# *Plastic recycling and carbon footprints*

# *Carbon Footprint*


caused by:

- Individual
- Event
- Organization
- Service
- Product

# *Plastic Production*

Plastic

Fossil fuel-based plastic → Bio-based plastic

1.8 gigatons of carbon dioxide equivalent (2015)

(3.8% of global emissions)

6.5 gigatons (15% of global carbon budget)

(2050)

# Agenda

- Difficulties in plastic recyclings
- Other strategies
- Suggestions
- References

# Difficulties (related to products)

Not 100% made with plastic

→ Difficult to separate the plastic and aluminium layers

E.g. Flexible packaging


Potato chip bags

# Difficulties (related to products)

Different types of plastic are used

→ Not easy to recycle a particular type of plastic

E.g. Deodorant

➢ Composed of adhesive label, protective cap and twistable gear

E.g. Yogurt and butter tubes

➢ Tubs are often made with a mix of plastic types

# Difficulties (related to products)

Structure of plastics

→ Thermoplastics

➢ Can be remelted and remodeled

into new products

→ Thermoset plastics

➢ Contain polymers that cross-link

to form an irreversible chemical bond

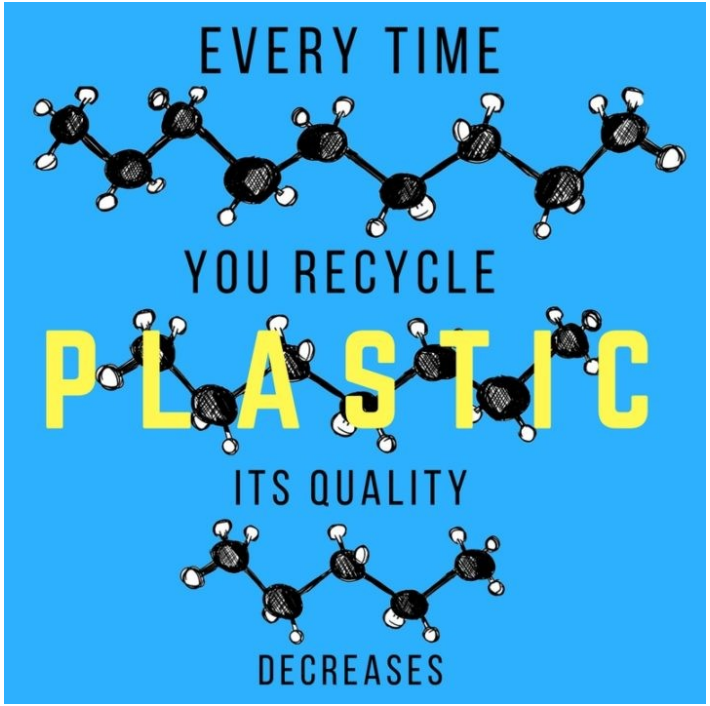
the way clamshells are molded affects the structure of the plastic

# Difficulties (related to products)

Structure of plastics

→ Recycling plastics downgrades its quality

- ➢ Long chains of atoms are arranged repeatedly
- ➢ polymer chain grows shorter after recycling (quality decreases)
- ➢ Same piece of plastic can only be recycled 2-3 times



# Difficulties (related to products)

Some parts need to be removed before recycling

E.g. Beverage bottles

➢ The plastic film labels are not recyclable

E.g. Other bottles

➢ Need to remove metal springs in the nozzle heads of spray cleaners

# Difficulties (related to products)

Small plastics affect the operation of recycling equipment

→ 3 inches or smaller

E.g. Bread bag clips adn pill packaging

➢ get caught or fall between the belts and gears of the machinery

# Difficulties (related to packagers)

The price of plastics is vulnerable to the ups and downs of the markets

→ packagers tend to buy raw, virgin plastics instead of recycled plastics

# Limitation of recycling plastic (3)

- Insufficient equipment and technica


Example 1) Potato Chip Bags → Flexible pack

1. flattens out on the MRF's conveyor be
2. Misclassified and mixed with paper
3. Unsellable

Example 2) POLYSTYRENE FOAM

1. Remove the air by a special machine/condense the material into a patty or block for resale
2. Very little material remains
3. Foam products only have very little value

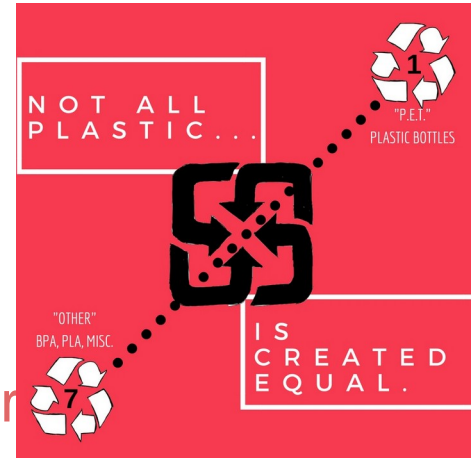
# Limitation of recycling plastic (

Example 3) Beverage Bottles

1. High pressure in the sorting and baling process
2. force caps off at high speeds

Result → Harmful to workers

# Limitation of recycling plastic (4)




- Consumers have insufficient knowledge about r

1. Did not put the recyclable plastic in the recycling bin
2. Recycle uncleaned plastic
3. Recycle the non-recyclable plastic

# Limitation of recycling plastic (5)


- Local government's regulations

1. Plastic after recycled → lower quality

→ lower market value → Not recycled by the government

2. Not all recyclable plastic can be recycled

# Suggested Strategies  (Glass & Metal)

Pros:

- Can be recycled infinitely without losing quality
- No need to add extra material

Cons:

- Higher shipping cost
- Risk of breaking

# Suggested Strategies

Use renewable energy instead of fossil-based energy:

- Halve the greenhouse gas emissions

Reduce the demand of new plastic in the market:

- Population growth will increase the demand,
  so we should increase the recycling effectiveness

# Suggested Strategies  (Bioplastic)

-Made by extracting sugar from plants like corn and sugarcane to convert into polylactic acids (PLAs)

-Absorb CO2 during growing phase

-Decomposable in the ground

# What we help with plastics recycling?

Focus on

-Procedure to gather the waste

-Reduce consuming on non-recycling plastic

# How can we make sure our wastes can be recycled?

-Rinsing out of recyclables

-Make sure put into the right type of recycle bin

# How can we reduce the non-recycling plastic?

Boycotting over-packaging product

Reduce consuming over-wrapping product

# Promotion and education from the government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-Advertisement to public

-Education course to students

Label On every recycling bin

# Conclusion

After readings:

-Limitations and Difficulties exist

-The world are trying to help with different way

-Start from ourselves and government

# References


Everything you need to know about recycling plastics (recyclenow.com):
https://www.recyclenow.com/recycling-knowledge/how-is-it-recycled/plastics

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7 things you didn't know about plastic (and recycling) (National Geographic):
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