THE NEW GAMEPLAN FOR SUSTAINABLE AVIATION

AUDIO TRANSCRIPT

Michael: Welcome to Aviation Week's Check 6 podcast with Accenture. I'm Michael Bruno, senior business editor.

In the 1990s, commercial aviation leaders were increasingly losing sleep over the future of the industry. The good news was that they foresaw growing air passenger volumes – and with it hopefully growing airline and manufacturing profits. But they were appalled by the accident and fatality rates that existed at the time. It didn't take a rocket scientist to figure out that if the number of flights and passengers kept climbing, the number of accidents and deaths would grow exponentially. Even holding to the then-existing rates was not going to be good enough, because it would just mean a linear increase in mishaps and injuries. To save their industry, they recognized that mishaps had to be reduced, period.

The result was practically a complete re-evaluation of the commercial air system. Everything from how fasteners were riveted on to aircraft to how air traffic was managed was all reassessed with an eye toward safety. Yet, those were relatively low hanging fruit compared with cultural changes in the flight deck. Airline captains were no longer gods enjoying papal infallibility. Instead, crew resource management became the new, safer standard practice.

We know how the story turned out – it worked incredibly well. Commercial aviation became an amazingly safe transportation system, far safer than driving a car. But now commercial aviation is going through another existential moment. This time it's about environmental, social and governance concerns, and like safety before it, sustainability is now the overarching goal. For sure what lies ahead are both the opportunity to pick low-hanging fruit, but also the need to make controversial culture changes. But how does commercial aviation get there?

Joining me today to discuss two new reports that hone in on these issues are John Schmidt, Accenture's global leader for aerospace and defense, and Claudia Galea, Accenture A&D's global sustainability lead.

John, Claudia, welcome!

John: Hey Michael. Good to be with you.

Claudia: Hi Michael. Thank you for the introduction.

Michael: Thanks for joining. John, the first thing I want to talk about is Accenture's Beyond Flight report. In it you talk about investing in technology to accelerate industry's transformation to sustainability, addressing the sector's supply chain component, and last but not least, changing how it is all communicated so the message of sustainability rings through. Can you explain a little bit more about why this game plan provides a viable roadmap for OEMs and suppliers now for getting going.

John: Sustainability is a significant topic in our aerospace industry and while we've made significant progress over the years, there is still much we can do.

In fact, our research shows that over the next three years, nearly 60% of aerospace and defense executives see sustainability as a crucial topic to address across their operations. In the report we look at what companies can do within their operations, through their supply chain and then recognize the importance of evangelizing the success to help drive momentum.

We've also have found that 63% of aerospace and defense executives anticipate up to one-third of their revenues coming from more sustainable products or services in the next five years, driven by more efficient designs and new sources of fuel and advanced materials.

Michael: I'm fascinated by that last statistic, the one-third over the next five years. The next five years is when people are paying attention to actual results and you're saying one-third of revenue could come from things that are already lined up with sustainability is the end goal.

John: Well, what we find is that, typically speaking, when are able to drive out carbon comes through increases in efficiency and or reductions in waste. And so, if you look at those two things together typically that also comes with a corollary benefit for the shareholder in cost reduction.

Michael: So, let's talk about the technology first. The Beyond Flight report talks a lot about digitalization – a topic near and dear to our hearts – we've talked about it many times on this podcast. We've talked about blockchain, Internet of Things and advanced manufacturing technologies are where to put the dollars and to do it now. Why is it important to do those technologies and invest now?

John: The first example that jumps to mind is Rolls Royce. They created digital twins of their engines, where the company collects real-time data to assess engine performance, ultimately saving 22 million tons of carbon. We also see digital twin impacting sustainability in defense. The U.S. Air Force has reported potential savings of approximately $42 million annually by using a digital twin to support more sustainable operations.

I could point to the benefits of moving to cloud. For instance, Accenture has committed to net-zero emissions and zero waste by 2025. And we've also reduced our carbon emissions by moving to the cloud and in just 9 months we reduced over 220 metric tons and reduced our power consumption by over 900 kWh in the same period.

But it isn't all about digital technologies. It's also about sustainability by design, in the manufacturing and assembly operations. For instance, Airbus created a lighter, stronger "bionic" partition to separate the passenger compartment from the galley in the A320 aircraft. This could reduce up to 500 kg of weight, resulting in CO2 emissions reductions of up to 166 metric tons per aircraft per year.

An example of operations, Boeing is running its factories in Renton, Washington and Charleston, South Carolina through solar, wind and hydropower and its renewable energy procurement has reduced greenhouse gas emissions by 10% in 2020 alone.

Boeing has also been implementing a carbon fiber recycling process at 11 of its global manufacturing locations which will support the company's goal to drive a 20% reduction in solid waste going to landfills by 2025.

Michael: And again, you're outlining ROI that's happening quickly. This year…the next couple of years, it's an immediate return.

John: Indeed

Michael: So, I want to move on and talk about the supply chain part of this because the supply chain is important to me and a major part of the beat that I cover. I think it is always underappreciated that two-thirds of the spend on any given aircraft is critical to any sustainable measures taking hold. Two-thirds of the spend of any given aircraft program is done in the supply chain. And your report, the Beyond Flight report, talks about how it "It takes a village," of course, and sustainability is going to be no different when it comes to implementing what the whole industry wants to do. You're going to have to do it with and through the supply chain. So, John, what are some ways you are already seeing this change or the relationships that are forming in the industrial base when it comes to sustainability?

John: Well first of all, I think what you just said is absolutely right and what we're seeing there is a number of different things. Logistics is an obvious place to look where optimization of material flow can lead to significant reductions in carbon. We also saw that 64% of executive say they are targeting unsustainable extraction of resources as a component of green sourcing.

Also consider this. Aircraft manufacturers estimate that more than 40% of the global fleet will reach end of life in the next two decades and it will contribute to a lot of waste in our landfills if not recycled properly. So, you have Airbus exploring the use of natural fibers and bio-mass carbon fiber. Airbus is also working with its supply chain to establish a proven method for decommissioning, dismantling, and recycling the aircraft in an environmentally sustainable way with a goal of up to 90% of aircraft eligible for reuse or recycling.

Michael: So that brings us to the last part of the Beyond Flight report that I wanted to touch on, which it talks about how the sector essentially needs to rebrand some of these digital investments we talked about earlier as not just for profit making and total shareholder returns, but as moving toward sustainability. You know that sounds simple, but I know more than a few folks on Wall Street who are a bit skeptical of anything too fluffy and not immediately connected to ROI. They don't like spending on things that doesn't come back and hit the bottom line and turn into a dividend or share buyback. directly cutting into costs. So, this seems to be actually a bigger cultural shift that you are advocating for.

John: Well Michael, you know I think our position is building momentum around this is actually crucial. Companies can do this by both celebrating the impact they are having through design, manufacturing, and operations on the environment through sustainability as well as in the product and how it performs. I think everybody can recognize that in many cases, driving out carbon also relates to driving up efficiency and driving down waste. That's good for the environment, and ultimately that's good for the shareholders.

Michael: Alright, we're going to talk a little bit more about some of the revolutionary changes that aerospace has to make to get to so-called net zero by 2050. But before we do, let's hear a word from our sponsor.

Michael: At the top of the podcast, I mentioned another report and I'm happy to tease listeners with a little bit of breaking news here. Accenture has been helping the Aerospace Industries Association in the United States draft the Horizon 2050 report, which gets at the technology innovations that need to be achieved in aerospace to get the sector to net-zero. It seems to me that it's going to take a genuine overhaul in the end, but Accenture and AIA have come up with a blueprint for how to systematically tackle it. Claudia let's bring you in to the conversation. Can you explain a little bit more about the timeline and why that structure was chosen?

Claudia: Thank you Michael. Certainly. So, there are several technologies that promise significant emission reductions, but not all of them have the same impact and likelihood to succeed. The Horizon 2050 report outlines technologies in three time horizons. We have the near-term technologies these are market-ready technologies between now and 2030. Then we have mid-term technologies. These are typically in planning stages between 2030 and 2040. And longer-term technologies, mostly in research and development stages with a market entry point beyond 2040.

These time horizons allowed us to assess technologies not only by their emission reduction potential, but also to understand their applicability to the market segments. The industry, as we know, has two opportunities ahead of itself for big new aircraft programs to come online – we anticipate a new narrow body around 2030 and after 2040 for a new wide body aircraft. So, timing matters.

Michael: It seems interesting to me that when I read the report it sounded a bit like how to eat an elephant one bite at a time. You're not advocating to just jump to all of the big technologies right away.

So, within each of these decades there's a bucket of new tech that's called for…that you talk about in the Horizon 2050 report. For instance, folding wing tips and composites by 2030, open-rotor and new geared turbofan powerplants. What are some of these technologies and how did you decide what should be included and what is achievable with adequate resources in that time allotted?

Claudia: That's correct. It was a very rigorous process. We identified several technologies over the next decade, but most are estimated to enter market beyond 2030.

With that, we looked at the 2030–2040-time horizon and we anticipate increased electrification such as hybrid-electric, new aerodynamics such as Transonic Trust-Braced Wing, and advanced composites. In addition to new propulsion like open rotor, Geared Turbo Fan, and High-Pressure Ratio Core engines. Those are all for the mid-term.

Beyond 2040, we expect to see more novel solutions – these are the hydrogen, electric propulsion, and revolutionary fuselage designs such as Blended Wing Body. So, to maximize the impact these technologies would also be used in combinations such as having a wide-bodied hydrogen aircraft with a transonic trust-braced wing.

Michael: I've heard a lot more conversation about that idea lately and it's fascinating to me to think about the efficiency achievements you can gain with a blended wing design for an aircraft. But wow that's going to take some cultural shifts. We were talking about earlier…you put people inside that aircraft, and they make not even get windows. How do you keep everybody happen then? My little are going be well if you give them a screen they're going to be happy, but I digress. Let's get back to the 2050 report.

I find it very telling that the game plan focuses on enabling technology, and that the report acknowledges that a clean-sheet airliner is not expected until the 2030s. We're talking about the hard, dirty work here, not a sexy new aircraft, until the 2040s. Claudia, why not jump to that all-electric or hydrogen jet now and just try to make the investments and get their sooner?

Claudia: You hit the nail on the head Michael. This is hard and complex work. New energy pathways may have big emission reductions potential, but their likelihood for realization, is very uncertain.

Let's take electric propulsion for example. That will improve emissions by 100%. But we need a high-density battery and electricity using renewable energy sources for that. In addition, an all-electric aircraft can only fly up to 1000km because the weight and energy density of batteries, is limited.

And then there is hydrogen propulsion. This would bring down emissions by 50%-75%. It will also require significant investment in R&D to make the technology and massive investments in infrastructure to supply hydrogen at airports.

With this high level of uncertainty, the investment needed, and the several dependencies that these new energy pathways have, continuing down the dirty road of enabling technologies becomes a necessity, not a choice.

Michael: not surprisingly the Horizon 2050 report talks about what government can do. Because of course there's a report coming from a trade association, but I am struck about how that report again goes back to stressing that industry alignment is critical. Otherwise, it all remains just aspirational.

Claudia: That's right, Michael. The industry needs to harness the ecosystem. There is no doubt in that. For these technologies to be feasible, government and industry must be aligned. In Horizon 2050, we identified several opportunities for how industry can collaborate to influence government support. Some examples are we should have a policy construct that facilitates the transition to decarbonization. We need to have regulatory framework that accelerate technologies into the system. And then, last but not least, access to funding. This will enable greater scale and a higher adoption rate for these technologies.

Michael: John, last point I want hit on in the podcast today. Getting to net zero won't happen without emissions and waste reductions of course, but there is a lot more to do for the environment. There is no silver bullet. I hear that time and time again every conference I go to, the issues come up. Nobody's got the golden plan to solve everything. The industry wants to tackle the challenges, but there are so many of them out there. There are things people really haven't even started tackling like contrail-based cloud generation, for example, and there is still the looming issue what to do with a generation of retired composite-based aircraft. So, like the safety revolution, sustainability is not going to be a one-and-done effort is it? This is going to be an ongoing permanent change in the industry.

John: Michael, this is certainly going to be a journey. Even without the results of our research – it is clear that every business will be a sustainable business, and, in our industry, we have significant opportunities to make positive impact today and in the future through a wide range of changes and it can start today by looking at how we design and how we do sustainable engineering. It can move on to how we look at our manufacturing, operations, logistics and into even how we even see the products being operated in the field themselves. It's also going to have to do a lot with the technologies that we look to in the future and some of the things highlighted in the report that we did with AIA. We believe this is going to result in a positive impact on both the environment and the bottom line. When those two things come together well, that builds its own momentum for making change happen.

Michael: That's right. Just like it did with safety. Well, that brings us to the end of another Check 6 with Accenture. John, Claudia, thanks for joining me.

John, Claudia: Thank you.

Michael: I encourage listeners to check out the Beyond Flight and Horizon 2050 reports. Don't miss a single episode. Subscribe to Aviation Week's Check 6 podcast in Apple Podcasts, Google Podcasts, Stitcher and Spotify. That's it for us today. Thanks for joining us and have a great rest of your day.