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To Reduce Leakage of Expanded Polystyrene (Styrofoam) to the Ocean: Efforts in Japan

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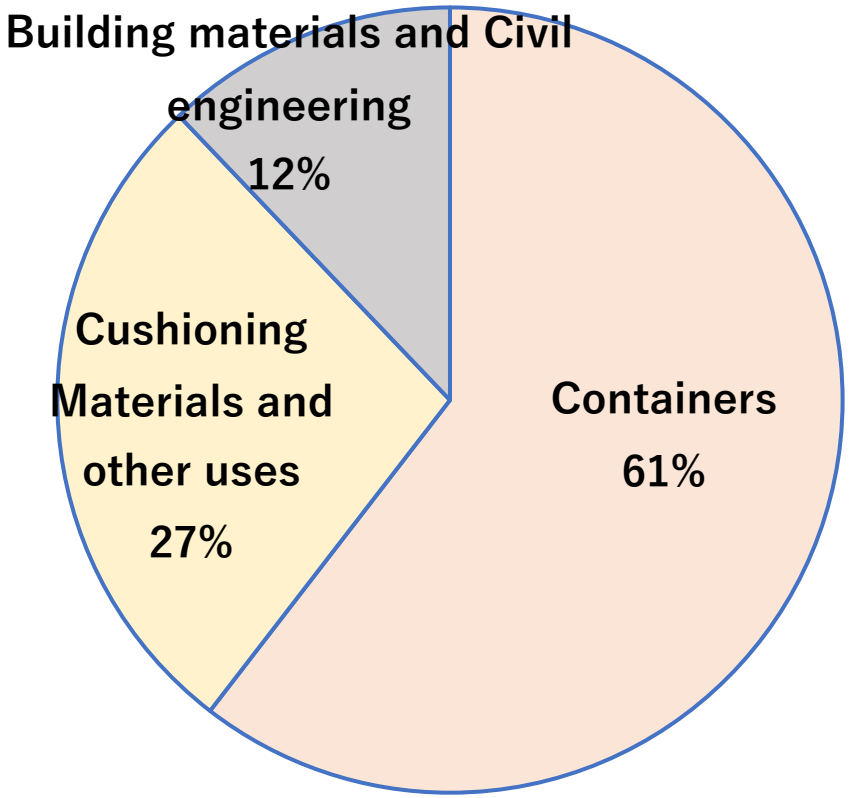
(Web-site of Regional Knowledge Center for Marine Plastic Debris)
https://rkcmpd-eria.org/ focusing on ASEAN +3 countries

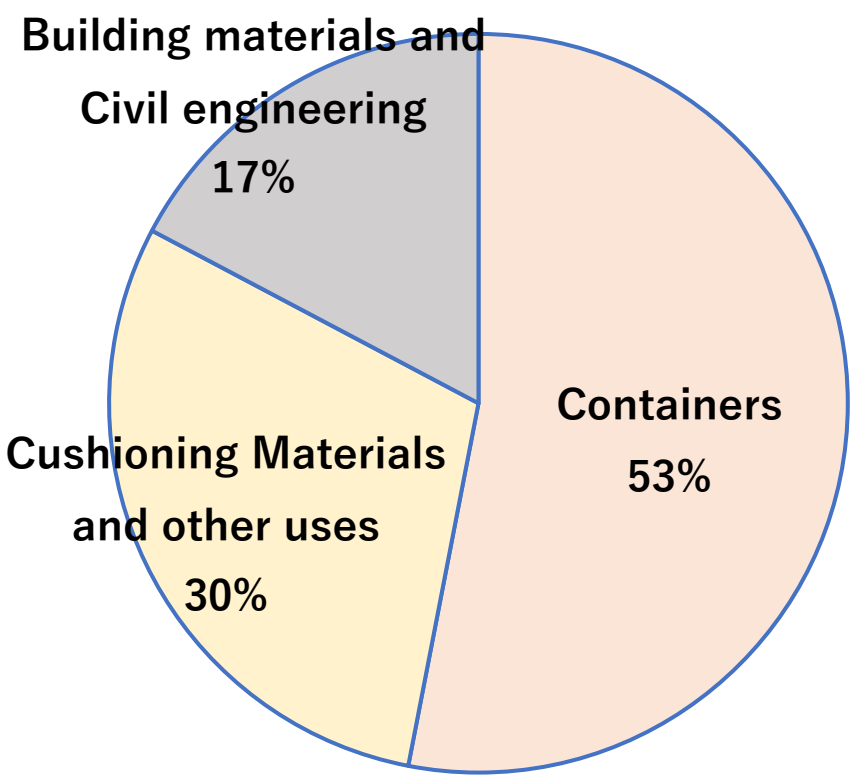
Production of EPS by use in Japan

2009



Production: 151 Thousand Tons

2019



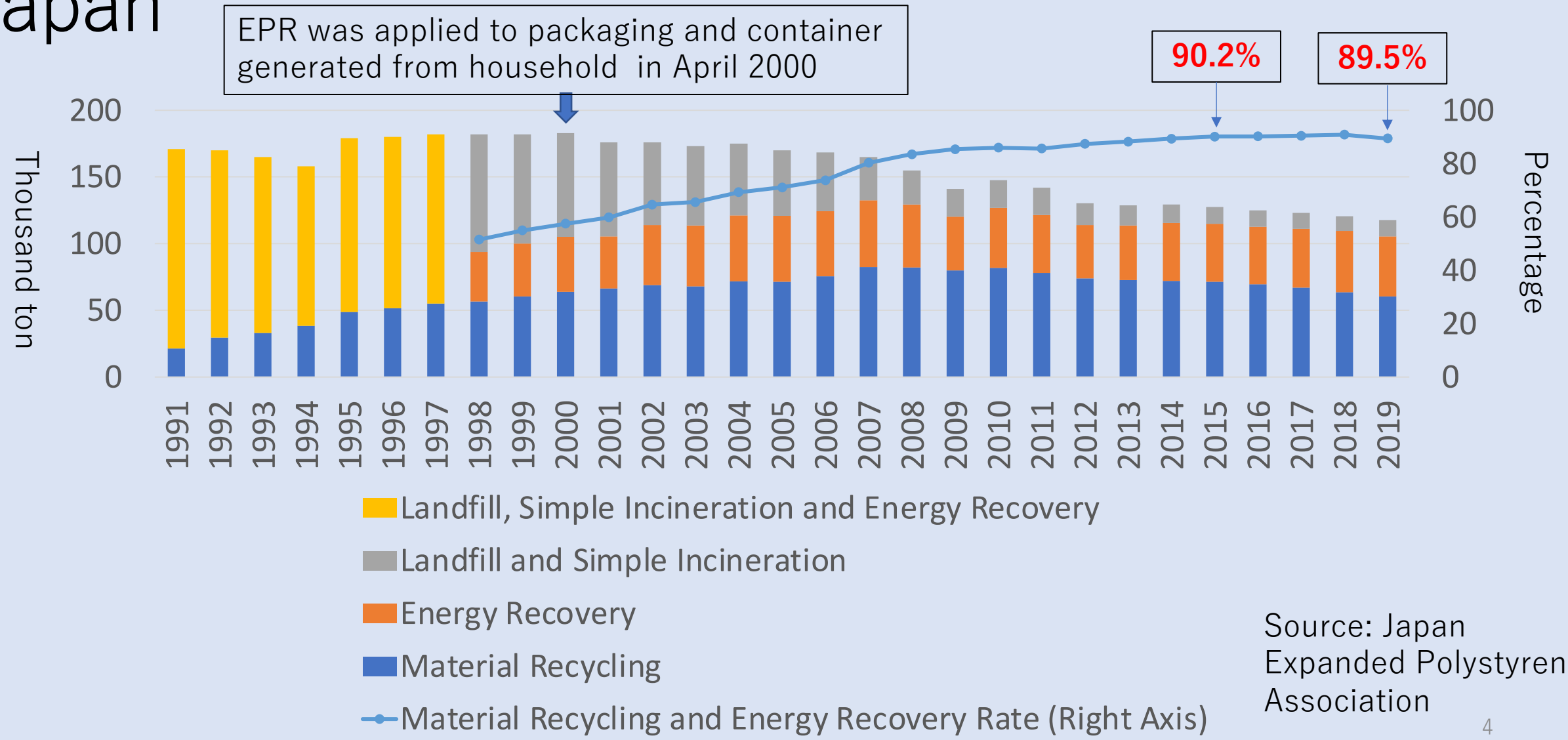
Production: 128 Thousand Tons

Source: Japan Expanded Polystyrene Association

PSP Tray

Fish Box

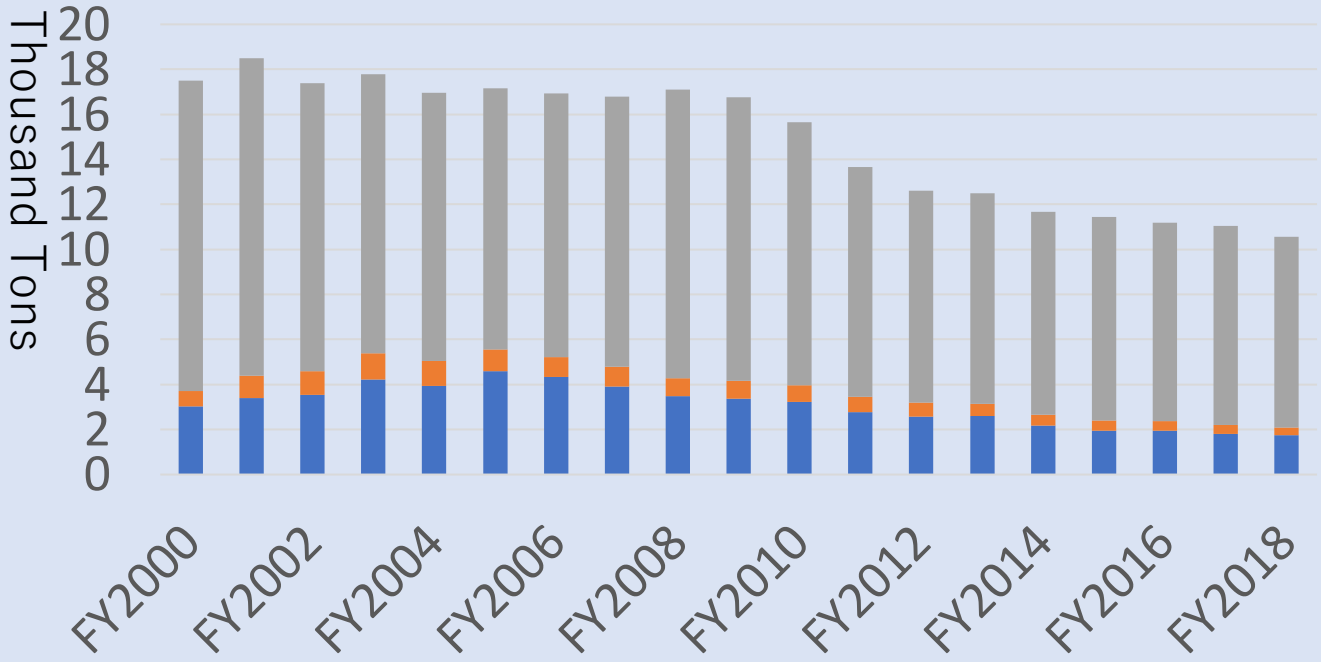
Successful Disposal, Recycling and Energy Recovery of Expanded Polystyrene (EPS) in Japan



Source: Japan Expanded Polystyrene Association

Three Collection Routes of PSP (polystyrene paper) Tray for Recycling

A voluntary collection box for PSP Tray at a shopping center in Chiba City, Japan.



Voluntary Collection Route

- Shops and recyclers set up collection boxes in stores.

Designated Body (PRO) Route

- Local government designates an organization to collect PSP trays with other plastic packaging and containers. Part of an EPR system.

Independent Collection Route

- Local governments separately collects PSP tray and send the waste to recycler.

Reducing cost of transportation

- To transport bulky expanded polystyrene (EPS) or Styrofoam waste efficiently to recycling factories, technology to reduce the volume is crucial.
  - Compressing machines: EPS to reduce the volume to one-fiftieth of the original size.
  - The first machine was installed in 1977 in Tsukiji Fish Market.

↑ Machines compressing EPS Fish Boxes at Tsukiji Fish Market in 2004.

Compressed EPS from the machine.→

Video in English
https://youtu.be/Rjcp7fK8i2o

EPS use in aquaculture, ports and ships

- Floats made of EPS are widely used in aquaculture. EPS is also used as fenders of ships and ports.
- Annual production of floats in Japan is 500 tons. (NOWPAP MERRC 2015)
- Environmental risk when floats gradually decomposed and became microplastics.

Float used as fender of ship, 2019.

Action to address EPS marine debris

Machine for compressing EPS used in demonstration project.

(NOWPAP MERRC 2015)

https://www.youtube.com/watch?v=9YNVGkII7yA

- **2002:** JEAN, a leading NGOs working on marine debris issue in Japan, organized a workshop on EPS floats to start addressing the issue for various stakeholders.

- **2003:** Fisheries Agency started the project for treating waste EPS used by fishery sector.
  - Demonstration projects to compress waste EPS generated by fishery sector were conducted in several places.
  - From 2003 to 2012, 12 municipalities in 7 prefectures processed 44,871 EPS floats (182 ton).
  - A semi-governmental organization is conducting a program to lease the compressing machine to fisheries associations and local governments.

Shift from the conventional EPS floats to high durability floats

https://www.yasui-kk.co.jp/expanded-polystyrene/float/

- The Fisheries Cooperative Association of Tarumizu city of Kagoshima prefecture replaced EPS floats to High Durability Floats.
  - It took 10 years for the cooperative to replace all floats to high durability one, since 1996.

	Conventional EPS Floats	**High Durability Floats** **Combination of polystyrene beads and the hard plastic (5mm thickness PE)**
Durability	Easily fragmented	No fragmentation
Period of Services	3years	10 years
Workability	Impossible to scrape attached organism	Easy to scrape to remove the attached organisms.
Penetration	Seawater penetrate EPS.	Seawater cannot penetrate EPS.
Recycling	Water and attached organism may hinder recycling.	Seawater cannot penetrate EPS. Attached organisms can easily removed. Easy to be recycled.

Source: Made by the author, based on NOWPAP MERRC 2015)

References (only English one)

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  - https://www.meti.go.jp/policy/recycle/main/data/pamphlet/pdf/handbook2010-eng.pdf
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