

GUIDE

Sustainably Simple: The Truth Behind Manufacturing's Most Common Eco Myths



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Introduction

As severe weather events become more frequent and their effects harder to ignore, consumers are increasingly conscious of their impact on the planet. Temperatures are rising, pollution threatens humans and other animals alike, and resources once taken for granted as plentiful are dwindling. The fact is that—for society to thrive—change isn't just recommended; it's imperative. In recent years, individual consumers have committed to doing their part, and [manufacturers are following suit](#).

However, getting sustainability “right” can be challenging on both the personal and corporate levels. As is often the case in today's highly connected supply chain, the ripple effects of each choice are more complex and interwoven than many can fathom. As a result, the path to achieving the seemingly simple call to operate more “sustainably” has been muddied by misinformation and myth.

We're here to cut through the noise, examine the industry's most enduring environmental myths from all sides, and help manufacturers identify sustainable changes that will help move the needle on emissions and waste.

Correcting the Record

The public have made it clear: they want to support companies that do their part. This is particularly important for manufacturers, who account for a whopping [77% of total U.S. energy consumption](#). To many, that means opting to buy biodegradable products, prioritizing brands that strive for carbon-neutral shipping, and ditching single-use items as much as possible. As a result, these types of eco-conscious solutions have become popular touchstones for businesses seeking to do more for the planet.

While these initiatives are certainly valuable, new research—aided by expanding access to supply chain and on-the-floor intelligence—is revealing that traditional wisdom about sustainable pivots may not be as reliable or universal as we once thought. Or at least that these popular “green” solutions require deeper understanding if they are to produce their intended outcomes.



The Plastic vs. Paper Problem

One of the most versatile materials on the market, plastic has become a staple of modern product design. It's adaptable, durable, cost-effective, and relatively easy to use. It's also one of the most wasted materials on the planet, with an estimated [20 million metric tons](#) of plastic litter ending up in natural ecosystems each year.

Plastic has other drawbacks as well, and they start well before disposal. To start, it's a fossil fuel byproduct, the creation of which has its own implications. Because of its long lifespan and durability, most [plastic trash ends up incinerated](#), exacerbating air pollution and releasing significant amounts of greenhouse gases. It even does damage while waiting to be burned, as the material leaves behind microplastic particles in water and soil.

With all this in mind, it's no mystery why environmental activists are itching to reduce reliance on plastic. Heeding these calls, governing bodies have implemented regulations designed to curb single-use plastics, and brands the world over have worked to comply. The problem, though, is that—sometimes—plastic is actually the best option.

Take, for example, the push away from plastic and toward paper bags. Paper bags excel in many of the areas in which plastic falls short, with their biodegradable material and relatively easy recycling process being top selling points for many. However, research indicates that the jury on the environmental benefits of switching to paper en masse is still out.

Though paper options are undeniably easier to deal with at the end of their lifecycle, their production is more resource-intensive than that of plastic. A 2020 report on the topic from the United Nations Environment Programme concluded that, while paper bags may mitigate litter, they “in most cases have a [larger impact on the climate, eutrophication and acidification](#), compared to [single-use plastic bags].” Why is that? Because disposal is only one small part of the product lifecycle.

A 2007 study found that producing paper bags uses 17 times more fresh water and 3 times more energy [for the same carrying capacity](#). Because they are both larger and heavier when packaged for delivery, paper bags also use more fuel (and create more emissions) when shipped. Then, there’s potential for reuse—another category in which paper falls short as it is among the least durable of all options. Even with the ease of recycling in paper bags’ favor, there is a huge caveat. Though an estimated [68% of paper products](#) used in the U.S. are recycled, the material’s extended lifespan is relatively short compared to plastic and other options. Since the material’s fibers are short, to begin with, there is a limit to its capacity for continual reuse.

These issues are relevant not just when discussing bag choices at checkouts. They apply to packaging, product design, and other areas as well. They also provide a compelling reminder as to why manufacturers’ initiatives must account for impact not just at the end of the item lifecycle but from start to finish.



PLASTIC

Pros:

- Adaptable
- Durable
- Cost-effective
- Easy to use

Cons:

- Fossil fuel byproducts
- Incineration increases air pollution
- Leaves behind microplastic particles in water and soil



PAPER

Pros:

- Biodegradable
- Easy recycling process

Cons:

- Resource intensive to produce
- Heavier & harder to ship
- Lack of durability



Alternative Energy Anxieties

Another popular “green” initiative is the move away from fossil fuels toward cleaner energy alternatives. Though the topic has been heavily politicized, there are a few undeniable drawbacks to our overreliance on oil and gas:

- It’s a limited resource.
- It contributes to pollution.
- It doesn’t “burn clean,” releasing large amounts carbon into the atmosphere.
- Drilling and refinement processes and their byproducts can have negative effects on the health of people and wildlife.

Climate change and global warming aside, failing to seek alternatives to oil and gas will have consequences. However, as with the switch to plastic above, there’s more to the story than “fossil fuels are always worse than other options.”

One compelling example comes from the automobile industry, where the pursuit of quality electric vehicle (EV) options is driving considerable research and innovation. While getting carbon-emitting cars off the road is an undeniably noble mission, the environmental impact of manufacturing EVs is significant. Other limited, natural, and potentially toxic materials are needed to produce the high-capacity batteries that are central to EVs’ future. Mining these materials has proven to have significant environmental and social impacts of its own.

Manufacturers hoping to pivot to renewable sources for their facilities face a similar quandary. Though the procurement and use of fossil fuels do significant damage, other available options [have their own drawbacks](#).

Large-scale solar power systems, for example, occupy incredibly large footprints, which means they impact animal habitats and natural ecosystems. Furthermore, solar plants—like all energy conversion facilities—must use water for cooling, and as they produce more energy, those demands grow proportionally. Meanwhile, biomass options—though “renewable”—still contribute to carbon emissions as the energy potential comes from combustion, and the growing of energy crops (like switchgrass) demands agricultural resources and land investments.

Bidding Instructions Goodbye

Paperless does not mean wasteless

DATA CENTERS

2%

of the world's total energy demand (2022)

1.5%

of 2022's total greenhouse gas emissions

40%

of energy consumed is heat loss and waste

550k

gallons of water to meet one hyperscale facility's daily cooling needs

In an effort to reduce waste and increase accessibility, many consumer product manufacturers are ditching the paper instruction booklets that used to come along with their merchandise. No doubt a continuation of the “go paperless” ethos adopted by banks, doctors’ offices, and other customer service organizations, the “scan for instructions” approach offers buyers a way to learn about the product without a physical footprint.

A seemingly small change on its surface, foregoing paper instructions can have a significant impact on manufacturers and waste production. Omitting handbooks and assembly instructions from packaging not only saves paper from trash cans and money on printing costs. It also can allow for lighter, smaller boxes which means cheaper, more efficient shipping.

What most leaders and consumers don’t realize when making this switch is that “paperless” does not mean “wasteless.” All those instruction booklets must be hosted somewhere, and that comes at a cost—just a less visible one. Data centers and mobile communications infrastructure, which enable anytime-anywhere connections to online resources, are resource-hungry, highly demanding facilities with serious environmental impacts.

In 2022, data centers accounted for [2% of the world's total energy demand](#), with that number expected to be closer to 6% by 2026. Data centers are also significant contributors to CO2 emissions, having produced 1.5% of 2022's total greenhouse gas emissions; that's on par with the global airline industry.

Data center sustainability is even more complicated, though, as power conversion and data processing inevitably lead to heat loss and waste. As such, about [40% of the energy consumed](#) by these facilities—and about [550,000 gallons of water per facility each day](#)—goes toward cooling, which helps protect equipment and [local ecosystems from high temperatures](#). Add in the fact that many of these facilities use “dirty” energy sources, and the foundation of the idea that “paperless is always better” becomes even less sound.

It's worth noting that the above is not intended to criticize enterprises pursuing these types of initiatives nor discourage others from doing the same. Such pursuits may help to reduce emissions, enable more efficient recycling, and cut waste. All of these outcomes are, indeed, essential to reducing environmental impact.

The intention is to illustrate why change does not happen in isolation and the importance of seeing the full picture before choosing a path forward. Luckily, manufacturing's ongoing digital transformation is bringing that picture into focus.





Simplifying the Sustainability Equation

The end-to-end data that a Manufacturing Execution System (MES), like [TrakSYS™](#), makes available to manufacturers has highlighted the complexity of operating sustainably in today's landscape as well as the importance of evaluating initiatives holistically. Having access to supply chain, production, and fulfillment insights empowers teams to model outcomes to determine whether their waste reduction plans will actually get the job done.

An MES uses Industrial Internet of Things (IIoT) devices to gather to-the-second data from production and fulfillment facilities to create a holistic, integrated record of operations. This gives manufacturers real-time visibility into production performance, energy consumption, quality control, and more, so sustainability-focused teams can track their progress. By unifying current and historical records, these teams can identify areas of opportunity, monitor the impacts of changes, and pivot if their initiatives aren't going as planned.



Energy optimization

[Energy management](#) helps manufacturers understand their consumption, identify patterns, and find areas of their operations that use more energy than expected. It can also provide insight into which types of energy the facility is using, emissions, and other key metrics to inform conservation roadmaps.



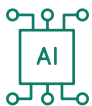
Predictive maintenance

[Predictive maintenance](#) tools monitor things like real-time equipment performance alongside past performance and trends to highlight how actual utilization compares to forecasts. They can use this information to identify when assets begin operating out of spec. This allows manufacturers to get ahead of things like costly equipment breakdowns and product quality concerns, which can lead to scrapped units or materials. At scale, this can offset significant amounts “e-waste” (discarded electronics and appliances), the improper disposal of which can harm natural environments and people.



Traceability

Many manufacturers view [traceability](#) in terms of quality assurance and recall support, but product and material lifecycle information is [highly valuable for environmental protection](#). Knowing where a material came from, what product it went into, and where it ended up helps manufacturers implement [circular production and disposal models](#), provides visibility to consumers, and helps companies assess the actual environmental cost of their practices so they can improve them effectively.



AI-based modeling and forecasting

Though AI certainly contributes to rising data center demand, its potential benefits may offset some of those concerns. Armed with insights concerning material origins, shipping, production, and other factors, these systems can help manufacturers [forecast materials availability and product demand](#) to reduce waste. With these toolsets, businesses can also model potential sustainability projects, so they fully understand the pros and cons before implementation.



Compliance support

[Regulations](#) around sustainable operations have ramped up in recent years, and they're likely to continue to change as we near the [UN's 2050 Net Zero deadline](#). MES platforms can help manufacturers ensure they are meeting standards, have detailed records to prove it, and have the tools they need to continue to do so as guidance shifts.

While improving cycle efficiency or quality assurance to reduce wasted materials and energy may not sound as groundbreaking as changing packaging or going solar, they're adjustments that can deliver real results. Communicating about these changes with consumers may seem difficult, but the clear, verifiable proof points an MES provides give businesses ample talking points and a quantifiable impact they can share with their customer base.

As the journey to more responsible manufacturing operations continues, thoughtful, and continuous improvements will be the foundation for a brighter future. Guided by technologies like MES, businesses can ensure whatever size or shape their initiatives take, they will be as effective and value-additive as possible.

About Parsec

Utilizing their 30 years of experience in manufacturing, Parsec created TrakSYS: a best-in-class operations management software application and solution platform designed to significantly improve manufacturing operations. TrakSYS aggregates data from multiple sources to deliver real-time, actionable intelligence that helps manufacturers reduce production costs, decrease lead time, and improve profitability. TrakSYS is deployed at thousands of factories in more than 140 different countries.



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