The Tricks Pilots Are Using to Reduce Your Flight's Carbon Emissions

cntraveler.com/story/the-tricks-pilots-are-using-to-reduce-your-flights-carbon-emissions

Have you ever been fast asleep on a plane and been woken up when the engines feel like they kick into high gear mid-flight? Far from being a sign of impending doom, it's the aircraft climbing to a higher altitude, just one of the many tricks that we pilots employ to make our flights more environmentally friendly. Yes, aircraft are more fuel efficient than ever, but pilots are also able to fly them in ways that reduce the environmental impact further still without compromising the safety of passengers or crew.

While commercial aviation accounts for 2.5 percent of global carbon emissions, the industry is taking strides to reduce its carbon footprint. Here are five small steps—from takeoff to landing—we take in the cockpit to minimize the amount of fuel we use, fly more efficiently, and cut down a flight's carbon output:

1. Using less power for takeoff

Very rarely does an aircraft take-off at full power. Instead, before each departure we use various weather and airfield metrics to calculate the minimum engine power that will get us safely airborne. This is known as a de-rated takeoff, and is why some takeoff runs seem to go on forever.

Even with this reduced engine power, we always plan for the worst possible scenario: an engine failure on liftoff. We always ensure that even if only the remaining engine is running on the de-rated thrust setting, the aircraft will still climb safely away from the ground.

2. Taxiing with just one engine

Have you ever felt like it's taking an eternity just to get from the gate to the runway? You're not imagining it. At some airports (like New York's JFK), it's often because we're stuck in a 45-minute queue of flights all waiting their turn to take off. But the plane could also simply be taxiing to the runway more slowly because it's only using one engine, in an effort to cut carbon output.

When pushing back from the gate, the pilots will start just one engine, waiting to start the other until the plane is closer to the runway. Not only does this save the emissions from one engine, it also means that they can start taxiing to the runway much sooner since they don't have to wait at the gate for both engines to start up.

3. Maximizing cruising altitudes and winds

The higher an aircraft flies, the more efficiently the engines perform. However, the altitude an aircraft can reach is limited by its weight, so a compromise must be made. As the flight progresses, fuel is used up, and the aircraft becomes lighter and can fly higher. (Here's your reminder that packing less can also help lighten the plane, making it ever so slightly more efficient.) As soon as the aircraft is light enough, pilots will climb to a more fuel-efficient altitude. This is known as a "step climb." So next time you hear the engines roar into life mid-flight, there's no need to panic.

The winds also play a major part in how we fly the aircraft. If we are able to take advantage of a strong tailwind, we will get to our destination quicker, reducing the time spent running the engines. In fact, the benefits from a strong tailwind at a lower altitude can sometimes even outweigh the reduced efficiency of the engines at that level.

4. More efficient circling

If you think circling in a holding pattern waiting for your turn to land is tedious as a passenger, trust me, your pilots are thinking the same thing. The long wait to land isn't just bad on your patience: since engines use more fuel at lower altitudes, circling just before landing is harder on the environment. In order to reduce these extra emissions, Air Traffic Control (ATC) at some airports are switching to a process called linear holding.

With linear holding, ATC will instruct us to slow down before we even start the descent from cruising altitude, often hundreds of miles from our destination. This absorbs the delay while the engines are operating most efficiently and reduces the time spent wasting fuel at lower levels.

5. Using less fuel to descend

In an optimum fuel-efficiency scenario, an aircraft would stay at its cruising altitude until the last minute and then glide all the way down to the runway. However, the complexities of ATC instructions and plane traffic mean that this is rarely possible.

To ensure that we don't fly level during the later stages of the approach—which would take more fuel than a smooth, constant descent—we constantly calculate our position in terms of altitude to lose versus distance remaining to the runway. (Do you remember those bizarre speed/distance/time problems your math teacher used to propose? They were clearly designed for the future pilots in the class because that's how we calculate how to save emissions when approaching a landing.) We can then adjust the rate at which the aircraft is descending, minimizing both the fuel burn and noise levels as we land.