EPISODE #159

The High Cost of Flight: Aviation and Impact Accounting

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EPISODE SYNOPSIS

In this episode of My Weird Prompts, Corn and Herman Poppleberry deconstruct the concept of impact accounting to ask a difficult question: can modern aviation ever truly be sustainable? They dive deep into the unforgiving physics of flight, explaining why current solutions like Sustainable Aviation Fuel (SAF) and electric batteries face massive scaling and energy density hurdles that many industry experts often overlook. From the hidden warming effects of high-altitude contrails to the promising efficiency of high-speed rail, this discussion challenges the "green" narrative of the airline industry and explores what it would take to balance the planetary books. If an airline's environmental damage exceeds its profit, is the industry effectively bankrupt? Join the brothers as they weigh the convenience of global travel against the urgent necessity of a livable future, offering a sobering yet fascinating look at the second-order effects of our need for speed.

DANIEL'S PROMPT

Daniel

I've been thinking about the concept of 'impact accounting,' which involves weighing a company's environmental harm against its profits. Given the significant environmental cost of flying, do you think modern aviation can ever truly be sustainable, or is it an inherently unsustainable practice? What forms of transport should we prioritize in the future?

TRANSCRIPT

Corn

Hey everyone, welcome back to My Weird Prompts. I am Corn, and I am sitting here in our living room in Jerusalem with my brother, the one and only Herman Poppleberry.

Herman

That is me. Happy to be here, Corn. It is a beautiful day outside, though I have been cooped up reading white papers all morning, as per usual.

Corn

Well, you are in luck because our housemate Daniel sent over a prompt that is right up your alley. It is about something we have touched on briefly in the past, but never really deconstructed. He was asking about the concept of impact accounting and whether modern aviation can ever actually be sustainable.

Herman

Oh, impact accounting. That is a heavy hitter. We are talking about the work coming out of places like the Impact Weighted Accounts Initiative. The idea that a company's balance sheet is basically a lie if it does not include the environmental and social costs of its operations.

Corn

Right, and specifically, Daniel was looking at the airline industry. If you take the profit an airline makes and then subtract the cost of the carbon and the non carbon impacts they pump into the atmosphere, does the business even make sense anymore? Or is flying just fundamentally at odds with a livable planet?

Herman

It is the ultimate test case for sustainability because aviation is what we call a hard to abate sector. In most other industries, we have a clear path. We can electrify cars, we can use heat pumps for buildings, we can use wind and solar for the grid. But pushing a hundred ton metal tube through the air at five hundred miles per hour? The physics of that are incredibly unforgiving.

Corn

I remember back in episode two hundred forty one, when we talked about the tech behind missile defense, we discussed the sheer kinetic energy involved in flight and impact. It is a similar scale here. To get that much mass to stay in the air, you need an incredible amount of energy density. And right now, nothing beats old fashioned kerosene jet fuel for energy density.

Herman

Exactly. And that is where the impact accounting gets really scary. If you look at the numbers from twenty twenty four and twenty twenty five, the global aviation industry was responsible for about two point five percent of global carbon dioxide emissions. That sounds small, until you realize that if the aviation industry were a country, it would be a top ten emitter.

Corn

And it is not just the carbon dioxide, right? I have read that the contrails, those white streaks you see behind planes, might actually be worse for warming than the fuel itself.

Herman

You hit the nail on the head, Corn. This is the part most people miss. When a plane flies at high altitude, it emits nitrogen oxides, soot, and water vapor. In certain atmospheric conditions, that water vapor creates cirrus clouds. These clouds trap heat that would otherwise escape into space. This is called radiative forcing. Some studies suggest the total warming impact of aviation is actually double or even triple what the carbon dioxide numbers alone suggest.

Corn

So if we are doing impact accounting, we are not just looking at the fuel burned. We are looking at this massive secondary effect on the atmosphere. If an airline makes a billion dollars in profit but causes three billion dollars in atmospheric damage, they are effectively bankrupt from a planetary perspective.

Herman

Precisely. They are subsidized by the future. And that brings us to Daniel's core question. Is it inherently unsustainable? Can we fix it, or do we just have to stop doing it as much?

Corn

Well, let us look at the fixes first. Everyone is talking about Sustainable Aviation Fuel, or SAF. Is that just greenwashing, or is there some there there?

Herman

It is a bit of both. SAF is usually made from things like used cooking oil, agricultural waste, or even captured carbon combined with green hydrogen. The big advantage is that it is a drop in fuel. You do not need to redesign the planes or the engines. You just pump it in.

Corn

But I am guessing the scale is the issue.

Herman

It is a massive issue. Right now, SAF accounts for less than one percent of total jet fuel used globally. To get to net zero by twenty fifty, we would need to scale that up by thousands of percent. And there is the land use problem. If you grow crops specifically for fuel, you are competing with food production and potentially causing more deforestation, which ruins your impact accounting balance sheet before you even take off.

Corn

It feels like a shell game. You save carbon in the air but lose it on the ground. What about electric planes? We see those small two seaters and commuter planes. Could we ever see a trans Atlantic flight on batteries?

Herman

Not with current physics, no. This is where the energy density becomes a wall. Liquid jet fuel has about fifty times more energy per kilogram than the best lithium ion batteries we have in twenty twenty six. If you tried to power a Boeing seven eighty seven with today's batteries, the batteries would be so heavy the plane could never leave the ground. Even if we get five times better battery tech, we are still looking at short hops. Maybe London to Paris, or New York to Boston. But for long haul? Batteries are a non starter.

Corn

So we are stuck between a fuel that is hard to scale and batteries that are too heavy. That leaves hydrogen, right? I know Airbus has been pushing their ZEROe project.

Herman

Hydrogen is fascinating. It has great energy density by mass, but terrible energy density by volume. You need huge, pressurized, cryogenic tanks to store it. That means you have to completely redesign the airframe. You cannot put fuel in the wings anymore; you need big tanks in the fuselage, which means fewer passengers or a much bigger plane. Plus, we need to produce all that hydrogen using renewable electricity, which is another massive scaling challenge.

Corn

It sounds like every solution has a massive asterisk attached to it. It makes me think about what we talked about in episode one hundred thirty nine regarding the impact of light on sleep. Sometimes the technological solution creates a whole new set of biological or environmental problems we did not anticipate. We solve the carbon issue but create a massive demand for rare earth minerals or a global land grab for biofuels.

Herman

That is the second order effect you are always pointing out, Corn. And it is why some people argue that the only truly sustainable aviation is less aviation.

Corn

That is a tough pill to swallow. We live in a globalized world. I mean, we are sitting here in Jerusalem, our family is spread out. The idea of giving up the ability to see the world or see loved ones is a massive shift.

Herman

It is. But if the impact accounting shows that a flight to London actually costs the world five hundred dollars more than the ticket price in terms of environmental damage, then the current system is essentially a luxury being paid for by people who will never even step on a plane.

Corn

Let us take a quick break to hear from our sponsors, and when we come back, I want to dig into what the alternatives actually look like. If we fly less, how do we get around?

Herman

Sounds good. Larry: Are you tired of the sky being the wrong shade of blue? Do you worry that your personal carbon footprint is leaving a muddy smudge on the face of Mother Earth? Introducing the Atmos-Shield Personal Ionizer! This sleek, chrome plated neckpiece uses proprietary, unverified sub-atomic frequencies to repel greenhouse gases from your immediate vicinity. Does it work? Our lawyers say we cannot use the word "yes," but our satisfied customers say they feel at least twelve percent more ethical while wearing it. The Atmos-Shield: because the atmosphere is everyone's problem, but feeling guilty is yours alone. BUY NOW!

Corn

Thanks, Larry. I think. I am not sure I would trust a neckpiece to solve the climate crisis, but he certainly has energy.

Herman

He is consistent, if nothing else. Anyway, back to the real world. We were talking about the inherent sustainability, or lack thereof, in flying.

Corn

Right. So if we accept that aviation is going to be incredibly difficult to decarbonize at its current scale, what should we be prioritizing instead? Daniel asked what forms of transport we should focus on for the future.

Herman

The answer, at least for medium distances, is almost always rail. Specifically, high speed rail.

Corn

I figured you would say that. But why rail? Is it just the efficiency?

Herman

It is the physics again. When you are on tracks, you do not have to spend energy fighting gravity to stay in the air. You are just fighting rolling resistance and air resistance. And because trains stay on the ground and follow a fixed path, they are much easier to electrify. You do not need heavy batteries; you just use overhead wires. You are pulling power directly from the grid, which can be powered by wind, solar, or nuclear.

Corn

And the capacity is massive. I was reading a report the other day about the capacity of a single high speed rail line versus a highway or an airport. One train line can move the same number of people as a ten lane highway, with a fraction of the land use.

Herman

Exactly. And in twenty twenty six, we are seeing this play out in places like China and Europe. China now has over forty five thousand kilometers of high speed rail. They have essentially replaced their domestic short haul flight market with trains that go two hundred miles per hour. In Europe, they are actually starting to ban short haul flights where a viable train alternative exists.

Corn

That seems like a very practical application of impact accounting. If the train can do the journey in under four hours and has ninety percent lower emissions, the flight simply should not exist in a rational economy.

Herman

Right, but the challenge is the infrastructure cost. Building tracks is expensive and takes a long time. You have to deal with land rights, tunneling, and massive upfront capital. It is much easier to just build an airport and use the "free" highway of the sky.

Corn

But that sky is not free. That is the whole point of impact accounting. We have just been ignoring the bill.

Herman

Precisely. If we took the subsidies that currently go to aviation fuel and redirected them toward rail infrastructure, the math would look very different. There is also the "Time-Cost" misconception. People think flying is faster, but for a five hundred mile trip, when you factor in travel to the airport, security, boarding, and then the reverse at the other end, a high speed train from city center to city center is often faster and much less stressful.

Corn

I have experienced that myself. Taking the train through Europe is a completely different experience than being crammed into a metal tube. You actually see the transition of the landscape. It feels more... human.

Herman

It is. And then there are the more "out there" technologies. We have talked about Maglev and Hyperloop in the past. Maglev is already working in places like Japan and South Korea. By using magnets to levitate the train, you eliminate rolling resistance entirely. You can hit speeds of over three hundred seventy miles per hour.

Corn

That starts to compete with planes even on longer distances.

Herman

It does. The problem is the cost. Maglev tracks are incredibly expensive to build and maintain because the tolerances are so tight. And Hyperloop... well, Hyperloop is still a bit of a dream in twenty twenty six. The engineering challenges of maintaining a vacuum in a thousand mile tube are immense.

Corn

It feels like we are looking for a silver bullet when we already have a silver arrow, which is standard high speed rail. But what about the oceans? If we are talking about truly global travel, we cannot build a bridge to New York from here.

Herman

That is the hardest part. For transcontinental travel, we are currently stuck with ships or planes. Shipping is actually relatively efficient per ton of cargo, but for passengers, it is slow. We are talking about a week to cross the Atlantic.

Corn

Which brings us back to a cultural shift. Maybe the future of sustainable transport is not just about changing the vehicle, but changing our relationship with time and distance.

Herman

I think that is the most profound takeaway from the impact accounting movement. It forces us to ask: "Is this trip actually worth the cost?" Not just the dollars, but the cost to the commons. Maybe we do not fly across the world for a two day business meeting that could have been a video call. Maybe we take one long vacation every two years instead of four short ones every year.

Corn

It is a return to a more deliberate way of living. In episode two hundred sixty four, we talked about the Model Context Protocol and how AI is making remote collaboration much more seamless. If we can work together effectively without being in the same room, the necessity of frequent flying drops significantly.

Herman

Exactly. We use technology to reduce the need for physical movement, and then we use the most efficient physical movement possible for the trips we do take.

Corn

So, to summarize Daniel's question: is aviation inherently unsustainable?

Herman

In its current form and scale, yes. The physics of high altitude, high speed flight are simply too carbon intensive and have too many non CO2 warming effects to be compatible with a net zero world at the volumes we are currently seeing. We can make it better with SAF and hydrogen, but those solutions are incredibly hard to scale.

Corn

But it is not a "no" forever. It is a "not like this."

Herman

Right. It is about right sizing. Using aviation for the things only aviation can do, like crossing oceans or reaching remote areas, and moving everything else to the ground. And for the flights that remain, they will likely become much more expensive as the true cost is priced in.

Corn

Which means flying might go back to being a rare, special event rather than a casual commute.

Herman

Which, from an impact accounting perspective, is exactly what needs to happen.

Corn

It is fascinating how much of this comes down to just being honest about the numbers. We have been living in a period of "carbon debt," and the bill is coming due.

Herman

It is. And the companies that survive will be the ones that start accounting for that debt now, rather than waiting for the atmosphere to foreclose on them.

Corn

Well, I think we have given Daniel plenty to chew on. Before we wrap up, Herman, do you have any practical takeaways for our listeners? What can a regular person do with this information?

Herman

First, if you have the option to take a train instead of a short flight, do it. Even if it takes an extra hour or costs a bit more, the impact difference is massive. Second, look into carbon removal, not just offsets. Offsets are often sketchy, but supporting technologies that actually pull carbon out of the air is a way to start balancing your own personal impact account.

Corn

And I would add, support policy that prioritizes rail infrastructure. In many places, the reason we fly is simply because we do not have a choice. We need to demand those choices.

Herman

Well said, Corn.

Corn

And hey, if you are enjoying these deep dives into the weird and wonderful prompts Daniel sends our way, please consider leaving us a review on your favorite podcast app. It really does help other curious minds find the show.

Herman

It really does. We appreciate every single one of you who tunes in.

Corn

You can find us on Spotify and at our website, myweirdprompts.com. We have the full archive there, including those episodes we mentioned today.

Herman

This has been My Weird Prompts. I am Herman Poppleberry.

Corn

And I am Corn. Thanks for listening, and we will talk to you next week.

Herman

Until next time!

Corn

Let's go see if Daniel wants to grab some coffee. I think he is in the kitchen.

Herman

Sounds good. I need to stretch my legs anyway. All this talk of high speed rail has me wanting to move at more than zero miles per hour.

Corn

Fair enough. See ya, everyone!