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PRESENTATION

Steven Eric Winoker ***General Electric Company - VP of IR***

Good morning all, and welcome to this year's Paris Air Show Investor Meeting for GE Aviation and GECAS. I'm Steve Winoker, I'm happy to be in Paris with the team. And we are joined by our GE Vice Chairman and Aviation CEO, David Joyce; and GECAS and GE Capital CEO, Alec Burger.

Before we start, I'd like to remind you that the presentation for today is available on our Investor website. Please note that some of the statements we're making today are forward-looking and are based on our best view of the world and our businesses as we see them today. As described in our SEC filings and on our website, those elements can change as the world changes. We'll open up the meeting to Q&A following the presentation.

Now with that, I will hand the meeting over to David to start with an update on GE Aviation.

David Leon Joyce ***GE Aviation - CEO, President and Vice Chairman of GE***

So I'll get started. Just as a quick reminder, our business, $30.6 billion of revenue in 2018. We look at the business really in 6 segments, and we will spend most of the time this morning talking about 2 of these, which is the commercial and the military business. We'll spend the lion's share of the time. However, I do want to let you know that the majority of my staff is here with us today. So feel free to ask any questions or when we're in the Q&A or even after the meeting. All my colleagues are here, and they're, of course, not only capable but willing and able to answer any questions.

So with that, let me get started with a little discussion of what's going on since we were here a year ago, the Farnborough Airshow. Commercial engines and services backlog is now at a record high of $209 billion, $177 billion of that is in our services backlog and $32 billion of that is in the equipment, commercial equipment backlog.

LEAP had another great year. Our production rate for this year are going to be north of 1,800 units. That's a 60% increase year-over-year in our LEAP production. And at the same time, LEAP is transitioning at that rate which is the fastest rate in the history of our business.

We have passed a heck of a milestone on the entire CFM family of engines by being able to state in April that the CFM has reached 1 billion flight hours in service across all of its products. And there's, quite frankly, no other engine manufacturer that can make that claim. CFM is an incredibly important brand for commercial aviation, and I'm going to show you the interaction of this LEAP production rate and the transition of LEAP and the services side of that entire family based on CFM and LEAP.

GE9X readies itself for the Boeing flight test which will occur this year. I'll take you through some more color on that relative to where we are on the engine, the GE9X. I did bring a friend with me. This is the plane from the GE9X, 134-inch diameter. It's the biggest engine we've ever built, also the most advanced engine we've ever built.

Really good military wins this year, both on the Trainer with Boeing, which we're very proud of. And that replaces the J85, which is our engine on the existing Trainer for the U.S. Air Force. And also, with the Army's T700 engine replacement ITEP, the Army chose us for that program, and the GAO confirmed that, that was the right choice just a couple of weeks ago. So we're very, very happy with the work of the ITEP program in the future. That's 6,000 engines, 3,000 helicopter program as we take a look in the out years for that.

And finally, Passport, which is our new business in general aviation engine is enabling the Global 7500 to set new records. As you know, they've set 4 new records both in terms of speed and distance traveled, and we're thrilled with the performance of the Passport engine so far in service. So a pretty dynamic year, quite frankly, when you take a look at it, and it's across all the segments and the businesses.

Now let me take a minute in the commercial environment, and we can talk a little bit about how I think it's going for us. 2018 was a really record year when you look at it, 7.5% growth in demand and really strong freight growth as well. But 2019 is shaping up as a very strong year. It's a solid year, 5% growth in demand for air travel is nothing to sneeze at. And in addition to that, load factors are at an all-time high, 82% for a total network load factor means that there is a scarcity of seats which helps offset the pressures on yields, quite frankly.

Now you couple that with fuel being either stable or slightly deflationary, which is the largest variable cost for our airline customers, and this is a strong market. And just to put that in perspective, this year, I think IATA forecast that the entire commercial industry will burn 97 billion gallons of fuel to give you an idea of just how big of a user of fuel we are. So having a stable to a slightly deflationary fuel bill is a good thing in this industry. So offsetting pressures on yields due to load factors, which means capacity is being nicely constrained against demand, and fuel being stable is a very good thing.

We'll add about 1.3 million departures, taking total departures to 39.4 million. And just to give you a little color on that, that means that every minute, 75 commercial airplanes depart somewhere in the world, and 2/3 of those are powered by either GE or CFM to give you some idea of the strength of our commercial business within this marketplace.

The right-hand side shows the 2019 forecast by region. You can see each one of the regions is shown from North America all the way down to Asia Pacific. The right-hand side of that chart is the total demand in that region. So you can see, the largest market demand is, of course, in North America at 2.3 trillion revenue passenger kilometers, followed by Asia Pacific at 1.9 trillion kilometers. And you could see the growth rates in both of those markets are strong, 4.3% and 6.3%, respectively.

I want to continue on that theme of talking about segment -- of talking about the regions. When I talk about our positioning relative to this kind of demand growth, which is on this next page. A little bit of a complicated chart but an important chart for us to communicate exactly where GE and CFM are relative to this entire industry. So I'm going to start in North America and use that to kind of explain the whole chart.

The left-hand side in service percentages represent -- if you take a look at all the airplanes in service in North America, CFM represents 32% of those. GE, in addition to that 32%, represents another 29% on top of it. So in North America, more than 6 out of every 10 airplanes that fly are powered by GE or CFM is the right way to look at it.

Now the bar charts in the North American region represent 3 years total growth of airplanes in region. So the region growth, they're adding airplanes at a clip of 7% over 3 years. GE and CFM are adding airplanes in that same region at a clip of 17% over those same 3 years. So not only, today, do we represent 6 out of every 10 airplanes that are flying in North America, we actually are growing our penetration by 10% relative to the growth of the entire region, 7% versus 17%.

Now if you take that same equation, that same dialogue and look at Europe, China, Asia Pacific, Middle East and Africa, what you'll find is that today, we represent more than 50% of all the airplanes that fly in any region in the world, and that you'll see that we're growing at parity or greater than parity in terms of our penetration in every one of those regions, which will increase our backlog even further. Okay, make sense?

All right. Now let's go on and talk a little bit about the products, and I thought I'd start with LEAP. 2016 was the first year that we've put LEAP in service, 3 years ago, just put a few of them in service now. This year, the transition is in full swing. We'll ship more than 1,800 units this year, you can see on the right. And then next year, we'll follow that up with another year of 2,200 units.

As we are here today, we're on purchase order at Boeing as well as at Airbus. As you can imagine, the MAX situation is front and center for CFM. And we're in contact with Boeing every day, multiple times a day to make sure that not only are we clear on where they want the rates to be today as well as where they think the rates are going in the rest of 2019 and beyond, but that we're doing everything we can to support a smooth reentry of this fleet in service. There's 380 airplanes at our customers, and we're making sure that the reentry of that fleet as the MAX gets reauthorized for safe flights goes as smoothly as the original entry into service went.

Relative to the performance of the engine, it's doing quite well, 99.9% dispatch reliability. We have over 17,000 commitments to the product, and that was before the show which you saw yesterday, we've added to. We have -- we're approaching 5 million flight hours already and 2 million departures, and it's performing. The fuel burn is at least 15% better than the CFM. We're getting very positive responses from our customers relative to the fuel burn savings.

We're very happy with the positioning of LEAP relative to its competition. It's 6% better in utilization which is a value proposition for our customers of almost $2 million of revenue a year per aircraft. And Airfinance Journal has ranked it as the most investable engine within the narrow-body space with a residual value that's $1.4 million better than its competition. So this is about a transition to a brand new generation of engines for the CFM family, a successful transition, an engine that is performing in the fleet and one that we're very proud of relative to the value proposition that we bring to our great customers.

Now the reason this is so important is because it is essentially, over time, going to replace one of the most iconic brands in commercial aviation. 7 million passengers a day fly on existing CFM products, whether it be on the A320 or the 737 next gen. 23,000 engines in service with an incredible departure reliability of 99.97%. And as I said, we've just hit this milestone of over 1 billion flight hours over the entire family.

Now the right-hand side talks a little bit more about the strength of this services portfolio as we go through the transition of the production portfolio. By 2024, 75% of the overhauls will still be the CFM family. And by 2029, 50% of the overhauls that we occur within the entire CFM will be on this generation of engines. While LEAP transitions now, the services transition will occur out past the next decade. So there's a lot of calories in the services model here. And quite frankly, that's the enduring value of this business is that as we transition into this next generation of products, we have a great services life cycle on the existing engines because of the success that we garnered from the previous generation.

Similar story with GEnx. Certainly, the engine of choice for the 787. Just to give you a perspective on this, today, we offer a 13% better utilization than the competition which translates into $10 million of revenue per aircraft per year for our customers. In the last 1.5 years since January of 2018, our win rate on 787s is 80%. We have a lot of customers buying GEnx. It is certainly the preferred power on the 787, and we're quite happy with it. And again, it's ranked #1 in investor appeal and #1 in remarketing potential. It has a residual value advantage over its competition at $1.6 million per engine in addition to the utilization advantage for our customers. So a great franchise. Again, a really good transition, and we see some real enduring value both on the CF6 and the GEnx in the services portfolio out through the next decade as well.

Now the GE9X. Yesterday, I gave a couple of press briefings, and I spent a little time talking about the status of the 9X. We're about 85% done on the certification program on the engine. That certification program is -- just to put it in perspective, we take 8 full engines, and we run them for almost 2,700 hours. We fly the engines for 450 hours by ourselves before we ever allow Boeing to fly one. We finished the certification which, like I said, we're about 85% complete.

One of the last test we do on the engine is what we call the block test. And the block test is where we literally configure the engine to run way outside of its normal operating range. High. We run it for extended periods of time at extendedly high thrust and high temperatures. We do that because we want to ensure the margins of design in the engine for the durability of the engine in the field.

During that test, we discovered that we had wear on one of the components inside the front of the compressor that was higher than we anticipated. As a result of that, we pressed the pause button to redesign that component before we want to fly this thing with Boeing. So we're in the process of redesign as we speak. We'll have a redesign. We have to take it back to that same block test. We have to run those same cycles and prove that we've actually increased the durability of the part, and then we'll go ahead and retrofit the Boeing airplane and allow that to fly.

We think all of that gets done this year. So we're still on plan for certification of the the GE9X engine this year as well as first flight of the 777X this year. But we have taken a slight step back to make sure that we have a durable engine and revenue service. And quite frankly, that's why we run the tests. This is a development program. This is not for the weak of heart. 2,700 hours is a lot of hours, finding these things now, fixing them, ensuring that we have the right level of durability for our customers is what they expect and what Boeing expects from us. So we're in lockstep with Boeing. And of course, you can imagine the communications have been frequent. And they're engaged in all the analysis and all the investigations up to this point and will continue to be for the rest of this year.

Again, this 777X replaces one of the most iconic brands in commercial aviation, which is the GE90 flying on the 777-300ER. That airplane-engine combination set an entirely new standard for big twins. And this engine is every bit its successor: 134 inches in diameter; 5% better in fuel burn than anything, at that time, 10% better than the GE90 itself; good improvement on nitrous oxide emissions as well as carbon footprint. So this is a really good program, and this does kind of wrap up the transition of the commercial aviation product family for us from GEnx into the LEAP family and now into the 9X family, and this will enter into service in 2020.

So let me transition a little bit to the military if I could. This is another story of really good growth through at least the middle of the next decade. In fact, since the outlook meeting, we're upping our numbers in 2020 through 2025 in terms of what we think the sales revenue is going to be in our military portfolio. And most of this is due to the President's budget this year as well as the FYDP, the long-term budget. International defense budgets are growing due to modernization of fleets by 3%. The President's budget is up 5%, which is 5% in operations, 9% in research and technology. And we're a big player in this market. We represent 56% of everything that the DoD flies.

So we see a 10% compounded annual growth rate inside the military business through 2025, and I'll take you through a little bit of color on that. Our existing core products represent about 9% growth for that same time period. Our new product introduction as well as our technology programs represents 18% growth during that same time period. I told you a couple of times that we've transitioned the number of engineers to support this military growth. We're now to the point where I can say we've got 1,000 engineers transferred. Gary -- I'm looking at Gary to make sure that I got the numbers right.

Gary D. Mercer ***GE Aviation - VP and GM of Engineering***

You got it.

David Leon Joyce ***GE Aviation - CEO, President and Vice Chairman of GE***

From our commercial to our military programs, and that's paying off. And I think it's paying off as evidenced by the ITEP win, to be very honest with you. Very experienced engineers that helped transition our entire commercial portfolio are now working actively for the opportunities that exist inside our military business.

So here's the expanding core, which is 9% growth rate in engines and services. The left-hand side shows just the growth in the Department of Defense revenues over that same time period on an annual basis. If you take a look at the equipment that's being sold to our allies, we are the power of choice for many of these campaigns. So for example, there are 16 countries right now with active campaigns on F-15s and F-16s, and they're all featuring the F110 as the engine of choice in all 16 of those campaigns. There's 8 countries that are right now in campaigns for F-18 and Growlers powered by our F414, and there's 31 countries in active campaigns for our helicopter engine, the T700 on the Apache and on the Black Hawk. So tremendous growth in U.S. equipment being used by our ally as the modernization of defense fleets occurs on an international basis.

And lastly, indigenous growth platform themselves. We're the engines of choice for many of our allies who are building their own fighters. So whether it be Korea with the Trainer, the T-50 or the KF-X or whether it be Turkey on the TF-X or whether it be Sweden with the Gripen, all of those are choosing GE Aviation engines to power these fighters, and that's another growth opportunity for us.

Now in addition to that piece of the military growth, our next generation of development programs is kicking in as well. So we have our advanced combat engine which takes advantage of incredible technology called adaptive cycles, 25% reduction in fuel burn and a 10% increase in thrust. We're on contract right now to develop this engine. That's got -- it's a very disruptive technology and has great growth potential on more than 1 platform in the future.

As we talked about the ITEP program which is the replacement for the T700, again, a 25% reduction in fuel burn and a 50% increase in power for that engine based on the technologies that we can bring to market, 3,000 helicopters, 6,000 engine opportunity. And that's just with the helicopters that we know are going to get retrofitted, let alone any new applications that can exist once this engine is in service.

And finally, heavy lift, that's the Sikorsky CH-53K, 18% better fuel burn, 57% increase in power for the next generation of heavy lift propulsion, a terrific product, and it's now in its LRIP. I think there's 20 of these helicopter have been released on low rate production as we speak. Tony, is that right numbers?

Anthony Aiello ***GE Aviation - VP of Supply Chain***

It's 22 engines.

David Leon Joyce ***GE Aviation - CEO, President and Vice Chairman of GE***

22 engines, I'm sorry. 22 engines have been released.

So if you take this plus the technology programs themselves, that represents an 18% growth in addition to the 9% growth in the quarter. So the military business is a very active market for us in addition to what we've gone through in the commercial business.

With that, this is the chart that we presented in March during the outlook meeting. No change in the outlook. The dynamics that you should think about in '19, we certainly have got a headwind as a result of this mix shift between CFM and LEAP. That production going up to north of 1,800 engines. That's offset though with great services growth, terrific military services growth which I've shown you, the transition of some of our NPI resources from company-funded to customer-funded which you see in the military charts and, finally, value gap and our productivity.

In addition to the 180 basis points, as you know, our Passport program on the business, general aviation side is ramping, and that's also an additional 70 basis points of pressure as well. Okay?

And then for 2020, that's the introduction of the GE9X. Another transition of products for the next generation, and we're guiding flat on segment profitability and a little bit of increase, flat to growing on cash flow.

Now when we did the outlook meeting, I put a chart in to give some color on engineering because there were some questions. So we thought to follow that theme, we would put a chart on to give a little bit more color on our free cash flow from 2018. And I start in the left-hand side and bring your attention to really 2 -- as we go through the walk, bring your attention to 2 items.

First of all, the working capital item. We are a user of working capital last year in 2018 of about $300 million, and we can go through the dynamics in the right-hand side in a minute. And also, our total CapEx, which is about $1.1 billion. Our reinvestment ratio for 2018 was approximately 1.4, somewhere around there, right, Shane?

Shane M. Wright ***GE Aviation - Senior VP, COO & CFO***

Yes.

David Leon Joyce ***GE Aviation - CEO, President and Vice Chairman of GE***

The business generated $4.2 billion of free cash flow conversion in the high 80s. If you look at the dynamics of the working capital accounts, it really reflects the dynamics of the business cycle we're in. So our cost of goods sold volume in 2018 was up a full 12.5% V. You see that reflected in our payables and also that we have more favorable contracts with some of our LEAP suppliers. So we've actually increased our days to pay by 2 days.

And you also see the headwind that comes with that in inventory. Total of $500 million in the inventory account. The actual material growth pressure in the inventory account was more like $600 million, but we offset about $100 million of that in productivity. And you can see that running through the inventory turns which were better by a full 0.5 point in 2018.

Receivables. Again, sales volume growth of 13% which then reflects itself in receivables, slightly worse at $700 million. Improvements in our days sales outstanding to offset that sales growth, which is a good thing. And our progress payments, mostly timing more than anything else, still covering about 94% of our total inventory inside the receive -- inside our progress collections balance.

So with that, before I turn it over to Alec, let me just summarize what I hope you saw in these charts, which is this is a business that continues to both invest and to deliver. And to be able to pay for the complete transition of this commercial portfolio and the next generation of products, thanks to the success of the previous generation and the services backlog of $177 billion, is really something we're quite proud of. The strength of the aftermarket allows the enduring value of this business model to be the reinvestment in these portfolios for the future.

Unprecedented growth in equipment as well as in services as we talked about. We're making the right investments in technology first on the commercial side now transitioning to the military side. The continuity of that intellectual capital is paying off as evidenced by the ITEP win. We're successfully navigating this big commercial product transition for the future, and this model is very resilient. It's resilient because it performs in the military side in a growth market, it performs in the aftermarket in the commercial side and it performs in new make. So it's a solid business, and we're in a good cycle.

So with that, Alec, I'm going to turn it over to you.

Alec Burger ***GE Capital Aviation Services, Inc. - CEO and President***

Yes. So good morning, everybody, and I wanted to move forward and talk about the GECAS business. And I'd start with an important point to say, this is a proven business model. GECAS has celebrated its 50th year anniversary. It is deeply steeped in risk management. That's a huge underpinning of our business. It has over the years and continues to generate attractive returns for the General Electric company.

We have a very large and diverse asset base, 1,200 aircraft that is cornered by the commodity narrow-body aircraft, and we'll talk more about that. We have broad product offerings both in equity leases and the lending business. Extremely global, 21 offices around the world, strong redeployment capabilities. This is an industry where it's actually relatively easy to invest money. The trick is how do you get it back, how do you redeploy the assets. I think we've got an unparalleled ability to do that.

One of the, I think, most important metrics when you think about the aircraft finance business is how many planes you have on the ground. And we've had 2 aircraft on average on the ground for the last 10 to 15 years. That's an important metric for us. So it's a proven business model, I think you need to innovate. We'll talk about some of the new areas that we're looking at. And as David has mentioned, there is significant synergies with the GE Aviation business.

So global reach and local expertise, I think, is something that we really live. I think when you look at the growth, I think some of the key metrics I'd point out at, this is looking at 2008 to 2018 and where we've actually invested new originations. So if you look at North America, more than 10 years ago, 50% of the money that we deployed is within North America. Today, that's 3%. Asia has been and will continue to be a huge growth part of the equation for us going from 17% to 49%.

Other key statistics are we've got the most customers of any leasing company in the industry, 225. We operate and finance in 75 countries. 21 offices around the world. We've got a couple of our team members from the GECAS business in the front row here. We've got, on average, with the senior leadership team, 25-plus years of experience in the industry. And then if you look across the GECAS business, we're represented by over 30 nationalities.

So one of the things that we've talked about is the ability to offer a full array of products for our customers. In a competitive landscape, it's important to not just have a simple one product solution. So we've got anchored by the aircraft leasing business which, obviously, is made up of narrow-body, wide-body as well as a growing business for us, the cargo space, we have an ability to provide lending capability. Our engines business has been and continues to be a very attractive segment for us. Capital markets capability, we'll talk more about how that is shaping up for us as a business.

But continuing to refresh the portfolio is a very important part of our business model. And we're going to talk about why we do that, how that has actually kept the portfolio attractive. And then something again that I don't think anybody else in the industry has in the leasing space is our materials business. So we actually have a complete cradle-to-grave capability. Not all the planes that we end up leasing end up getting part of that, but we do have that capability to squeeze out every last dollar from the investment that we have.

And then milestone aviation, we will talk about that in a few slides. It's our helicopter leasing business that was acquired a few years back. And I think we've actually made great progress in terms of taking what is a GECAS capability in terms of how we think about the market, how we think about asset management to take a business that has been in a brutal cycle to actually performing at a pretty good level. So I think what we talk about is an ability to deliver multiple products to our customers to maximize the investments that we're making in this space.

So if we go -- we look at the environment in the leasing space to compared to 2 years ago, we have challenges. There's absolutely no question that there are challenges in the sector. If you look at the OEM level, clearly, there's uncertainty around the impact of the MAX grounding, and we will talk more about that. There was and is record-high level of narrow-body supply coming into the market. In the leasing industry in general, you have over 150 competitors. That translates to intense competition.

There are numerous new entrants in the space. This is obviously -- there's been pockets of credit issues in the sector. Some of that driven by a strong U.S. dollar that has put some of the international carriers under more stress. And then there's -- I think you have to be balanced on this when you talk about slower passenger growth. So we're growing from 7% to a forecast of 6%. We're still at 5%. And if you look at the emerging middle class in a lot of the growth markets, there's still a very strong growth demand engine in the cycle. I don't think people should lose sight of that.

Geopolitical uncertainty is rampant. No -- there's obviously no question about that. Trade talks between U.S. and China, in particular, country hotspots, Brexit, to name a few. But I think that the GECAS experience and track record kind of stands alone in terms of the ability to actually manage through the uncertainty and some of the, quite frankly, brutal cycles that we've already experienced over the last several decades.

So I think we are still positive on a long-cycle, long-term industry outlook. And I think that's to differentiate from some of the short-term headwinds that undeniably are out there for the leasing sector. So we've got, as I mentioned, huge demand driven by large emerging middle class in Asia Pacific. Airbus and Boeing, their forecast are obviously to double their fleet. That's going to be an opportunity for us.

And I think something that differentiates aviation finance from a lot of asset-backed lending, these are portable assets. And I think one of the real strengths that we've seen is even where there have been credit issues, I think one of the health meters of the industry is how quickly you can actually redeploy those assets when you have to take action, and that is still I think ultimately very much in our favor.

So I think I would say that the leasing channel supply will normalize over time. I think both Boeing and Airbus are very committed to having a healthy leasing channel. And we've had some very good discussions with them during the air show. I think there's a strong commitment there.

I think rationalization of leasing companies will occur over time, and that doesn't mean we're going to go from 150 back down to 5. But I would just go back to it's easy to invest money. You've got to be able to get the money back. And I think over time, that will separate the long-term players in the industry. I've mentioned the fact that there's still an ability to get the planes back and redeploy, that's been a positive. And then underneath all of this, airlines are forecast to be extremely profitable for the 10th year. And so I think when you look at the overall sector, the sector is not going away, and I think GECAS is well positioned for the future.

So let's talk about how we're thinking about our current strategy and game plan. So first of all, we're focused on refreshing the portfolio age. If you look at the average age of our portfolio today, it's a little over 7 years old. That, to some extent, in terms of the age is by design. We are starting obviously a new cycle of technology. And so with the skyline that we have in place, by 2024, that portfolio will just naturally become about 1.5 years to 2 years younger and we think will be around 5.5 years.

I think we have to find places in the sector where you're not a "me, too" player. And the 2 examples I would actually talk about here are cargo and -- David obviously talked about the fact that their forecast for 2019 is flat basically in cargo, I would just ask anybody in the room to really think about do we really think aviation cargo is not going to be a growth driver. I don't think the high-street chops are coming back anytime soon. People are still going to be ordering online. We are very bullish on this sector, and I think we are extremely well positioned to capture that.

Second thing is the engines business as both an owner and a servicer, strong linkage with David's business. It's something that is a real differentiator for us.

Emerging markets. I talked about how we've looked in terms of big volume and investing growth. That's obviously going to continue to be a big deal to us, and 80% of our skyline placements, we think, are going to be into emerging markets over the next 5 years.

One of the things that we talked about 2 years ago and we really invested heavily in is taking advantage of other people's money. And I think that this is something we've made tremendous progress on, and then we'll talk about some of the investors that we've had and some of the progress we've made there. And then rigorous risk and portfolio management, we have a solid operating rhythm, sophisticated models to manage the portfolio, and we really think of risk in terms of the individual airline credit risk, the country risk and the asset risk.

So highlighting a little bit more the cargo space. We've had and we'll continue to have a very strong cargo conversion program with the Boeing Corporation. We've now got options up to 65 freighters. I think the way to think about this is that this is a tremendous life-extending, asset-maximizing defensive play for us that has actually turned out to be attractive in terms of returns that we can generate also. So that's something that we are going to continue to just, I would say, modestly grow the share of our portfolio that's invested in the cargo space. And in terms of squeezing extra life out of the engines which ultimately is good for the services franchise, that's something that has been, I think, a big win for us.

Milestone, I think we say ongoing tough cycle. Obviously, oil prices remain volatile. The -- I think the arm-to-arm combat in the helicopter leasing business for us has been how do we keep the helicopters flying, how do we diversify away from oil and gas where possible. And I think the 2 biggest data points that I would give you are that the portfolio has been 90% plus utilized. It's still today is 90% plus utilized unlike some of the competitors that have obviously had huge problems in the sector. And the milestone has remained profitable throughout the downturn. It is a tough, difficult space that I think we're starting to finally see some rays of light in.

So I'll talk more about the assets trading part of our business. There's an element of this where you are trading assets to some extent create capacity for growth. We have strict limits in terms of how much we will invest, lend to one particular customer, to one particular geography. And then it also, as I mentioned, really helps us rejuvenate the fleet over time. So when we look at the math of our overall sales over the last several years, I'd say about 2/3 of those sales were driven towards portfolio metrics. So how do we change the dynamic in terms of reduced concentration in terms of credits, in terms of geographic and then start moving the needle on the age, and then 1/3 of the sales are being just opportunistic-driven. There has been incredibly strong investor demand. Every time that we go to market with the portfolio in the space, the number of NDAs and bids that get signed up are extraordinary, very low interest rates, and there's an element of just being opportunistic in terms of how we think about the trading model.

I mentioned that we wanted to focus on the building our served assets model. And I think this is simply -- there's really, I think, 2 ways to think about this. One is we are partnering with very strong investors that want to have exposure to the sector. So it's a capital-efficient way for us to leverage our franchise. The second part about this is rather than just selling to a third-party, we're retaining our customer footprint. We retain the servicing element to it, and I think that's extremely important to us.

Just over a couple of years ago, we had $3 billion of served assets. We now have $6 billion. We have a tremendous relationship with the Caisse de dépôt in Canada. We've got a great relationship with Och-Ziff. And this is just a list of all the transactions that we've closed since 2016, a couple just in the financing and the securitization in the engine space. And like I said, it's been balance sheet-efficient and helps us preserve the relationship very importantly with the front end.

So you saw that over the last week, Larry was in Greenville on lean. I think I'd just point out here is that lean and how you think about the business is not just on the industrial side. I think a lot of that has run through the veins of the GECAS business for a long time. It is a data-driven business. So rigorous portfolio analytics, robust asset valuation and airline credit models, diligent impairment testing. We impair assets when they fail the cash flow test and we have to take action and strong risk management compliance and controls, again, globally set out.

Relentless focus on fleet management. We have weekly QMI calls to focus both on new origination opportunities but then talk about portfolio quality issues that we have and how we're doing in terms of redeploying assets. I mean these are Monday morning calls every week across the globe. And then continuing industry monitoring. I think this team -- I'm most proud about the tentacles that they have into the industry, the depth of the relationships that we have with the OEMs. And then we have steering committee of aviation experts constantly looking at values while leveraging market intelligence. So there really is an ongoing cadence in the business that is extremely ultimately data-driven in terms of how we invest.

So the portfolio, not surprised by it, but what I talked about earlier on is skewed towards narrowbodies. And the simple reason why it's skewed towards narrowbodies is that it is the most commodity of the aircraft type, there is the most investor demand for it. And we're in a business where we certainly lend and invest, expecting that the asset is going to be an airline for a long period of time, but you better be ready for the event of having to redeploy. So that's where, today, we're mostly focused. 22% of the portfolio is in widebodies, 0 aircraft on the ground, 0 whitetails. And then we're looking at options for end of lease, how do we when we ultimately get to the end of lease, take the plane back, how do we maximize value out of those assets. And we've actually got some, I think, very interesting discussions currently ongoing.

I'm not going to talk much more about the helicopters except the fact that the H225 was the most troubled assets that we had, and we're starting to see some return to service on the H225. Regional jets has been something that we have been focused on reducing our exposure. We sold a pretty significant portfolio earlier this year, and we've reduced that book from what used to be 16% down to 6%.

Engines and cargo, plenty of room for growth I think is the bottom line, very attractive, strong return on assets. Cargo still only 4% of the portfolio, and that's something that between those 2 sectors, attractive returns and looking for growth.

So the skyline, 350 total units in the skyline. I just say some important statistics here. One is looking at us versus the industry average. So the entire skyline is new technology, probably not a big surprise given where we are in terms of the technology refresh. I think important a couple of other important data points through. So when you look at the quantum of the skyline compared to our portfolio, it's 30%. So what that means is just kind of, in terms of the digestibility of that skyline, we're at 30%. The industry is at 55%. So I think when you look at the history of what GECAS has been able to place every year, and it's averaged on it, probably around 50 to 60 aircraft a year. Our skyline looking forward is very consistent with that. I think we're well positioned to do that.

Global demand overall remains strong. I asked Declan, who's our Chief Commercial Officer, discussions that we're having with customers today that are looking for MAX placements, and we've got 20 ongoing discussions today for MAX placements. Obviously, we're closely monitoring the MAX situation. But I think overall, we think that the order book is manageable. The returns that we've achieved so far in terms of placement have been completely consistent with what we had pro forma before we made the original commitments and investments with both Boeing and Airbus.

So when we get back to the Air Show, we had an announcement with Colorful Guizhou, which I think is just probably sort of typical of a new customer, 4 neo placements, 738 conversions. There was a ceremony that we had with Boeing yesterday where we've now got firm orders and options to get to 65 overall conversions. We did a sale leaseback with a start-up, David Neeleman's new start-up Moxy with the A220s, it's a new aircraft to us. And then there's more to come. This afternoon, I think should be pretty energizing, and we've got a -- I think we're on track for 15 aircraft enhancement, which is very consistent with what we thought about in terms of the growth leverage for the business.

So in summary, GECAS has been and remains a great business. It's the most global of the lessors out there. It's got the deepest domain with 50 years in the industry. We're refreshing the portfolio with new technology aircraft. We've got the broadest product offering of any of the leasing competitors that are out there. We think we're driving growth in attractive markets. We can't really be just a complete me-too player here. We're not really interested in showing up when 1 airline is looking to finance 1 aircraft. That's really not our game. We're in the customer solution business, and we're looking to continue to capitalize on what really is leadership position in cargo, engines and emerging markets.

The businesses had attractive earnings and returns. This year will be no exception. And then ultimately, with GE Aviation and GECAS, I think there's really unparallel industry expertise. So those were the -- just kind of a GECAS overview, and I think we'd be handing it back over to Steve.

Steven Eric Winoker ***General Electric Company - VP of IR***

Yes. All right. Great. Well, before we get started on Q&A, we've got over 150 people in the room. So if I could just ask a couple of things. One, before you ask your question, if you could just state your name and firm, I think that will be helpful for the transcripts and everything else afterwards. And other than that, try to leave as much time as we could to get into your questions. Okay? So Julian, let's start, and we will have mics that reach you if you could also wait for the microphone.

QUESTIONS AND ANSWERS

Julian C.H. Mitchell ***Barclays Bank PLC, Research Division - Research Analyst***

Julian Mitchell, Barclays. Maybe first question around commercial aftermarket. How much do you think growth will slow down after what's been an exceptional sort of couple of years for you? And when you look out CFM56, how quickly do you think that kind of ice cube melts on a 10-year view in terms of shop visits?

David Leon Joyce ***GE Aviation - CEO, President and Vice Chairman of GE***

Well, you saw it on the chart, right? So you're still 50% of the total CFM shop visits in 2029 are the -7 and the 5B, which is on the seal on the A320 and the current next gen [73]. So you should think we're transitioning the production line. By next year, we'll be almost 100% transition. So you should fast forward at least a decade, maybe more in terms of the value that's sitting inside that services portfolio.

Now in terms of growth, we just went through a 5-year plan with Jean a couple of weeks ago. I'm probably more bullish now than I was before we got together. We thought we would get worldwide shop visits to 5,500 by 2020. We'll actually hit that this year, and we're talking north of 5,600 by next year. And if we cast that out to 2025, it's growing every year. So the aftermarket is strong, and that's -- again, that's the discussion about the beauty of this model. We can afford to invest in the next generation because of the strength of this portfolio and the life cycle right now. It's really important.

Julian C.H. Mitchell ***Barclays Bank PLC, Research Division - Research Analyst***

And then just one follow-up around the free cash flow dynamics. How are you thinking about working capital movements and CapEx in the next couple of years?

David Leon Joyce ***GE Aviation - CEO, President and Vice Chairman of GE***

I would say reinvestment ratio is pretty much on track from what it was in '18. I would say on a CapEx -- so the CapEx question. On a working capital basis, you might see it flip slightly positive or around 0 for 2019, but around that same dynamic that you see in terms of total working capital that you saw on the chart in '18. Maybe it moves a little bit. Shane, I'm looking at you while I say this. Yes.

Andrew Alec Kaplowitz ***Citigroup Inc, Research Division - MD and U.S. Industrial Sector Head***

Andy Kaplowitz, Citigroup. David, maybe you can talk about -- you won a big order yesterday at the show and there's some concern that maybe you're buying share. Maybe you can talk about sort of respond to that and the terms and conditions on these types of contracts.

David Leon Joyce ***GE Aviation - CEO, President and Vice Chairman of GE***

Sure. Well, look, IndiGo -- the last thing we did is buy share. I mean those of you that have read the press over the last 2 years know the trials and tribulations that IndiGo has had as they try to grow their airlines with the lack of the liability. I mean it's been tough. They've even had the fleet grounded. They've had their extended twin operations limited to 60 minutes. They've had their fair share of problems. So when Rahul approached us and said he was running a campaign, this is the fourth campaign at IndiGo go for us. We've walked away the previous 3 times because the pricing was completely unacceptable. So I can assure you I was ready to walk the fourth time. I have a really nice franchise already established on CFM, but Rahul needs to reduce risk. He needs the risk abatement associated with being able to actually depend on a more reliable engine, which is LEAP, 6% utilization, $1.4 million of residual value, dispatch reliability at 99.9%. So the terms on this deal assure him outstanding value in terms of long operating cost. But I can assure you that this is nowhere near what's been rumored. This is a very healthy deal for us, and I'm quite proud of it. And I'm proud of Rahul for finally buying for value rather -- in this case. So it's a good deal.

Andrew Alec Kaplowitz ***Citigroup Inc, Research Division - MD and U.S. Industrial Sector Head***

And then David, I think we noticed that you didn't talk about digital or Additive during this presentation. So just maybe in terms of the aftermarket growth, how much is digital sort of helping that? And then any sort of update that you could give us on sort of the future of Additive within GE Aviation?

David Leon Joyce ***GE Aviation - CEO, President and Vice Chairman of GE***

Yes. I've got Jason here, so I'll turn it over to him in just a second. But we're probably more -- again, more bullish. And by the way, after we're done, take a look at some of the hardware up here to give you an idea how fast Additive is starting to penetrate our thinking in terms of the way that we design. So we're more bullish on Additive as being as disruptive in the future as ever. And we're seeing it inside all of our new product designs, the ITEP engine that we just won on the military. That thing has, what's called, a particle separator. You've seen these helicopters come down in the middle of sandstorms, right? You can't ingest all that sand, so there's this very sophisticated system of particle separation that keeps that sand from getting inside the engine. We've revolutionized our thoughts on particle separation using Additive manufacturing, which we could never manufacture if we had to weld and braze it. But with Additive, we literally can improve particle separation leaps and bounds using different design techniques because we can manufacture using Additive. So I would say we're more bullish now than ever on Additive. The business itself is up 50% in revenue year-over-year, right? That's 18 -- go ahead, Jason, so I don't get it wrong. What are the numbers?

Jason Oliver ***GE Aviation - CEO and President of Additive***

It will be up 50% this year in overall revenue, 40% up in units. And we're seeing, right now, about 50% repeat orders and 50% new orders. So we're seeing those who have started on this Additive journey begin to invest more and more equipment, but we're seeing new opportunities both in the aerospace industry, nautical and even now more and more in tooling dyes as well as automotive. So we're seeing good growth across the industry, but a lot of what we're doing is investing heavily in new technology, binder jet, some new machines and laser. So we continue to invest pretty significantly.

David Leon Joyce ***GE Aviation - CEO, President and Vice Chairman of GE***

Yes. And now on digital, I would tell you that a lot of what happens in the aftermarket is a result of our ability to use big data. So we can garner productivity. That $177 billion of services backlog, that's a big beautiful productivity target for us on a year-over-year basis, and it's the use of big data and digital that allows us to go after it on a yearly basis. And you really think of it 2 ways. We extend time on wings, that means we get more revenue, right, dollar per hour, before we take the engine off. And then when it comes off, we want to reduce the cost per shop visit because we have more information about exactly what we have to go target when we're in the engine. Both of those really play well to digital for us. That plus AirVault, which is a small company we bought, which is a configuration company that allows us to actually understand the configurations of each engine and make sure we keep those configurations, that's doing 2 things. It's improving the residual value of GE's services fleet under TRUEngine as well as allowing us to make sure that we understand what configurations we're dealing with at every overhaul before we get them, which is improving our turn times and efficiencies when we get the engines in the shop.

Gautam J. Khanna ***Cowen and Company, LLC, Research Division - MD and Senior Analyst***

Gautam Khanna, Cowen and Company. I have 2 questions for you. One, you mentioned on the LEAP production system you're at rate now. You talked about if you still have pinch points in the supply chain forgings and castings, etc, and then I have a follow-up.

David Leon Joyce ***GE Aviation - CEO, President and Vice Chairman of GE***

Yes. I don't think it's any secret. The pinch point in the entire industry is forgings and castings, and we are no different than most of the other engine manufacturers. So when it comes quite frankly to our disappointment and the fact that, that has resulted in all of us having to work to get back on schedule. Now that being said, we're on purchase order. We took advantage of the rate of Boeing to catch up so that we're on PO. We're actually a little ahead of PO at Boeing right now.

I would tell you we're actively developing our supply chain. We think there needs to be a broader scope of players in the supply chain in general that allows us to have good competition for deflation going forward as well as ensure continuity of supply. So we are actively looking at developing more supply base in order to ensure that as we continue to grow. Our production rates this year in new make is up north of 15% in '19 over '18 alone. And as that production rate continues and the aftermarket spares continue to grow, we have to make sure that we have continuity of supply, and that's going to require us to work with folks that want to invest in the market inside our supply chain on a global basis, too.

Gautam J. Khanna ***Cowen and Company, LLC, Research Division - MD and Senior Analyst***

Helpful. And just as a quick follow-up, recently, you guys came to an agreement. CFM did with IATA with the European Commission on aftermarket practices. And some of the PMA guys have talked about an opportunity to take share from CFM. How are you guys responding to the threat? How big is this threat in your opinion?

David Leon Joyce ***GE Aviation - CEO, President and Vice Chairman of GE***

I'll let Jean -- I'll turn this over to Jean in a second, but let me give you my perspective. PMA is not new. You know what I mean? There's -- the rules and regulations around PMA have been the same forever. Folks can come in and they can certify components to put inside the engines. And to be honest with you, that's the market we live in. And our job is to create a value proposition for original equipment parts that is better than the value proposition for PMA. I would say that the agreement we reached with IATA was more to ensure that, as you saw as that services market continues to be as big as it is in CFM, IATA wants to make sure that, that market stays open. They want to make sure that there's open competition in the aftermarket, and we're fine with that. We believe that the products that we can bring to market through Jean's portfolio are -- and as evidenced by how successful Jean has been with her backlog are more than adequate for us to continue that marketplace. So we have an open back-end market now. IATA wanted to make sure that, that was maintained. We work in concert with them to come up with an agreement. We think it's a framework for the entire industry. So we think IATA is going to take that framework beyond CFM and now apply it elsewhere, and we encourage that. And game on, we're ready to compete against the PMA guys.

Jean M. Lydon-Rodgers ***GE Aviation - CEO of GE Aviation Services and President of GE Aviation Services***

So the only addition that I would add to David's comments is that we have always been advocates of open and competitive MRO markets. The opportunity to work with IATA relative to this complaint was truly an opportunity to listen to our customers, and what it did was allow us to have a lot more transparency about our practices and a confirmation that we do support an open and competitive MRO market. As David said, we have always competed with PMA and DER suppliers and we're going to continue to be successful in supporting and advocating for an OEM solution because it does provide best value to our customers. So there's no material impact on our services business as a result of the agreement.

David Leon Joyce ***GE Aviation - CEO, President and Vice Chairman of GE***

Jean, your residual value is on your TRUEngine, which is where we are back to both records and we can ensure the configuration control. Your residual value on an engine that goes through her program is almost 2:1 over one that isn't. So there is a value proposition if you're the asset owner to make sure that it's properly taken care of, and Jean has the ability to do that.

Steven Eric Winoker ***General Electric Company - VP of IR***

David?

Unidentified Analyst

Last year at Farnborough, I think you were also highlighting the premium utilization rates, LEAP versus GTF. I think GTF had more (inaudible) issues. Last year, the number seem to be quite a bit high last year versus this year. What do you see the utilization advantage in 5 years and in 10 years for LEAP versus GTF. How do you think this curve will develop? However you want to answer it.

David Leon Joyce ***GE Aviation - CEO, President and Vice Chairman of GE***

If you've got a coin, I'll flip it. But look, we feel very confident in the architecture of LEAP. We think LEAP will hit the levels of dispatch reliability that CFM has. There's not another engine that's gotten close to that, 99.9%. So I'm confident that LEAP is on track to be as dispatch reliable as the CFM is today, which is the standard that every one of the engine manufacturers in narrowbody original get measured against. I can't speak for the gear, but I certainly can speak for LEAP, and we feel really good about where it's going.

Unidentified Analyst

Just a follow-up, can you comment what you think is the right level of leverage for GECAS? Have you reconsidered it given what's happening?

Alec Burger ***GE Capital Aviation Services, Inc. - CEO and President***

I think the right leverage of GECAS is where we're at today. I think if you look at the fact we have within GECAS a lending franchise that has a very stable earnings stream and also some of the benefits that we have in terms of the portfolio diversification globally by asset type. So I think we feel good about where the leverage is, and I think that continues to be validated.

Steven Eric Winoker ***General Electric Company - VP of IR***

All right. Steve Tusa.

Charles Stephen Tusa ***JP Morgan Chase & Co, Research Division - MD***

Hi, Jean, first question for you. Just judging by the shop visits that you guys put up there. Should we think about kind of like the CF6 and CF34 as being roughly half of your business from a revenue perspective?

Jean M. Lydon-Rodgers ***GE Aviation - CEO of GE Aviation Services and President of GE Aviation Services***

The CF34 and the CF6 do contribute significant number of shop visits to the overall quantity, as David mentioned. We had about 5,100 last year growing to 5,500 this year. A very large percentage of our shop visits are CFM actually at this point in the process, and they're going to continue to grow. We actually see growth in CFM, the GE90 and the CF34 through the next decade. So those have not even seen their peak yet. And it's interesting to note that about 63% of our engines have had one or fewer shop visits to this point in their life. So there's quite a bit of shop visits ahead for us.

Charles Stephen Tusa ***JP Morgan Chase & Co, Research Division - MD***

But I guess CF6 and 34s specifically, roughly 50%-ish?

Jean M. Lydon-Rodgers ***GE Aviation - CEO of GE Aviation Services and President of GE Aviation Services***

Slightly less than that right now.

Charles Stephen Tusa ***JP Morgan Chase & Co, Research Division - MD***

Okay. And then David you mentioned on the -- great detail on the cash flow, something I think everybody's focused on. Your target was $2.9 billion in cash. You ended up doing $4.2 billion. So when you look at those various moving parts, where was the upside surprise given that the earnings were not $1 billion higher? So within those kind of categories, where was the biggest upside surprise relative to what you had planned at the beginning of the year in '18?

Shane M. Wright ***GE Aviation - Senior VP, COO & CFO***

Yes, yes. I think David talked about this. We had $1.1 billion of payables that was offset by $600 million. So you had a little bit in payables. You saw that we extended terms with our suppliers, and the mix is also changing right as we transition into LEAP. The suppliers that were transitioned into have longer payables terms. So you saw a bit of that benefit in AP. And I think beyond that, we had a very strong aftermarket in Jean's business. The volume in Jean's business was fantastic, probably a little better than we expected last year. So you had a lot of good cash flow coming from that.

Steven Eric Winoker ***General Electric Company - VP of IR***

Cliff?

Clifford Ransom ***Ransom Research - President***

May I ask the 3 of you to give me one or two sentences a piece about your reactions to the exercising Greenville last week?

David Leon Joyce ***GE Aviation - CEO, President and Vice Chairman of GE***

Sure. I'll start. I was there. Well, let me give you a little bit of my reaction to Larry and then give you my reaction to Greenville because they're both very similar. Look, Larry brings an incredible toolkit of operational excellence to this company. I mean it is world-class to say the least at Danaher. The event in Greenville was 120 of our family and friends including Tony Aiello, who runs my supply chain with me. Shane was there. For us, the first-hand experience and actually participate in a full week LEAN event. We've broke to 10 teams, 1 transactional LEAN event and 9 manufacturing LEAN events to help the power business with -- working on a moving line to help their turn times. And we, first-hand, had an opportunity to not only participate but to actually provide solutions that would last beyond the week for power to help them with their productivity. For me, it was a terrific learning experience to say the least. Every evening, we had an opportunity to kind of sit and talk about what we've learned and how that should change the way we think about our business and the way we run our business, and we've got a chance to do that not just with me alone, but to do that with the head of my supply chain and my Chief Operating Officer and CFO. So the 3 of us had an opportunity to think strategically about how we wanted to run the business as well. So for me, it was a very enlightening reach, but it's just part of the journey with Larry. This is who he is. You know what I mean? This is a man who has -- comes to GE with an incredible operational focus. I love it because GE Aviation inherently is a learning business, and we've got a lot we can learn from Larry. So I think we can make this business better just picking up his toolkit and running with it. Meanwhile, we have an opportunity to teach him the aerospace business. So there's a really nice balance between from my point of view on how it's going.

Alec Burger ***GE Capital Aviation Services, Inc. - CEO and President***

I'll just add that the -- I think the operational focus and true metrics-driven approach that Larry has brought to financial services has been very interesting and helpful to see. And I think his big focus is on not necessarily talking about where the metric is today, but it's the continuous improvement. And it really is just that extraordinary passion from the top down on that focus.

David Leon Joyce ***GE Aviation - CEO, President and Vice Chairman of GE***

Yes. And I think we're learning about it. This is -- think about a company that is communicated to itself in terms of output metrics, but now it's communicating to itself in terms of control metrics. And there's a difference between those.

Shane M. Wright ***GE Aviation - Senior VP, COO & CFO***

The only other thing I would add to that, and we talked earlier, for me, it was my first Kaizen LEAN event, a full week immersed in it. It was eye-opening. It was educational, it was inspirational to a way, but it goes beyond the factory. David talked about, we had 1 team on the transactional basis. There's a lot of places we can apply this stuff not just on the factory floor, but I think in the offices as well.

David Leon Joyce ***GE Aviation - CEO, President and Vice Chairman of GE***

Deal factories. Same thing that....

Unidentified Company Representative

Absolutely.

David Leon Joyce ***GE Aviation - CEO, President and Vice Chairman of GE***

Deal factories. So start looking at your deal factories and apply LEAN into it. So same exact thing that Alec was talking about.

Steven Eric Winoker ***General Electric Company - VP of IR***

Nigel?

Nigel Edward Coe ***Wolfe Research, LLC - MD & Senior Research Analyst***

A question on GECAS. A lot of new tales coming in over the next few years. How do you fund that? I mean how much of that is funded from aircraft sales and how much prudent from new debt? And then what happens to ROA as you -- as the fleet gets younger? ROA has been coming under a bit of pressure. Maybe address that. And then what happens as you get younger fleet?

Alec Burger ***GE Capital Aviation Services, Inc. - CEO and President***

So I'd start with, I guess, the second part of it. That ROA has declined over the last 5 or 6 years, which basically means in terms of where we're deploying new capital, we just choose here. And you have to find other areas beyond whether it is the true vanilla deals. So the business today in terms of both where we're deploying capital as well as the portfolio is still an attractive level for the business.

In terms of how we fund it, I think the simplest way to think about the business, we've been relatively stable in terms of the portfolio. Over the last several years, we're in that sort of $42 billion, $43 billion of on-book assets. We are able to originate in the range of $6 billion of stuff here. That's the equivalent of most of the kind of the second-tier leasing companies in terms of their entire portfolio. And we're able to actually -- the business is self-sufficient from a capital perspective, and that's purely a function of collections that we received, asset sales and earnings. And that basically allows you to be -- to have self-sufficient capital model. And I think the upside to us is then having some of these third-party capital investors that allows you to even go beyond that.

Nigel Edward Coe ***Wolfe Research, LLC - MD & Senior Research Analyst***

And a quick one on aviation free cash flow. Equipment, so customer progress collections were a slight headwind last year, which is a bit of a surprise. How do you expect that trend over the next 2 or 3 years? Will that be a tailwind or fairly neutral or even a headwind?

David Leon Joyce ***GE Aviation - CEO, President and Vice Chairman of GE***

I'd say progress really. It's a lot about timing when you take a look at where we were in '18. I think it's a tailwind. I mean if you just take a look at the growth in the LEAP, for example, I think that progress is going to be more of a tailwind. I don't think it's going to be a big tailwind, but I would say it's really about the timing of where we are at the end of the year, on this stuff.

Shane M. Wright ***GE Aviation - Senior VP, COO & CFO***

I think that's right. I think the other thing you saw as we ended last year, that $200 million headwind that David talked about. There's a bit of that that's in military as well. As Tony delivered towards the end of many of his contracts, you saw a little bit of a headwind from that. The new orders that he is getting all this year should, I think, bolster that in addition to the LEAP stuff, as David talked about.

Steven Eric Winoker ***General Electric Company - VP of IR***

Nicole?

Nicole Sheree DeBlase ***Deutsche Bank AG, Research Division - Director & Lead Analyst***

Nicole DeBlase from Deutsche Bank. So first just to follow up on Julian's question on free cash. When you talked about working capital being 0-ish for 2019, does that include a headwind from the MAX?

David Leon Joyce ***GE Aviation - CEO, President and Vice Chairman of GE***

No. I mean I would tell you that we've guided for this quarter $200 million to $300 million of impact as a result of working capital. You can imagine we're following this thing very closely relative to when the reauthorization occurs and how fast then Boeing starts flying the airplanes that they have on the ground back out. I -- we aren't giving a guide right now for the year. I would tell you for the quarter, it's approaching closer to $300 million for the second quarter as to where we are right now, and it's so dynamic depending on how fast they get these things back in the air. You know what I mean? I think it's going to happen sooner rather than later based on everything we know. And in that case, once we get it back in the air, we'll be able to give you some more certainty as about how fast we think the inventory is going to burn. But I hate to speculate right now until we at least get the airplanes flying again.

Nicole Sheree DeBlase ***Deutsche Bank AG, Research Division - Director & Lead Analyst***

Understood. And then just as a follow-up, could you provide an update on the LEAP cost curve and I guess scope of upside -- scope for upside to margins on the OE side related to that.

David Leon Joyce ***GE Aviation - CEO, President and Vice Chairman of GE***

Yes. Look, we're -- and Bill, if I get to -- I'll let you answer when I'm done here, if I get the numbers wrong. But think of round numbers on the Airbus pride, the LEAP-1A, we're down 40% in cost since the beginning of the program. We're down north of 45% on cost on the 1B now. High single digits in cost reduction this year again on both of those programs, if I got it right, Bill...

William A. Fitzgerald ***GE Aviation - VP and General Manager of Commercial Engines Operation***

It was the right numbers, David.

David Leon Joyce ***GE Aviation - CEO, President and Vice Chairman of GE***

Yes. And so -- and volume is a friend here. You know what I mean? It really is. And as we get better learnings with the production of some of these new technologies like Additive in our Auburn plant or ceramic matrix composites, we're taking cost out just because we're learning how to use this stuff better. That not only bodes well for LEAP, but bodes well for GE9X. It bodes well for ITEP. It bodes well for Passport. It bodes well for the catalyst engine in the turboprop area, which all are introducing these same technologies. So I think that's...

William A. Fitzgerald ***GE Aviation - VP and General Manager of Commercial Engines Operation***

Yes. I would agree with that, David.

David Leon Joyce ***GE Aviation - CEO, President and Vice Chairman of GE***

And that's ahead of our learning curve assumptions in the...

William A. Fitzgerald ***GE Aviation - VP and General Manager of Commercial Engines Operation***

It's ahead of our learning curve assumptions, and that's before we start doing more of these Kaizen events that could also help us.

David Leon Joyce ***GE Aviation - CEO, President and Vice Chairman of GE***

Yes. Yes.

Steven Eric Winoker ***General Electric Company - VP of IR***

Joe?

Joseph Alfred Ritchie ***Goldman Sachs Group Inc., Research Division - VP & Lead Multi-Industry Analyst***

Joe Ritchie, Goldman Sachs. Just real quickly on the LEAP, so talking about cash flow just near term in 2Q. Now that you're back at rate, how should we be thinking about the cash flow implications 2Q year-over-year versus what you saw in 1Q?

David Leon Joyce ***GE Aviation - CEO, President and Vice Chairman of GE***

Well, again, I think a lot -- we got to get -- I'm going to specifically go right back to the MAX because it is the elephant in the room. You know what I mean? We got to get the MAX back up in the air and then depending on what Boeing does with that rate for the rest of this year. Now we've talked to Boeing a lot about what is the rate -- we have a very long cycle supply chain. So you don't dial it down and dial it back up in 3 months. You know what I mean? So it's imperative that we have real clarity and transparency with Boeing as to where this rate's going for the rest of this year and into 2020, so that we can make adjustments in the supply chain and reallocate capacity elsewhere without finding ourselves behind the curve when they take a rate back up. You know what I mean? So this thing is, as we speak, it's playing out. I mean we probably model 4, 5 scenarios literally a week as to when are they going to get back in the air, what's that mean on rate, how fast are they going to be able to take the inventory down in Seattle, and where do we think we're going to be and how do we communicate that into the supply chain. So rather than having our supply chain go up and down and up and down, we've flatten them on what we think is more than adequate on rate. We're taking the capacity of everybody in the supply chain and reallocating it if we have any because we've got more demand. I mean we've got tons of demand outside of LEAP-1B so that we can have our supply chain, the same supplier's manufacturer. So between the services business, the T700 military business, the CF34s which are on rise, the GE9Xs, GEnxs, we can work with the supply base and say, hey, a little less of this and dial this one up a little bit because of the spares volume, keep their capacity constant in terms of the way they look at their output to us, and we change the mix a little bit of that on a regular basis. So rather than give you a specific on cash flow because, again, I'm just speculating, that's how we're managing the supply chain through this thing. We're not jerking them up and down. We're trying to keep ourselves pretty steady so that we can ensure we can deliver when this thing gets back in the air and they get back on rate again.

Joseph Alfred Ritchie ***Goldman Sachs Group Inc., Research Division - VP & Lead Multi-Industry Analyst***

Got it. Okay. That makes sense. And then just a follow-on, maybe elaborate a little bit more on the compressor component issue on the 777X. So you talked a lot about Additive and ceramic composites. How much of the issue is shifting your material base versus other...

David Leon Joyce ***GE Aviation - CEO, President and Vice Chairman of GE***

This is durability. This is just -- we run these engines beyond what we'll see in normal service to assure ourselves that they're durable, and we can measure durability by taking these engines and stress testing. We take them outside of the operating envelope normally, and we run them for extended periods of time and then we look at the condition of the engine when we're done. We share that condition with the FAA, and the FAA uses that as an assessment of the durability of the engine in addition to the airworthiness at the time certified.

During that process, we went into the front of the compressor, and there is a component, stationery component, in front of the compressor that was wearing more than we had anticipated, which means that we had to go back and model it, understand the loading on it and then understand what we had to change in the geometry. So we took took care of the durability issue, the wear issue.

We've done all of that. Now we have to prove that we did it, so we take that new component. We go up and run those same tests, the same conditions and prove that we don't have that wear anymore in the component. This is more a durability issue. If we don't do this, the engines come off wing too early. That's not good for Jean's services model, you know what I mean, because it's more shop visits within the contract time. It's not good for the customer, and it's certainly not good for Boeing. So that is what we're doing to the engine. Like I said, I'm not thrilled that it happened, but that's why we run the engines. And the reason we run this block test so late is we have to retire a lot of risk in the development program before we want to take the engine this far out of its operating zone. We don't do this on day 1. We get really far down the road that we feel very comfortable we understand the engine, and then we go ahead and turn to wick up and run it for extended period of time and see where the margins are. So inherently, this test happens towards the end of certification. And when you find something like this, it's disruptive. There's no doubt about it. We have to go do the redesign, but we're on it as fast as we can.

Unidentified Analyst

(inaudible), BNP Paribas. I have a few questions. The first one is about your trend in spare engines for CFM56. And I guess on the LEAP as well, you probably have a few spare ones to deliver right now. So some granularity on that will be helpful.

Second, Airbus is chasing or said that they would be chasing a supply chain again this year to be able to organize a further increase in their A320 production rate and specifically that they were hoping for an improvement of the [on-site] of the engine makers on their ability to support that appraisal. How do you consider this?

David Leon Joyce ***GE Aviation - CEO, President and Vice Chairman of GE***

So I'll answer the second one first. And then Bill, I'm going to turn it over to you because I don't know the numbers on where we are on spares rates.

I would tell you that, as you -- as we talked about in this room, the pinch point in the industry right now is the supply base. There's no doubt about it. That doesn't mean that we didn't have great suppliers. It just means that there is so much demand out there whether it be the Pratt on the geared fan and all of their partners, whether it be the GE9X, whether it be the LEAP product, whether it be the C-series, the A220, whether it be whatever. There's a lot of demand for new products. In addition to that, as you saw, the service market continues to grow. So there's an aftermarket for the existing parts that says you can't just reconfigure a line of blades from CFM56-7 onto LEAP-1Bs because you still have to provide 1 LEAP of NG blades into the marketplace that handle all of the services demand.

As a result of that, when it comes to any rate discussion, it has to start with how confident are we in the robustness of the supply chain. It's not that we don't want to go to rate. It's that we aren't going to go to rate if we can't make it. You know what I mean? It just doesn't make sense for anybody. It makes everybody feel good the day we go and then the rest of it is a hangover because we're chasing to try to get those demands based on whether our supply base really has that as an entitlement based on our CapEx investments and our assurance. And we have to stress test that, assuming that one of our suppliers is going to have an issue because not everybody performs perfectly all day long. So you have to make some of discussions on part yields with yourself and make sure you're robust enough to be able to handle rates. When we get to the point that we feel comfortable with that, we'll sit with Airbus or Boeing or anyone else, and we'll adjust the rates accordingly. But doing it prematurely just to make ourselves feel good about it is just a recipe for disaster when we can't deliver. And I've got to tell you the pain level that we cost Boeing by not being on PO for the last year, they had so much work that was out of sequence in that plant, and we were accountable for it. We have to say that because it's true because we didn't deliver the engines when we were going to, and the reason was we couldn't get blaze and forgings on time. So I think that -- I could tell you, I don't want to relive that scenario in any way, shape or form. So we're going to make sure that we've got robust supply that has the right entitlement. And when we do, we'll be more than happy to talk about rate increases. This is the other reason we're not taking the rates way down right now on the MAX side because they're coming back, and we have to make sure that we can handle it when we -- when they're back where we think they're going to be. I don't know if that's a good answer, but that's -- the spares rates...

William A. Fitzgerald ***GE Aviation - VP and General Manager of Commercial Engines Operation***

We're trying to get you the...

David Leon Joyce ***GE Aviation - CEO, President and Vice Chairman of GE***

We're trying to get them.

William A. Fitzgerald ***GE Aviation - VP and General Manager of Commercial Engines Operation***

Yes. We operate on about a 10% spares ratio basis. And as the ramp has been going up from a LEAP perspective, that's been about what we've been out. So I think the numbers are about 150. We're trying to get exact number here, but I think it's about 150 for this year for LEAP, right, between the 1A and 1B. It's 156. We have verified the number. It's 156.

Timm Schulze-Melander ***Redburn - Specialist Sales***

It's Timm Schulze-Melander, Redburn. Just a question for GECAS, and apologies if this is something you've talked about. But DHL, FedEx and Amazon, could you just talk about where you are today, what you expect from Amazon going forward? You've talked about pressure on rates of return. Is there a risk in the industry that Amazon becomes a kind of a must-win account?

Alec Burger ***GE Capital Aviation Services, Inc. - CEO and President***

I think that the -- Amazon is somebody that would be, actually, a great partner, and that's how we're really thinking about it. And if you look at where they kind of the independent carriers are, there's still a significant amount of demand there between Federal Express, DHL and Amazon. But -- so we view it as Amazon is not a must-win account. We've had a lot of very productive discussions with them and something that we would view as a very strong partner.

Steven Eric Winoker ***General Electric Company - VP of IR***

Right, right. So it looks like we've exhausted the room of questions. So that concludes our webcast. Buses outside to the Air Show if you're registered for them. And we also have box lunches on your way out the door. So thank you, everybody, and we appreciate you coming. Investor Relations team and I are happy to field more if you have them. Thanks.