Renewing Urban Waste Management System in Energy Crisis:
Volume-based Garbage Collection Fee (VGCF) System in Korea

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An energy crisis can be the bottleneck in deterring sustainable economic growth. Nevertheless, most of countries have been suffering from useless energy and wasted materials. In this context, this paper is asking a question. What are the relationships among energy, economy, and wastes? Many new experiences on the Volume-based Garbage Collection Fee (VGCF) system in Korea can give us meaningful information for understanding the ambiguous relationships among those things. Based on the data analysis on the VGCF system in Korea, this paper is trying to develop a sustainable garbage collection and recycling method from the renewing urban waste management point of view.

1. Introduction

Municipal solid waste (MSW), or garbage from households and small businesses, is managed by a challengeable system in Metropolitan Seoul, Korea known as the Volume-based Garbage Collection Fee (VGCF) system. Unlike the preceding system, this newly designed system, which came into full effect in 1995, charges a fee according to the amount of garbage.

This VGCF system was based on two theoretical principles: (1) public service ‘coproduction’-cooperative production between citizen and city government-principle or citizen volunteerism, and (2) ‘polluter-pays’ principle and pay-as-you-throw (PAYT). Thus, this system is characterized by two disparately oriented policies. The first of these is that “recyclable materials voluntarily sorted by residents, which are curbside collected at no cost by city government.” The other is “the garbage disposal bag collection fee is charged to residents by city government according to the garbage collection volume.”

In metropolitan Seoul this system successfully reduced per capita waste generation from 1.42kg/day/person in 1994 to 1.13kg/day/person in 2004, while at the same time it increased the amount of recycled materials from 0.3Kg/day/person in 1994 to 0.62Kg/day/person in 2004.
2. A Solution to the Urban Waste Problems: VGCF system

Since the early 1990’s in Korea, waste problems emerged as one of the biggest urban issues. The rapidly growing economy led to mass production and mass consumption, which in turn resulted in an increase in the amount of waste generated. Complaints and strong movements against constructing new waste treatment facilities forced waste problems to be tackled differently, rather than just focusing on the supply of waste treatment facilities.

Within this context, the Volume-based Garbage Collection Fee (VGCF) system was introduced. The amount of municipal solid waste generated in Seoul came to the daily average of 15,397 tons in 1994. Most wastes (12,238 tons) were incinerated or landfilled and 3,159 tons (20.5%) were recycled. However in 1995, the year when the VGCF system started, the amount of the domestic wastes was reduced to the daily average of 14,102 tons by 8.4%, 4,137 tons of which were recycled by 30.9% and only 9,965 tons incinerated or landfilled. The amount of treated wastes diminished by 18.6%, in contrast, the recycled wastes increased by 31%. At a glance, this system appears to be very simple. Nevertheless, there were some difficulties that must be overcome for the system to be implemented.

3. Risk and Fortune of Korea Economic Crisis in 1997

The successful results from the VGCF system were very tremendous in both reducing wastes and increasing recyclable materials. However, the most difficult problems from VGCF system came from unexpectedly increased recyclable materials. Papers, cans, even iron scraps were not recycled, the price of recyclable goods dropped, and a lot of recyclables were accumulated at the backyard of waste hauler companies. Politicians just began to blame for the limitations or demerits of VGCF system. Only a few years after implementing VGCF system in 1995, the system had a big crisis in early 1997. Unfortunately or fortunately, Korean financial crisis occurred in December 1997. The value of Korean currency (Won) had fallen from 800Won/1 US $ to 1,700Won/ 1 US $. The price of recyclable materials jumped up to double and more. Most accumulated recyclable goods sold out and recyclable material markets had reopened. After experiencing in economic crisis, VGCF system firmly established. Although Korea economic crisis in 1997 was bad experience, it was good fortune for citizens to understand the value of VGCF system. In this energy crisis period, relationships
between economic crisis and recycling wasted material give us a strong policy implementation.

Table 1: Policy performance of Seoul VGCF system

<table>
<thead>
<tr>
<th>Year</th>
<th>Waste generation</th>
<th>Landfill</th>
<th>Incinerating</th>
<th>Recycling</th>
</tr>
</thead>
<tbody>
<tr>
<td>1994</td>
<td>15,397 ton/day</td>
<td>12,144 ton/day</td>
<td>94 ton/day</td>
<td>3,159 ton/day</td>
</tr>
<tr>
<td>1995</td>
<td>14,102 ton/day</td>
<td>9,965 ton/day</td>
<td>4,137 ton/day</td>
<td></td>
</tr>
<tr>
<td>2004</td>
<td>11,673 ton/day</td>
<td>4,498 ton/day</td>
<td>749 ton/day</td>
<td>6,426 ton/day</td>
</tr>
</tbody>
</table>

Policy Performance of VGCF system in a decade : 1994 vs. 2004

<table>
<thead>
<tr>
<th>Year</th>
<th>Waste generation</th>
<th>Waste disposal**</th>
<th>Recycling material</th>
</tr>
</thead>
<tbody>
<tr>
<td>1994</td>
<td>1.42 kg/day/person</td>
<td>1.12 kg/day/person</td>
<td>0.3 kg/day/person</td>
</tr>
<tr>
<td>2004</td>
<td>1.13 kg/day/person (-20.4%)</td>
<td>0.51 kg/day/person (-54.4%)</td>
<td>0.62 kg/day/person (+80.6%)</td>
</tr>
</tbody>
</table>

*) Waste generation = landfill + incinerating + recycling
**) Waste disposal = landfill+incinerating

Source: Seoul Metropolitan Government Yearbook 1995-2005

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