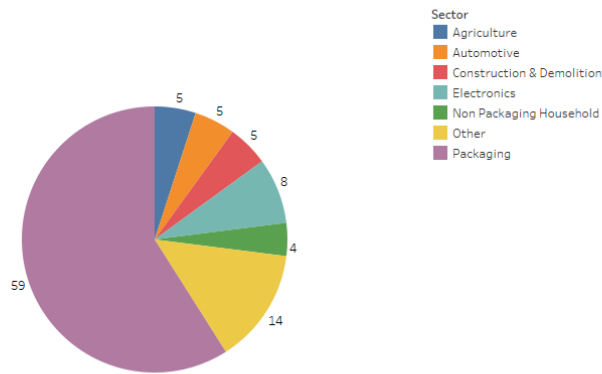# Plastic pollution

Data Visualisation Final Assignment Report

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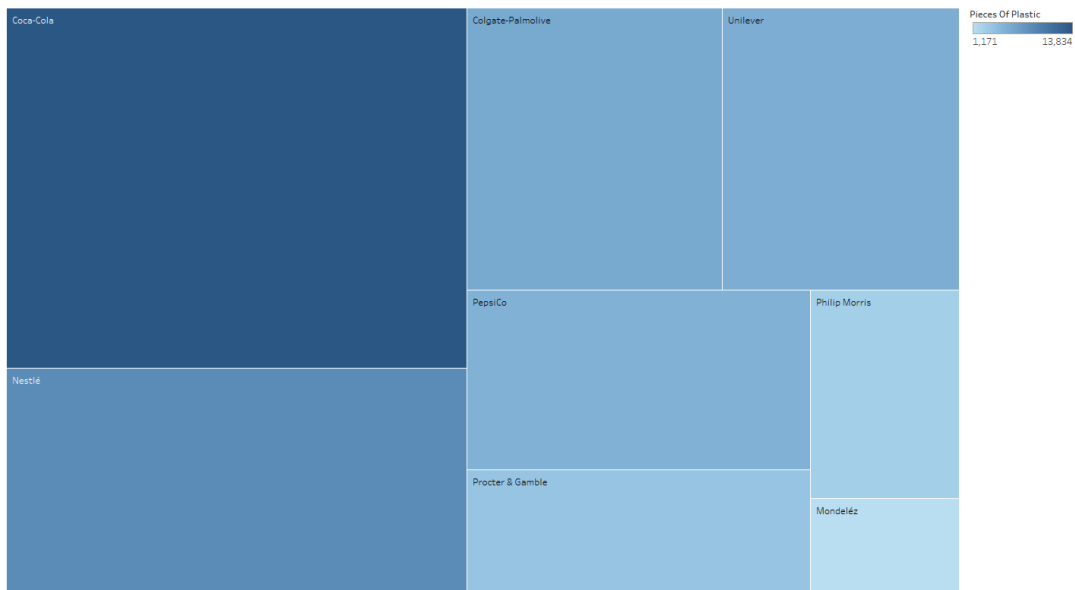
Plastic waste production sources

Contribution of different sectors to plastic waste in Europe in %

This chart shows what sectors contribute most to plastic pollution. The data comes from a report written by the european commision.

https://op.europa.eu/en/publication-detail/-/publication/3cdca2d1-c5f2-11e8-9424-01aa75ed71a1/language-en/format-PDF

Plastic pieces found in global cleanups from the companies wiht the largest plastic waste foot prints in 2020


Company name. Color shows sum of Pieces Of Plastic. Size shows sum of Pieces Of Plastic. The marks are labeled by Company name.

The information is based on the results of 55 countries that participated in global cleanups. In total 346,494 pieces of plastic were analyzed of which 63% was branded.

https://www.statista.com/chart/23744/branded-plastic-waste-found-in-global-cleanups/#:~:text=With%2013%2C834%20branded%20items%20found,%2C%20Colgate%2DPalmolive%20and%20Unilever.

Plastic pollution sources

Total plastic waste in relation with the share of inadequatly managed plastic

Share of plastic inadequately managed

0,00   88,00
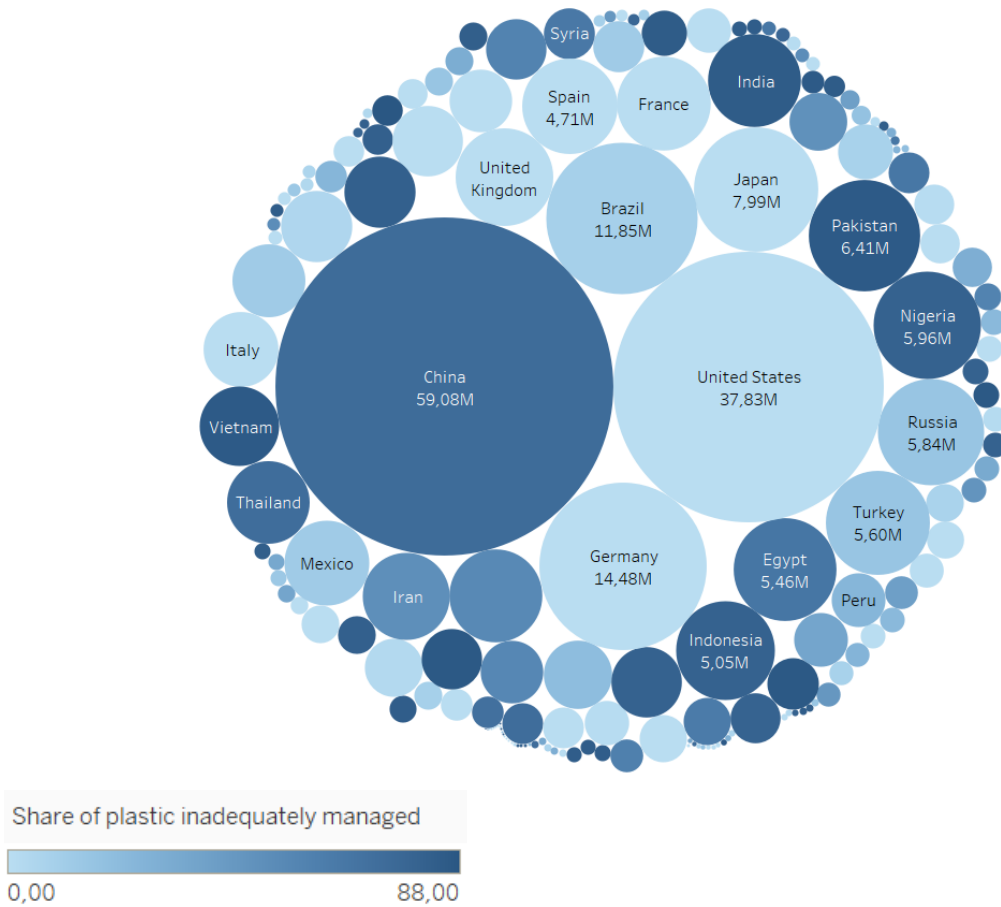
This graph represents two aspects. The total amount of plastic waste created per country in tonnes is visualized by the size of the circles and in the bigger circles also labeled inside. The darkness of the circle color represents the percentage of the total plastic waste that is inadequately handled and will end up in nature. The data is preprocessed in excel, to combine the data together.
Source: https://science.sciencemag.org/content/347/6223

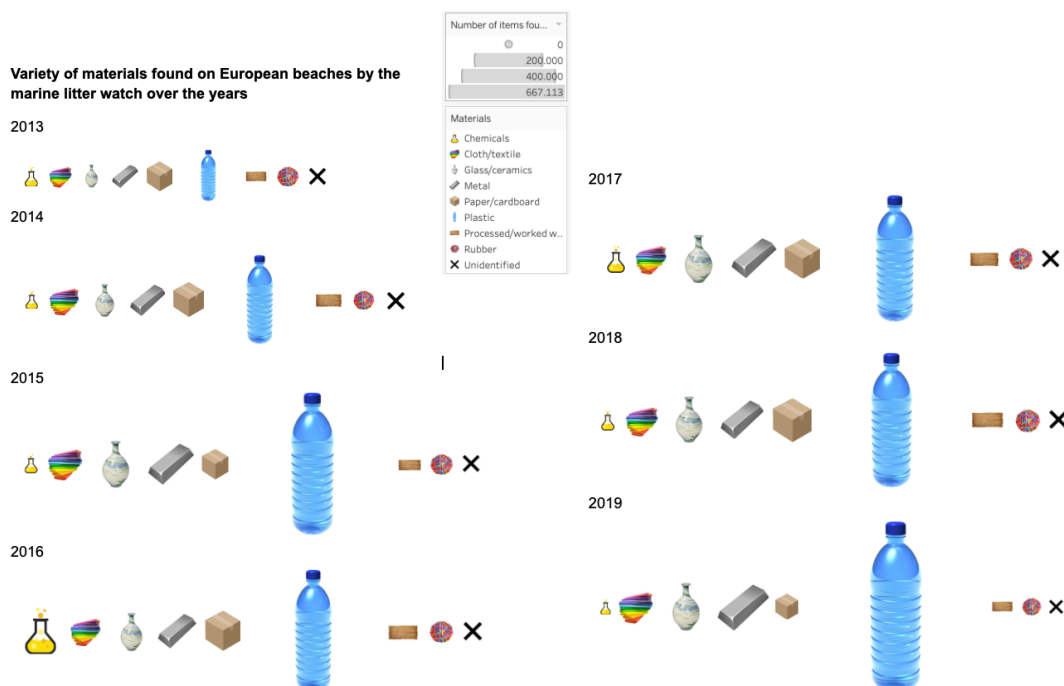## Materials found in landfills in relation with the break down time
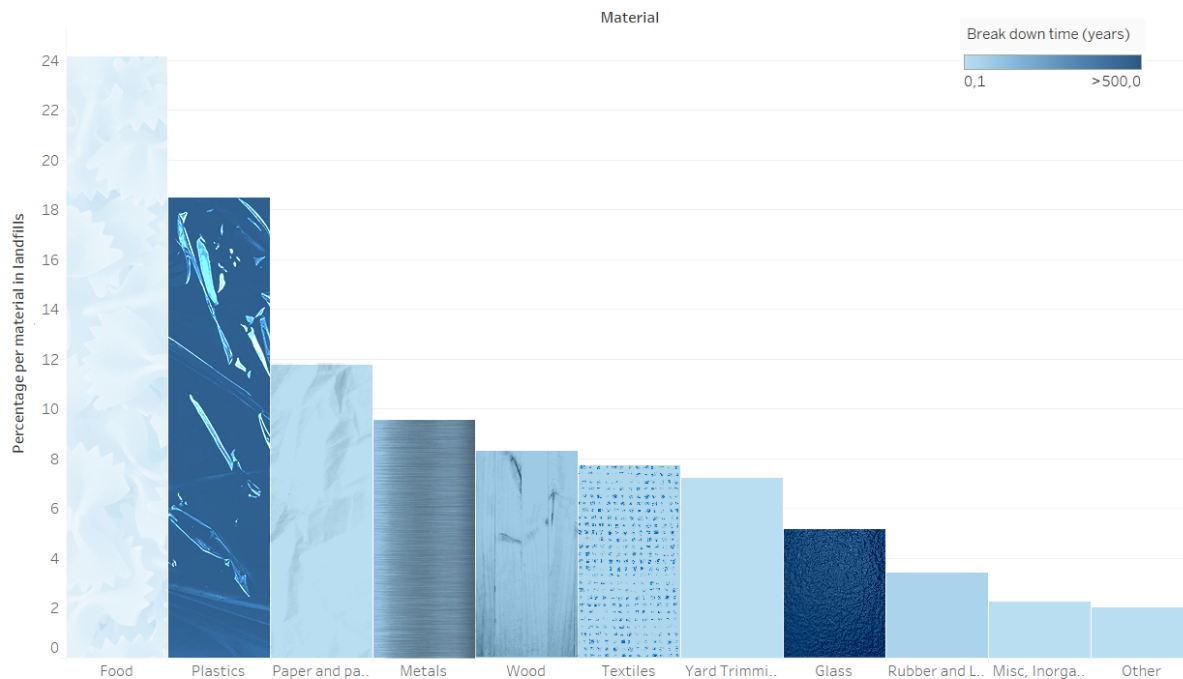
This height of each bar represents the percentage of a certain material found on landfills. The darker the color of the bar, the longer it takes for the material to break down in nature. The data from the two different data sources are preprocessed in excel to combine the data.

Source:
https://www.epa.gov/facts-and-figures-about-materials-waste-and-recycling/national-overview-facts-and-figures-materials
https://www.sciencelearn.org.nz/resources/1543-measuring-biodegradability

Plastic in Oceans and beaches

Variety of materials found on European beaches by the marine litter watch over the years

For these 2 visualizations displaying the variety and growth of materials found on european beaches over time, a dataset was used from a marine litterwatch app developed by the European Environment Agency to fill data gaps in beach litter monitoring. The data was preprocessed using excel and openrefine to limit the data to the strictly needed columns and further categorize the materials in smaller categories to make the visualization clear and uncluttered.
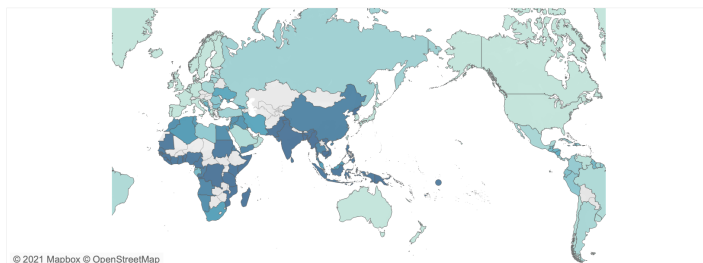https://data.europa.eu/data/datasets/dat-142-en?locale=en

Weight of plastic emitted to the oceans compared to percentage of waste inadequately managed

Weight of plastic found in the oceans from 2010-2012 in g/km^2

Percentage of waste inadequately managed per country in 2010

The visualization above uses 2 datasets, firstly
https://figshare.com/articles/dataset/Plastic_Marine_Pollution_Global_Dataset/1015289 containing the data about the weight of plastic found in the oceans from 2010-2012. This data was preprocessed to combine the different weight categories in one category. The second dataset responsible for the bottom visualization sources from
https://ourworldindata.org/grapher/mismanaged-waste-global-total and is mostly used as reference material to compare the top visualization with, showing countries' share of inadequately managed waste in 2010.

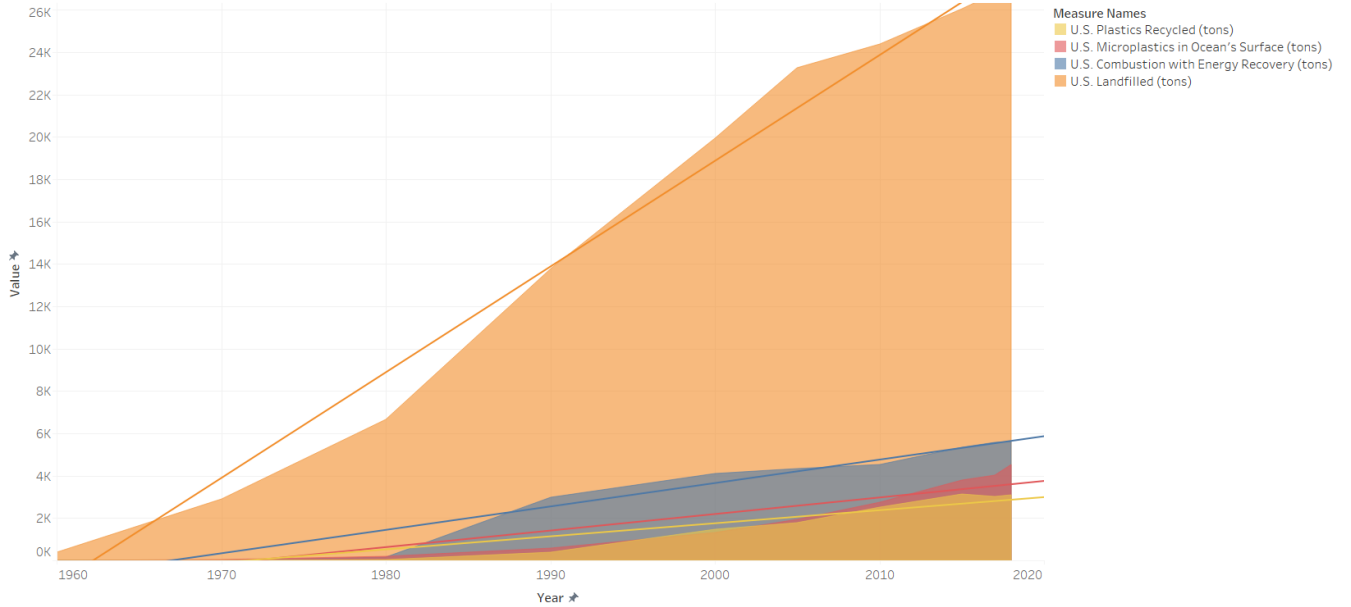# Consequences in landfillsResults regarding microplastics and wildlife

https://data.mendeley.com/datasets/c9s8b54ksh/1	The first link is the dataset which I edited in openrefine with the experiment and findings of microplastics in fish
https://ourworldindata.org/grapher/microplastics-in-ocean?time=earliest..2050	The dataset to all microplastics on the ocean's surface
https://www.epa.gov/facts-and-figures-about-materials-wast	dataset for plastic waste management in the U.S.

Plastic Management U.S. 1960 - 2018 (Tons)

Measure Names
- U.S. Plastics Recycled (tons)
- U.S. Microplastics in Ocean's Surface (tons)
- U.S. Combustion with Energy Recovery (tons)
- U.S. Landfilled (tons)

The plots of U.S. Plastics Recycled (tons), U.S. Microplastics in Ocean's Surface (tons), U.S. Combustion with Energy Recovery (tons) and U.S. Landfilled (tons) for Year. Color shows details about U.S. Plastics Recycled (tons), U.S. Microplastics in Ocean's Surface (tons), U.S. Combustion with Energy Recovery (tons) and U.S. Landfilled (tons).

Length Comparison Fish and plastic found inside them

Position (group)
- Intestine
- Stomach
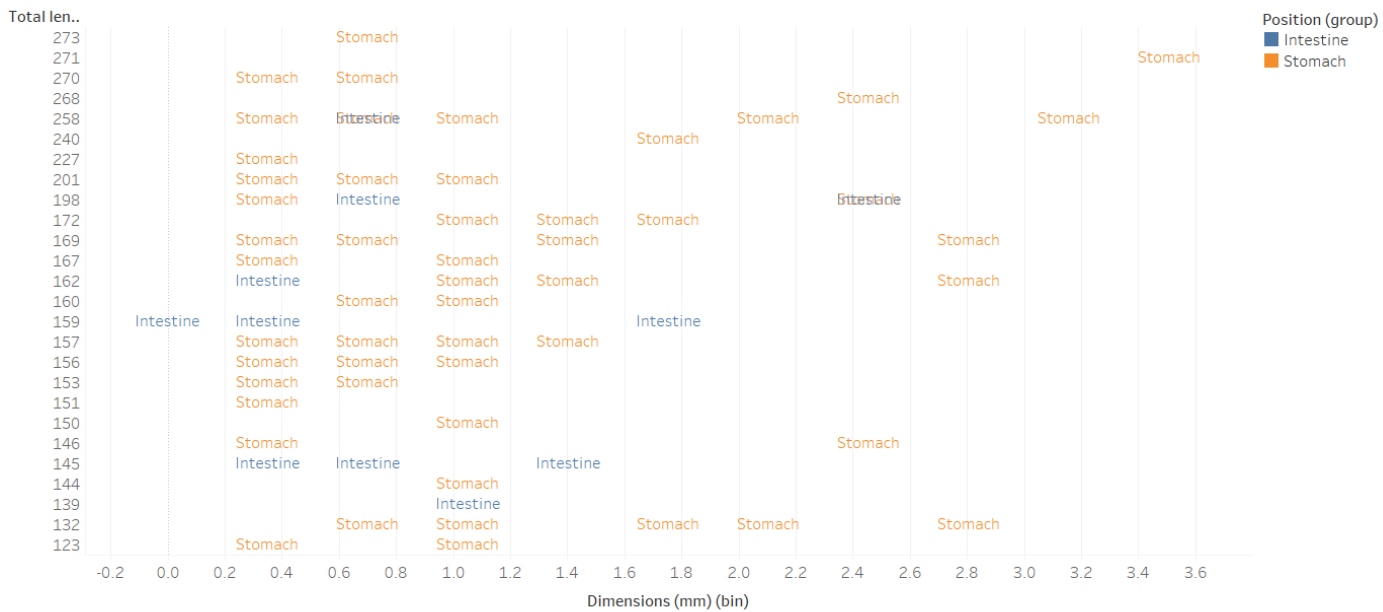
Dimensions (mm) (bin) for each Total length (mm). Color shows details about Position (group).

U.S. Waste management shows added microplastics in oceans in huge amounts over the years. We calculated the U.S. Amounts using the global waste percentage with the U.S. being 0.86%.

In the results You can clearly see that besides the Landfilled area all trend lines are parallel towards each other between the Combustion of plastics, recycling of plastics and Oceans surface microplastics. The worst thing is that the results keep rising each year.

Some of this environmental pollution is from littering, but much is the result of storms, water runoff, and winds that carry plastic—both intact objects and microplastics—into our oceans.

A consequence is that In the oceans, microplastic pollution is often consumed by marine animals.

This is the result of an experiment on Reef Fish found with plastics inside them. This visualization shows the comparison of length of the fish on the vertical axis to the size of the plastics inside them in dimension on the horizontal axis. The position of the plastic can be seen in the graph as well, this is always the stomach or the intestines.

How larger the fish, how larger the plastic ingested can be.

Furthermore, most fish have it stuck in their stomachs causing some to die or getting into the human food cycle, because there is proof of fish being cooked which had microplastic remains inside them.

fun fact: Research has shown most microplastics in the ocean is PET, which is mainly used for drinks and beverages. See the connection between that type of plastic and plastic pollution in the ocean?

Recycling as a solution

Reclycling rate of countries in Europe (2017)

Recycling rate (%)
18 ▭ 74

© 2021 Mapbox © OpenStreetMap
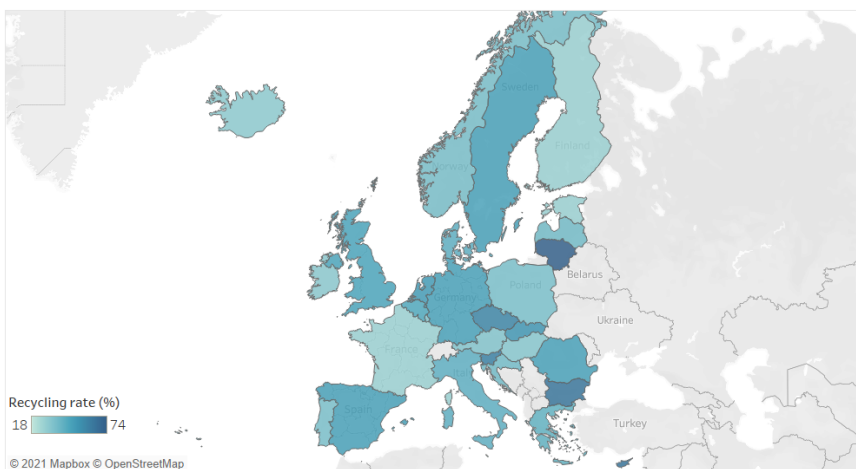
Best recycling countries

| Country	Recycling rate (%)
Lithuania	74
Bulgaria	65
Cyprus	65
Slovenia	60
Czechia	59

Recycling rate is the percentage of waste recycled from the total waste generated

Worst recycling countries

Country	Recycling rate (%)
Liechtenstein	18
Malta	19
Estonia	27
Finland	27
France	27

This visualization uses data of countries' recycle rate for 2017 and 2018. Since some data was missing for 2018, the choice was made to use the data from 2017 for this visualization. The data can be found at:

https://ec.europa.eu/eurostat/databrowser/view/ENV_WASPACR__custom_422013/default/table?lang=en
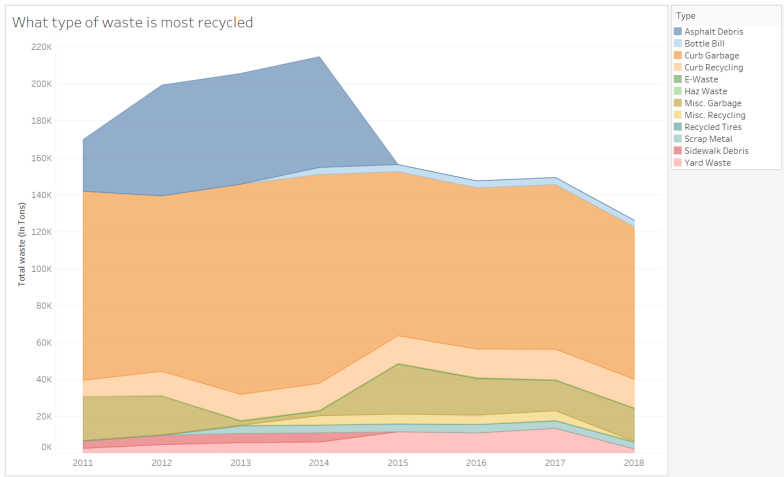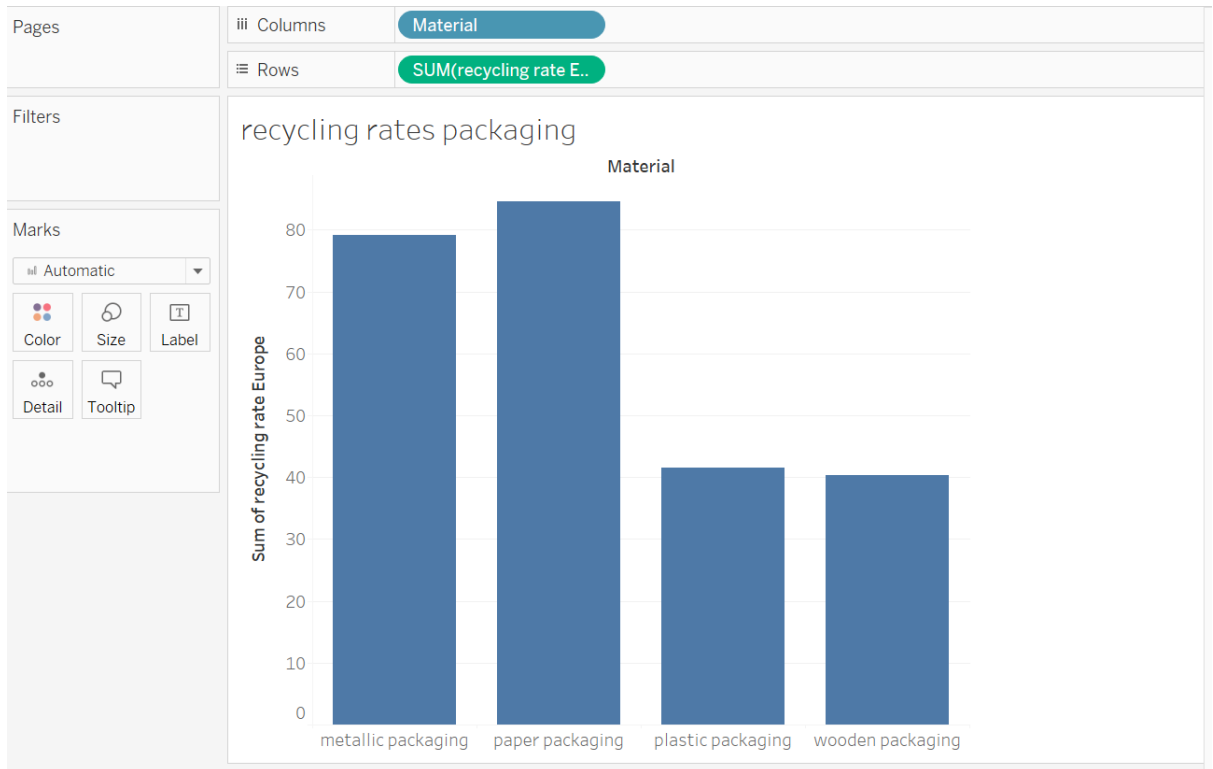
This visualization shows the type of waste that is most recycled. The type of waste is not the material, but rather where the waste is found. The data for this visualization can be found at: https://data.world/buffalony/2cjd-uvx7/workspace/file?filename=monthly-recycling-and-waste-collection-statistics-1.csv
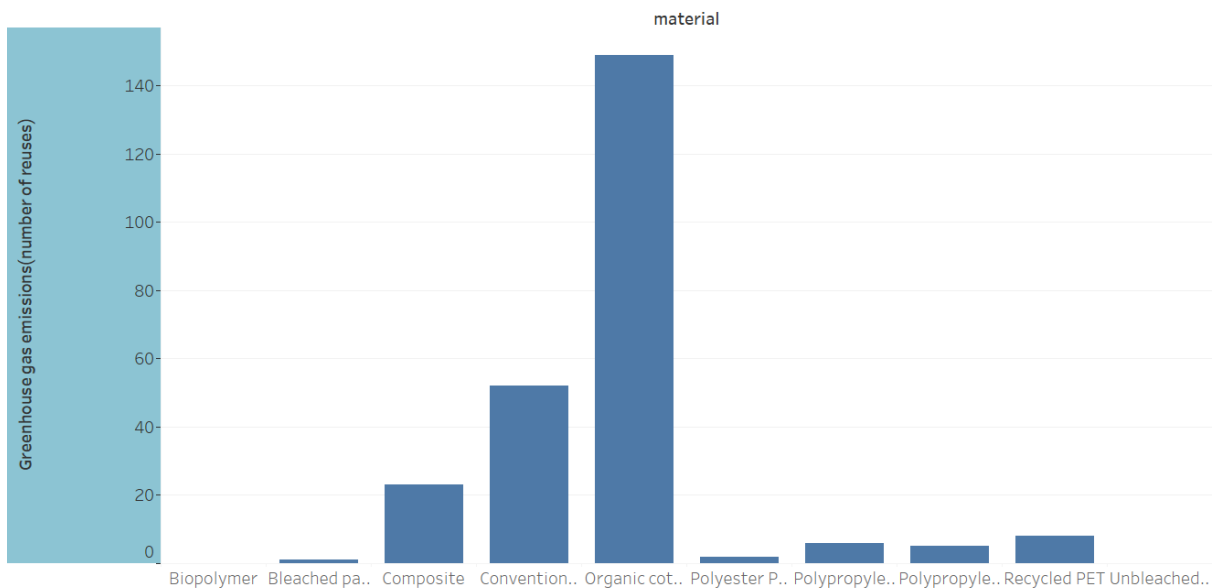
Alternatives as a solution

-

recycling rates packaging

alternatives to plastic bags

Sum of Greenhouse gas emissions(number of reuses) for each material.

The three visualisations above show at first how much plastic is produced per industrial sector by the color and size of the square shown. (https://www.statista.com/statistics/1134796/plastic-production-by-industrial-sector-worldwide/) Second, a bar graph of what the recycling rates are for alternative packaging, since packaging is the largest sector in producing plastics. (https://ec.europa.eu/eurostat/databrowser/view/cei_wm020/default/table?lang=en) Last, a bar graph of the alternatives to plastic bags, since this is a very common type of packaging. (https://ourworldindata.org/faq-on-plastics#are-plastic-alternatives-better-for-the-environment). The last visualisation shows how many times a bag of a specific material can be reused to have the same emission as a plastic bag used once.