WEDNESDAY 21ST AUGUST, 2024 SUSTAINABLE DEVELOPMENT GOALS YOUTH SUMMER CAMP

# Trends and Options of Plastic Alternatives

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# Introduction

### PLASTIC ALTERNATIVES OVERVIEW

A high-level introduction to the presentation on emerging trends and selection of plastic alternatives

### CURRENT PLASTIC USE AND CHALLENGES

Discuss the widespread use of plastic and the environmental and sustainability concerns associated with it

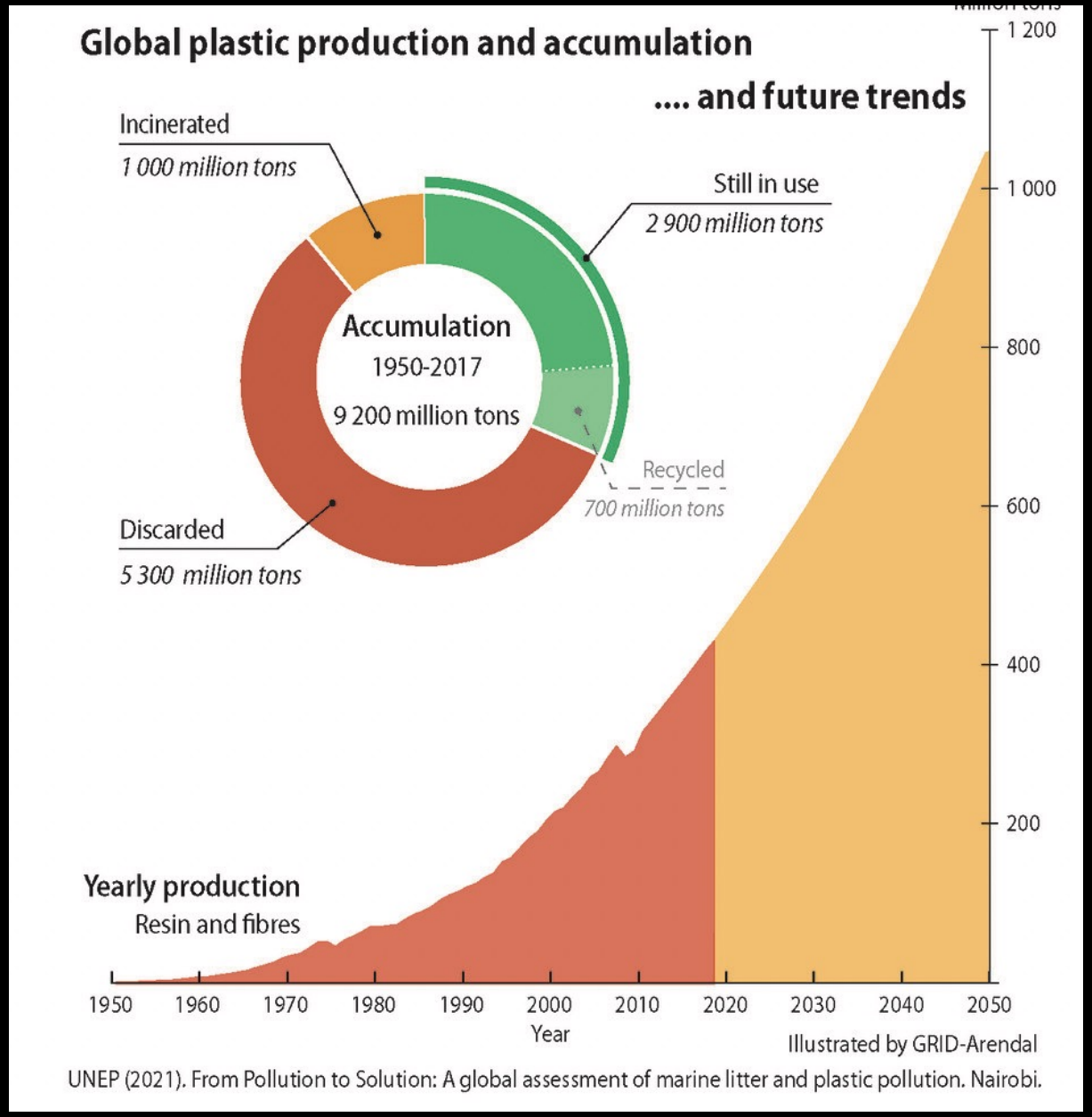
### EXPLORING SUSTAINABLE OPTIONS

Highlight the growing interest in finding eco-friendly and biodegradable alternatives to traditional plastics

### CRITERIA FOR EVALUATING ALTERNATIVES

Outline the key factors to consider when selecting suitable plastic alternatives, such as cost, availability, and performance

**THIS INTRODUCTION SETS THE STAGE FOR A COMPREHENSIVE EXAMINATION OF THE TRENDS AND SELECTION PROCESS FOR PLASTIC ALTERNATIVES, AIMING TO IDENTIFY SUSTAINABLE SOLUTIONS TO THE GLOBAL PLASTIC CRISIS.**




# The Problem with Plastics

Plastic pollution has become a pressing environmental issue, with billions of tons of plastic waste accumulating in our oceans, waterways, and landfills. Traditional plastic, derived from fossil fuels, is slow to degrade and often ends up in natural ecosystems, harming wildlife and contaminating the food chain.

# Types of Plastic Alternatives

### BIODEGRADABLE PLASTICS

Biodegradable plastics break down naturally over time.

### BIO-BASED PLASTICS

Bio-based plastics come from renewable resources, reducing our reliance on fossil fuels.

### RECYCLED PLASTICS

Recycled plastics help us make better use of existing materials, cutting down on waste.

# Biodegradable Plastics

## BENEFITS

Reduced environmental impact, less plastic waste, potential for composting and recycling, renewable and sustainable materials.

## CHALLENGES

Higher cost compared to traditional plastics, limited availability, potential performance issues, lack of infrastructure for disposal and recycling.

## TYPES OF BIODEGRADABLE PLASTICS

Polylactic acid (PLA), polyhydroxyalkanoates (PHA), cellulose-based plastics, starch-based plastics, and bioplastics.

## DISPOSAL AND COMPOSTING

Proper disposal and composting infrastructure is crucial for biodegradable plastics to have a positive environmental impact.

## REGULATIONS AND STANDARDS

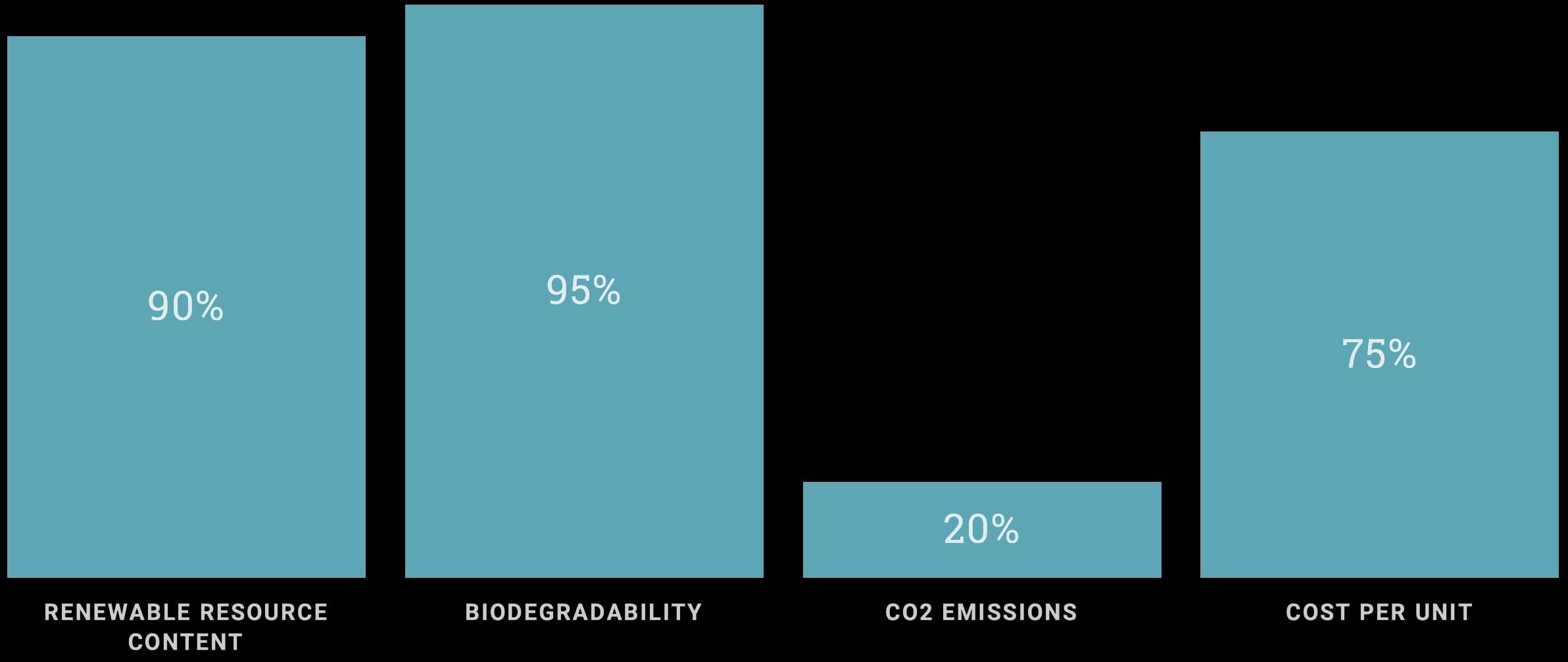
Varying regulations and standards across regions and industries, ensuring consistent and reliable biodegradability claims.

## FUTURE DEVELOPMENTS

Continued research and innovation to improve performance, reduce costs, and expand the availability of biodegradable plastic alternatives.

# Bio-based plastics

Comparing the key environmental and cost factors of bioplastics and traditional plastics



# Recyclable Plastics

## THE PROBLEM WITH PLASTIC WASTE

Plastic waste is a significant environmental issue, with billions of tons of plastic ending up in landfills, oceans, and the natural environment each year. This pollution has harmful impacts on ecosystems, wildlife, and human health.

## IMPROVING PLASTIC RECYCLING

Increasing the recycling rate of plastic is crucial to reducing plastic waste. This involves improving collection, sorting, and processing infrastructure, as well as educating consumers on proper recycling practices.

## RECYCLABLE PLASTIC ALTERNATIVES

There is a growing trend towards the development of more sustainable, recyclable plastic alternatives. These include bioplastics made from renewable resources, as well as plastics designed for easier recycling or biodegradability.

## THE ROLE OF CONSUMERS

Consumers play a vital role in the success of plastic recycling and alternative plastic solutions. By making informed choices, reducing plastic consumption, and properly recycling, consumers can drive demand for more sustainable plastic products and help create a circular economy.

# Emerging Trends in Plastic Alternatives

**2018**

Bioplastics made from agricultural waste gain traction as a sustainable alternative to traditional plastics.

**2019**

Emergence of compostable and biodegradable packaging solutions made from plant-based materials like seaweed, mushrooms, and algae.

**2020**

Development of recyclable and reusable plastic alternatives, including innovative bottle refill systems and reusable food containers.

**2021**

Increased focus on circular economy principles, with companies exploring ways to upcycle and repurpose plastic waste into new products.

**2022**

Advancements in chemical recycling technologies, enabling the conversion of hard-to-recycle plastics into valuable raw materials.

**2023**

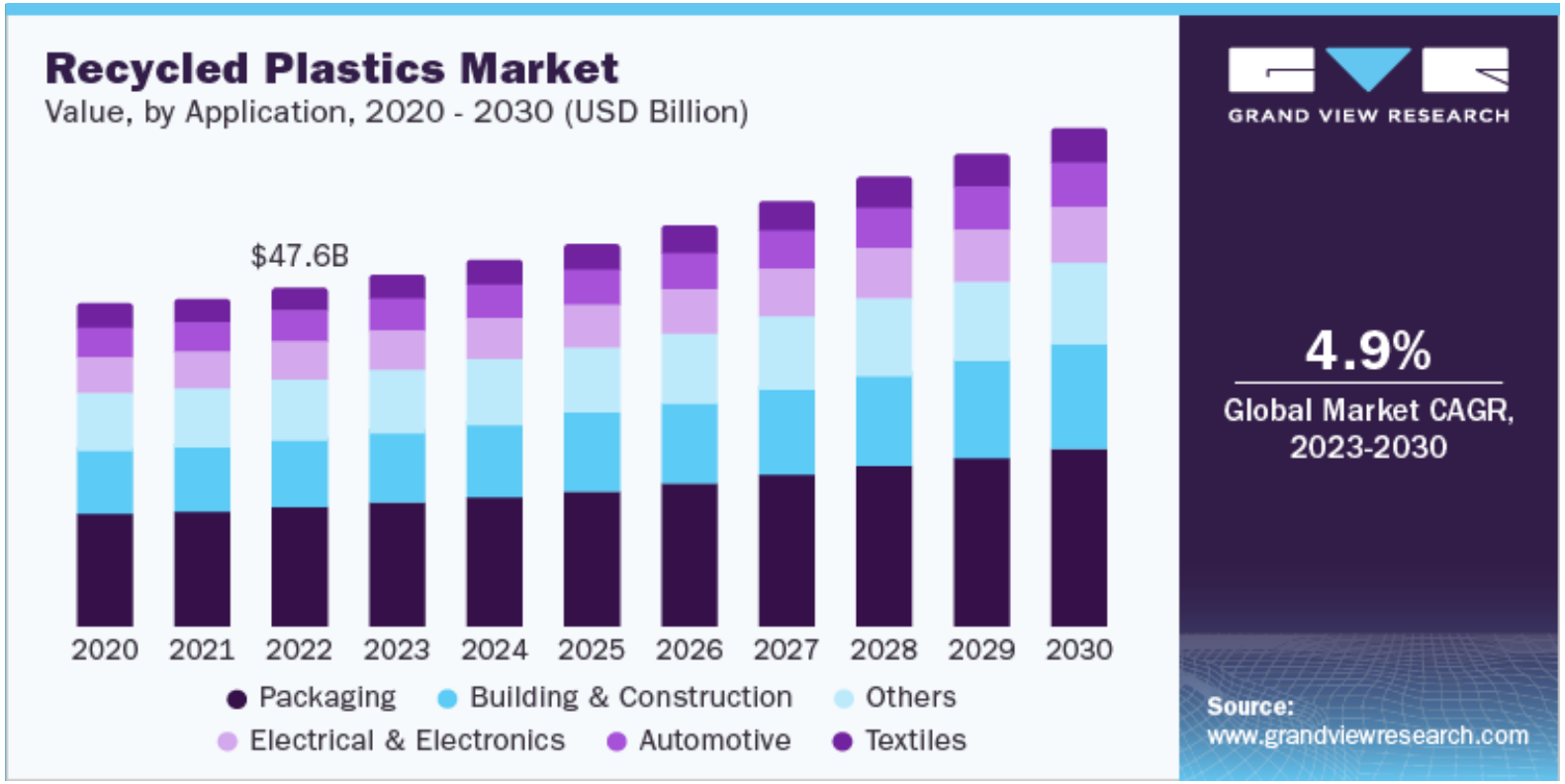
Integration of digital watermarking and smart packaging technologies to improve the sorting and recycling of plastic-based products.

Summer 2024

# Market Trends

"Global demand for plastic alternatives is growing, with Europe and North America leading the way"

"Market Growth is driven by environmental awareness, regulatory pressures, and corporate sustainability initiatives."



# Factors to Consider

- **COST COMPARISON**

  Assess the cost of the plastic alternative compared to the traditional plastic material, considering factors like raw material costs, manufacturing processes, and potential economies of scale. (European Bioplastics, 2021)

- **ENVIRONMENTAL IMPACT**

  Evaluate the environmental footprint of the plastic alternative, including its biodegradability, recyclability, and carbon emissions throughout its lifecycle. (UNEP, 2021)

- **PERFORMANCE CHARACTERISTICS**

  Analyze the physical and chemical properties of the plastic alternative, such as tensile strength, flexibility, heat resistance, and compatibility with existing manufacturing processes. (Nature, 2023)

- **REGULATORY COMPLIANCE**

  Ensure the plastic alternative meets relevant safety and regulatory standards, including restrictions on certain chemicals or materials. (European Bioplastics, 2021)

- **AVAILABILITY AND SUPPLY CHAIN**

  Assess the availability and reliability of the plastic alternative's supply chain, including the sourcing of raw materials, production capacity, and distribution channels. (Innova Market Insights, 2023)

- **CONSUMER ACCEPTANCE**

  Consider the target market's perception and acceptance of the plastic alternative, including factors like aesthetics, branding, and end-user experience. (UNEP, 2021)

Quick Guide

# Selection Criteria for Plastic Alternatives

## LIFECYCLE ASSESSMENT FLOWCHART

**Life cycle assessment is crucial i evaluating the overall impact of each alternative**

## ENVIRONMETAL CRITARIA

**Environmental criteria focus on biodegradability, carbon footprin and resource renewability**

## ECONOMIC CRITERIA

**Long-term economic benefits often outweigh initial higher costs associated with sustainable alternatives**

## TECHNICAL CRITERIA

**Alternatives must meet the functional demands of various applications**

# Policy Support and Recommendations

- **R&D FUNDING**

  This funding is crucial for developing innovative technologies and solutions, particularly in the field of plastic alternatives. By investing in R&D, governments can foster technological advancements and promote sustainable practices.

- **TAX INCENTIVES**

- **REGULATORY FRAMEWORKS**

  Analyze the physical and chemical properties of the plastic alternative, such as tensile strength, flexibility, heat resistance, and compatibility with existing manufacturing processes. (Nature, 2023)

- **INTERMATIONAL COLLABORATION**

  Assess the availability and reliability of the plastic alternative's supply chain, including the sourcing of raw materials, production capacity, and distribution channels. (Innova Market Insights, 2023)

- **CONSUMER EDUCATION**

  Consider the target market's perception and acceptance of the plastic alternative, including factors like aesthetics, branding, and end-user experience. (UNEP, 2021)

# Case Studies


### ECOVATIVE'S MUSHROOM-BASED PACKAGING

Ecovative Design, a sustainable materials company, has developed a plastic alternative made from mycelium, the root structure of mushrooms. This biodegradable and compostable packaging is used by companies like Dell and Ikea.

### SEAWEED-BASED STRAWS BY LOLIWARE

Loliware, a company focused on ædible and compostable alternatives, has created straws made from seaweed. These straws are marine-degradable and provide a sustainable solution to the plastic straw crisis.

### BANANA LEAF PLATES BY BIOTECH INNOVATIONS

Biotech Innovations, an Indian startup, has pioneered the use of dried banana leaves to create durable, compostable plates and bowls. This innovative solution helps reduce plastic waste while supporting local farmers.


### WHEAT STRAW CUTLERY BY VERTERRA

Verterra, a US-based company, manufactures cutlery made from wheat straw, a byproduct of wheat farming. This biodegradable and renewable alternative to plastic cutlery is being used by cafes and restaurants across the country.


# Thank you

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