The 2023 Jeju Plus International Environmental Forum(Sep. 8th, 2023)

Plastics in the Context of Circular Economy

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Academic Background

- Ph. D. in Public Administration(Yonsei University, Korea, '22.2)
- MA in Public Policy(Seoul National University, Korea)
- Diploma in International Political Economy(Warwick University, UK)
- BA in Law(Korea National Open University, Korea)
- BA in Public Administration(Yonsei University, Korea)

Career

- President, Korea Resource Circulation Service Agency(present)
- Administrator, Youngsan River Basin Environmental Agency
- Administrator, Saemankeum Regional Environmental Agency
- Administrator, Seoul Metropolitan Area Air Quality Management Agency
- President, National Institute of Environmental Human Resources Development
- Chief, Korean Secretariat of the COP12 of the Convention on Biological Diversity
- Director, International Affairs Division, MOE
- Director, Waste Management Division, MOE
- Director, Environmental Policy Division(Prime Minister's Office)
- Counsellor, Embassy of the Republic of Korea to the EU

Contents

1. Circular Economy

- circular economy vs. linear economy

- from the aspect of resource depletion, environmental pollution, carbon emission, un-sustainability

- linear economy

- material input to production > distribution > consumption > disposal

- circular economy

- suppressing "disposable items," enhancing the durability of goods, reuse, recycle and energy recovery

- circular economy helps conserve resources, lower environmental pollution and greenhouse gas emissions, enhance sustainability

2. The Three Pillars of Circular Economy

- government policy
- corporate sector technology and innovation
- public engagement and awareness

2-1. Government Policy

- government policy plays a crucial role in circular economy
  - penalize or tax businesses that are cons of the circular economy
  - give incentives or benefits to the pros of the circular economy

- good examples of government measures for the circular economy
  - deposit-refund system for beverage/alcohol bottles
  - Extended Producer Responsibility (EPR) system" for packaging materials, home appliances, lubricants, tires, and other items
  - volume based waste charge system in Korea in mid - 1990s
  - request for citizens' cooperation for "bottle-to-bottle" recycling PET

2-2. Corporate Sector Technology and Innovation

- business sector is another pillar for circular economy
  - eco-design in production, distribution, practice is needed
  - eg, milk dispenser system is better than carton recycling system at school
  - similar situation at a garage during motor oil change
- manufacturers' cooperative measures for PET bottle-to-bottle recycle
  - producing bottles without labels
  - producing bottles with easily removable labels
- business sector covers normal manufacturing/recycling materials after use
  - the former is referred to "arterial industry," the latter "vein industry"
  - technology is needed to realize a circular economy on both sides

2-3. Public Engagement and Awareness

- public awareness and participation is also crucial for circular economy

  - active participation of residents in voluntary segregative discharge of plastics, glass bottles, metal cans, and papers from the apartments is a strong pillar for the circular economy
  - widespread consensus on the circular economy will increase the acceptance of the government's policies and facilitate eco-design concept in the industry

3. Plastic Packaging Materials and Extended Producer Responsibility (EPR) in Korea

- EPR is a crucial tool for circular economy
  - Law on the Promotion of Resource Conservation and Recycling
  - producers to recycle product/product's packing container
  - producers be penalized if failed to meet the responsibility
- nine products
  - lubricating oil, batteries, tires, lighting products, floating items for seafood farming, bailing silage film, and plastic products
- four types of packaging materials (KORA/KPRC's responsibility)
  - cartons, metal cans, glass bottles, and plastic materials

3-1. EPR Status of Plastic Packaging in Korea

The Status of Recycled Rate of Major Plastic Items (Jan.-Jun. 2023, KORA)

category	mandatory recycling rate (%)	annual mandatory recycling amount (T)	recycled amount (T)	recycled rate (%)
transparent PET bottles	80	255,993	112,306	44
PE, PP, PS	87	274,635	134,793	49
composite plastics(MR)	86	104,298	56,390	54
composite plastics(TR)	86	243,362	122,735	50
PVC	38.5	1,601	783	49

3-2. EPR Institutions for Plastic Packaging

- Korea Packaging Recycling Cooperative (KPRC)
  - collects financial resources from producers based on their individual mandatory recycling rate and the unit cost

- Korea Resource Circulation Service Agency (KORA)
  - gives money to recyclers based on their recycled amount and unit cost

- Korea Environment Corporation (Keco)
  - verifying the data/performance of KPRC, KORA

4. Additional Comments

- To subdue the enemy without fighting is the acme of skill(Sun Tzu).
  - the hierarchy of circular economy "avoid to use products or containers> reuse>recycle>waste disposal"
- for “bottle-to-bottle“ recycle of PET bottles(for food/beverage)
  - coloring of non-food/beverage PET containers
  - minimizing labels/adhesives, securing ease of label-removal
  - technology innovation, rationalizing regulation, expanding public awareness
- technological innovation in optimal recycling of composite plastics
  - material recycling, gasification, pyrolysis, chemical recycling, etc.

4. Additional Comments

- regulatory innovation/technological improvement regarding hard-to-recycle packaging
- development of technology/alternative material and regulatory innovation on PVC
- policy neutrality in biodegradable plastics/plastics from biomass

- Thank you very much for your attention.