung, Daewoo, LG) and EIAK announced a voluntarily agreement. The content indicates 2 things. One is that producers will try to construct WHA recycling system by themselves. The other is that producers will have not to pay deposit to government. Government (EPA) admitted the voluntary agreement in June 2000(But if the system can't be operated, it must be back deposit-refund system). It is so-cold, "Producer Responsibility System". The system introduced in January 2001 as testing. AEE put on collecting/recycling ration by producers themselves (Figure.3).

Because of introducing "Producer Responsibility System", producers have to treat and recycle all WHA.

So they are trying to construct system to collect WHA as many as they can. Sellers become to have to take-back WHA.

On the other hand, local governments have only to collect WHA. They don't have to treat and recycle WHA. Estimated by AEE, if consumers hand over WHA to local government, consumers will have only to pay about 1,000-2,000W. It will be able to be method to reduce illegal disposal. It is because when consumers hand over WHA to local government, the fee is very cheap. And when consumers hand over it to sellers, sellers take back it free.

But in Korea, good laws and plans come out, in practice, it is not easily to move on.

In Korea, the system is like OECD as a part that treatment and recycling responsibility of local government moves to private, especially producers. Local governments don't have to do treatment and recycling. They have only to collect WHA which sellers don't take back.

In Taiwan, on the one hand, there was a main stream to have to consider about waste. In Taiwan, scrapping ship was very popular, and there were many scrapping ship manufactures in Kaoshung.

So there were many waste metal manufactures. They imported waste including metal (for example, WHA, waste electric wire, waste cable, etc) . They gathered only metal (Al, Cu, Pb, Ag, Au) and valuable things, and they threw away the residue. It caused pollution. So EPA started to control for such a kind of things including noxious. EPA coordinated to build funds of each thing for treatment them.

The other hand, sellers left WHA on sidewalk in front of their shops. The government wanted to remove them. But they had no money to remove and treat them. There were some sellers who received treatment fee from consumers though they threw away WHA. So sellers made an association and asked producers to build a fund for treatment.

At first, producers didn't receive the offer. So EPA coordinated between sellers and producers, Resource Recovery Fund Management Commission (RRFMC) was

founded.

But at first, the fund wasn't operated well, EPA couldn't grasp even the condition of recycling. So, EPA decided that RRFMC became a foundation under EPA.

In Taiwan, under the RRFMC system(Figure.5) producers pay money to RRFMC according to their shipping. And all subjects can get refund from RRFMC if they participate in treatment and recycling WHA(including transporting WHA. EPA coordinated the system assuming all people will participate treatment and recycling to get refund. In this system, existing responsibility is only for producers paying money to RRFMC.

There were 6 recycling plants in Taiwan. At first, there were many WHA for treatment and recycling. Because many WHA that were illegal dumped were gathered under this system. So, in a sense, this system succeeded in decreasing illegal dumped WHA. But nowadays, quantity of WHA is getting smaller and smaller than before. So recycling plants are, so-called, in a saturation point. Recycling plants were fighting to get more WHA. There was a case that manufactures in Southern region go to Northern region to get WHA. They pay more money to stockyards than the amount of money that EPA decided for stockyards, and intercept WHA of Northern region. It is a competition. After this, the competition among the recycling plants will become intensified.

If we refer to EPR of OECD, we can say, in Taiwan, there is no concept about EPR. Because local governments have no responsibility.

Conclusion

Table.2 is a comparison of three countries. The contents are their background of establishing of WHA recycling systems and responsibility of each subjects. And I considered about EPR concept of each countries conform or not , still more there is another concept.

The background of establishing is very difference. In Japan, it is reducing disposal cost of local government. In Korea, we can't know real reason , but there is a question that it is a tool of gathering budget for government. In Taiwan, it is reducing illegal disposal. That is to say, all three countries have different background of WHA

recycling.

In addition, the concepts of EPR of three countries are different. In Japan, producer responsibility is extended to treatment and recycling of WHA. But it isn't all WHA. It is only for WHA of provided by law. On another WHA, recycling and treatment responsibility is still under local government. So, it is important that reducing responsibility of local government and extending responsibility of private, especially producers. In Japan, the purpose is mostly achieved (not all). The greater part of responsibility of treatment and recycling of local government is moved to producers. So, Japanese EPR gets near EPR of OECD.

In Korea, under deposit-refund system, producer responsibility is only to pay money to the refund. Under producer-responsibility system, producer responsibility is recycling all WHA. So, responsibility of local government becomes to gather WHA. This is a system of complete moving treatment and recycling responsibility from local governments to producers.

So, that is like just EPR as shape. But in Korea, the effect isn't clear in some years because an action has a tendency to delay. In addition, Producers disclose their real intention, Producer Responsibility System isn't for moving responsibility from local governments to producers, but for reducing cost of WHA they have to pay. So it can't be said EPR of OECD.

In Taiwan, producers and local government have no responsibility for treatment and recycling is the individuality. Producers responsibility is only to pay money to RRFMC, and all subjects can get refund if they participate recycling and treatment aciton. But the latter isn't responsibility, it is only to voluntarily actions to get money. So from the concept of EPR, there isn't EPR which is moving responsibility of treatment and recycling to private.

But, concretely, we can consider that EPR is the concept which indicates only moving responsibility of treatment and recycling for 'general waste' from local government to private, more extended. The concept involves that private indicates especially producers who knows well about their products and can produce the biggest effect to the lifecycle of their products. Provided

the tool and situation is different in each country.

No longer, the concept fits for not only 'general waste', but also 'not-general waste'. It indicates whole products that local governments haven't treated. So, we can consider that the EPR concept involves and extends.

As mentioned above, I compared backgrounds of WHA recycling system in three countries and EPR concept considering with the concept of OECD. And I lead the conclusion the concept can regard as envolved and extended .

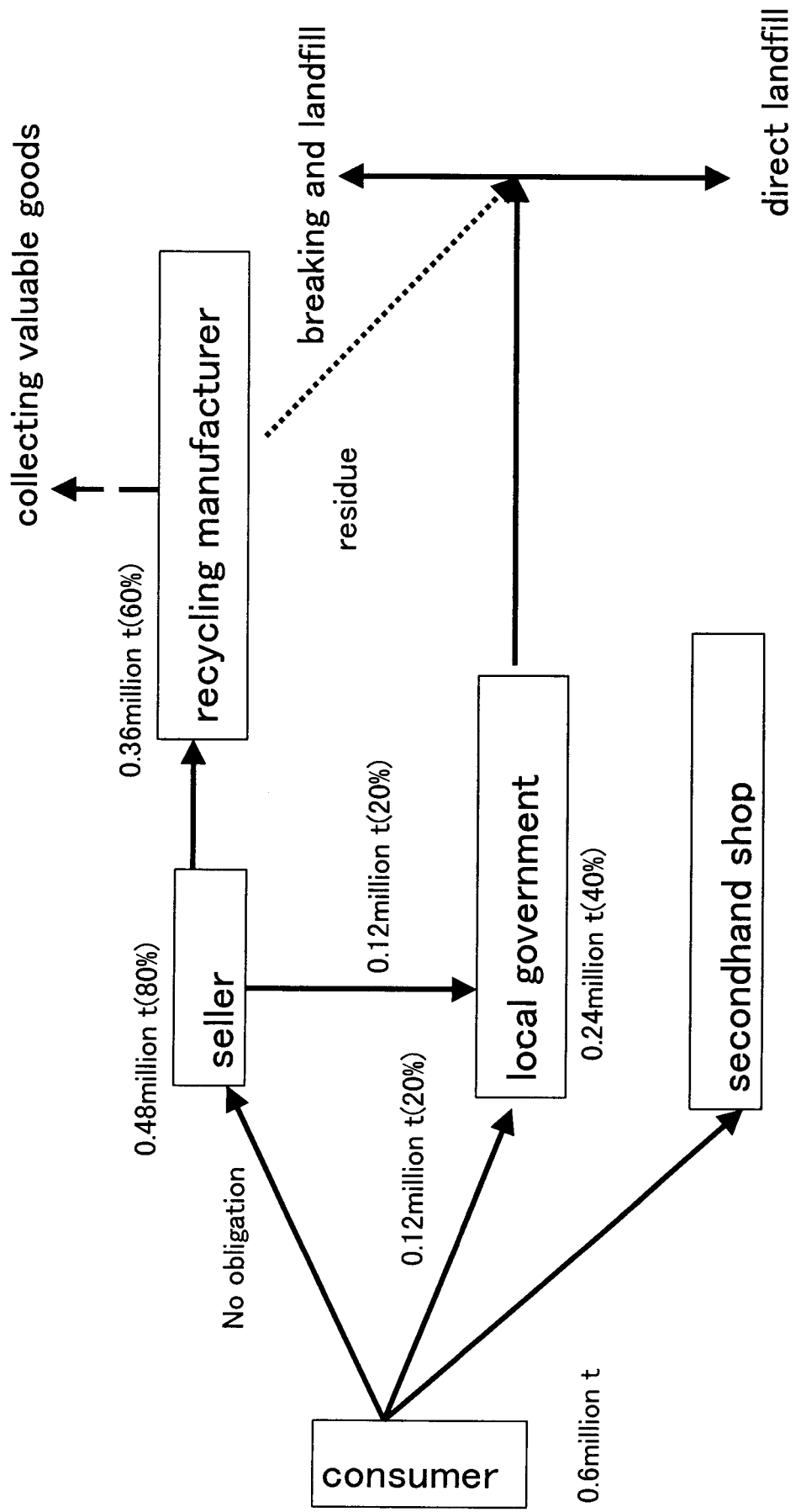
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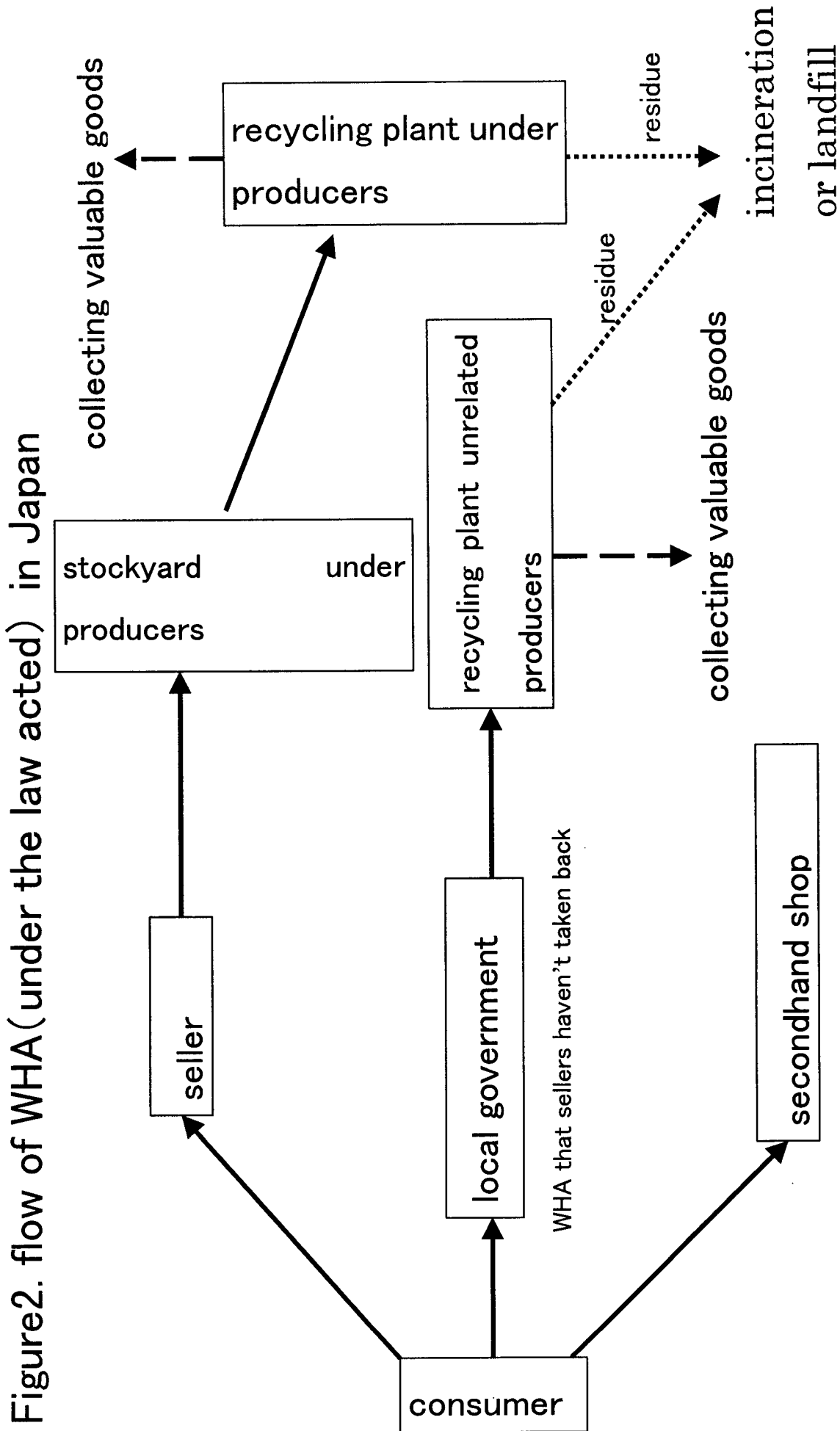
References

- [1]Hun-S Chuang "'Legislation of Waste Management in Korea" The 5th International Symposium on East Asian Resources Recycling Technology, Proceeding, 1999, pp.23-26.
- [2]H.K. Ma, W.C. Chang, N.M. Wu "Waste Home Appliances Recycling and Resource Recovery in Taiwan" ENERGEX2000 THE 8th International Energy Forum, in U.S.A. , July 23-28,2000.
- [3]リサイクル法令会/監修『家電リサイクル法（特定家庭用機器再商品化法）』中央法規,2000年.
- [4]佐野敦彦・七田佳代子/著『拡大する企業の環境責任』環境新聞社,2000年.

Figure 1. flow of WHA (before the law acted) in Japan



(revising materials from AEHA; Association for Electric Home Appliances)



(revising articles from MITI)

Figure 3. flow of WHA (under deposit-refund system) in Korea

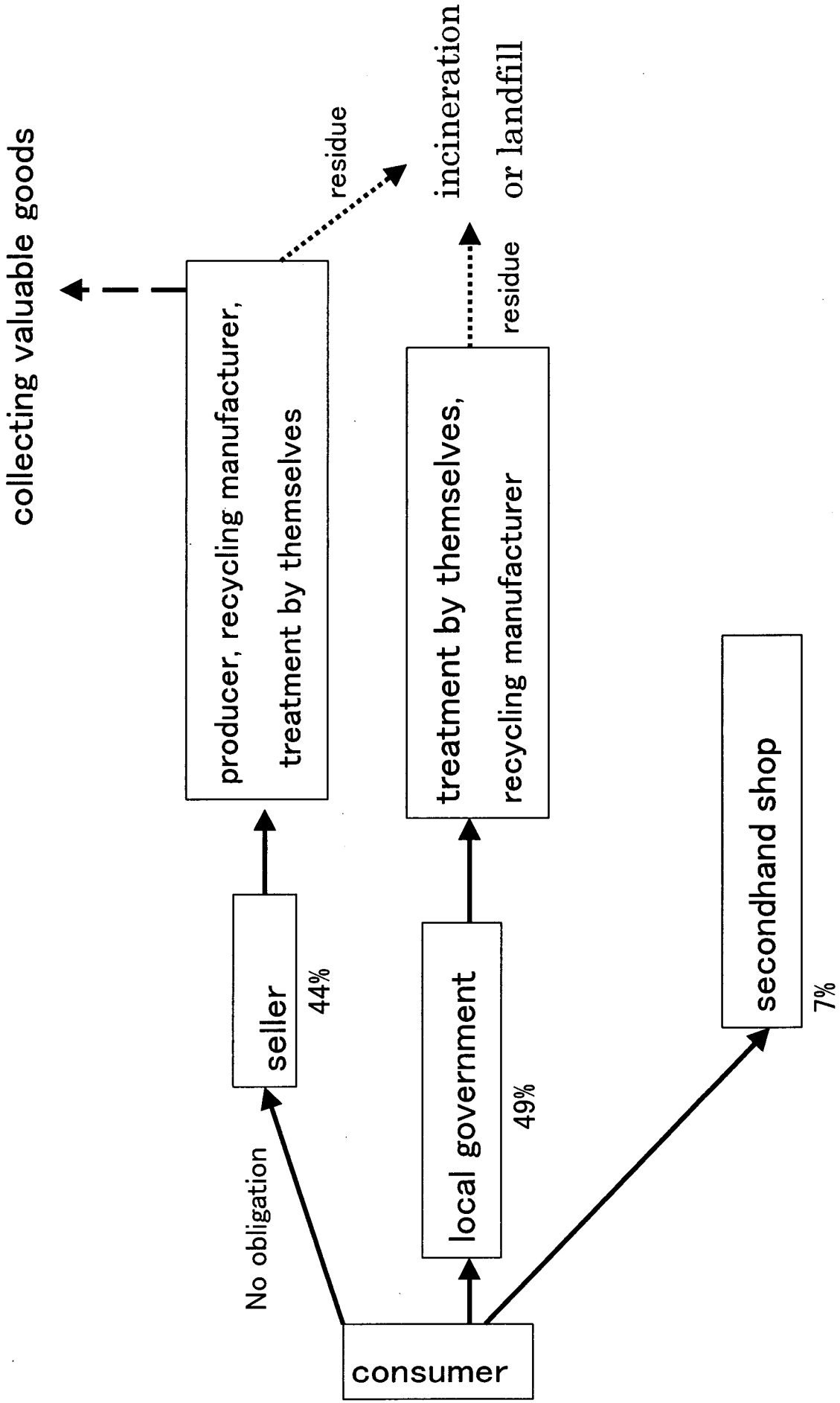
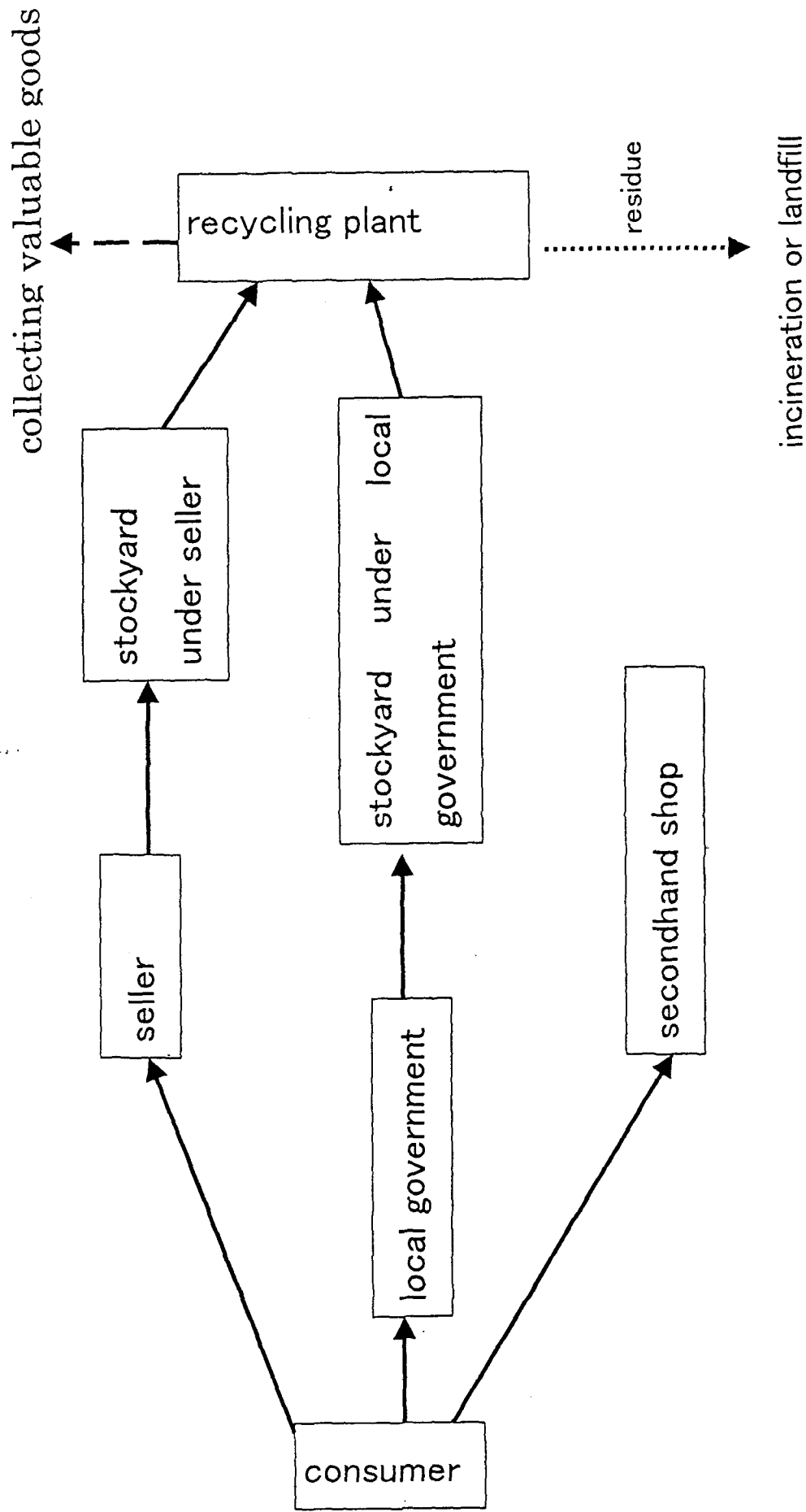
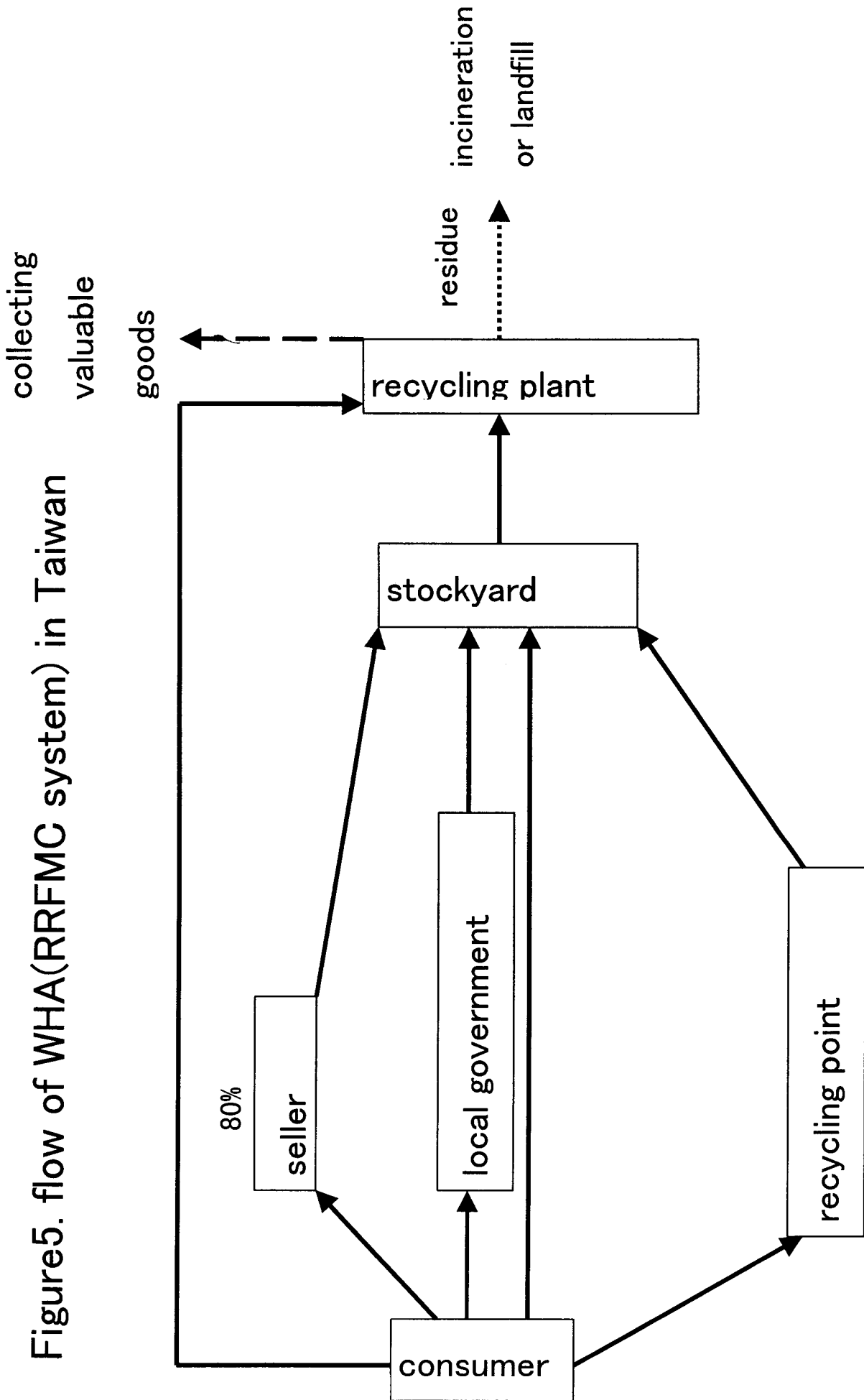


Figure 4. flow of WHA (under producer responsibility system) in Korea



(made from hearing research)

Figure 5. flow of WHA(RRFMC system) in Taiwan



(revising ;Ma,2000)

Table.1 the situation of deposit-refund system in Korea

year	deposit(billionW)	refund(billion W)	ratio of refund
1995	5.0	0.15	3.0%
1996	6.4	0.35	5.6%
1997	14.5	1.2	8.3%
1998	14.1	1.0	7.1%

made from revising materials of EIAK

Table.2 comparison of three countries

	Japan	Korea	Taiwan
the amount of WHA (4 kinds)	1.8 million units (estimated/all)	1.2-1.5 million units (estimated/all)	3million units(estimated/all)
market trade of WHA	almost BADS	mixture of BADS & GOODS	mixture of BADS & GOODS
background to start recycling			
1) illegal dumping	○	△	◎
cope with illegal dumping	x (rather than for fearing rise)	x	○(deposit and refund)
2) rise in cost of local government for disposal	◎	△	x
3) problem of shredder dust	◎	△	x
4) others	to raise recycling business	money collected from producers are used for budget of EPA?	
role of subjects			
1) producer	recycling as mark(not duty) →final responsibility of treatment/recycling	pay deposit →final responsibility of treatment/recycling	pay deposit
2) seller	x →already sold by themselves /hand over when new HA are sold	x →hand over when new HA are sold	x
3) consumer	hand over local government or sellers	x	x
4) local government	all treatment/disposal →only for WHA that were left by producers	collecting/recycling→only collecting	x
concept of EPR			
1) EPR of OECD	○	○	x
2) contents of producer responsibility (reference)	x →treatment/recycling	pay deposit →treatment/recycling suggest EPR for abolition of deposit-refund system	x →pay deposit

*made from discussion with Mr. Ken'ichi TOGAWA

* BADS : cash and WHA flow same direction

*GOODS: cash and WHA flow inverse direction