

FROM SCIENCE TO GLOBAL ACTION



DAV CTE KORAPUT

World Ozone Day, 16th September 2025



PREFACE

With reference to the subject cited above I directed to say that the Forest, Environment & Climatic Change Department, Government of Odisha has informed that World Ozone Day will be observed on 16th September 2025 with the theme "From Science to Global Action". The Ministry of Environment, Forest & Climate Change (MOEF&CC).

As per the indicative list of activities for observance of World Ozone Day 2025. The following may be taken up in your institution:

- I. Promote awareness among students on the importance of protecting the stratospheric ozone layer.
2. Encourage publication of articles in print/electronic media highlighting and promoting the availability of climate-friendly products.
3. Organise scientific/technical webinars, seminars, or lectures on ozone layer protection and its positive climate impact, particularly with reference to the Montreal Protocol.

Based on the above criteria to fulfil DAV CTE, Koraput published this article on climate-friendly products.

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1st yr

Climate-Friendly Products

In the face of escalating climate change, the importance of adopting sustainable practices and products cannot be overstated. The world is at a critical juncture, where the decisions we make today will determine the quality of life for future generations. One crucial step towards mitigating the impacts of climate change is the adoption of climate-friendly products. These products, designed with sustainability at their core, offer a beacon of hope for a future where economic growth and environmental stewardship go hand in hand.

Understanding Climate Change

Climate change is no longer a distant threat; it is a reality that affects us all. Rising temperatures, more frequent natural disasters, and unpredictable weather patterns are just a few of the many indicators of the planet's deteriorating health. Human activities, particularly the emission of greenhouse gases like carbon dioxide and methane, are significantly contributing to this crisis. The burning of fossil fuels for energy, deforestation, and industrial processes are among the primary culprits.

The Role of Climate-Friendly Products

Climate-friendly products are goods and services that are designed to reduce environmental impact. They are made from sustainable materials, are energy-efficient, and are produced with minimal waste and pollution. By choosing these products, consumers can significantly reduce their carbon footprint, support sustainable practices, and contribute to the global effort to combat climate change.

The Benefits of Climate-Friendly Products

1. **Environmental Impact:** Climate-friendly products help reduce greenhouse gas emissions, conserve natural resources, and minimize waste.
2. **Health Benefits:** Many climate-friendly products are free from toxic chemicals and pollutants, contributing to better health and well-being.
3. **Economic Benefits:** Sustainable products can lead to cost savings through reduced energy consumption and extended product lifetimes.
4. **Social Responsibility:** By supporting climate-friendly products, consumers can promote sustainable practices and encourage businesses to adopt environmentally-friendly policies.

Examples of Climate-Friendly Products

1. Renewable Energy Systems: Solar panels, wind turbines, and geothermal systems provide clean energy alternatives to fossil fuels.
2. Energy-Efficient Appliances: LED bulbs, energy-efficient refrigerators, and smart thermostats can help reduce energy consumption and lower utility bills.
3. Sustainable Fashion: Eco-friendly fashion brands prioritize environmentally-friendly materials, production methods, and supply chains.
4. Eco-Friendly Cleaning Products: Natural cleaning products are made from biodegradable ingredients and are free from harsh chemicals.

The Future of Sustainability

As awareness about climate change and its impacts grows, the demand for climate-friendly products is expected to increase. Governments, businesses, and consumers must work together to create a sustainable future. This can be achieved through policies that support sustainable practices, investments in clean technologies, and conscious consumer choices.

Conclusion

The adoption of climate-friendly products is a crucial step towards a sustainable future. By understanding the benefits of these products and making informed choices, we can reduce our environmental impact, promote sustainable practices, and contribute to the global effort to combat climate change. As we move forward, it is essential to prioritize sustainability, support eco-friendly policies, and encourage others to join the journey towards a more sustainable future.

1. Educate Yourself: Learn about climate-friendly products and sustainable practices.
2. Make Conscious Choices: Choose products that are designed with sustainability in mind.
3. Support Sustainable Brands: Look for brands that prioritize environmental stewardship and sustainable practices.
4. Advocate for Change: Encourage policymakers and businesses to adopt sustainable practices and support eco-friendly policies.

By working together, we can create a more sustainable future and ensure a healthy planet for generations to come.

Chinmayee Chandra Mohapatra

Roll No. - 79

1st yr

The Two Worlds of 2050: The Choice We Make Today

Scene 1: The Grey Future

It's 2050, and the sky never clears. A dull twilight hangs overhead, thick with smoke and dust. You wake not to birdsong, but to the sound of someone coughing in the street below—a reminder that inhalers are worth more than gold here.

The water from your tap carries a bitter aftertaste, filtered and refiltered from an overworked desalination plant. Outside, the streets feel abandoned. An old petrol car splutters past, leaving behind a trail of fumes. Children no longer play outdoors; the air is too harsh for games.

You scroll through faded photos of forests and glaciers, of skies so blue they look unreal. Your grandparents swore they were once ordinary. Now, they feel like postcards from another planet.

This is not an accident. It is the slow result of small compromises and silent apathy.

Scene 2: The Green Future

Another version of 2050 begins differently.

Morning sunlight is caught by your window itself, which doubles as a solar panel. The room smells of rain and jasmine drifting in from a garden-lined street. You dress in clothes that grew from mushrooms and recycled fibers but feel softer than cotton.

Your coffee was grown in a forest farm that heals the soil while feeding families. Stepping outside, you don't hear traffic—you hear laughter. Electric pods glide silently along streets turned into parks. Buildings are wrapped in vertical gardens, alive with color and shade.

This world is not a fantasy. It is the direct result of choices made decades earlier. The future of our children isn't waiting in some laboratory—it's waiting in our shopping carts, our dinner plates, our everyday decisions.

This isn't a dry documentary. It's a thriller. The world is the set, and we are both the heroes and the potential victims. The tools to change the ending aren't hidden—they're already in our homes, shops, and neighborhoods.

Each product we choose is a plot device. Together, they push the story toward either the Grey... or the Green.

Act I - power

The Hero: Solar roofs. No longer clunky add-ons, but the roof itself—seamless, durable, and quietly turning sunlight into power.

The Supporting Cast:

Smart thermostats that learn your habits and cut waste.

Smart plugs that stop “phantom power” from draining your bills.

Why it matters: Energy is the single largest source of global emissions. Switching to renewables doesn't just shrink bills—it rewrites the story from pollution to resilience.

Act II: Transport — Freedom Without Chains

The Hero: Electric vehicles, powered by the sun on your own roof. No exhaust, no gas stations, no guilt.

The Sidekick: E-bikes, zipping past traffic, flattening hills, and making city life breathable again.

Why it matters: Transport emissions are rising fast. Each EV and e-bike is a blow against oil dependence and a step toward cleaner, freer cities.

Act III: Food — The Soil is the Soul

The Hero: The modern plant-based burger. Juicy, indulgent, and crafted to use 90% less land and water than beef.

The Revolutionaries: Vertical farms rising in city centers—lush towers growing pesticide-free food year-round with a fraction of the resources.

Why it matters: What we eat shapes the planet. Choosing plant-based and local regenerative farms helps protect rainforests, rebuild soil, and restore balance.

Act IV: Home — The Sanctuary We Build

Quiet Warriors:

A countertop composter that turns scraps into rich soil overnight.

A single, elegant metal razor—lasting a lifetime, instead of endless disposables.

Cleaning tablets that dissolve in water, ending plastic jug waste.

Why it matters: Our homes can be waste factories or sanctuaries. Choosing well-made, waste-free products is more than minimalism—it's survival made simple.

This film doesn't end on its own. Its climax is being written right now, in the choices we make daily. Every time you choose... green power over the default grid, an EV or e-bike instead of a gas car, a plant-based meal instead of factory-farmed meat, reusable over disposable...

...you are voting for the Green. You are helping turn the tide.

The truth is, this isn't about perfection. It's about progress—one better choice, and then another. Because when millions of people choose, markets shift, policies follow, and futures change.

The curtain is rising. The camera is already rolling. 2050 will arrive whether we act or not.

The only question is: Do we step into it as survivors in the Grey... or as builders of the Green?

Let's write the ending we'd be proud to leave behind.

Thank you,...

Bibhushree Behera
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2nd yr

CLIMATE FRIENDLY PRODUCTS: A STEP TOWARDS SUSTAINABLE LIVING

The world today faces one of the most urgent challenges in human history: climate change. Rising global temperatures, melting glaciers, unpredictable weather patterns, and increasing levels of pollution threaten not only ecosystems but also human health, livelihoods, and economic stability. While governments, industries, and international organizations are making efforts to mitigate climate change, individuals too can play a crucial role. One powerful way is through the adoption and promotion of climate-friendly products—goods designed, produced, used, and disposed of in ways that reduce their environmental footprint.

These products minimize greenhouse gas emissions, conserve energy and water, encourage the use of renewable resources, and reduce waste. From bamboo toothbrushes and biodegradable packaging to solar-powered devices and electric vehicles, climate-friendly products provide a pathway to align consumption patterns with sustainability goals.

UNDERSTANDING CLIMATE FRIENDLY PRODUCTS

Climate-friendly products are designed with the environment in mind at every stage of their life cycle—from sourcing of raw materials to production, distribution, usage, and disposal. Their defining feature is the reduction of carbon emissions and other harmful impacts on the environment.

Key Characteristics:

-  Low Carbon Footprint – They require less energy and generate fewer emissions during manufacturing and use.
-  Sustainable Materials – They are made from renewable, recycled, or biodegradable materials.
-  Energy Efficiency – They consume minimal energy, often relying on renewable sources.
-  Durability and Reusability – They last longer and encourage reuse instead of single-use.
-  Safe Disposal – They are biodegradable, recyclable, or compostable, leaving little or no harmful waste.

Examples include solar lamps, reusable cloth bags, bamboo-based household products, electric scooters, organic clothing, biodegradable packaging, and plant-based foods.

THE NEED FOR CLIMATE FRIENDLY PRODUCTS



Rising Greenhouse Gas Emissions

Industrialization, transportation, and over-consumption have led to high levels of carbon dioxide and methane emissions. Climate-friendly products help lower emissions through cleaner production and use of renewable resources.



Resource Depletion

Earth's natural resources are finite. Unsustainable consumption patterns are exhausting forests, water, and fossil fuels. Sustainable products ensure efficient resource use and encourage circular economies.



Plastic Pollution

Conventional products often rely on plastics that persist for centuries. Biodegradable packaging and reusable alternatives significantly reduce this burden.



Consumer Awareness

Modern consumers are increasingly aware of environmental issues. They demand ethical, eco-friendly, and transparent product options, driving markets towards sustainability.

THE GROWING CONSUMER MINDSET

A major catalyst for this movement is a significant shift in consumer values. Data shows that a substantial percentage of consumers are not only aware of environmental issues but are actively changing their purchasing habits to address them.



Generational divide: younger generations, particularly Millennials and Gen Z, are driving this trend. Studies show they are more likely to prioritize sustainability and are even willing to pay a premium for eco-friendly products.



Demand for transparency: Consumers are holding companies accountable for their environmental claims. Clear labeling, third-party certifications like Fair Trade or B Corp and supply chain transparency are becoming critical for building trust.



Digital empowerment: Tools like apps and social media platforms are empowering shoppers with information to help them

CATEGORIES OF CLIMATE FRIENDLY PRODUCTS

-  Household products, bamboo toothbrushes, combs, and kitchenware. Reusable cloth or jute shopping bags Energy-efficient LED bulbs and appliances Water-saving taps and showerheads
-  Personal Care and Fashion Organic and herbal cosmetics Bamboo or cork-based footwear Eco-friendly fabrics like organic cotton, hemp, and bamboo. Natural skincare products free of harmful chemicals
-  Food and Beverages Organic produce grown without synthetic pesticides Plant-based proteins (soy, pea, and mushroom-based foods) Locally sourced products reducing transportation emissions Packaging-free bulk food stores
-  Technology and Energy Solar-powered lanterns, chargers, and cookers Energy-efficient laptops, refrigerators, and washing machines Smart home devices that optimize energy use
-  Transport and Mobility Electric vehicles (EVs) and bicycles Ride-sharing apps reducing the number of cars on the road public transportation systems powered by renewable energy
-  Packaging and Materials Biodegradable packaging made of cornstarch or bagasse Compostable cutlery and plates from areca leaves or bamboo Recycled paper and cardboard products.

BENEFITS OF CLIMATE FRIENDLY PRODUCTS

-  Environmental Benefits:
 - Reduced carbon emissions and energy use
 - Conservation of forests, water, and minerals
 - Decrease in pollution and waste
-  Health Benefits:
 - Chemical-free personal care reduces risks of skin diseases and allergies
 - Organic food promotes better nutrition and avoids pesticide-related illnesses
 - Cleaner air and water due to lower emissions and waste
-  Economic Benefits:
 - Long-term cost savings from durable, reusable products
 - Energy-efficient appliances lower electricity bills
 - Growth of green industries creates new employment opportunities
-  Social and Ethical Benefits:
 - Encourages fair trade and ethical labor practices

- Strengthens community-based enterprises (such as bamboo crafts or organic farming)
- Promotes responsible consumption and lifestyle choices
- Challenges in Adopting Climate Friendly Products

DESPITE THEIR NUMEROUS BENEFITS, CLIMATE-FRIENDLY PRODUCTS FACE SEVERAL OBSTACLES

-  High Initial Cost – Many eco-friendly goods, like solar panels or EVs, are expensive upfront, discouraging buyers despite long-term savings.
-  Limited Awareness – A significant portion of consumers lack knowledge about sustainable options or their benefits.
-  Greenwashing – Some companies falsely market products as eco-friendly, misleading customers and undermining trust.
-  Limited Availability – In rural or remote areas, climate-friendly alternatives may be difficult to access.
-  Behavioral Resistance – People often prefer convenience and affordability over long-term environmental benefits.
-  Solutions and Strategies for Wider Adoption
-  Government Policies and Incentives – Subsidies for renewable energy products, tax benefits on electric vehicles, and strict regulations against single-use plastics.
-  Corporate Responsibility – Businesses must adopt sustainable production, transparency in labeling, and genuine eco-friendly innovations.
-  Consumer Awareness Campaigns – Educating people through schools, media, and social platforms about the benefits of climate-friendly living.
-  Affordable Innovations – Research and development should focus on making sustainable products affordable and widely available.
-  Circular Economy Models – Encouraging recycling, reusing, and repairing products to extend life cycles and reduce waste.

MARKET OPPORTUNITIES

The global market for climate-friendly products is rapidly expanding. Reports indicate growing investments in renewable energy, organic food, green packaging, and electric mobility. For entrepreneurs, this is a golden era to innovate and create eco-conscious brands. Startups focusing on bamboo-based goods, plant-based foods, eco-fashion, and zero-waste packaging are already gaining traction.

India, for example, has a strong base of traditional crafts and natural resources, offering vast opportunities in bamboo products, jute bags, herbal skincare, and solar energy solutions. Similarly, developed nations are investing heavily in electric vehicles, smart homes, and carbon-neutral packaging.

ROLE OF CONSUMERS IN DRIVING CHANGE

The success of climate-friendly products ultimately depends on consumer choices. By adopting sustainable products, individuals send strong market signals, encouraging industries to innovate and governments to support green policies. Small lifestyle changes—like carrying a reusable bottle, preferring local produce, or switching to LED lights—can collectively create a massive impact.

THE FUTURE OF CLIMATE FRIENDLY PRODUCTS

Looking ahead, the demand for eco-friendly goods will only increase. Advancements in technology will bring more affordable solar panels, efficient EVs, biodegradable materials, and carbon-neutral buildings. Smart cities and sustainable industries will integrate these products into mainstream life. Moreover, with international agreements like the Paris Accord emphasizing climate action, governments worldwide are compelled to support green initiatives. This will ensure that climate-friendly products are no longer seen as luxury or niche items but as essential everyday choices.

CONCLUSION

Climate change is not just an environmental issue—it is a social, economic, and moral challenge. Climate-friendly products represent a practical and accessible solution, empowering individuals, communities, and nations to contribute to sustainability. By reducing emissions, conserving resources, and promoting responsible consumption, these products help protect the planet for future generations.

However, for their widespread adoption, collaborative efforts are needed from policymakers, industries, entrepreneurs, and consumers alike. Each eco-friendly choice—no matter how small—creates ripples of positive impact. As Mahatma Gandhi once said, “Be the change that you wish to see

in the world.” By choosing climate-friendly products, we are indeed becoming that change and paving the way for a healthier, greener, and more resilient planet.

Amaresh Biswas

Roll No. - 31

1st yr

Climate Friendly Products

Introduction

In the present era of increasing global warming and climate change, the importance of adopting climate-friendly products has gained immense recognition. Human activities, particularly industrialization, deforestation, and the excessive use of fossil fuels, have caused significant damage to our environment. As a result, rising temperatures, extreme weather conditions, melting glaciers, and the loss of biodiversity threaten the planet's sustainability. One of the most effective ways to address this crisis is by shifting our lifestyle and consumption habits towards eco-friendly and sustainable alternatives. Climate-friendly products play a vital role in reducing greenhouse gas emissions, conserving energy, and promoting a healthier environment for present and future generations.

Definition of Climate-Friendly Products

Climate-friendly products are goods and services designed and manufactured with minimal impact on the environment. These products are energy-efficient, biodegradable, recyclable, or made from sustainable materials. They help reduce carbon footprints and support renewable energy sources. Examples include solar panels, organic food, biodegradable packaging, electric vehicles, reusable water bottles, energy-efficient appliances, and products made from recycled materials.

The Need for Climate-Friendly Products

The Earth is experiencing a climate crisis caused by human overconsumption and unsustainable production. The excessive burning of coal, oil, and gas for energy has led to higher concentrations of carbon dioxide and other greenhouse gases in the atmosphere. These gases trap heat and result in global warming. If this trend continues, it will lead to catastrophic impacts, including floods, droughts, hurricanes, rising sea levels, and food insecurity. Therefore, adopting climate-friendly products is not just an option but a necessity to protect the environment and ensure human survival.

Benefits of Climate-Friendly Products

1. Reduction in Carbon Emissions:

Climate-friendly products reduce the release of greenhouse gases. For instance, electric vehicles emit

far less pollution than conventional petrol or diesel vehicles. Similarly, solar energy products reduce dependence on coal-based power generation.

2. Conservation of Natural Resources:

Sustainable products ensure that natural resources such as water, forests, and minerals are used responsibly. For example, bamboo-based products are more sustainable than those made from plastic because bamboo is fast-growing and biodegradable.

3. Promotion of Renewable Energy:

Many climate-friendly products encourage the use of renewable energy sources like solar, wind, and hydropower, which are abundant and eco-friendly compared to fossil fuels.

4. Waste Management and Recycling:

Products made from recycled materials or designed for reuse reduce the burden of waste on the environment. Reusable bags, bottles, and containers significantly cut down on single-use plastics.

5. Health Benefits:

Eco-friendly products such as organic food, non-toxic cleaning materials, and natural fibers reduce exposure to harmful chemicals, thus ensuring better health and well-being.

Examples of Climate-Friendly Products

1. Solar Panels and Solar Cookers:

These products harness solar energy, reducing reliance on electricity generated from fossil fuels.

2. Electric Vehicles (EVs):

EVs reduce air pollution and help combat climate change by eliminating exhaust emissions.

3. Biodegradable Packaging:

Made from natural substances like cornstarch or sugarcane fibers, biodegradable packaging decomposes easily without harming the soil or water.

4. Reusable Household Items:

Steel straws, cloth bags, glass containers, and water bottles help minimize plastic waste.

5. Organic Farming Products:

Organically grown crops avoid the use of chemical pesticides and fertilizers, thus protecting the soil and human health.

6. Energy-Efficient Appliances:

LED bulbs, energy-efficient refrigerators, and washing machines consume less power, thereby

lowering electricity bills and reducing greenhouse gas emissions.

Challenges in Promoting Climate-Friendly Products

Despite their benefits, climate-friendly products face several challenges. These include high initial costs, lack of awareness among consumers, limited availability in certain areas, and resistance from industries dependent on fossil fuels. Additionally, some people believe that eco-friendly alternatives are less durable or convenient, which discourages widespread adoption.

Role of Government and Policies

The government plays a crucial role in promoting climate-friendly products through policies, subsidies, and awareness campaigns. By providing financial incentives for renewable energy, banning single-use plastics, and enforcing strict environmental regulations, governments can encourage industries and consumers to shift towards sustainable practices. Educational institutions also play a significant role in spreading awareness among the youth about the importance of eco-friendly choices.

Role of Education and Youth

Students and young people are the future leaders of society. By adopting sustainable habits such as using reusable stationery, preferring bicycles over motorbikes for short distances, and practicing waste segregation, youth can set an example for others. Educational programs that integrate environmental awareness into the curriculum can create responsible citizens who prioritize climate-friendly living.

Conclusion

Climate-friendly products are no longer luxuries; they are essential tools for survival in the 21st century. By reducing carbon emissions, conserving natural resources, promoting renewable energy, and safeguarding human health, these products pave the way for a sustainable future. However, their widespread adoption requires collective efforts from individuals, industries, and governments alike. Every consumer choice matters. Whether it is carrying a cloth bag to the market, investing in solar panels, or choosing organic food, small steps together create a significant impact.

As global citizens, it is our responsibility to embrace climate-friendly products and contribute to the protection of our planet. The Earth is our shared home, and safeguarding it for future generations should be our ultimate priority. Only through conscious efforts and sustainable practices can we ensure a cleaner, greener, and healthier world for all.

Mitrajit Panigrahi
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1st yr

Are You Being Greenwashed? A Smart Shopper's Guide to Real Sustainability

The Aisle of Doubt :-

Picture this: you're standing in the supermarket aisle, two laundry detergents in hand. One is your old, reliable brand. The other is wrapped in green leaves, stamped with bold promises—"eco-friendly," "all-natural," "planet-positive."

You pause. You want to choose better. But deep down, a voice asks: is this really helping, or just making me feel less guilty?

If you've ever had that moment of doubt, you're not alone. Welcome to the modern shopper's dilemma: navigating a marketplace where every product wants to look greener than the next. Some of it is real progress. A lot of it is marketing spin. So how do you tell the difference?

Part 1: The Green Sheen

"Greenwashing" isn't just a buzzword—it's a business strategy. It's when companies exaggerate or invent eco-claims to win your trust.

Think of the oil giant bragging about its tiny solar program while drilling record amounts of crude. Or the fast-fashion brand with a "conscious collection" made from "recycled" fabric... which turns out to be just 10% recycled polyester, stitched into millions of throwaway clothes.

The trick is often in the words. Natural, planet-friendly, clean, green. Sounds good, means little. Even arsenic is natural.

And sometimes, focusing on one angle hides the bigger picture. That “vegan leather” jacket? Yes, it avoids animal skin. But if it’s made from polyurethane, it sheds microplastics and lingers for centuries. True sustainability isn’t just about carbon—it’s about water, chemicals, biodiversity, and fair labor too.

Part 2: The Sustainability Hierarchy That Actually Works

Before we ask which product to buy, the smarter question is: do I need it at all?

The old “Reduce, Reuse, Recycle” mantra is more than a slogan—it’s a hierarchy. Here’s the mindset shift conscious consumers use:

- Rethink – Do I actually need this? Could I borrow, rent, or go without?
- Reduce – If I must buy, can I use less or buy in bulk to cut packaging waste?
- Reuse/Repair – Fix before replacing. Thrift before buying new.
- Replace – Only if the first three fail, choose the most responsible product available.

When you flip the script like this, “green” products stop being the easy guilt-button and start being the last, best resort.

Part 3 - How to Be a Label Detective

Let’s say you do need something new. Now it’s time to go full detective mode. Here’s a 6-step checklist:

- Check Certifications – Look for trusted, third-party stamps like B Corp, Fair Trade, FSC, USDA Organic, Energy Star.
- Read the Materials – Is that “bamboo” really bamboo, or chemically processed viscose?
- Check the Origin – Was it shipped across the world or locally made?
- Lifecycle Questions – What happens when it’s done? Recyclable, compostable, or landfill forever?
- Transparency Test – Does the brand clearly share its supply chain, or hide behind vague claims?
- Audit Clues – Are there independent reports or watchdog reviews, or just pretty packaging?

According to a European Commission study, over 40% of green claims made online are misleading or exaggerated. That's why detective work matters

Part 4: The Decision Flow

Choices still messy? Here's a simple decision path you can literally sketch on a sticky note:

Do I need it?

→ No → Don't buy.

→ Yes → Can I repair or borrow instead?

→ Yes → Do that.

→ No but must buy → Check labels + lifecycle → Only purchase if it passes.

Most purchases get filtered out before step three. And that's the point.

Part 5: Beyond Your Cart

Here's the hard truth: you can't shop your way out of climate change.

Yes, your choices matter. They shape demand and push industries to improve. But the real lever isn't just your wallet—it's your voice. Corporations and governments shape the rules of the game, and they need pressure.

Vote for leaders who back climate policy. Support laws that make companies responsible for their waste. Speak up on social platforms, in community groups, at the ballot box. Buying "better" matters. But demanding better systems matters more.

Part 6: Progress, Not Perfection

- Conscious consumption isn't about eco-perfection. It's about stacking better choices over time. Repairing instead of replacing. Asking one more question before buying. Supporting brands that prove their claims.
- I once bought a "biodegradable" phone case, only to learn it needed an industrial composting facility—which didn't exist in my city. Into the trash it went. A small lesson: not all "green" promises are made equal.

- Celebrate the small wins: the shoes you repaired, the detergent you refilled, the fast-fashion ad you scrolled past with a skeptical smile. Every act chips away at the illusion that guilt-free consumption is just a shopping trip away.

So next time you're in that aisle, remember: the greenest choice isn't the one that looks good—it's the one that does good.

Sudeep Das
Roll No. - 74
1st yr

THE GOAT ARTICLE ON CLIMATE-FRIENDLY PRODUCTS (NO, SERIOUSLY)

You've been lied to.

Climate-friendly gear isn't charity. It's not about guilt, sacrifice, or living like a monk. It's an upgrade.

That reusable bottle? Smarter flex than a Supreme hoodie.

Solar panels? They don't just save the planet—they slap fossil fuel companies across the face. EVs? Faster, cleaner, and cooler than anything your uncle's pickup can do.

Climate-friendly products aren't for tree-huggers. They're for winners. Let's break it down.

1. THE LIE YOU'VE BEEN SOLD

Here's the plot twist: for decades, corporations told you your choices don't matter. That you recycling a soda can while they dump barrels of waste into rivers is pointless.

But look around:

Five years ago, oat milk was "hipster." Now Starbucks keeps it on tap. Vintage thrifting? Once a niche. Now it's a \$36 billion market.

Tesla went from a meme stock to outselling BMW in the U.S. Why? Because millions of people voted with their wallets.

Your shopping cart is louder than you think.

🔖 Bold line to share: “Every receipt is a receipt for the future you want.”

⚡ 2. THE GOAT PRODUCTS (THAT ACTUALLY SLAP)

Forget boring “eco-friendly tips.” These are sustainable upgrades you actually want:

Home batteries + Solar panel

Be your own power company. No blackouts. No surprise bills. Just clean energy.

Case in point: In Adelaide, Australia, an entire neighborhood went solar + battery. Result? Bills basically vanished. Vibe? Untouchable.

"You don't pay the grid. The grid pays you."

🚗 **Electric Vehicles (EVs)**

EVs aren't the future—they're the now.

Instant torque. Silent flex. Plug in at night, wake up fully “fueled. Maintenance? Practically none. Oil changes are dead.

And it's not just Tesla—Hyundai Ioniq, Ford Mustang Mach-E, Kia EV6. They're all beasts. Fun fact: In Norway, EVs already outsell gas cars.

🍔 **Plant-Based Meat**

Burgers that taste like burgers, minus the climate hangover. Uses 90% less land + water.

Same grill marks, same flavor, less guilt. Burger King's Impossible Whopper has already sold millions. That's not hippie food. That's mainstream.

👕 **Sustainable Fashion**

Stop funding fast fashion landfill piles. Patagonia repairs your jacket for free. Veja sneakers = ethical drip.

Thrifting is the new luxury—vintage Levi's > polyester sweatshop garbage.

Mini-story: My friend grabbed a \$20 thrifted leather jacket that gets more compliments than my \$200 Zara one.

Refillable Everything

From soap tablets to detergent refills, you slash plastic without sacrificing vibes. Blueland, CleanCult, Everdrop = eco + aesthetic.
Your kitchen looks Pinterest-worthy, and your trash bag cries less.

3. THIS ISN'T "ECO-FRIENDLY." THIS IS ELITE.

Let's kill the myth: sustainability isn't sacrifice—it's status. Money saved: Solar cuts bills. EVs save gas + repairs. LED bulbs last years. Better quality: Reusables are tougher. Ethical brands focus on durability.

Social flex: Pull up with a Tesla, Veja kicks, oat latte in a KeepCup. Tell me that doesn't hit. "The new luxury isn't waste—it's care."

4. The Future is Already Here

If you're not paying attention, you're already behind. Renewable energy is cheaper than coal. EVs outsell manuals (and soon, gas cars).

Plant-based meat is eating into a trillion-dollar industry. Even airlines are testing sustainable jet fuel.

This isn't a fringe rebellion—it's the mainstream takeover. Line to tweet: "The future isn't green. The future just is."

5. Your Move

You can keep scrolling, convinced your choices don't matter. Or you can start playing like a wizard. Swap one meal for plant-based. Test-drive an EV this weekend. Try a refill kit for your soap. Just one switch. That's all it takes. Because the truth is this:

👉 The greatest products aren't just climate-friendly.

👉 They're life-friendly.

And honestly? They're just built different. Stay sharp. 🌍 🙌

Sushree Liteswari Priyadarshini

Roll No. - 69

1st yr

Climate friendly products

Introduction:

The term “climate-friendly” is used to describe activities which are good for the environment. It is a shortening of “ecologically friendly,” and you may also hear terms like “environmentally friendly” or “green” used to describe similar activities. There are a range of ways in which activities can be eco or environmentally friendly, ranging from products which are constructed in an environmentally friendly way to making lifestyle changes which are designed to benefit the environment.

People engage in Climate-friendly activities because they are concerned about the health of the environment. Environmental issues were first pushed to the forefront of the collective consciousness in the late 1900s, when people realized that their activities were having a negative impact on the environment. Pollution, rampant use of natural resources, and other activities were questioned in light of information about how these activities hurt the environment, and people began to look into more environmentally friendly ways of living and doing business.

Many savvy companies realized that investing in green product development would pay off, and lines. Of eco-friendly products can be found in many regions of the world today as a result. These products are usually made in factories which are environmentally friendly, such as facilities built from recycled materials which use solar panels for power, and they

are made from components which are also good for the environment, like plant-sourced ingredients for soaps, or recycled metal for electronics. Product packaging, advertisements, and other materials may also be environmentally friendly.

Strictly speaking, eco-friendly products still have an impact on the environment, but the impact is greatly reduced when compared to conventionally produced products. In some cases, environmentally friendly products may even have a positive benefit, depending on how the company does business.. Many such products are also aimed at lifestyle changes which benefit the environment, so even if the product itself is not totally neutral, the actions undertaken by the consumer after buying the product.

are beneficial. For example, eco-friendly light bulbs require energy and resources to make, but they save energy once they are installed in a home.

Products are not the only thing which can be environmentally friendly. Activities can also be friendly to the environment, as in the case of things like carpooling, gardening, composting, and recycling. Some people think that eco-friendly products are only the first step, and that people who are really committed to the environment also need to modify their lifestyles, reducing the amount of resources they use by living

Recycled and Biodegradable products:

Plastics have become an indispensable ingredient to modern life. But the environmentally degradable plastics are finding innumerable opportunities and application. Physical and chemical methods of pollution control were always in the forefront because they were easy to understand, easy to control and were reproducible. Biodegradation is the real mechanism of nature of balancing the material. A better option is to modify the materials, processes and products in such a way that one can rely upon the biodegradation in nature, recalcitrance and bioaccumulation problems are overcome. We are slowly changing our philosophy and are not merely targeting for clean-up or removal of pollutant but are aiming for prevention of pollution or facilitating biodegradation.

Bio plastics are biodegradable plastics, whose components are derived from renewable raw materials. These plastics can be made from abundant agricultural animal resources like cellulose, starch, casein collagen, soy protein polyesters and triglycerides. Large scale use of these would help in preserving non-renewable resources like petroleum, natural gas and coal and contribute little to the problems of waste management. Biodegradable Plastics degrade over a period of time when exposed to sun and air. The demand for biodegradable Plastics is ever increasing. Biodegradable products are a great alternative to plastic and Styrofoam products. These products are toxic free, compostable, and easily affordable. There are many eco-friendly products, which include PLA cold cups derived

from corn bio resin, completely compostable hot cups, soufflé cups, plates, utensils, bowls, and take-out containers that are made from discarded sugarcane fibre etc in the market. These biodegradable products can replace plastic and Styrofoam consumption and help in minimizing the impact on environment by reducing environmental waste and promoting sustainability while providing the highest quality biodegradable products available.

The main properties of the biodegradable plastics are: Low barriers of oxygen/water vapour transfer, best suited for short shelf life products, fully compostable in commercial composting facilities and Manufacturing processes are rapidly changing and biodegradable products are fast replacing man-made, difficult to degrade products. Partially biodegradable shopping bags are already manufactured from thin matrix of conventional polythene filled in with starch. Application areas identified in India for biodegradable plastics are agricultural much, surgical implants, industrial packaging, wrapping, milk sachets, foodservice, personal care, pharmaceuticals, medical devices, recreational etc. Over the past year packaging suppliers have been introducing various forms of biodegradable plastics made from a variety of plants, in the main corn, based on projections that consumers and recycling regulations will

drive demand for environmentally-friendly packaging. Some companies are predicting that the market will grow by about 20 per cent a year.

In addition, a combination of pricing and retail uptake has led more and more processors to look at biodegradable products as an alternative to polyethylene terephthalate (PET). The biodegradable products include a variety of fibre-based trays, containers and clamshells for foodservice, retail-packaged meat and produce, frozen entrees and prepared foods. Approximately a dozen of inherently biodegradable plastics are now in the market, with range of properties suitable for various consumer products. Some examples are biodegradable films or other raw material (for biodegradable plastic articles). New market opportunities are emerging for the development of biodegradable and bio-based products as the next generation of sustainable, eco-friendly materials that meet ecological and economic requirements. The coming years will see a new revolution

Aims And Objectives.

1. To create opportunities and environment and provide guidance for economic, social and eco development of the people and the area.
2. To educate people through various programs and activities like tournaments, games, championships, training programmes, camps, field visits, environment preservation and organizational environment.
1. To educate people to organize & play sports under eco friendly environment. Educating people about rain harvesting of the play grounds, drip irrigation, recycling of the water in sports stadiums & other educational institutes.
2. To encourage youth for courageous deeds and to provide them training and sponsorship for playing tournaments by which they play their role in economic, social and moral upliftment of society.
3. To work for the eradication of poverty specially in the field of sports & environmental education.
4. To study all aspects of corrupt practices prevalent in social, administrative, sports, structure of the society in the country & to educate the people for fighting against these practices.
5. To encourage & promote sports goods manufacturing industry, to use eco friendly material.
6. Provide total solutions to the enterprises to help them release low carbon emission trajectory.

7. Actively promote a business model that ensures that India follows cleaner, greener & profitable development path.
8. To educate people through various programmes about KYOTO PROTOCOL for reducing

Green House Gas (GHG) emissions & its links to the United Nations framework convention. On climate change.

1. Organizing various sports tournaments & championships to educate people about the consequences of global warming and ways to cut the green house gas emissions.
2. To promote environmental and pollution control awareness through sports tournaments & championships, coaching camps and arrangement of training classes in cities and people living in far flung areas
3. To provide playing facilities sports equipments, drinking water, clean electricity (eco friendly lights), sanitation facilities, and eco friendly stadiums.
4. To organize tournament for awareness of ecological balance of our planet through plantation of trees and natural herbs.
5. To stimulate various sports organisations to join hands with EFSO to spread the message of Global Warming, this is the most critical emergency of our time

The Importance Of Choosing Environmentally Friendly Products

Preferences for buying an Eco design, Eco energy and Eco-Friendly products will create a suitable and lovely environment for us to live and enjoy its benefits.

Fortunately, there are far more eco-friendly products now than in the past. There are many company who apply technology and application for a greener world. So it's upto you and me to take the right decisions and make this world environmentally clean, safe and friendly.

Government, businessmen, manufacturers and consumers have to consider the effects of manufacturing on the environment. We must consider a variety of measures to save our environment products while designing or manufacturing products.

Many companies in the world today have products in their lines that are produced using sustainable ingredients with eco design, eco energy in manufacturing environment friendly products that are safe and reliable to use.

Products like Induction Cook tops, Propane Gas Fire pits, Kitchen appliances, Kindle, e-book readers, Tablets, ipads, etc are designed and manufactured with the environment in mind. Every possible action has been taken to reduce poor environmental effects in manufacturing these products.

Designing and manufacturing with the environment in mind is a good sales point. When you design. And manufacture a product it's very Important and crucial that you design with the environment in mind.

Priorities and preferences should be given in choosing natural and environment friendly materials which require minimum processing in the factory. The lesser the processing, the less pollution it will produce.

Kindle, Speakers and Cooktops are manufactured in an environmentally friendly factory which limits and monitor pollution.

Today, environmental problems are increasing day by day and its always in the headline in every newspapers and news report, especially the damage caused by air and noise pollution.

Saving energy, reducing waste is a part of careful planning and that will reflect our concern for the environment. Without considering the importance of reducing waste, products will become more expensive since more materials will be needed to produce.

Consumers demands products that are less harmful to the environment. People today are well aware of the environment around them and they tend to avoid products that will harm them when using it

Pros and Cons of Using Climate Friendly Products

You are probably somewhat familiar with eco-friendly products that can help to reduce toxic wastes and prevent environmental pollution. If you start thinking about the advantages of using such products, you can come up with countless reasons for why to use them. The main benefits are saving money and energy, as well as reducing harmful chemicals. However, living a green life isn't perfect. Let us discuss a few advantages and disadvantages of using eco-friendly products in our daily life.

Pros of Using climate-friendly Products

Pollution Reduction Of course, this is the most well-known and biggest advantage of using such products. They help you reduce the amount of toxic wastes and non-degradable substances on the planet which means less pollution. Imagine all those plastic bottles and similar items that won't disintegrate getting eliminated totally from the face of earth. Some ways to help with this are using a filter on your tap water and using cloth diapers instead of disposables.

Personal health Plastic substances and such other items we use can produce many health issues, due to the chemicals present in them, right from the time of manufacture to the time it becomes an end product. Switching to eco-friendly items can eliminate this fear and make your lives greener and fresher. Look for items that don't contain BPA, phthalates, and other harmful chemicals.

Long term savings If you are looking for some savings in the long run, then eco-friendly products are a good way to go. Many of them are also quite energy efficient. Products like solar panels and electric or hybrid cars can save you a lot on energy costs. Something as simple as switching out your incandescent bulbs with CFL or LED bulbs can help save money with reduced energy consumption and you won't have to replace them as often.

Cons of Using Climate-friendly Products

Limited availability The first and foremost problem you may face when looking for eco-friendly products is where to find them. Finding the best eco-friendly products that can suit your requirements may not be such an easy job. Sometimes you have to go to smaller stores or online to find products that are eco-friendly.

Initial Cost-In the case of bigger eco-friendly products like the solar panel or the electric or hybrid car, you may find that the initial cost needed to buy them would be far more compared to a normal mass market product. This can act as a hindrance if you are on a low budget, but this doesn't necessarily apply to smaller products or for those people who are prepared to spend more to make green changes in their life.

Implementation-It can be hard to make changes to your routine. The intention to go green is much easier than actually doing so. It's best to start with small changes, such as changing light bulbs or buying reusable shopping bags instead of using plastic.

Eco Friendly Products You Can Buy Today to Help Stop Plastic Pollution.

To say plastic pollution is a widespread problem is not doing it justice:

Only 27% of plastic bottles are recycled. The rest sit in landfills where they can take up to 1,000 years to decompose.

One million seabirds and 100,000 marine mammals die each year from plastic pollution in our oceans.

In one study by the U.S. Centres for Disease Control, nearly 93 percent of people tested positive for BPA (a potentially harmful chemical present in plastic products).

Think the problem is too big for you to make an impact?

Think again.

We put together this list of eco friendly products to show you just how easy it can be to replace some of the plastic products you buy. By replacing them, you can virtually eliminate your single use plastic pollution in that area.

One of the best ways to fight plastic pollution is to live by example and ensure the products you buy are produced with both ethics and the environment in mind.

Also, don't forget to share the journey with your friends and family. The more friends you convince, the more people you share articles like this one with, the more people will begin using environmentally friendly products in their everyday lives, and that is how we change the world.

Scroll down to see where you can make some simple

Climate Friendly Clothing

Most clothing is made from cotton, but there is a surprising percentage that's made out of flexible plastic sheeting and plasticized fabric.

The products in this section will either help you avoid clothing made out of plastic or help you reduce clothing waste in our landfills.

1. Clothes Made From Recycled Fabric

Recover Brands produces clothing that's made entirely out of recycled material.

They also use the most environmentally sustainable manufacturing methods possible by eliminating the use of dyes and minimizing chemical, water, and energy use.

1. Wool Footwear

Allbirds created an innovative wool fabric made specifically for footwear.

By wearing a pair of Allbirds wool shoes (which don't look half bad) you can wear a pair of comfortable shoes from a company that found a new use for naturally existing materials, rather than relying on cheaper synthetics.

1. Reusable Coffee Cups

Single-use coffee cups account for a large amount of unnecessary waste.

By using a reusable, environmentally friendly coffee cup, you can help reduce this waste.

In a similar style to coffee cups you get from Starbucks and other shops, Onya's reusable coffee cups are made out of 100% food safe silicone.

They're also made to barista's standards, so they fit snugly in the machine at your favourite coffee shop.

Drink Bottles and Accessories

Not only does this plastic end up in landfills, in our oceans, and in other parts of the environment where it can cause damage, it also contains BPA.

BPA is a potentially harmful chemical found in plastic products that can leak into your water and other beverages.

The following products can help you eliminate your plastic bottle pollution and keep you and your family safe from harmful chemicals.

4 Fair Trade Organic Towels.

Glo has made some fantastic fair trade products. Their organic towels, made from cotton grown and picked with sustainable farming methods, are no exception.

5 Ballpoint Pens Made From Recycled Water Bottles

Water bottles are one of the top contributors to not only plastic pollution, but to world pollution in general. You can support removing some of those bottles from landfills by purchasing these ballpoint pens from Pilot.

6 Biodegradable Garden Pots

Help keep your garden safe from plastic and rubber pollution with these biodegradable garden pots. They're made from recycled material and decompose in about a year.

Home Items/Camping/Travel

The items are great for reducing your waste production at home, on camping trips, and while travelling.

7 Compostable Cutlery (Forks, Spoons, Knives and Tasters)

Plastic cutlery is almost always used once and thrown away. Parties, BBQs, or school lunches can produce a lot of plastic cutlery waste.

Reduce or eliminate this waste by using compostable forks, spoons, knives and tasters.

8 Compostable Party Plates

Just like plastic cutlery, plastic and paper plates are almost always used once and thrown away. Parties, BBQs, or school lunches can produce a lot of plastic and paper plate waste.

Reduce or eliminate this waste by using compostable party plates.

9 Compostable Bowls

Instead of putting party, BBQ, or camping snacks in a plastic or paper bowl, you can use a compostable bowl that's both human and environmentally friendly

10 Reusable Produce Bags (8 Pack)

Onya reusable produce bags are some of our most popular products.

Instead of using the produce bags from the grocery store and throwing them out when your food is consumed, you can use these reusable ones and never throw away a plastic produce bag again.

They also let water and air through, so you can wash your fruits and veggies within the bags before popping them in the fridge.

Tips for Purchasing Environmentally Friendly Products:

Firstly, learn of those environmentally-friendly conscious service providers and manufacturers before you decide to choose any particular product of your choice.

Evaluate services and products for environment friendly attributes. You'd like your product to be non-toxic, resource and energy efficient, durable, recyclable and repairable.

As far as possible, choose products that are made of recyclable materials that can be reused with less wastage.

Check out for Energy Star, Energy Efficient, Environmentally suitable and Non-ozone depleting substances in the products of your choice.

In the present generation, majority of consumers have begun to ask questions and make choices about the products they buy, based on their knowledge of the environment. This is also known as "Green Consumerism. Consumers are aware of the environmental damage caused by manufacturing.

Marketing is now identifying the needs of the consumers. So Companies and manufacturers have to meet those challenges and offer the customers their best.

Customers and consumers are more likely to buy those products that are environmentally friendly and safe to use.

Purchasing energy efficient, eco friendly, eco design products and services; learn to minimise waste in manufacturing and contributing for the development of environmentally-friendly products will greatly help in making this world the safest place to live.

Product improvement and life cycle

Consumers are becoming more concerned about sustainability and more knowledgeable about environmentally friendly products. Rather than just thinking about the initial price many customers now make their purchasing choices based on the expected life span of a product, the running and maintenance costs and its overall carbon footprint.

With increasing pressure from government and regulators many businesses are looking for ways to decrease the carbon footprint throughout the life cycle of their products or developing new products and technologies for sustainability.

Any sustainability improvements and information generated from these activities can be used in promoting your products to the 'green' markets.

Sustainable practice

Life cycle analysis

Life cycle analysis (LCA) can be used to identify the inputs to and outputs from a product or process, including all the steps in its production, transport, use and disposal, and then to calculate the overall environmental impact. Inputs may include, for example, the extraction, growth and processing of raw materials and consumption of energy, water and fuel. Outputs could be the consumer products, waste to landfill, heat and energy loss and particulate emissions.

This information can be used to identify how to reduce the carbon footprint of your production processes and across the life of the product.

You can decide what to analyse and how you apply a life cycle assessment to suit your goals. You may want to calculate the environmental impact of a used product that is sent to landfill and compare it to a modified product that can be recycled or remanufactured

The depth of analysis can also vary although a life cycle assessment should calculate both direct and indirect impacts, for example:

Direct and indirect environmental impacts from the products and processes in the growth.

Harvesting, processing and transport of raw materials

Direct energy, water, fuel consumption as well as energy and heat loss calculated through

Energy balancing

Emissions such as direct release of gases and particulates as well as calculation of embodied emissions using mass balancing and carbon equivalence

The energy consumption and emissions of various methods of disposal-burning vs landfill
vSustainability product features Many of your customers will be interested in purchasing products and services that are energy efficient or have other clear sustainability features. Sustainability features could focus on reduced carbon footprint, improved energy efficiency, lower running costs and the longevity of the product. Or they could focus on 'clever' features such as self monitoring, automatic switching systems or self contained energy, heating or cooling systems. Recyclable products or components, reusable products and product stewardship where you take back and remanufacture your products are also attractive sustainability features. Research how you can improve your products or design new

ones. You might use a continuous improvement scheme, suggestion box or brainstorming sessions to get input from your frontline staff as well as your designers and technicians. Or you might want to hold focus groups with customers to gain their input. They may have unique ideas based on regular use of the products. Focus groups can be a

great way of connecting with consumers and demonstrating that you are listening. This in turn can improve your reputation in the community and your long term viability.

Breakthrough sustainability innovations

You might decide to focus on breakthrough innovations for sustainability products and services. This might mean using research and development projects to identify

Low energy low carbon materials and products

New sources or better production of renewable energy

New applications for existing and recycled materials

Processes for decontaminating, remediating and rehabilitating water and soil

Energy recovery or cogeneration systems

Tools for measuring and calculating emissions

Production technologies that use less energy and generate less waste.

There are a number of funding and incentive programs targeting areas research and development, technology innovations, renewable energy and water and energy saving innovations. These are provided by various state, federal and local governments.

Managing your performance

Product improvement and life cycle analysis have a significant impact across most aspects of sustainability, ranging from small scale product improvements to big picture technology innovations.

Things to think about include

Your goals, available resources and the return on investment from incremental improvements versus breakthrough innovations.

Reviewing any funding and incentive programs that might be available to identify the benefits and eligibility and contract requirements

Measurement, costing and analysis models such as life cycle analysis, full cost analysis, lean. Accounting, carbon foot printing, ecological foot printing

How to get input from your staff and customers to maximize your sustainability innovations

And to support employee engagement and customer relationships

Marketing strategies to ensure existing and potential customers understand

General Environmental Benefit Claims

1. Marketers should not make broad, unqualified general environmental benefit claims like “green” eco-friendly. Broad claims are difficult to substantiate, if not impossible.
2. Marketers should qualify general claims with specific environmental benefits. Qualifications for any claim should be clear, prominent, and specific.
3. When a marketer qualifies a general claim with a specific benefit, consumers understand the benefit to be significant. As a result, marketers shouldn’t highlight small or unimportant benefits.
4. If a qualified general claim conveys that a product has an overall environmental benefit because of a specific attribute, marketers should analyze the trade-offs resulting from the attribute to prove the claim.

Recyclable

Marketers should qualify recyclable claims when recycling facilities are not available to at least 60 percent of the consumers or communities where a product is sold.

The lower the level of access to appropriate facilities, the more a marketer should emphasize the limited availability of recycling for the product.

Recycled Content

1. Marketers should make recycled content claims only for materials that have been recovered or diverted from the waste stream during the manufacturing process or after consumer use.
2. Marketers should qualify claims for products or packages made partly from recycled material for example, “Made from 30%, recycled material.”
3. Marketers whose products contain used, reconditioned, or re-manufactured components should qualify their recycled content claims clearly and prominently to avoid deception about the components.

Made with Renewable Materials

Unqualified claims about renewable material may imply that a product is recyclable, made with recycled content, or biodegradable. One way to minimize that risk is to identify the material used clearly and prominently, and explain why it is renewable.

Marketers should qualify renewable materials claims unless an item is made entirely with renewable materials, except for minor and incidental components.

e.g. This package is made from 50% plant-based renewable materials. Because we turn fast-growing plants into bio-plastics, only half of our product is made from petroleum-based materials.”

Made with Renewable Materials

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Plastics getting to Humans Impacting Health

Different plastics spread throughout the ocean. As Styrofoam breaks into smaller parts, polystyrene components in it sink lower in the ocean, so that the pollutant spreads throughout the sea column.

In fact, not only do the toxins in plastic effect the ocean, but acting like sponges, they soak up other toxins from outside sources before entering the ocean. As these chemicals are ingested by animals in the ocean, this is not good for humans. We as humans ingest contaminated fish and mammals.

There are different types of ways that plastic is dangerous for humans. Direct toxicity from plastics. Comes from lead, cadmium, and mercury. These toxins have also been found In many fish in the ocean, which is very dangerous for humans.

Diethylhexyl phthalate (DEHP) contained in some plastics, is a toxic carcinogen. Other toxins in plastics are directly linked to cancers, birth defects, immune system problems, and childhood developmental issues. To learn more on effects of plastics on humans visit the Ecology Centre

BPA is used in many things including plastic bottles and food packaging materials. Over time the polymer chains of BPA break down, and can enter the human body in many ways from drinking contaminated water to eating a fish that is exposed to the broken down toxins. Specifically, BPA is a known chemical that interferes with human hormonal function.

Arizona State University has studied plastics adverse effects on humans and has thus far concluded that an exact outline of health effects of plastics on humans is almost impossible to determine. This is due to the fact that the problem of plastic contamination in humans is globally spread, there are

almost no unexposed subjects. That being said, it is evident that the chemicals are not healthy for humans.

There are efforts to protect the oceans from plastic pollutants along with human health, but they are mostly grassroots organizations. One in particular that I discovered during my research is Save My Oceans which anyone can become involved with.

As far as protecting yourself from contamination, it is probably best not to have a diet that consists mainly of fish, since most is probably contaminated. However, one of the most effective things we could all do as members of this fragile ecosystem is to be responsible for our trash. When we have the opportunity, we should try to avoid buying products packaged in plastic. We should always recycle plastic when we do use it. At the store, request a paper bag instead of plastic, or bring your own. Use a reusable water bottle, and of course don't litter.

Reusable shopping bag

A reusable shopping bag, sometimes called bag-for-life in the is a type of shopping bag which can be reused many times. It is an alternative to single-use paper or plastic bags. It is often made from fabric such as canvas, natural fibres such as Jute, woven synthetic

fibres, or a thick plastic that is more durable than disposable plastic bags, allowing multiple use.

Reusable shopping bags are a kind of carrier bag, which are available for sale in supermarkets and apparel shops. Reusable bags require more energy to produce than common plastic shopping bags. One reusable bag requires the same amount of energy as an estimated 28 traditional plastic shopping bags or eight paper bags. "If used once per week, four or five reusable bags will replace 520 plastic bags a year" A study commissioned found that the average cotton bag is used only 51 times before being thrown away. In some cases, reusable bags need to be used over 100 times before they are better for the environment than single-use plastic bags.

Food safety

1. States should consider requiring printed instructions on reusable bags indicating they need to be cleaned or bleached between uses.
2. State and local governments should invest in a public education campaign to alert the public about risk and prevention.
3. When using reusable bags, consumers should be careful to separate raw foods from other food.

Products.

1. Consumers should not use reusable food bags for other purposes such as carrying books or gym clothes.
2. Consumers should not store meat or produce in the trunks of their cars because the higher temperature promotes growth of bacteria, which can contaminate reusable bags.

The Use of green bags

It is obvious how harmful plastic bags are, they are one of the factors why were pollution bad air sometimes, they are one of the reasons why drainage gets clogged, we won't be discussing the effects of plastic bags, however. I believe it's much better to look on the positive viewpoints than the negative impacts. So, let's concentrate on the use of eco friendly bags. These are the best replacement of

plastic bags as they provide much better effects to the users, like you and me, and to the entire environment.

I'm personally giving companies and organizations two thumbs up for promoting environmentally friendly bags. I've been to a few stores that use eco friendly bags. I was like "Wow, this is not bad at all That's the first time I decided and dedicated myself to totally ban the use of plastic bags. As a green energy and healthier environment advocator, it would be a lie to my own self to agree with these stores green campaign without applying it on my own. Now, I've never been proud than to share to you what I know and experienced from using eco-friendly bags.

Ideal for Moms and Kids

Eco friendly bags are very useful in many, different ways. They are good personal bags you can use whenever you go to the grocery store, drop by to a post office or even when taking some time off shopping. I'm guilty to most of these things because I never go out without an eco-friendly bag gripped on my hand or hanged on one of my shoulders. Believe me, it works for children too. They can be messy and get them stained but since these bags are recyclable, you can just wash them like your normal laundry. A little brush there and a few short here would be enough. See, that's not how difficult to reuse eco friendly bags at all. The advantage here is that you won't need to throw the bag after using it. That alone can save the environment because a single plastic bag when thrown anywhere becomes an instant producer of toxic chemicals. That's when pollution starts to expose toxins in the air, water and even soil

Come in Stylish and Colorful Designs

Plastic bags are simply plastics. It means they're not fashionable at all. They look trash for me. One reason why eco friendly bags are much better is because they are designed in stylish looks. You can use them for both casual and semi-formal occasions. Eco friendly bags are definitely attractive than plastic bags. Whatever you are wearing would be a good match with the eco friendly bags. You just have to make sure you have the right style and color to make your outfit and bag to appear as partners.

You are probably wondering now what eco friendly bags are made of. Well, they're not manufactured in various chemicals, that's why they are not harmful to use as far as health and environment are concerned. Most eco friendly bags are made from

waste so they are considered as recyclable items. Do not worry, they are thoroughly processed and well cleaned to assure safety when they are reused.

Pros and cons of using green bags

With so many environmental issues plaguing the planet, the least we can do is make an effort to contribute our bit to making the world a better place to live in. Amidst all these environmental issues is the use of plastic and paper grocery bags to carry your groceries home. While we all know the repercussions of using plastic bags on the environment, you ought to know that using paper bags also doesn't cause any less damage. The number of trees that go into making a paper bag, and the amount of water involved to produce just one paper bag is simply unimaginable. Moreover, production of paper bags results in harmful toxic emissions which are unsafe for the environment. Are you causing lesser harm to the environment by using paper bags then? An alternative to both these varieties are reusable grocery bags, the use of which has been encouraged by governments worldwide, in an attempt to reduce the amount of plastic used. Also, plastic and paper bags have been banned in a lot of states for this purpose

What are Reusable Grocery Bags Made Of?

Reusable grocery or shopping bags are simply made of material that allow the bag to be reused. These materials may include heavy duty plastic, canvas, or synthetic fibers. Some bags are also made from recycled materials, that make them friendlier to the environment than others. Some common materials used are:

Canvas

Hemp

Jute

Polypropylene and polyethylene

Most such bags are lightweight, heavy duty, and are machine washable. This makes them easier to use. However, most people complain that they forget to carry these bags with them, which makes shopping a tedious experience. Let's put it this way either you keep them in your car, or fold them up and put them in your bags so you

are never without them. People also make these bags themselves as per their requirements and taste.

Advantages

Reusability:

Obviously this is one of the biggest advantages. You can use them till they wear out and perhaps even repair the damage to a certain extent to continue using them.

Lesser Damage During Production:

It is believed that lesser damage is caused to the environment during the production of reusable bags in comparison to plastic or paper bags. However, some reports suggest that the damage is greater, and that the bags will have to be used for longer amount of time in order to compensate for the damage.

Great for Multiple Items:

Since they are heavy duty, these bags are great to carry multiple items. They also have handles that are soft on the hands and easy to carry.

Conclusion

Key findings of the study reflect that Industries these days have high concern for environmental protection and have strong belief that green marketing can definitely be used as a tool for gaining competitive and sustainable growth. Some companies are initiating and implementing these practices as a part of their corporate social responsibility. However environmental strategy formation and implementation are slowly making it to the priority lists of Indian corporate.

Green marketing should not be considered as just one more approach to marketing instead should be pursued with greater vigour as it has societal and environmental dimensions, With this view organizations are now aware with the fact that without adopting green in the core of their strategy they cannot survive in the present competitive era. Automobile companies are also adopting green to retain their image in the market.

The majority of the automobile companies are partially aware about green marketing and they have implemented these green marketing practices in any of the form, including product modification, changes to the production process, packaging changes, which are less detrimental to the environment, developing environment friendly suppliers greening supply chains, use of renewable resources, considering products complete life cycle from raw material extraction to disposal which is less harmful to environment.(cradle to grave approach), waste minimization and pollution.

Climate-Friendly Products: The Clay Pot Refrigerator

Introduction :-

In the 21st century, climate change has emerged as one of the most critical challenges confronting humanity. Rising global temperatures, melting glaciers, erratic rainfall, and resource depletion have forced us to rethink the way we produce, consume, and live. Against this background, **climate-friendly products** have gained attention as sustainable alternatives that minimize environmental degradation, conserve natural resources, and reduce carbon footprints. Among these, the **clay pot refrigerator**, a simple yet ingenious innovation rooted in traditional wisdom, has become a striking example of eco-friendly living.

What are Climate-Friendly Products?

Climate-friendly products are goods designed or adapted to cause minimal harm to the environment across their life cycle. Their features typically include:

- Low energy consumption
- Biodegradability and recyclability
- Reduced greenhouse gas emissions
- Use of locally available and renewable resources
- Affordability and accessibility

Examples include solar cookers, bamboo furniture, compostable packaging, energy-efficient appliances, and natural cooling devices like clay pot refrigerators.

Clay Pot Refrigerator:-

A clay pot refrigerator, also known as a **zeer pot cooler** in African countries or **mitti fridge** in India, is a natural, electricity-free cooling device. It works on the principle of **evaporative cooling**: when water stored in the outer clay layer evaporates, it absorbs heat from the inner chamber, thereby lowering its temperature.

A typical design consists of two clay pots of different sizes, placed one inside the other with sand packed in between. The sand is moistened with water, which slowly evaporates through the porous clay, cooling the inner pot where vegetables, fruits, or even milk can be stored.

Historical Roots and Indigenous Wisdom:-

The concept of cooling with clay is not new. Traditional Indian households used earthen pots for centuries to keep drinking water cool. Similarly, ancient Egyptians used porous clay containers to preserve perishable food. Modern innovators like **Mansukhbhai Prajapati**, who designed the

famous *Mitticool refrigerator* in Gujarat, have revived this indigenous knowledge with a modern outlook, turning it into a symbol of climate-resilient living.

Working Mechanism of the Clay Pot Refrigerator :-

1. **Evaporation Principle** – When water evaporates, it takes heat energy from its surroundings, producing a cooling effect.
2. **Clay Porosity** – The clay's microscopic pores allow water to seep and spread, enhancing the evaporation surface.
3. **Temperature Reduction** – Depending on humidity and airflow, the temperature inside the clay fridge can drop by 8–10°C compared to the outside environment.
4. **Storage Capacity** – It can preserve vegetables for 4–5 days, fruits for about a week, and milk for 24–36 hours without refrigeration.

Climate Benefits of Clay Pot Refrigerators :-

1. **Zero Electricity Use** – Unlike conventional refrigerators that run on electricity (often generated from coal or gas), clay pot fridges operate without any power, drastically reducing carbon emissions.
2. **Low Carbon Footprint in Production** – Clay is locally available, and the making process involves simple pottery skills with minimal industrial input.
3. **Biodegradable** – At the end of its life, a clay fridge returns to the soil without causing pollution.
4. **Reduced Food Waste** – By extending the shelf life of perishable items, it helps reduce food spoilage, indirectly lowering methane emissions from rotting waste.

Socio-Economic Benefits :-

1. **Affordable for Rural Households** – With prices ranging between ₹2,000–₹3,000 for improved models, it is far cheaper than modern refrigerators.
2. **Empowerment of Potters and Local Artisans** – Rising demand for clay fridges revives traditional pottery, providing livelihoods to rural artisans.

3. **Accessible in Off-Grid Areas** – Ideal for villages without reliable electricity supply, ensuring food security.

4. **Cultural Continuity** – Promotes traditional practices in harmony with modern sustainability goals.

Limitations of Clay Pot Refrigerators

While climate-friendly, these refrigerators also have limitations:

Limited Cooling Range – Cannot achieve freezing temperatures; unsuitable for meat, fish, or medicines requiring very low storage temperatures.

- **Dependence on Climate** – Works best in hot, dry areas with low humidity. In coastal, humid regions, efficiency is lower.

- **Durability Issues** – Clay pots are fragile and prone to breakage.

- **Storage Capacity** – Smaller compared to modern fridges, making them less convenient for large families.

Comparative Analysis: Clay vs. Conventional Refrigerators

Feature

Clay Pot Refrigerator

Conventional Refrigerator

Energy Use

Zero

High (100–800 kWh/year)

Carbon Emissions

None

Significant (linked to fossil fuels)

Cost

Low (₹2,000–₹3,000)

High (₹15,000–₹30,000)

Lifespan

3–5 years

10–15 years

Environmental Impact

Biodegradable

E-waste, refrigerant gases (CFCs/HFCs)

Storage Suitability

Vegetables, fruits, milk (short duration)

All food, including frozen items

Relevance to Sustainable Development Goals (SDGs)

Clay pot refrigerators directly contribute to:

- **SDG 7** – Affordable and Clean Energy (zero electricity use)
- **SDG 12** – Responsible Consumption and Production (eco-friendly, biodegradable)
- **SDG 13** – Climate Action (reduced carbon footprint)
- **SDG 8** – Decent Work and Economic Growth (support to local artisans)

Conclusion

The clay pot refrigerator stands as a shining example of how **traditional knowledge and modern innovation can converge to create climate-friendly products**. While it cannot entirely replace modern refrigeration, it provides a practical, eco-sensitive alternative, especially for rural and resource-constrained communities. Its benefits extend beyond climate action to include economic empowerment, cultural preservation, and sustainable living.

Madhusmita Behera
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1st yr

CLIMATE FRIENDLY PRODUCTS

*Introduction to Climate-Friendly Products:

In today's world, the importance of reducing our environmental footprint cannot be overstated. One effective way to contribute to a more sustainable future is by incorporating climate-friendly products into our daily lives. These products are designed to minimize harm to the environment, reduce waste, and promote eco-conscious living.

*What are Climate-Friendly Products?:

Climate-friendly products are those that have a lower impact on the environment throughout their lifecycle, from production to disposal. They are made using sustainable materials, designed for recyclability or biodegradability, and often feature energy-efficient or renewable energy-powered technologies.

*Benefits of Climate-Friendly Products:

1. Reduce Carbon Footprint: By choosing products with minimal environmental impact, we can significantly reduce our carbon footprint.
2. Conserve Natural Resources: Sustainable products help preserve natural resources for future generations.
3. Promote Sustainable Living: Using eco-friendly products encourages a lifestyle that values environmental stewardship.
4. Improve Public Health: Many climate-friendly products are free from toxic chemicals, contributing to better health outcomes.

*Examples of Climate-Friendly Products:

1. Reusable Water Bottles: Reduce single-use plastic waste and save money.

2. Bamboo Toothbrushes: A sustainable alternative to plastic toothbrushes.
3. Solar-Powered Chargers: Harness renewable energy for your devices.
4. Energy-Efficient Appliances: Lower energy consumption and reduce utility bills.
5. Eco-friendly cleaning supplies: Made from natural ingredients, biodegradable, and non-toxic.
6. Reusable bags and containers: Reduce single-use plastic waste and keep food fresh.
7. LED light bulbs: Energy-efficient and long-lasting, reducing energy consumption.
8. Sustainable clothing: Made from eco-friendly materials, produced with fair labor practices.
9. Bamboo straws: A reusable and biodegradable alternative to plastic straws.
10. Compostable trash bags: Made from plant-based materials, reducing plastic waste.
11. Recycled notebooks and paper: Made from post-consumer waste, reducing deforestation.
12. Beeswax wraps: A reusable and sustainable alternative to plastic wrap for food storage.
13. Solar-powered lights: Harness renewable energy for outdoor lighting.
14. Eco-friendly personal care products: Made from natural ingredients, free from harsh chemicals.
15. Reusable coffee filters: Reduce paper waste and make coffee brewing more efficient.
16. Sustainable furniture: Made from reclaimed wood, bamboo, or other eco-friendly materials.
17. Energy-efficient window treatments: Designed to reduce heat loss and gain.
18. Biodegradable phone cases: Made from plant-based materials, reducing electronic waste.

***Conclusion :**

These products can help reduce waste, conserve natural resources, and promote sustainable living. By incorporating them into our daily lives, we can make a positive impact on the environment.

By embracing climate-friendly products, we can make a positive impact on the environment and contribute to a more sustainable future. Let's explore more about these products and how they can benefit us and the planet.

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Climate Friendly Products: A Path Towards Sustainable Living

Introduction

In the face of rising global temperatures, melting glaciers, severe weather events, and biodiversity loss, the world is increasingly waking up to the urgent need for sustainable practices. Climate change, fueled primarily by human activity and the overuse of natural resources, has become one of the most pressing issues of the 21st century. While large-scale policy interventions and industrial reforms are crucial, individual choices also play an important role in combating climate change.

One such choice involves the adoption and promotion of climate friendly products—goods and services that minimize environmental damage, conserve resources, and promote sustainable lifestyles. These products are not merely alternatives to conventional goods; they represent a shift in mindset toward responsible production and consumption.

This article explores the concept of climate friendly products, their importance, various types, benefits, challenges, and the collective role consumers, businesses, and governments play in advancing their adoption.

Understanding Climate Friendly Products

Climate friendly products are items designed, manufactured, and used in ways that reduce greenhouse gas (GHG) emissions, conserve natural resources, and minimize ecological footprints. Their development takes into account the entire life cycle—from sourcing raw materials to production, transportation, usage, and disposal. The goal is to balance human needs with environmental responsibility, ensuring that economic growth does not come at the cost of ecological collapse.

Key Characteristics of Climate Friendly Products:

Energy Efficiency: Consuming less power during operation. For instance, LED bulbs use far less energy compared to incandescent lights while providing the same brightness.

Sustainable Materials: Products made from renewable, biodegradable, or recycled resources reduce dependence on finite raw materials.

Low Carbon Footprint: Designed to minimize emissions during production and use, often by adopting renewable energy sources. 2

Durability and Reusability: Long lifespans and reusability reduce the need for constant replacements.

Eco-friendly Packaging: Minimal, recyclable, or biodegradable packaging that reduces plastic waste.

Ethical Production: Goods manufactured under conditions that respect labor rights, reduce pollution, and protect ecosystems.

In short, climate friendly products embody sustainability at every stage of their existence, making them a cornerstone of green economies.

Why Climate Friendly Products Matter

The relevance of climate friendly products extends far beyond individual benefits. They play a critical role in addressing environmental, social, and economic challenges associated with climate change.

Reducing Carbon Emissions: Using products such as electric vehicles (EVs), energy-efficient appliances, or renewable-powered devices significantly reduces the release of carbon dioxide and methane—two major greenhouse gases responsible for global warming.

Conserving Natural Resources: Traditional products often exploit non-renewable resources unsustainably. For example, petroleum-based plastics contribute to fossil fuel depletion. In contrast, bamboo toothbrushes, recycled paper, and bio-based plastics help conserve forests, water, and minerals.

Minimizing Waste: Disposable items and single-use plastics overwhelm landfills and oceans. Reusable containers, compostable packaging, and durable household products promote circularity, reducing waste accumulation.

Protecting Ecosystems and Biodiversity: Eco-friendly products help curb deforestation, mining, and harmful chemical use—practices that destroy habitats and endanger species. By choosing them, consumers contribute to preserving fragile ecosystems.

Promoting Healthier Lifestyles: Many climate friendly products avoid harmful toxins and pollutants, ensuring safer environments for humans. Organic food, for instance, reduces pesticide exposure, while natural cleaning products minimize indoor air pollution.

Examples of Climate Friendly Products 3

Household Appliances: Energy-efficient refrigerators, washing machines, and air conditioners reduce electricity consumption. LED bulbs save up to 80% more energy than conventional lights.

Personal Care and Daily Essentials: Biodegradable soaps, bamboo toothbrushes, menstrual cups, and safety razors reduce plastic dependency and waste.

Clothing and Textiles: Sustainable fashion emphasizes organic fabrics like hemp and recycled polyester. Slow fashion encourages long-lasting, timeless designs instead of fast-changing trends.

Transportation: Electric cars, hybrid vehicles, bicycles, and expanded public transport options reduce reliance on fossil fuels. Shared mobility platforms also promote efficiency.

Food and Agriculture: Organic produce, plant-based meats, and fair-trade goods like coffee and cocoa reduce ecological damage and promote ethical practices.

Packaging and Containers: Cloth shopping bags, reusable glass jars, and stainless-steel bottles replace single-use plastics. Innovations like cornstarch-based compostable packaging are gaining popularity.

Renewable Energy Products: Solar panels, small-scale wind turbines, and portable solar chargers bring clean energy directly to households.

Benefits of Climate Friendly Products

1. Environmental Benefits

Lower greenhouse gas emissions.

Reduced deforestation, air, and water pollution.

Conservation of soil and water quality.

Less reliance on fossil fuels and harmful chemicals.

1. Economic Benefits

Long-term savings from energy-efficient and durable goods. 4

Creation of green jobs in renewable energy, sustainable agriculture, and eco-manufacturing.

Reduction in healthcare costs by preventing diseases linked to pollution and toxins.

2. Social Benefits

Support for ethical labor practices and fair trade.

Promotion of community awareness around sustainability.

Improved quality of life through healthier living conditions.

These combined benefits highlight how climate friendly products contribute not just to the environment but also to human well-being and economic resilience.

Challenges in Adoption

Despite the clear advantages, several barriers prevent widespread adoption:

Higher Initial Costs: Many eco-friendly products, such as EVs or solar panels, have high upfront costs despite long-term savings.

Limited Availability: Rural areas or developing regions may not have access to sustainable alternatives.

Consumer Awareness: Many people remain unaware of the impacts of their purchases or the benefits of climate friendly options.

The Way Forward

To overcome these challenges, collective effort is essential:

Consumers: Need to educate themselves, prioritize sustainable choices, and demand transparency. Even small changes like switching to reusable bags can have massive cumulative effects. 5

Businesses: Must innovate responsibly, adopt circular economy principles, and ensure honest marketing practices. Offering affordable green alternatives can increase accessibility.

Governments: Should provide subsidies, tax breaks, and supportive policies for renewable energy and sustainable production. Regulations can prevent greenwashing and enforce eco-standards.

Education and Media: Awareness campaigns and school programs can embed sustainability values in society from a young age.

Conclusion

Climate friendly products represent a tangible, actionable pathway toward sustainable living. They empower individuals to reduce their environmental impact without sacrificing quality or convenience. While challenges exist, rising awareness, technological advances, and supportive policies are making these products more affordable and accessible.

By choosing sustainable alternatives—whether it is a bamboo toothbrush, an energy-efficient appliance, or an electric vehicle—we collectively move closer to a future where human progress aligns with planetary health.

Ultimately, embracing climate friendly products today is not just a personal choice but a commitment to safeguarding the Earth for generations to come. Together, through mindful consumption and responsible production, we can shape a healthier, greener, and more resilient world.

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Roll No. - 73

1st yr

Climate friendly products

Introduction

The modern world relies heavily on chemicals, solvents, and advanced technologies in industries such as pharmaceuticals, plastics, textiles, paints, and agriculture. While these advancements have improved the quality of life, they also contribute to environmental challenges—especially the depletion of the ozone layer, which shields Earth from harmful ultraviolet (UV) radiation.

1. Understanding Green Substances

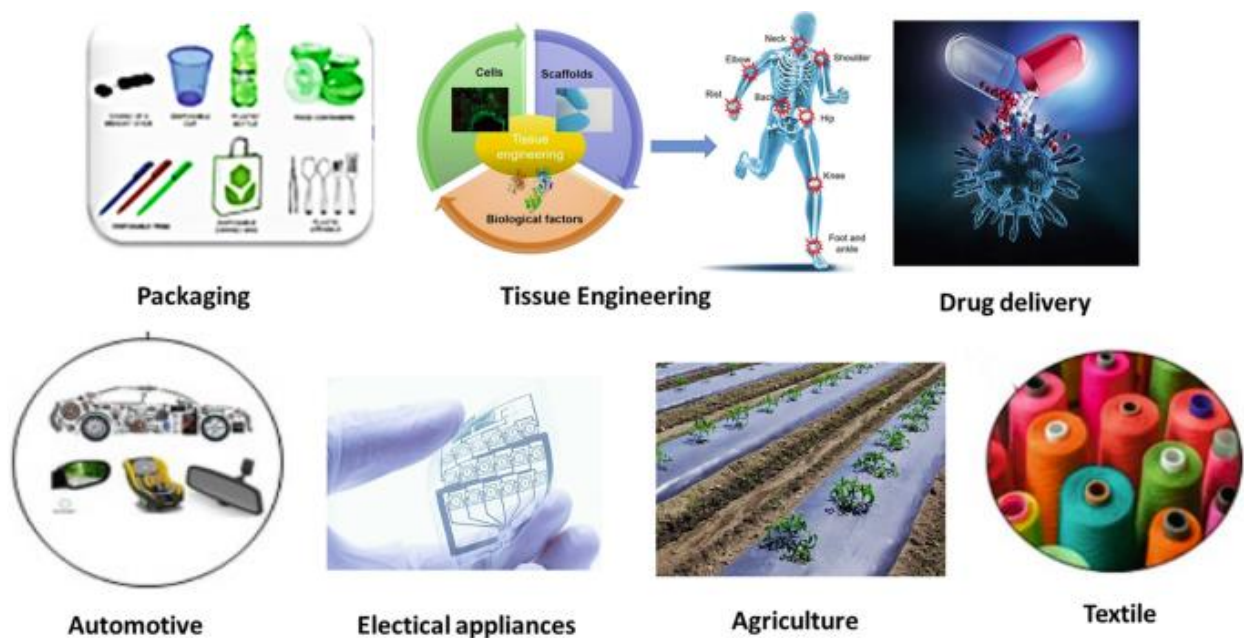
Green substances are materials designed to have minimal environmental impact while maintaining their functionality in industrial processes.

Key Features of Green Substances:

- Non-toxic or low-toxicity to humans and ecosystems
- Biodegradable and renewable
- Energy-efficient production processes
- Reduced persistence in the environment

Examples:

- Biodegradable polymers such as polylactic acid (PLA) and polyhydroxyalkanoates (PHA)
- Bio-based surfactants in detergents
- Hydrogen peroxide as a bleaching agent instead of chlorine



2. Green Solvents: A Safer Alternative

Solvents are widely used in chemical synthesis, cleaning, extraction, and manufacturing. Traditional solvents such as benzene, toluene, and chlorinated hydrocarbons are toxic and often ozone-depleting.

Characteristics of Green Solvents:

- Non-flammable
- Low toxicity and biodegradable
- Derived from renewable resources
- No contribution to ozone depletion

Examples:

- Supercritical Carbon Dioxide (scCO_2)
- Ionic Liquids
- Bio-based solvents: ethyl lactate (from corn) and d-limonene (from citrus)
- Water as a solvent in green synthesis

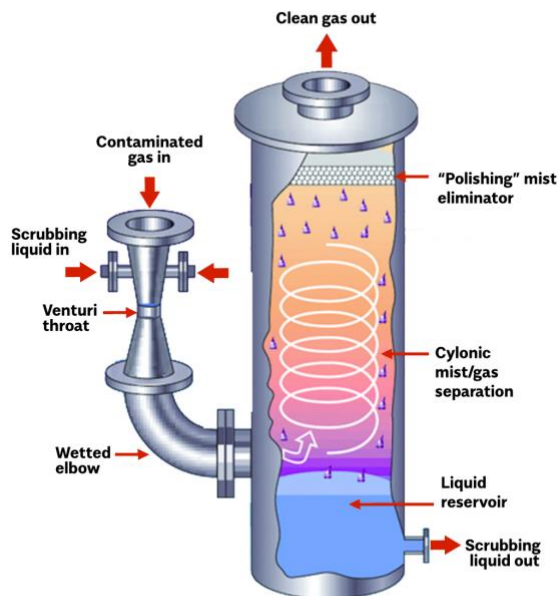
3. Green Chemistry & Sustainable Technology

The 12 Principles of Green Chemistry guide industries to innovate in ways that minimize waste and hazards.

Examples of Green Technologies:

- Catalysis using recyclable catalysts
- Biotechnology: enzymes in textile bleaching
- Energy-efficient microreactors in pharmaceuticals
- Nanotechnology for smart, emission-minimizing materials

4. Scrubbers in Industry: Air Pollution Control



Scrubbers are advanced pollution control devices used to remove toxic gases and particles from industrial emissions.

Types of Scrubbers:

- Wet Scrubbers
- Dry Scrubbers
- Electrostatic Scrubbers

electrostatic precipitator (ESP) removes particulate matter from gases by charging the particles with high-voltage electricity and then collecting them on oppositely charged plates. As polluted gas enters, it passes through an electrical field, which ionizes the gas and imparts a negative charge to the particles. These charged particles are then attracted to grounded, positively charged collecting plates, where they stick and accumulate. Periodically, the plates are "rapped" with hammers or vibrated to dislodge the collected dust, which falls into hoppers for removal.

Importance:

Scrubbers reduce acid rain formation, protect the ozone layer indirectly, and improve air quality.

5. Industrial Practices to Reduce Toxic Emissions

Industries have adopted several products and processes to reduce ozone-depleting substances (ODS) and greenhouse gas emissions.

Examples:

- Refrigerants: Replacing CFCs with HFCs, HFOs, and natural refrigerants
- Aerosols: Using compressed gases instead of CFCs



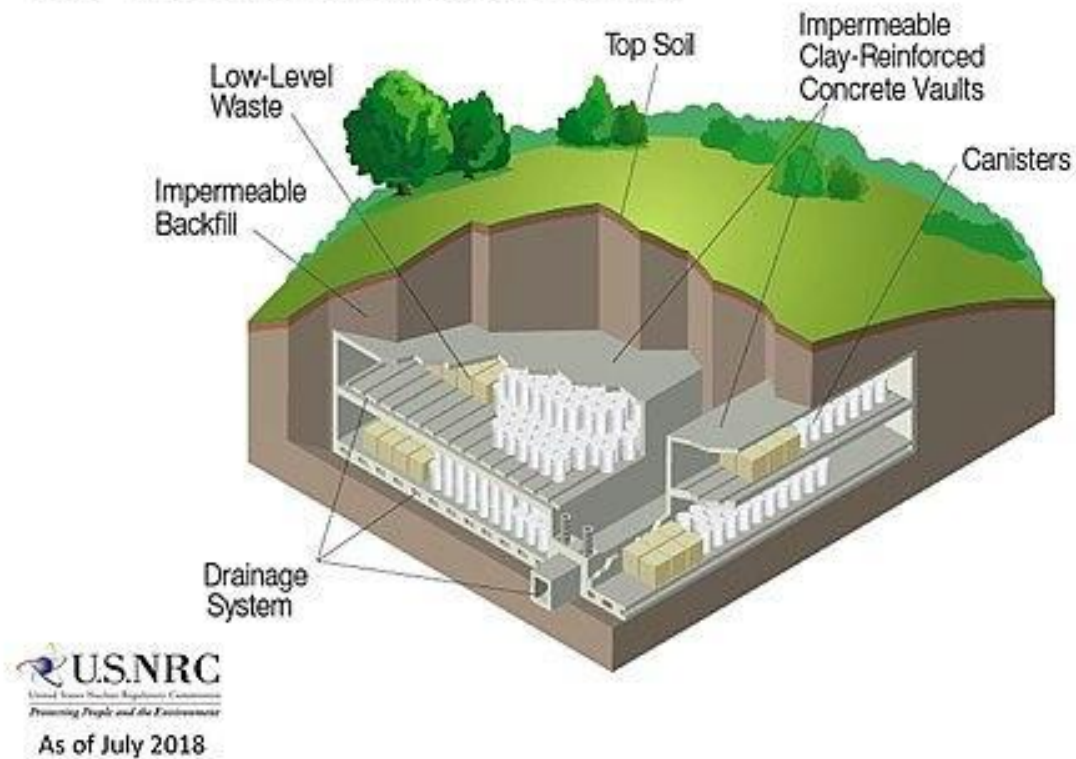
- Fire Extinguishers: Switching from halons to FM-200, Novec 1230, and water-mist systems
- Paints: Water-based and powder coatings instead of VOC-rich solvents
- Agriculture: Neem-based bio-pesticides replacing methyl bromide.



Killer product is a combination product consisting of PROFENOFOS and CYPERMETHRIN, which enables it to provide a more effective cover due to its dual action on insect central nervous system

6. Radioactive Waste Management

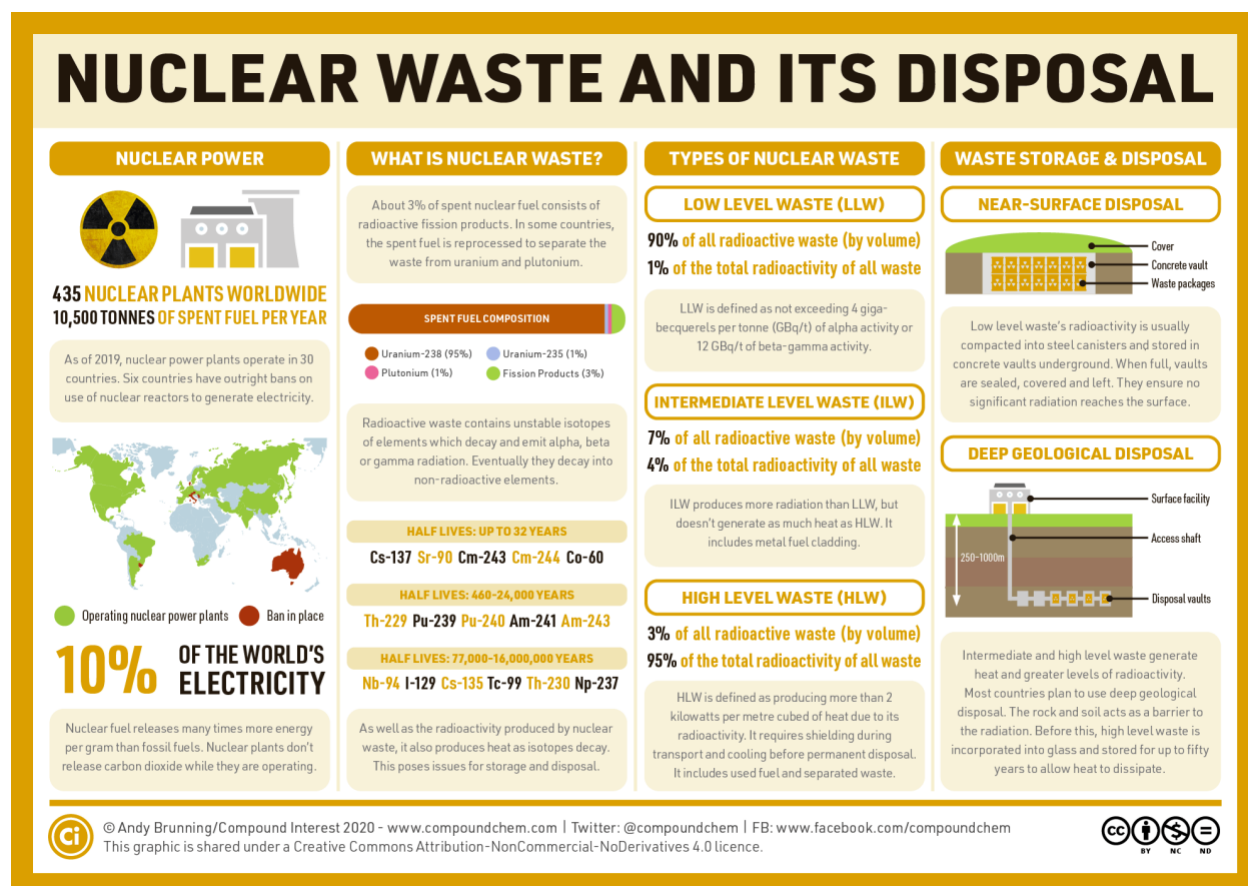
Low-Level Radioactive Waste Disposal



Radioactive waste comes from nuclear power plants, hospitals, and research laboratories.

Types of Radioactive Waste:

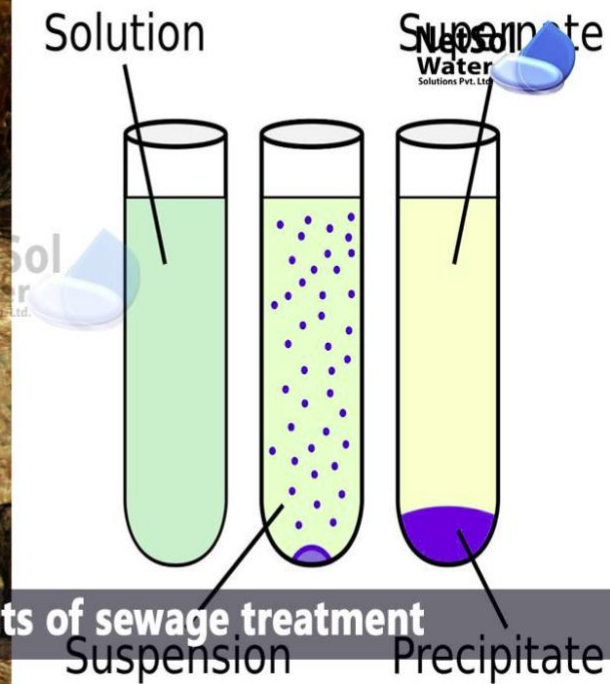
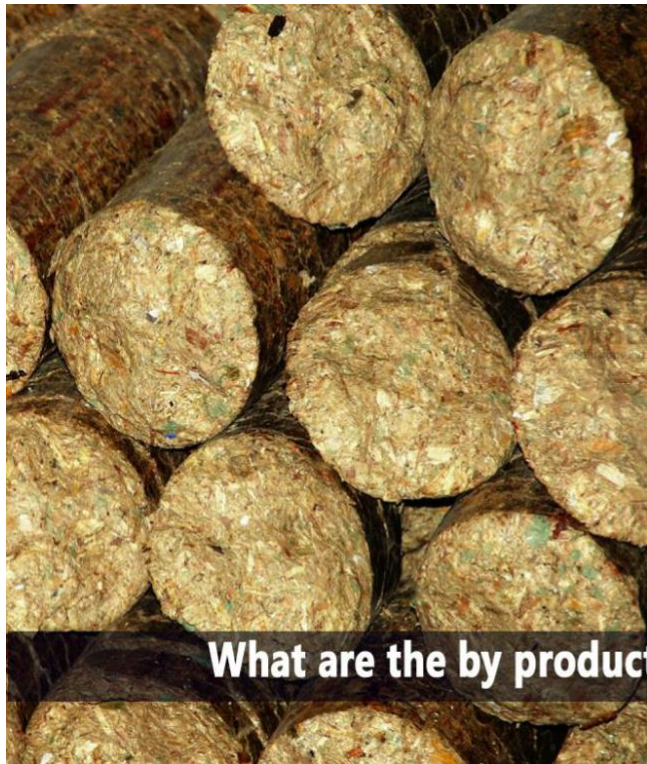
- Low-Level Waste (LLW)
 - Intermediate-Level Waste (ILW)
 - High-Level Waste (HLW)
- *Management Methods:*
- Storage & Shielding
 - Deep Geological Disposal
 - Reprocessing & Recycling



Importance:

Proper radioactive waste management prevents leaks, protects ecosystems, and reduces health risks.

The main by-products of a sewage treatment plant are treated wastewater (effluent) and sludge (also called biosolids). Sludge is the solid waste removed during treatment, which can be stabilized and reused as fertilizer or disposed of. Another potential byproduct is biogas, a gas produced from the decomposition of organic matter in sludge, which can be

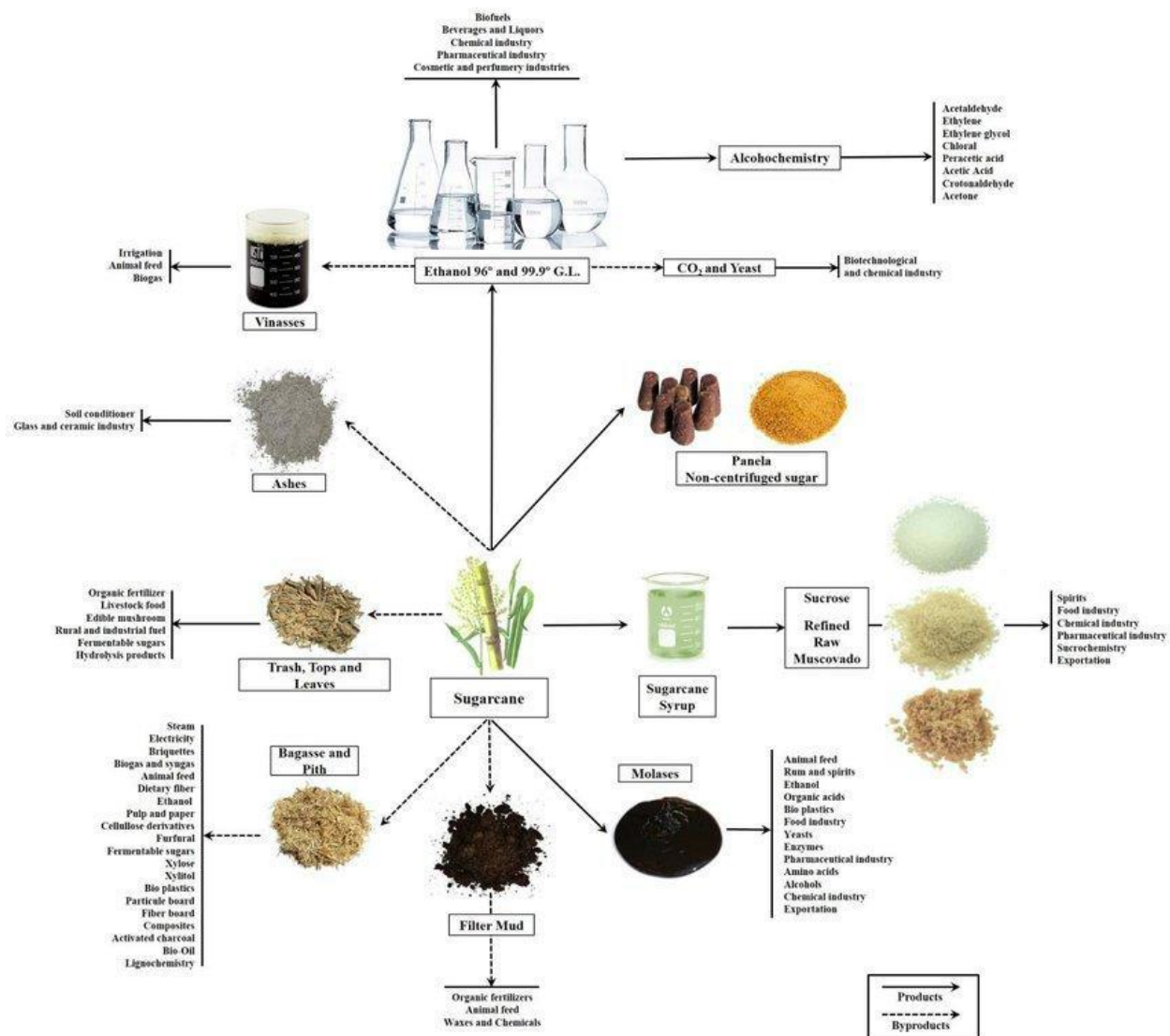


What are the by products of sewage treatment

captured and used as a fuel source.

*Sugarcane yields a wide range of primary products and economically useful byproducts across food, energy, materials, chemicals and agriculture. Key byproducts and their typical uses:

- Bagasse - Description: Fibrous residue remaining after juice extraction. - Uses: Boiler fuel for process steam and electricity (cogeneration); raw material for paper and cardboard, particleboard and fiberboard; feedstock for cellulosic ethanol and other biofuels; source of cellulose for bioplastics and specialty chemicals; mulch/soil conditioner.
- Filter cake (press mud, mudcake) - Description: Solid residue from juice clarification (suspended solids, organic matter, calcium salts). - Uses: Soil amendment and fertilizer (high in organic carbon and micronutrients); compost ingredient; feedstock for biogas; raw material for brick/ceramic additives and carbon-rich fillers.
- Molasses - Description: Concentrated sugar-rich syrup left after crystallizing sugar. - Uses: Direct source of sucrose for further sugar production;



fermentation substrate for ethanol (industrial and potable), rum and other spirits; feedstock for citric acid, acetone-butanol-ethanol, single-cell protein, yeast production; livestock feed supplement (energy source); ingredient in baking and food industries.

- Vinasse (stillage, distillery spent wash) - Description: Liquid residue from fermentation/distillation of molasses. - Uses: Fertilizer and irrigation nutrient source after treatment; substrate for biogas (anaerobic digestion); concentration to produce organic-rich fertilizers (condensed vinasse); aquaculture (treated) and industrial water reuse when appropriately managed. - Environmental note: High biological oxygen demand (BOD) and salts—requires treatment to avoid pollution.

- Straw and leaves (trash) - Description: Tops, leaves and dry stalks left in field after harvest. - Uses: Mulch, soil cover and erosion control; cattle fodder (fresh or processed); feedstock for bioenergy and cellulosic ethanol; raw material for thatch, weaving, packaging and low-cost building materials.

- Cane tops and roots (green biomass) - Uses: Incorporated into soil to return nutrients, burned for field ash (traditionally), or harvested for bio energy.

We can insecticide for insects like DDT Killing agent but it is harmful to the human being and also create soil infertility but we can use spinosod .it is a chemical but it is not harmful to human being.

7. Ozone Layer Protection: Global Actions*

The Montreal Protocol (1987) is a landmark treaty that phased out ozone-depleting substances.

Industries contribute by:

- Transitioning to ozone-safe refrigerants
- Eco-labeling of products
- Adoption of renewable energy in production

8. Future Directions in Green Industry

Future advancements include:

- Artificial Intelligence for optimized processes
- Circular Economy for recycling solvents and materials
- Bioplastics revolution to replace single-use plastics
- Carbon capture technology to convert CO₂ _into fuels and chemicals

CONCLUSION

Green substances, solvents, technologies, scrubbers, and radioactive waste management represent the future of sustainable development. Industries worldwide are replacing toxic chemicals with eco-friendly alternatives, reducing emissions, and contributing to ozone layer recovery.

