

Paper vs. Plastic

& the effect on hangers



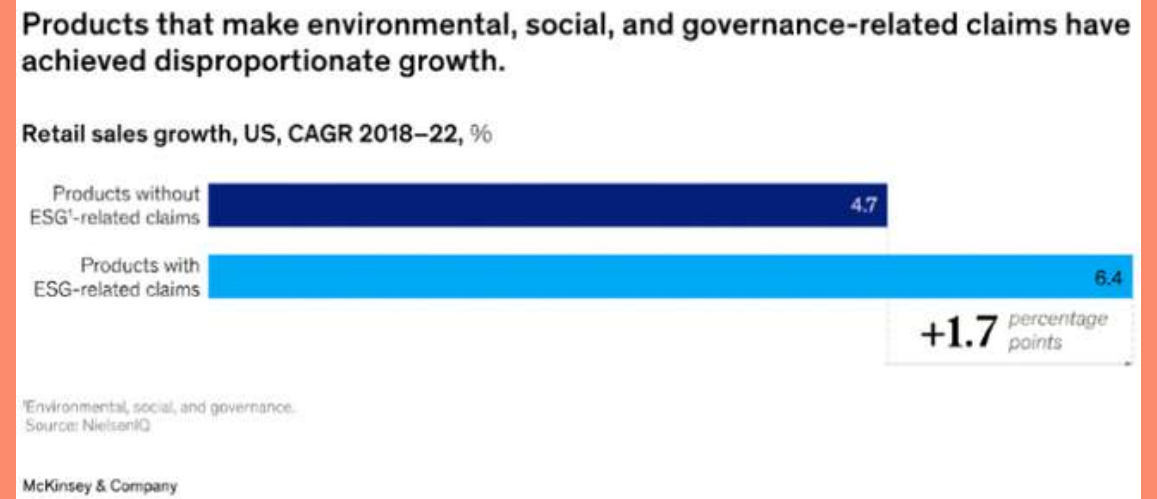


Executive Summary

This paper focuses on the **pros and cons of using plastic versus other materials for hanger production in retail**. This paper is divided into three sections. The first section talks about **single-use plastic**, its life cycle, and the drawbacks that come with it. The second section discusses **recycled plastic material** and how it could be a better alternative to using single-use plastic materials for hangers. The third section elaborates on the different types of **alternative materials (paper, wood, and wire)** hangers could be made out of instead of plastic. The paper concludes by stating how **paper is the best sustainable solution** for hanger production. It mentions **Nexgen Packaging's** success story with paper hangers and how they are actively striving to discover the next best packaging solution.

INTRODUCTION

The retail industry has recently embarked on significant initiatives to **minimize pollution** and environmental impacts. These efforts encompass ethical sourcing, energy-efficient practices, water conservation, and more. According to Retailist, **manufacturing, packaging, and transportation account for 80% of the total carbon footprint for many companies, with this figure rising to 98% for fashion companies.** Retailers and manufacturers must recognize how their practices contribute to environmental degradation and take proactive steps to mitigate this impact.



Recent studies have shown that consumers are starting to care more about sustainability within companies; According to a **2021 survey of over 10,000 people, sustainability has become increasingly important to customers' purchasing choices over the past five years** (McKinsey & Company). This trait is only increasing as younger generations are becoming adults. In a 2020 US survey that surveyed ten countries on their consumer preferences, more than **60% of respondents said they'd pay more for a sustainable product** (McKinsey & Company). This shows how there is a *demand for environmentally friendly products*, and consumers want to support companies that want to make the planet a better place.

The solution we're proposing

A large problem for the retail industry is *plastic usage*. There have been many strides to lower plastic usage altogether through implementing *plastic alternatives and reduction initiatives*.

Hanger alternatives are a great way for retail companies to minimize their plastic usage and footprint on the environment. **GOH, or Garments on Hangers**, is a manufacturing process where every single garment sold comes with a hanger. The problem with this process is that once that garment is sold, those hangers get automatically sent to landfills where they create an abundant amount of ecosystem problems. Then, another wave of GOH hangers comes to the store from the clothing manufacturers creating an **overpopulation of hangers**. This one-way cycle continues to generate pollution. The global retail industry can change this harmful process by **switching from plastic to paper hangers**.

SECTION I: SINGLE-USE PLASTIC

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Single-use plastics are items made from plastic that are intended to be used only once before they are discarded. They are typically designed for short-term use and are often thrown away immediately after their purpose has been served. They were initially created to eliminate the overuse of wood, metal, and glass in manufacturing. However, with time, single-use plastics have been proven to cause a lot of waste and environmental pollution. Some examples of single-use plastic items would be plastic bags, plastic straws, food packaging, and plastic bottles. **In the US, about 86% of single-use plastic waste ends up in landfills, 4% is burned, 9% is recycled, and 1% becomes litter that ends up in the environment (Goldstein).**



WATERBOTTLE



PLASTIC STRAWS



PLASTIC BAGS



SINGLE USE UTENSILS

Lifecycle of Single-Use Plastic Hanger

The retail industry is a large user of single-use plastic for hangers. The creation, implementation, and disposal of single-use plastic for hangers have had a detrimental impact on the environment.

Phase 1

Manufacturing

Phase 2


Distribution

Phase 3

Disposal

**** notice that this life cycle is not a closed-loop system****

Phase 1: Manufacturing



At the beginning of the product's life, when the hangers are being manufactured, plastic hangers contribute to greenhouse gas emissions and environmental degradation. **Plastic hangers are made from polypropylene or polystyrene** (commonly used materials due to their durability and flexibility). Polypropylene and polystyrene are a by-product of petroleum and natural gas processing. Because petroleum and natural gas are **non-renewable resources**, it means there is a limited availability of these "ingredients" and geographical implications to access these materials. Exploring and drilling for petroleum and natural gas disturbs land and marine ecosystems, as well as pollutes surrounding areas.

Eventually, after the extraction of materials is done, a process of controlled temperature and pressure turns the newly made plastic into small pellets. Afterward, the plastic pellets are processed or melted into products like hangers. This production of the literal plastic used for hangers is very **energy intensive**.

Phase 2: Distribution

The next step in a plastic hanger's life is delivery to distributors, retailers, and stores.

The problem with plastic hangers during this phase is that they are not the most durable and are **susceptible to breaking**. This demonstrates how plastic hangers are not manufactured for the long run and cost consumers more money on repeated purchases at the expense of the environment. When the product breaks or is otherwise deemed unusable, it leads to the last step: the disposal phase.



Phase 3: Disposal

Unfortunately, once these single-use plastic hangers are broken or thrown away, it leads to the end of the product life cycle. **Plastic hangers are non-biodegradable and are not 100% recyclable.** Recycling facilities have difficulty recycling hangers due to their shape and plastic compounds. So, when plastic hangers are discarded, it leads to (1) continuous consumption of plastic hangers –which restarts this environmentally harmful product lifecycle– and (2) leads to plastic hangers ending up in landfills. **In the US, 85% of plastic hangers end up in landfills which is about 34 billion hangers per year... an amount that could fill the Empire State Building 20 times over (Retailist).** To add salt to the wound, **it could take up to 500 years for a plastic hanger to fully break down** (Waste 360). This leads to landfill accumulation where the plastic hangers occupy space and potentially leach harmful chemicals into the soil. Some of these harmful chemicals include *benzene*, a carcinogen found in cigarettes that leaks into groundwater, and *bisphenol a*, a hormone disruptor that is banned in Canada (Barker). Depending on the location of the disposal, the plastic hangers could **impact the health and safety** of both marine and terrestrial wildlife.





Conclusion on Single-^{nxg}Use Plastic

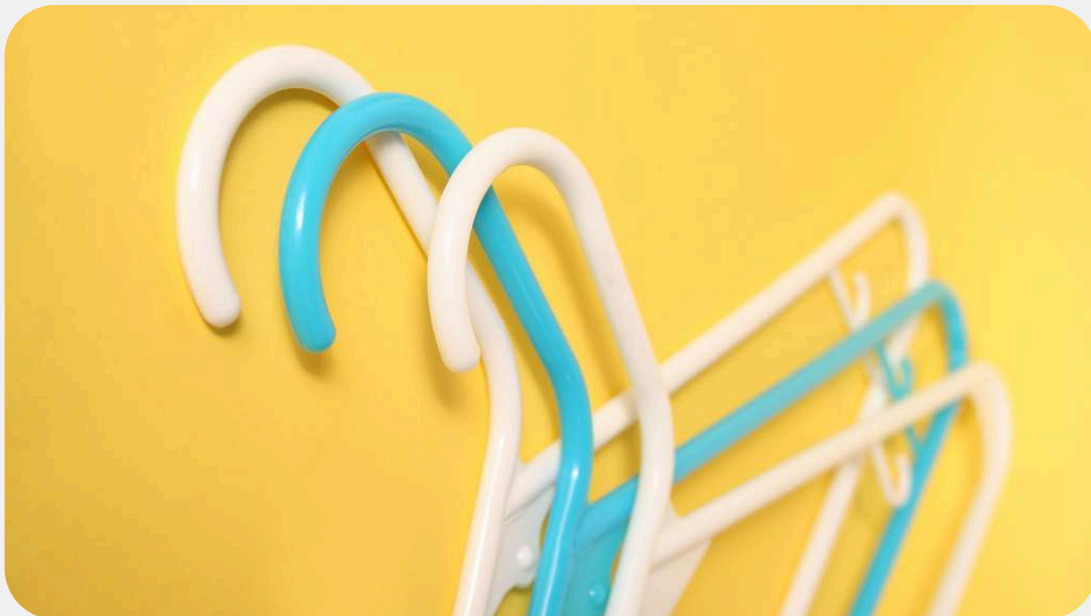
The product life cycle of a plastic hanger is important to take into account when looking into ways the retail industry can cut its single-use plastic usage. A lot of companies are trying to cut back on their single-use plastic as a way of helping the earth and supporting consumer preferences. Nexgen Packaging has a pivotal role in these efforts as a leading hanger manufacturer for retail brands.

SECTION II: RECYCLED PLASTIC

Recycled plastic is a step up from single-use plastic and is used in many industries that focus on sustainability. By using recycled plastics, manufacturers and retailers can **reduce the demand for virgin plastic** materials thereby lessening the environmental impact of producing more plastic. **When a plastic hanger is reused nine times, its' carbon emissions come down by almost 80%** (Mainetti). Incorporating recycled plastic supports a **circular economy** by giving waste materials a new life, and supports consumer pressures for environmentally friendly products.



nxg



The quality of a recycled plastic hanger is equivalent to the quality of a virgin plastic hanger. **A 70:30 ratio of blending recycled plastic with virgin plastic makes a new plastic comparable to the material quality of 100% virgin plastic** (Don't Waste Group).



Success story:

Logitech

There have been many other companies implementing recycled plastic initiatives into their products as well. Logitech, a technology design company, recently decided to make **65% of their mice and keyboards derived from post-consumer recycled plastic** to reduce their carbon impact. After the switch, Logitech **eliminated 8,000 tons of virgin plastic in 2021 and saved 19,000 tons of CO2**. This amount of CO2 **equates to an average passenger vehicle driving 1,740 times around the earth** (Don't Waste Group).

Retail companies can eliminate the same by switching to using recycled materials rather than raw plastic materials for their hangers. According to Mainetti, **"If fashion brands reuse a billion hangers every year, it could prevent around 35,000 metric tons of (...) recyclable materials ending up in landfills"**. Some of the ways they can collect recycled plastic are by implementing **plastic waste collection bins** in strategic areas (shopping malls, recreational facilities, etc.) and creating consumer awareness on how and where to recycle old plastic items. These strategies can help manufacturing companies reload on plastic waste faster and issue more hangers to keep up with retail demands.



However, it is important to note that recycled plastic hangers still have negative impacts. In fact, VICs (Voluntary Inter-industry Commerce Solutions Association), a supply chain standards organization, attempted to create a new hanger with recycled plastic in hopes of cutting down the retail industry's plastic emissions. They created the **484 Hanger** which was a thinner, recycled **black-plastic hanger**. The hope was that the thinness would decrease the amount of plastic used and the black plastic would make it easier to use recycled materials of all colors and kinds. Black plastic is typically made from old consumer electronics and e-waste.

With time, this product was beginning to show its flaws; it was revealed that sorting machines in recycling facilities couldn't identify black plastic, so most of the recycled hangers would end up in landfills. It also showed that black plastic had **low re-usage value** since not many companies need that material. Scarily enough, it eventually was shown that black plastic derived from electronics was coated and filled with toxic lead and flame retardants which can cause **severe skin reactions and off-gas** into clothing or closets. **This exposure could eventually lead to poisoning of the brain and kidneys** (Barker).

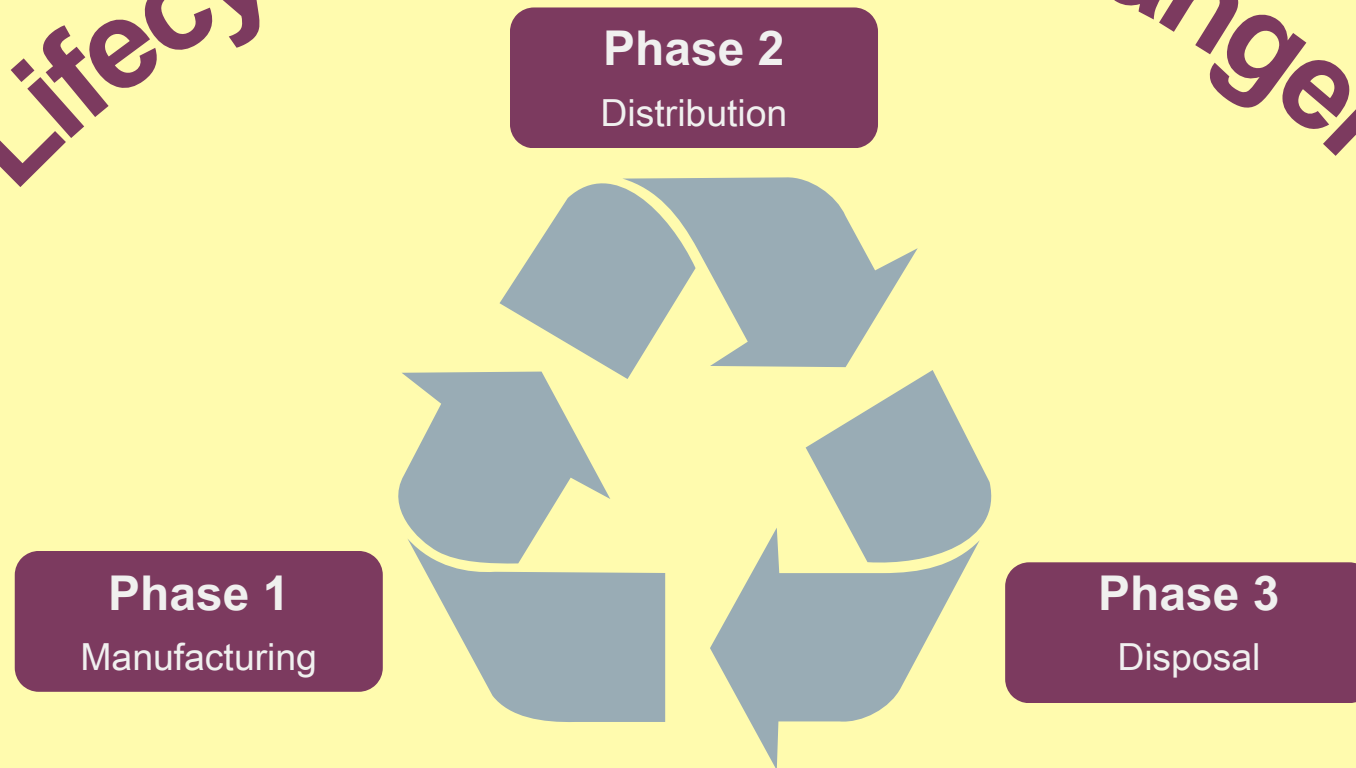
This shows that the cons associated with recycled plastic hangers heavily outweigh the pros. Paper hangers relieve companies of the downsides that come with using recycled plastic.

SECTION III:
PLASTIC ALTERNATIVES
Part A: Paper

Section III, Part A: Paper Hangers
(favorable choice)

Paper is an alternative choice to using plastic for hangers. This section walks through the process and effects of creating and selling paper hangers. The paper hanger life cycle is worth touching on as it is much more environmentally friendly than the plastic hanger life cycle. The material used for paper hangers is typically wood and PCW, or Post Consumer Waste.

Lifecycle of a Paper Hanger



**** notice that this life cycle is a closed-loop system****

Section III, Part A: Paper Hangers Phase 1: Manufacturing

The wood used to make paper hangers derives from a process of deforestation. Comparing the environmental impacts of the deforestation process to make paper hangers to the drilling/extraction process to make plastic hangers is difficult. While deforestation might have a more immediate effect on carbon emissions and biodiversity, drilling poses significant risks of pollution and the burning of nonrenewable resources in the future.

Nexgen makes sure to use **FSC recycled (Forest Stewardship Council) wood** which not every company complies with. FSC is an international non-profit organization created with the mission of responsible forestry. This helps to ensure **Nexgen is employing lawful and responsible logging practices.**

PCW in this scenario means that manufacturers are using different types of paper and cardboard previously used by a consumer, disposed of, and diverted from landfills to make different kinds of products (Mass Gov).



Section III, Part A: Paper Hangers Phase 2: Distribution

After the manufacturing phase, paper hangers are sent and delivered to stores and retailers. An overlooked benefit to using paper hangers over plastic hangers is how weight and thickness affect the distribution process. Because **paper hangers are generally thinner and lighter than plastic hangers**, it is much easier to put more products in a shipment. The table below demonstrates this:

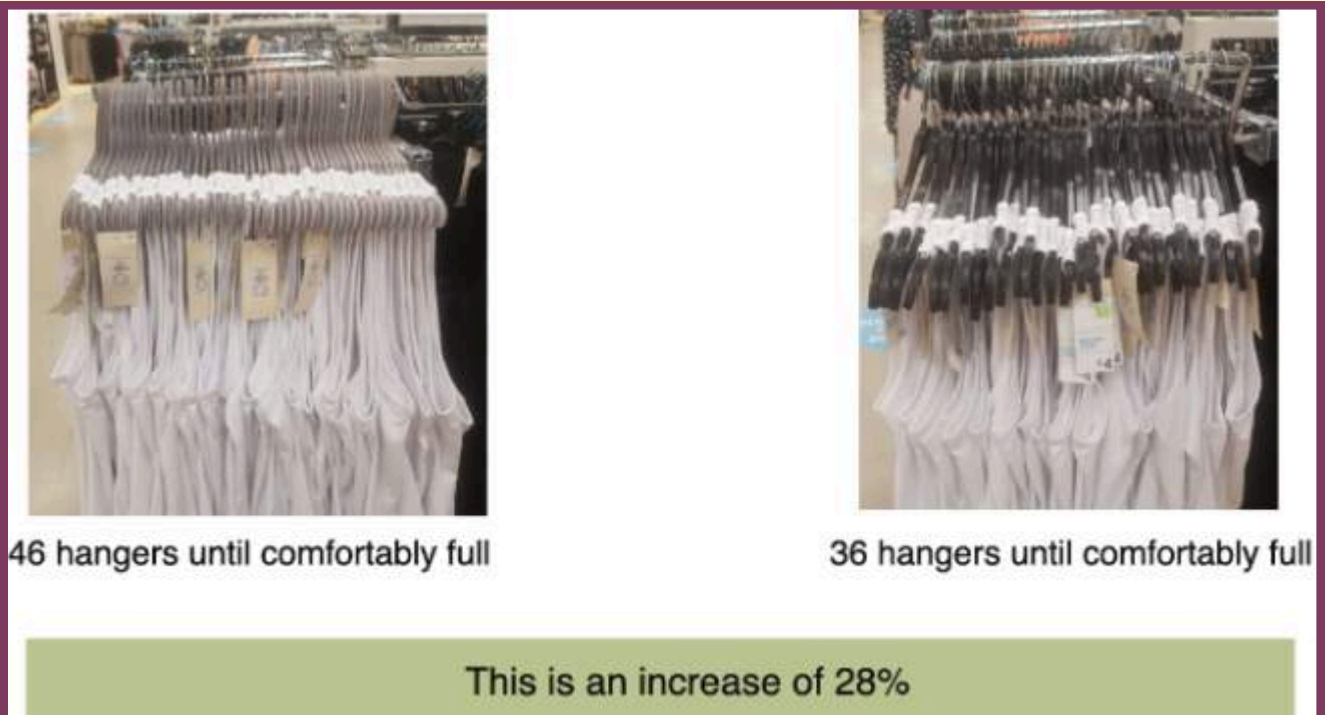
In summary, paper hangers' weight/thickness allows for fewer shipments than for the same number of plastic hangers. This can significantly reduce the amount of carbon emissions that come with shipping products; **It can even cut the supply chain shipping costs by 20%** (Barker).

Size of carrier	Maximum weight carried by truck (lbs) (1 lb≈16 oz)	Amount of paper hangers that can fill the truck (≈1.6 oz per hanger)	Amount of plastic hangers that can fill the truck (≈3.55 oz per hanger)
12-ft box truck size	3,610 lbs	≈36,100 paper hangers	≈16,270 plastic hanger
26-ft box truck size	10,000 lbs	≈100,000 paper hangers	≈45,070 plastic hangers

Truck statistics: International Used Truck

Phase II: Distribution

Once the hangers are delivered to retailers and stores, clients can put these hangers to use. Because these paper hangers are generally thinner than plastic, **retailers can put additional products on the shop floor**. More products on the floor potentially could mean more sales which is good for the retailers. The faster inventory and hangers leave the retailer, the more hangers Nexgen Packaging can provide.



Paper hangers on left. Plastic hangers on right

Phase III: Disposal

The best part about using paper hangers is the disposal stage. Because the hangers are composed of recycled paper and material, the **paper hangers can be reused, biodegraded, or composted.** Nexgen's paper hangers are designed to decompose or be easily recycled like cardboard. This turns what would've been **waste into new products or non-toxic soil amendments.** This is otherwise known as a **closed-loop system**; The paper hangers are collected, recycled, and made into new products simultaneously to minimize waste and resource consumption. And then, the loop repeats.

Marketing Benefits

Another benefit to paper hangers is the **marketing appeal.** Switching to paper hangers is great if a client wants to use fun colors, designs, or printing. Printing on the hangers can open all sorts of **branding and advertising opportunities.**

There are options for water-based adhesives and vegetable-based ink. This helps to ensure that all materials being used are still green.

**SECTION III:
PLASTIC ALTERNATIVES
Part B: Wood**

Section III, Part B: Wooden Hangers

Wood is another alternative to using plastic hangers. The wood can be derived from primarily **Oak, Maple, Walnut, Cedar, or Bamboo** trees.

The advantage of using these types of trees is that they are often very abundant.

After the trees are cut down and made into logs, the wood is sent to a cutting and shaping process. **One log can produce about 2,000 hangers** (Hanger Store). Once the hangers are cut, shaped, and sanded, they move on to the varnishing and glossing process.



Section III, Part B: Wooden Hangers

The **varnishing process** often takes various chemicals to enhance the wood's durability and appearance. The chemicals include chlorine, pesticides, heavy metals, azo dyes, and more. The wood is sprayed with **preservatives** to clean the wood of fungi and insects. A **staining** process occurs for the color and protection of the wood. **Wax or oil-based sealants** are used to protect the wood. Towards the end, the wood is treated with finishes like **shellac or lacquers** to provide a hard, glossy finish. There are also **fire retardants** which are acidic materials combined to reduce the flammability of the wood.



Section III, Part B: Wooden Hangers

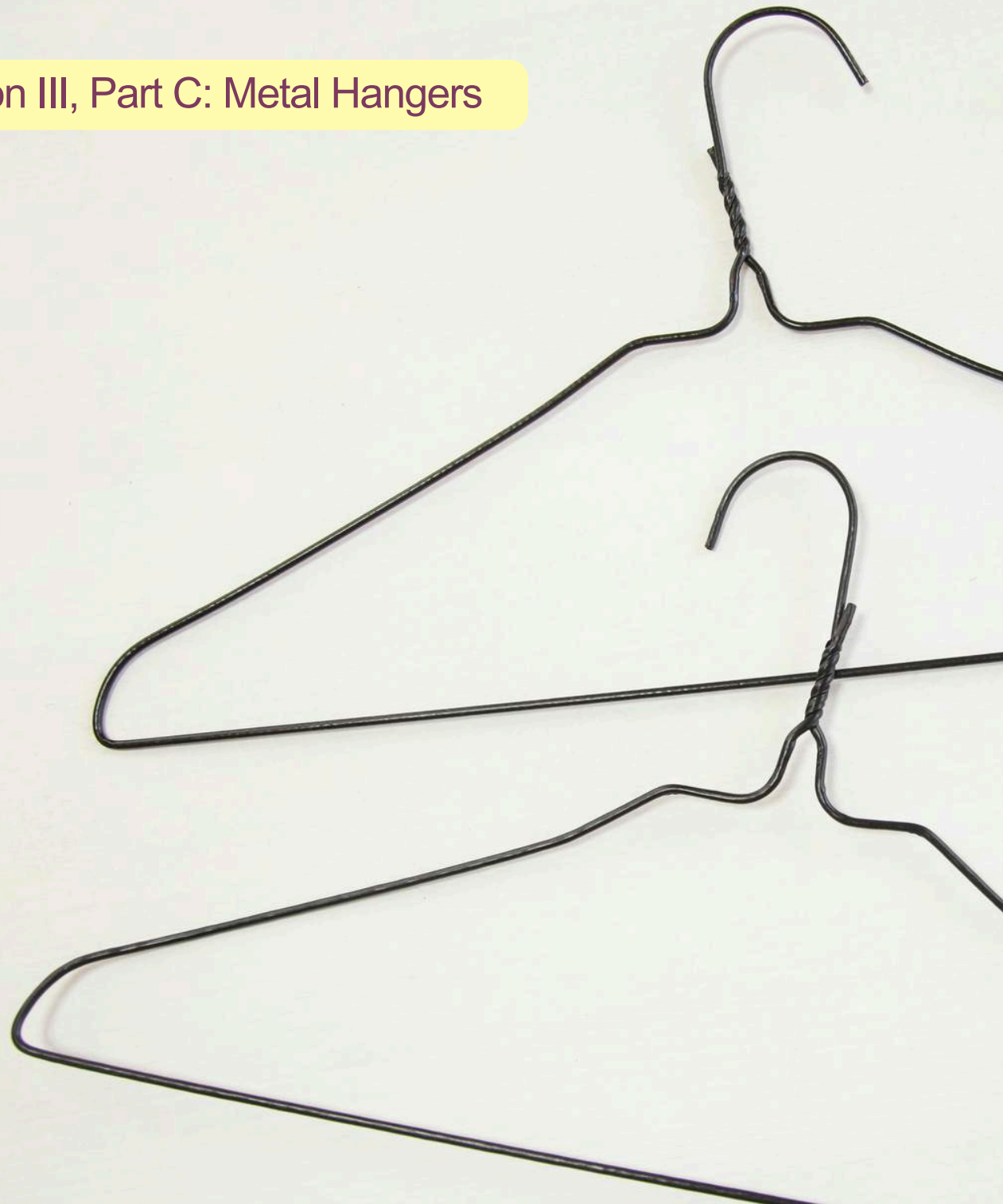
The disposal stage is important to note. Many people may think that because the hangers are made of wood, they will decompose the same way a raw wooden log would decompose into the ground. Unfortunately, this is far from the reality. Similar to plastic hangers, most wooden hangers end up in landfills where they create large amounts of **methane** that gets put in the atmosphere. **It can take over 100 years for wooden hangers to break down** (Barker).

While wood may seem like an obvious material for making sustainable hangers, its **chemical treatment and metal accessories** make wood not so environmentally friendly. So, in short, wooden hangers are a great alternative to using plastic. But paper hangers are still the better, more utilized (wood is not the right material for hanging accessories, footwear, baby products, lingerie, packs of garments, and lightwear products), and more green choice.



**SECTION III:
PLASTIC ALTERNATIVES
Part C: Metal**

Section III, Part C: Metal Hangers



Metal is another alternative to using plastic for hanger production. Metal hangers are **typically used in the dry cleaning business**. The metal used for wire hangers is **low-grade pot metal**. It is the same kind of steel that is often used for highway fences, shopping cart baskets, and umbrellas. It comes from a process of extracting iron ore mined from the Earth. This **metal extraction** can have significant environmental impacts including habitat destruction, biodiversity loss, and air/water pollution from the chemicals used. Nonetheless, it is used for its high hardness and bright appearance (Hanger Machine).

Section III, Part C: Metal Hangers

After the metal is extracted, it is flattened and thinned into long spooled coils that **typically weigh 3,000 to 5,000 pounds per coil** (Hanger Machine). Later, it is cut into the correct lengths and cleaned from oil, dirt, and debris. Then the metal is shaped into a hanger and **coated with either zinc**, to prevent rusting, **or oil-based paint**, for coloring and further protection of the wire. **This plating is an extremely toxic process.**





Most metal hangers are disposed of in landfills where they sit for years due to their **non-biodegradability**. The **recyclability level of metal hangers is extremely low**; Most MRFs (Materials Recovery Facility), or recycling centers, will turn away or have banned wire hangers because they can get tangled in the recycling separation process and can break the expensive sorting machines.

Similar to wooden hangers, metal hangers are a good alternative to plastic but still not as good of an alternative as paper hangers. Metal hangers typically have a longer lifetime than plastic. However, metal hangers still derive from a series of extraction processes that are bad for the environment and have a **detrimental disposal phase**. Paper hangers eliminate these harmful processes.

ADDITIONAL RESEARCH ON PLASTIC ALTERNATIVES

Consumers have recently shown an **increased preference for sustainable and environmentally friendly products.**

Naturally, as humans, consumers want to be aware of the environment and are concerned for their health and others. So when the opportunity arises to support a company that can improve the planet's health, the natural inclination is to support those products. Switching from plastic hangers to plastic alternative hangers shows a retailer's initiative to contribute to a larger sustainability problem our world faces.





Between 2012 and 2022, 731 new plastic pollution policies came into effect worldwide (Bailey). Canada, India, and Europe are actively creating legislation that will decrease the amount of plastic waste used in their countries.

Canada



In Canada, the Trudeau government has already implemented a plan to eliminate plastic waste by 2030 through the gradual elimination of single-use plastics (Goldstein). Plastic checkout bags, cutlery, takeout containers, straws, and any other single-use plastics will be banned. And by December 2025, all designated single-use plastics are aimed to be prohibited. This new legislation “**will remove 1.5 million tonnes of plastics from the waste stream from 2023-32. It will add almost 2.9 million tonnes of plastic substitutes, such as paper, wood, moulded fibre, aluminum, and alternative plastics.**” (Goldstein). The removal of plastic forces Canadian businesses to reconsider how much plastic they are using and how they can replace this usage with something more sustainable.

India

Similarly, in India, the production, usage, and disposal of plastic waste is extraordinary. Because of this, **India is paving the way for a plastic ban in 18 states and Union Territories of India** (Nomani). Some of the regulations include banning **Multi-Layered Plastics (MLP)** and incorporating **Extended Producer Responsibility (EPR)**. MLPs are plastic items that contain 3-12 different layers of varying types of plastic (Ridwell). Most recycling facilities can only recycle one type of material, so MLPs can often be complicated to recycle. Some MLP items include food bags and wrappers (and hangers depending on how they are produced). EPR is a policy approach that assigns producers greater responsibility for their product's lifecycles. This requires corporations and manufacturers to help pay for the cost of recycling their waste (a lot of that being plastic). These are just two examples of the many plastic limitation laws India has put in place. India will likely add more as our world makes more sustainable efforts.



EU (European Union)



As of July 3rd, 2021, the EU has put a **ban on single-use plastics** to be placed on the market (EU). The EU is focusing on limiting single-use plastic through consumer awareness, introducing plastic alternative designs, EPR, and new disposal options for plastic. The EU also has implemented the **EU Green Claim Directive** which will outlaw businesses using terms like “environmentally free” or “climate neutral” without the products having quantifiable evidence of doing so (Bailey). This prevents unethical companies from greenwashing consumers with misleading labels.

Additionally, they have already implemented the **Plastic Packaging Tax** which charges tax on all plastic packaging containing less than 30% recycled plastic content (Source Green). They aim to promote a more circular economy and sustainable business models that create a functioning yet green economy.

United States

The US is not far behind. While there are **no federal bans** on single-use plastics yet, states such as Delaware, California, Hawaii, Connecticut, Maine, New York, and Oregon have placed bans on plastic bags (Seaside Sustainability). Other states have implemented EPR legislation. These bans are only going to grow nationwide. The **US estimates plastic litigation in 2030 is expected to exceed \$20 billion (Bailey).**



Government Legislation

As more and more countries start to implement regulations, taxations, laws, etc., it will become harder to use plastic in manufacturing. It is another reason for companies to look into plastic alternatives so that they can stay ahead of the curve. In this case, retailers should be looking for plastic alternatives for hangers.





Additionally, these green strides of switching from plastic to plastic alternatives are very important for stakeholder engagement. According to a Morningstar survey that polled **2,820 active individual investors across the US, Europe, and Japan, 54% of individual investors plan to increase their sustainable investments in the coming year and 77% are interested in sustainable investing.** Even though this was a smaller-scale survey, it demonstrates the growing **importance of sustainability across all investors internationally.** Retailers and manufacturers need to consider small strides that could boost their **ESG** (environmental, social, governance) level. Switching from plastic to plastic alternative hangers could be that change that attracts consumers' attention and stakeholder investments.

CONCLUSION

Findings

Sustainability takes thought, engineering, and time. Environmentally friendly products need to go through a development stage, trial and error process, etc. before reaching the market. **Careful research and testing** need to be done to ensure new products and business strategies are safe and profitable. While all materials for manufacturing hangers come with environmental implications, it is clear that paper is by far the least environmentally impactful. Hopefully, there is a day when there won't be a need to manufacture hangers at all; But until then, **paper hangers are the best possible solution for function and sustainability.**

The Future with Nexgen Packaging

Nexgen Packaging is the future of viable packaging solutions. Nexgen Packaging has gone through rigorous research, experimentation, and innovation tactics to come up with the most sustainable and environmentally friendly solutions. They came up with the **paper fiberboard hanger that is now available for retailers.**

In 2021, Nexgen acquired Ditto Hanging Solutions. After the acquisition of **Ditto Hanging Solutions**, Nexgen used Ditto's expertise in eco-friendly materials in combination with Nexgen's engineering to create a brand-new paper fiberboard hanger. This hanger is non-toxic, biodegradable, and designed to hold any weight of clothing.



The Future with Nexgen Packaging: current events



This hanger was used in **KidKanai**, a children's second-hand clothing store in France. KidKanai's brand wanted to implement a hanger solution that would be reusable and 100% plastic-free. Eventually, after careful research and hundreds of prototypes, Nexgen offered the official paper fiberboard solution that perfectly fit all of KidKanai's requirements. After the implementation of the hangers in-store, the **reviews were very positive**; There were no reports of breakage or poor quality reviews. KidKanai was able to reduce its carbon footprint through these hangers.

[LEARN MORE](#)

Most recently, **Nexgen won the UK Packaging Design Team of the Year award** in honor of their sustainable packaging solutions and paper fibreboard hangers. Nexgen collaborated with Primark to create a wide range of paper fibreboard hangers to provide their clients with quality solutions that also protect the environment.

[LEARN MORE](#)



Nexgen Packaging continues to innovate new packaging and retail solutions for their clients with the ecosystem in mind.

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