




Plastics Back To Petroleum Almost as good as fusion And Closer

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- Pollution is nothing but the resources we are not harvesting. We allow them to disperse because we are ignorant of their value.

- R. Buckminster Fuller 12 July 1895 – 1 July 1983



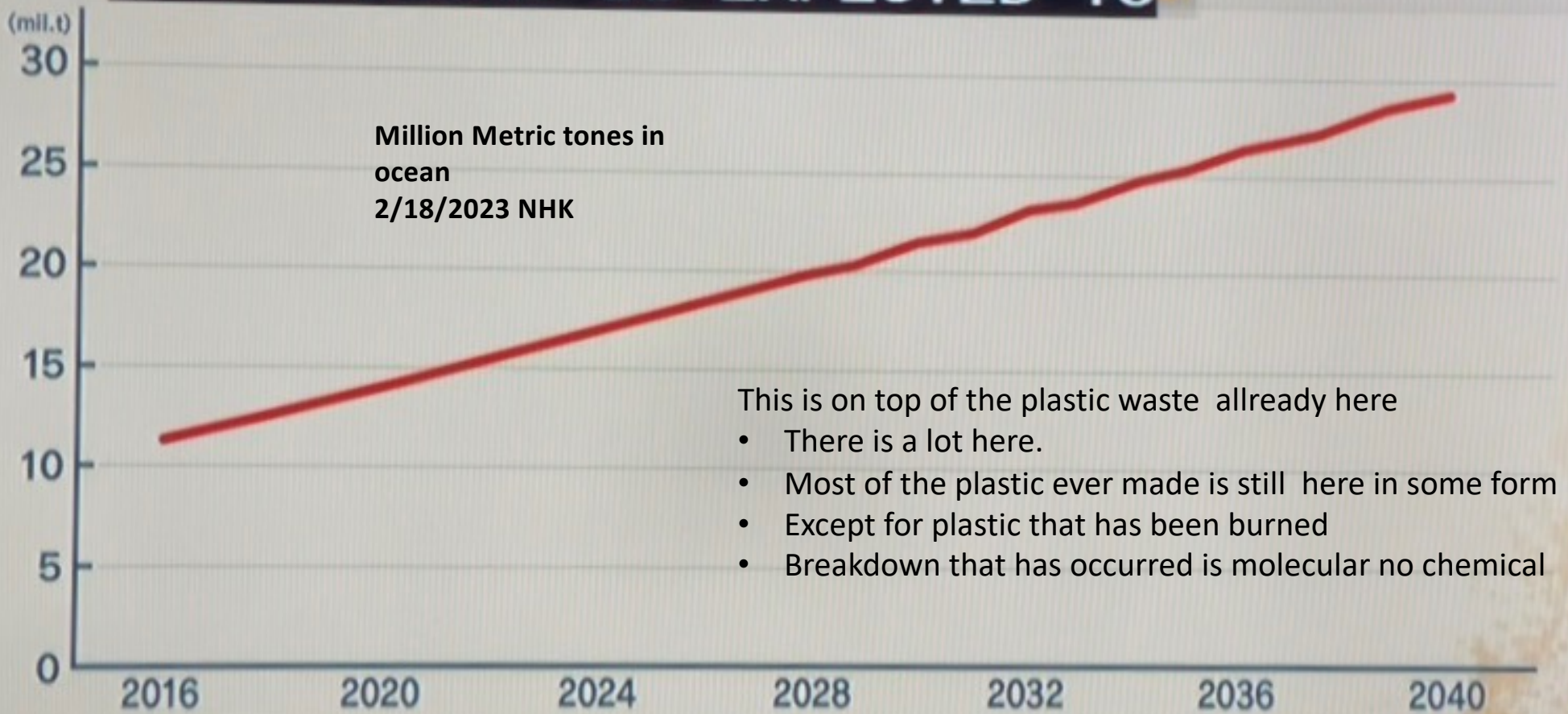
Worldwide production of plastic continues to increase and is expected to triple by 2060.

BBC report 14 March 2023

Carl Slater carlslater@mac.com

206 595-6954

Million Metric tones plastic into the worlds oceans by year. NHK Japanese World Service



This is on top of the plastic waste already here

- There is a lot here.
- Most of the plastic ever made is still here in some form
- Except for plastic that has been burned
- Breakdown that has occurred is molecular no chemical

Source: "Breaking the Plastic Wave", The Pew Charitable Trusts (2020)

From Source of the Seas to SDGs

Plastic Pollution Is Recognized World Over As Serious Problem Yet:

- **But Plastic Use is Surging Replacing Established Alternatives**
- Our supermarket and pharmacy shelves show mass invasion.
- Historic paper and glass disappearing
- Plastic replacements could be part of a “buy in strategy.”
- Moving to plastic means long period to pay for new equipment.
- Plastic egg cartons pushing out century old paper solution
- **Major oil company’s new plant produces 1.6 metric new tons per year**

Dairy



Glass long gone. Paper on its way to Plastic

In Your Mouth



Balsam Gum & Teeth

Easy to find plastic subs. A few uses then forever

Egg Transport

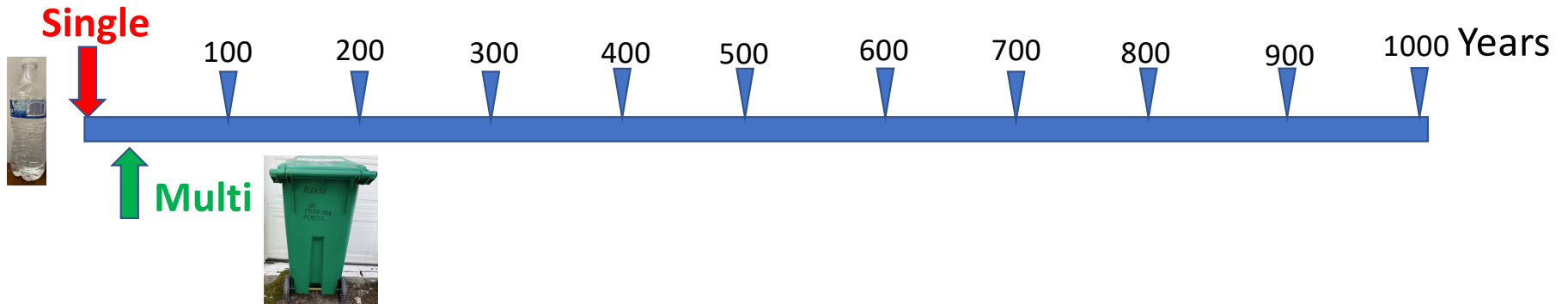


Plastic base With plastic Flip 2nd top

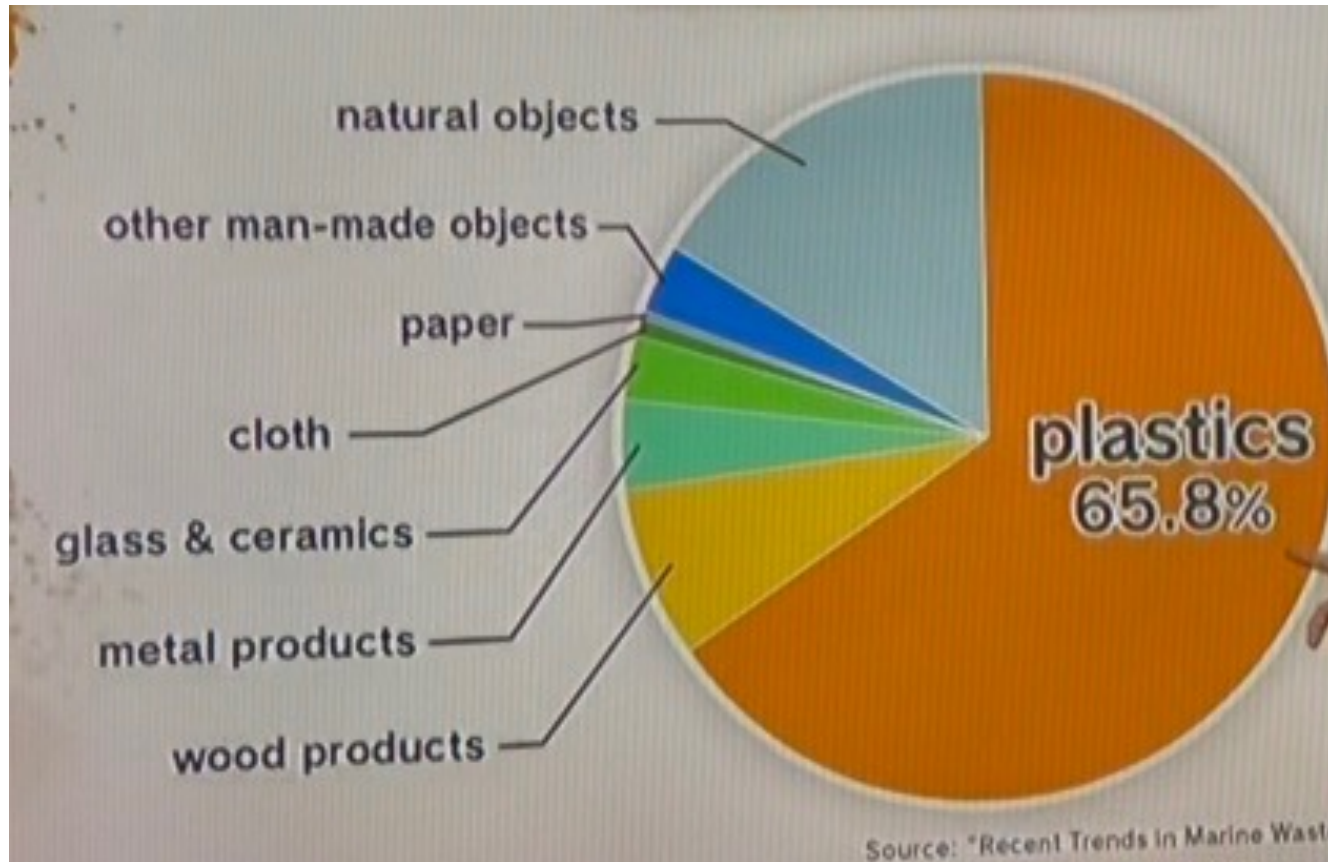
Paper base

We hear a lot about “Single Use Plastics”. But, is there really any other kind? The definition of Single-Use Plastics is well known. It is in the news a lot. “It means a plastic container or device that is discarded once used.

Search “Multi-Use Plastic” and you will get answers (10-15 yr). But relative to the estimated 400 to 1000 year plastic decay, the difference between **“Multi-Use” and “Single-Use”** may be close to the same.



Recycle/Challenge Composition But Only 9% Plastic Gets Recycled



Ghost net story include Japan Efforts



“Ghost Nets” includes fishing gear abandoned in the water. Any net or line left in the ocean can pose a threat to marine life. Wildlife Federation 2023

Some nets are lost. But after 2 to 4 years nets need to be replaced. Disposal of worn nets become a cost. Temptation is to save money and let go of the nets

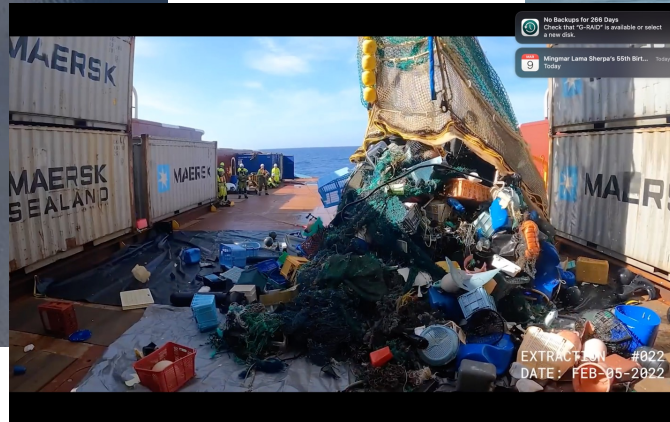
A Japanese NGO Produced over 1,300 metric Tons of recycled nylon last year.

- In Japan nets are replaced every 2 years
- Aim to process about 5 Tons a day.
- Cost needs to come down below original petroleum
- But 80% less CO₂
- Nets come in with many impurities
- **Cleaning technology may be breakthrough for all Plastic Recycling**

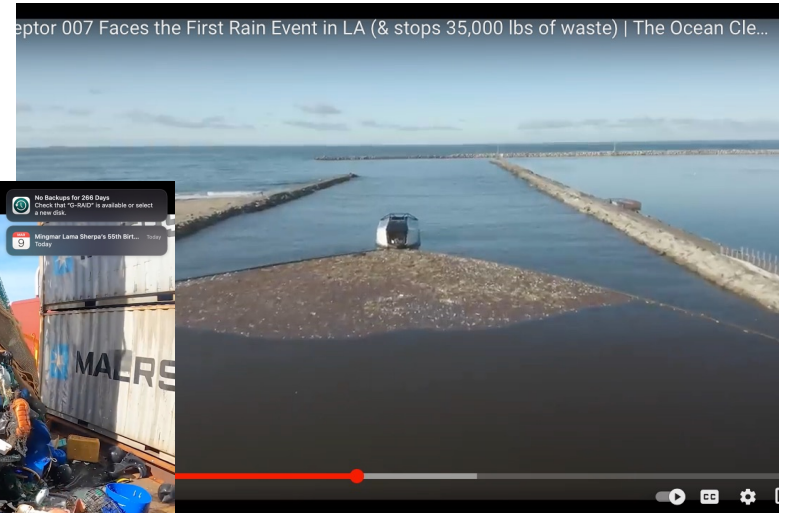
Good Water Recovery Efforts, But What To Do With Plastic



Pacific and other ocean collection projects are recovering a lot of plastic



But success yields more plastic to deal with. On top of what's on land already.



LA 007 Interceptor example of Stream & River collection. Similar projects all over world

Supply Side Reduction And Political Headwinds

Plastic waste crises could use a Climate Change level of concern and direction. World Governments have recently asked people with some or a lot of kickback:

- COVID Lockdown minority resistance used by opposition candidates.
- Vaccination “mandate” political minority kickback
- Climate Change: science itself under attack.

2024 Election Cycle Has Declared Presidential Candidates

- Candidates committed to Climate Change will be reluctant to take on Plastic
- Candidates already against Climate Change and Vaccine may add plastic.
- Those dependent on plastic will support pro-plastic candidates.

However Plastic waste as Resource May Be Closer Than You Think,

- With much lower political intervention
- Moving in Buckminster Fuller’s direction
- See next chart..

Technological Forecast Conditions Look Good. Much Plastic/Petroleum Work
The Broad Front Of R&D Activity Would Make Buckminster Smile
This Level Of Activity Usually Provokes Breakthroughs
To Get A Taste Of The Wave Front Search "Plastic Into Fuel." Much Will Show Up

Universities

In The Hunt

- Purdue
- Washington State
- U Of Cambridge
- UC Irvine
- U Cincinnati
- Swansea
- W Michigan

Active & Planned Programs

- Guntur, India
- Puget-Theniers, France
- UK Recycling Tec
- Chevron
- Blest Corp Japan
- Shinko Tecnos, China
- Envosmart Dutch
- Ozmotech Austria

In In Your Own Home

- Blest Corp Japan
- Puget-Theniers, France
- Numerous YouTube home rigs
- Note: Making Petrol in your own home not advised

Current State Of “Plastic To Petroleum” Looks Very Promising Worldwide Activity Of High and Low Intense Levels Of Technology

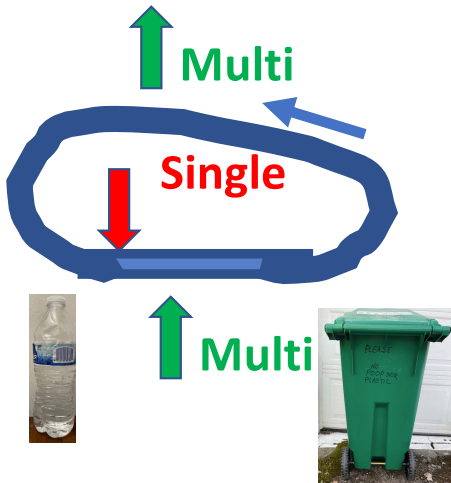
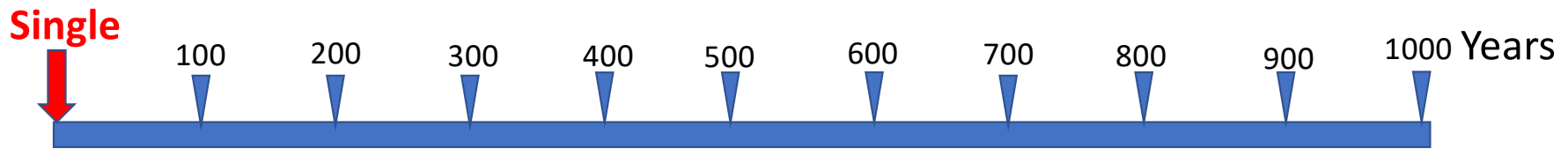
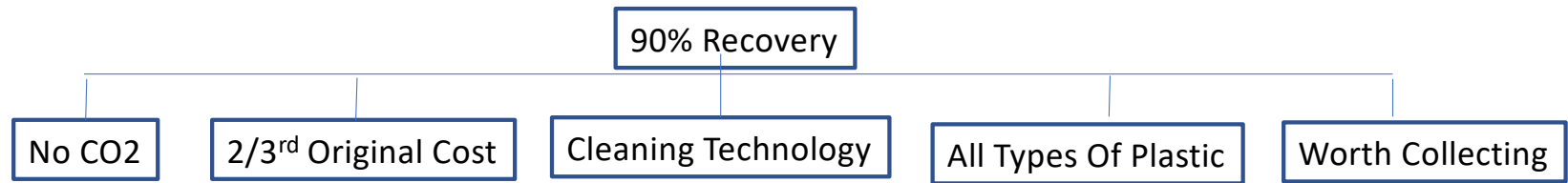
We have

- Worldwide Activity With Many Promising Results
- Some UK Work Also Pulling CO2 From Air As Well
- Different Kinds Of Plastic Needs Different Processes
- City In India Paying Small Amount To Pick Up Plastic Plus Fueling City Vehicles

Need

- Needed: Processes To Take Care Of all plastics at once
- Clean All Types Under All Conditions
- Scaling Process To Comprehensive And Profitable Level
- More International Coordination
- More Subsidies (would not take much more)
- Regulation For example Penalties For Ghost Net Losses
- Petroleum Self-interest To Put More Into It (preserve infrastructure – Jobs)

Systems Engineering: First Two Tiers OF Requirements Document



Petrol → Plastic → Petrol → Plastic

Mimics Organic Life cycle

References: Web References Are Frowned Upon In Academia
However, In This Case We Are Talking About Immediate Tec Status

- Basic “Plastic to Petroleum.” You will find a lot of stuff.
- Examples of doing it home home and large scale
- Harvard School A&S <https://sitn.hms.harvard.edu/flash/2021/converting-plastic-waste-into-fuel/>
- **Purdue innovation Affordable turing Plastics into fuel**
<https://www.purdue.edu/newsroom/releases/2021/Q2/purdue-innovation-that-converts-plastic-waste-into-high-value-fuels-could-turn-recycling-into-a-more-profitable-venture.html>
- Cheveron Phillips contract <https://www.hydrocarbonprocessing.com/news/2023/02/chevron-phillips-chemical-secures-contracted-long-term-supply-of-advanced-recycled-plastic-feedstocks>
- Chevron Plastic to Fuel Cancer Risk <https://www.propublica.org/article/chevron-pascagoula-pollution-future-cancer-risk>

- Only small sample of what is available