

JPMorgan Tech Forum

Company Participants

- Colette M. Kress, Executive VP & CFO

Other Participants

- Harlan Sur, Senior Analyst, JP Morgan Chase & Co, Research Division
- Unidentified Participant, Analyst, Unknown

Presentation

Harlan Sur {BIO 6539622 <GO>}

Okay. Why don't we go ahead and get started?

First of all. Good morning. And Happy New Year to all of you. Welcome to JPMorgan's 17th Annual Technology and Automotive Investor Forum here at the Consumer Electronics Show on Las Vegas. My name is Harlan Sur. I'm the semiconductor and semiconductor capital equipment analyst here for the firm.

Pleased to have a solid day of semiconductor, automotive, automotive technology and general tech companies presenting.

Also joining me from JPMorgan are my colleagues. I've got Bill Peterson who covers the RF semiconductor value chain. We've got my colleagues Ryan Brinkman and JosÃ© Asumendi, who cover the U.S. and European automotive sectors respectively; Paul Coster, our applied and emerging technologies analyst; and Sumeet Chatterjee who covers IT hardware and telecom and networking equipment.

So I hope you enjoy the conference. Thank you for participating. And remember, this session is for you guys. So please ask questions.

And with that, I'm pleased to introduce Colette Kress, the Chief Financial Officer of NVIDIA. It's been a tradition in the last few years to have the NVIDIA team kick off our investor conference because the team is driving much of the trends, artificial intelligence, deep learning, next-generation compute and automotive, next-generation gaming, to name a few, all of these timely topics here at CES.

The team held their press conference on Sunday. I'll ask Colette to start us off with an overview of what the team unveiled Sunday night. And then we'll go ahead and kick off the Q&A.

So Colette, thank you for joining us this morning.

Colette M. Kress {BIO 18297352 <GO>}

Okay. Thank you for allowing us to kick off your conference. It's great to be here at the Bellagio to help start off, in terms of CES. The team's already busy this morning. But we've been here since Sunday.

We announced, in terms of our press conference that we had done on Sunday night, it was our opportunity to continue our story of bringing Turing to many of our different areas of growth. We started with Turing, focused in terms of both our workstations as well as in our high-end gaming.

As you had seen us earlier last year, we had discussed Turing 2080 Ti, 2080, 2070, all hitting in terms of key price points for the high-end types of gaming. This brought us our opportunity here to announce and are very excited to announce that we brought Turing, our 2060, to the mainstream overall gamers.

Our price point for here is essentially about \$200 -- excuse me, \$350. \$350, which we -- turn that this way, try that -- which uses an opportunity to see gamers all across the world be able to appreciate, not only the next-generation Turing but probably what is most important within there is ray tracing.

Now we have brought ray tracing to the market back in the fall, which is essentially the holy grail of graphics. What we've done for so many years is simulate the ability to do ray tracing. And now we are bringing it live, which allows you the ability to address beams of light, rays of light, easier within the overall graphics, making them truly as about as real as you can expect.

And this excitement has excited the entire ecosystem, the overall gaming industry, everyone from the overall software developers that are bringing games as well as bringing this even to the overall enterprise in terms of ray tracing. So our excitement in terms of bringing in mainstream overall card to gaming was a very key highlight of our offering on Sunday night.

With that, we've also introduced it with several bundles in terms of very key games that are coming out, whether that be Anthem or Battlefield V. You can now get the card with one or the other included in there. True excitement that this will be in terms of a mainstream high volume for all across the world.

We're able to address many of the types of gamers that they have been -- purchased the overall 970, that have purchased in terms of the overall 1060 or others or about 1/3 of our installed base who now have the ability to upgrade and use what we can have with the overall 2060. So it was one of our very key announcements.

Additionally, we announced bringing Turing to our overall notebook or overall mobility. There has been a trend over the last couple of years, as you had seen us,

bring out Max-Q. Max-Q was really associated with overall trend of thin and light notebooks but also bringing the overall high performance that is necessary to do the gaming with that.

Why should they have to choose between "I want premium light" or "I want high performance"? We've been working for many years with the overall notebook OEMs to now incorporate the performance levels that you also have in terms of on the desktop.

So what you have coming out of the end of January is an astounding amount of notebooks for overall gaming using Turing, probably more than 40 different ones. They're all on display here at CES. So I strongly take -- there are some of the truly, truly beautiful notebooks that are there and really just prime for that overall mobility of gaming that is here.

Additionally, we announced with -- the overall G-SYNC. G-SYNC is our monitor frame sync that we do as well. You've seen us with this in market where we have certified many of the overall monitors to the overall GeForce card for many years. What we are now doing is extending that to almost every single monitor that is out there. So they will all be able to be G-SYNC available, just like we have in terms of those that are just specific to our GeForce.

So this again brings excitement for all of the different gamers out there, that they can have a super experience, whether they are mobile in terms of desktop in terms of (there).

We've also announced some key things in terms of broadcast capabilities on how to leverage the overall picture taking, which is so popular with inside the gamings and broadcasting that as well.

So those were some of the great highlights that we did. We focused all of Sunday night in terms of on gaming and additionally at our booth this week at the overall conference. We do have automotive. And we will be on the floor with many of our automotive partners as well.

Questions And Answers

Q - Harlan Sur {BIO 6539622 <GO>}

Great. Now that was a great overview. And yes, it was actually very refreshing for the first time in a while that the team focused on the core gaming platform. So that was really good. And my follow-up question on that is, most of the discussion on the new Turing architecture has been centered around Ray tracing capability. Obviously, it's a key capability. But the thing that struck me is that Turing is also the first gaming platform to actually bring artificial intelligence to graphics and gaming. And the Tensor Core technology, combined with -- you've got an image-based neural network called DLSS. And you can essentially use AI to improve the quality and

performance of the gaming platform. So maybe help us understand how DLSS works at a high level and how many of the upcoming games are actually going to support this pretty neat feature.

A - Colette M. Kress {BIO 18297352 <GO>}

Yes. So we are the first to bring to overall gaming the use of overall AI and so how you want to think about this is in order to improve in performance, all about those overall frame rates and how fast you can refresh. If we can take a simple example of looking at a pixel over here and a pixel over here and inferring in between the 2, based on what we see and what we know about the overall graphics, we can increase both the overall quality of the overall picture as well as the overall speed through that. That's what DLSS is. So there's many different pieces in terms of what we are bringing in terms of Turing. One, overall just performance improvement in terms of gaming overall. For games that you have today, games that you are using, the overall improvement that you can see, more than 60x in many of the overall cards that we can bring with Turing. Adding in terms of just DLSS what we may do with some overall games also improves the overall performance as well as the overall quality of the overall picture. Then the combination of ray tracing and DLSS today would make a tremendous overall gift in terms of what they see in terms of gaming. This is the next generation of gaming, the next generation of gaming that is going to focus in terms of on ray tracing.

Q - Harlan Sur {BIO 6539622 <GO>}

One of the statistics that Jensen threw out there on Sunday was that -- and you mentioned this on the last earnings call as well, which is that 1/3 of your installed base is on the GTX 960, 970, 1060 platforms, which is considered your midrange platforms. And that's the area that the RTX -- the new RTX 2060 that you rolled out, is targeting as well. And Jensen showed a significant performance step-up in the 2060 versus these prior generations, I guess, the implication being that given the performance step-up, there is a lot of motivation to upgrade. And so my first question to you, Colette, is 1/3 is midrange, what is the composition of the other 2/3 of the installed base looks like? Then second question is, historically when you've had these big performance step-ups, like for example, 2060 versus prior generation, how rapidly does the install base upgrade?

A - Colette M. Kress {BIO 18297352 <GO>}

Sure. So what we have is when we think about our overall upgrade process, there's definitely those that, at the moment a new architecture comes out, they are ready to overall purchase an overall new card. So we have many of our top, top high-end gamers that will literally buy the brand-new architecture on the day that it comes out and sometimes even buy twice within the same architecture for multiple overall gaming PCs that they may have. So what we have in terms of an explanation is yes, we are addressing with a single overall Turing with the 2060. Essentially 1/3 of our installed base that would be potentially looking at this is an opportunity for them to use this as an upgrade. So what we have is not only those that were in Pascal and focused in terms of on the 1060 -- but remember, at every architecture, we don't upgrade every single person before we start the next architecture out there. So there are many that are on the Maxwell. So when you think about the opportunity that you

are on Maxwell, you are at 960, you are at 970 and you think about using a 2060, that is a phenomenal overall performance improvement right after. And once they have a 2060, they are also ready to address ray tracing and the overall content of ray tracing going forward. So that's a great offering for a significant portion of our installed base. And it will be interesting to see what they will overall do over that period. But essentially, our installed base will be a combination of those that will be on the older architecture. There will be those that have moved to the most recent architecture and those that are the leading edge that have started in terms of Turing. Turing is very new, started at the very, very high end. And we are now just getting into the really -- the meat of the overall Turing by announcing the 2060 at this time.

Q - Harlan Sur {BIO 6539622 <GO>}

Got it. Then on Max-Q, it's -- I think you can actually see it amongst the gaming community, the adoption of these high-performance thin and light platforms. And Jensen, I think, showed the number of parts being rolled out every year, for the last couple of years, has gone up pretty dramatically. And so do you have a sense of the -- of your -- of new GeForce or existing GeForce installed base? What percentage of them are moving towards more of a kind of portable connected-in light notebook-based platform?

A - Colette M. Kress {BIO 18297352 <GO>}

Yes. I would say our overall notebook business, as we exited Q3 for our overall gaming business, was up quite strongly, probably can be almost double the growth rate in terms of what we're seeing in terms of the desktop. This is actually fueled by the thin and light movement. And the excitement across the industry, both the OEMs in terms of building them, the creativity that has gone in, as well as what they get in terms of those notebooks, in terms of carrying all of that desktop experience to an overall more mobile form factor. So it's still unclear to know exactly in terms of how large our overall installed base of notebooks is but definitely, what we see is it's probably one of the fastest-growing areas of our overall gaming business.

Q - Harlan Sur {BIO 6539622 <GO>}

Yes. And I've seen like what, introductions from GIGABYTE, MSI, Asus, Acer. I think a number of different -- have already started introducing the 20 series platforms in their notebooks, right, just here at CES. Okay, that's great. Maybe turning to more of sort of the near term. Based off of your Fourth Quarter, January quarter guidance, NVIDIA is on pace to grow fiscal '19 revenues by 26% year-over-year. Obviously, the Street has 6% growth for the overall company this coming fiscal year, fiscal year '20. Obviously, part of that is the impact of the current channel inventory wind-down that you discussed in the last call. The team discussed having a goal of having channel inventories back to normal levels exiting the current quarter. You basically shut off shipments of midrange GPU platforms into the channel, with the goal of working down those inventories. So what kind of progress has the team made in reducing channel inventories? And do you expect -- or when do you think you'll have a better view on when you can start to ship to consumption?

A - Colette M. Kress {BIO 18297352 <GO>}

Yes. So just to clarify where we ended at the end of Q3, it was our belief at the time, at the end of Q3, is that the overall channel inventory for the midrange was still a little high, a little high for us to continue, knowing that we would be moving to new parts of the architecture to be continuing selling in. So we had a little bit of excess channel inventory in our midrange Pascal at that time. We had pretty much penciled in that we believed it would take us about 1 to 2 quarters to work through that inventory. Then we would be back on track to continue in terms of what we have in terms of our architecture with Turing. All things are progressing well. We believe that we are on track to that overall estimate in terms of what we did. This gives us the opportunity to seed and be in the great mindset for the next architecture of Turing and the next generation as we took that pause to make sure that we could work through that quite well.

Q - Harlan Sur {BIO 6539622 <GO>}

As you monitor the health of the channel, pricing on some of these older midrange cards have stabilized?

A - Colette M. Kress {BIO 18297352 <GO>}

So the reason why we had reached the point of excess channel inventory was the pricing was still a little bit too high, following overall cryptocurrency. That's a different statement than in terms of, was there anything in terms of built too much or otherwise? Really, what it was about was the overall pricing dynamics that were out there in the channel. Keep in mind, our channel is a large channel. Our channel has many layers into it. So what they had seen at the -- once supply started to equalize, following a lot of the shortages that happened during overall cryptocurrency, the overall pricing was quite high. It didn't come down as fast as we had thought it would. And we were talking about a very important segment, which is price sensitive. That price sensitivity and having too high prices caused us to have too much excess demand at that -- excess supply at that time. So what our work has been, we have seen those prices, what we would refer to as normalize, normalize in terms of what we would say is manufacturers' suggested retail prices. And what you saw over the holiday period was points of several overall promotions, whether done by the overall channel or with help to essentially excite the overall community with that. Everything from what we saw on Black Friday, Cyber Monday and that will also continue through in terms of the Lunar New Year that finishes out our full holiday season.

Q - Harlan Sur {BIO 6539622 <GO>}

Yes. And I would say that the number of AAA-rated blockbuster games, the number of rollouts is actually quite healthy this year. So I would assume that just overall end demand by your gaming community would have helped that. Your channel partners now. And I assume, had visibility into the 2060 platform as well. And that might help pricing on some of the older SKUs. But Jensen did say on the earnings call that the target was to get to normalized channel inventories exiting this quarter. But...

A - Colette M. Kress {BIO 18297352 <GO>}

So our (full) is we feel we'll be in a fairly good position. Essentially, you're never going to be at 0 channel of inventory before we're actually moving to some of the

new things. So the normalization, correct, will be at that point. And -- but working through the excess will be about 1 to 2.

Q - Harlan Sur {BIO 6539622 <GO>}

1 to 2. Okay. Then postmortem, do you have a rough idea of how much sort of the crypto portion of that accounted for as you look back at fiscal '19? And more importantly, are there new monitoring systems or new product SKUs you can put in place that's going to help the team keep a better, more real-time view on some of these nongaming-related channels and sales on a go-forward basis?

A - Colette M. Kress {BIO 18297352 <GO>}

Sure. So a lot of what we've seen in fiscal year '19 was obviously really great overall gaming seasons and has continued for many years as the overall demand for gaming as an entertainment industry is extremely high. But we were also introduced with feeding the overall cryptocurrency, overall market, in the early parts of '19. Some of that ended up changing at the end of our fiscal year '19 to where you could almost normalize the full year is about what we see in terms of the overall gaming industry. Our overall channel and our distribution is quite large, quite wide. We do the best that we can in terms of getting information back. But in some regions of the world, it's not as easy because there may be 3, 4 layers of overall distribution for us to get real-time information back. We know that our overall GeForce experience is our opportunity to have a connection with our overall gamers. But not -- again, we don't see 100% of our gamers on that. But that gives us our best indication in terms of what our gamers are using and how we can help them in terms of the future in bringing products to market.

Q - Harlan Sur {BIO 6539622 <GO>}

Before I jump into any other questions, I want to make sure if there's any questions in the audience here. We have one right here. Do you want to wait for the -- do we have a microphone? Yes. It's coming.

Q - Unidentified Participant

I guess, one question I had in terms of the inventory work down was, I think in the past, you have used rebates in the channel as a way to help clear inventory. So I think some analysts had been looking for that as a mechanism. And I don't think we've seen that in the midrange yet. But I just kind of wanted to talk through how -- if you're using a different system or if we've missed that. Then the other thing on the gaming side is just how you have visibility on China in terms of that end demand because that (is a) part of your installed base and there's so much volatility in that market right now, just to get some added comfort there that you can see what consumers there might be buying or not?

A - Colette M. Kress {BIO 18297352 <GO>}

Sure. So let me address the first one. There's many different ways in terms of how we are trying to work through the overall inventory. Bundling has been quite popular as you have seen through the overall holiday seasons. From time to time, yes, we also look in terms of rebates. But you have to be careful with that. In many times, that's

very hard to get to because the overall inventory has probably already worked through down the channel. So we don't have necessarily the direct contact as we do with the initial part of our sale that we do to the AICs. But we do work from time to time in terms of working through inventories. Those are generally some of the work that we do to move the overall inventory. Your second question relates to the market in terms of China. In terms of for gaming, we've pretty much indicated our installed base and who we sell to for gaming, is probably about a 1/3, 1/3, 1/3 model: 1/3 model in North America, another 1/3 in Europe and another 1/3 in the Asia Pac or overall China area. We talk about the holiday season as a very important time of year because it is a time where overall content for gaming comes out. And that is a great opportunity to also think about the overall hardware improvements that you can make at the same time as the overall software. It is the time to do things. But keep in mind, the holiday season is broad and wide. Here in -- for example, in the U.S., I think it starts close to the end of October and actually stems all the way through some parts of overall January as we think about the after Christmas and some of that overall purchasing. But we're still in the initial stages of working towards what we would consider the holiday season in China, okay? In China, New Year doesn't necessarily start until the beginning of February. So going back to our earlier discussion, the 2060 Turing is a very, very important part for us as we knew moving through our inventory and getting ready for Chinese New Year and that holiday. we're extremely excited to be ready and positioned with our 2060 for the overall holiday season in China.

Q - Harlan Sur {BIO 6539622 <GO>}

Any other questions? Why don't we talk about the high-end enthusiast class segment of your gaming business. You rolled out the 2070, 2080 Ti platform in the second half of last year. I think the overall reviews were really good. I think what we're waiting for and maybe what some of your enthusiast gamers are waiting for, is for more titles to come out with the ray tracing capabilities, if you can give us an update on that. And again, given that the AAA-rated gaming season and rollout of new games was actually quite healthy, maybe just give us some sense of the momentum for 27 -- 2070 and 2080 from a new product launch perspective.

A - Colette M. Kress {BIO 18297352 <GO>}

Sure. Our branch of 2070, 2080 and 2080 Ti is a great set of overall high-end cards. As we had talked about at the early stages, our 2080 Ti, the priced over \$1,000 one, was probably one of the most successful overall cards that we had in terms of it sold out very, very quickly. But that still leaves our group of high-end cards well positioned, both for existing games in terms of the overall performance improvement. But this is definitely a lasting overall set of cards that will bring us more overall content as we go forward. When you look at our overall presentation on Sunday night in our press, we really talked about our overall engagement with the ecosystem of the software developers. This is a part of our business that we know is extremely important in terms of bringing this content, whether that be Anthem, whether that be Battlefield V, whether that be a host of overall games that we will see going in the future. We are very, very dedicated to it as well as they are. So I think there's an important part that they also see the use of ray tracing as bringing excitement to these overall games. So we see the conglomerate of this high end in terms of a choice. In terms of where, we're still in the early stages of seeing this go

through. But as a whole, we think this will lead to great game purchasing and also buying into an architecture for the future.

Q - Harlan Sur {BIO 6539622 <GO>}

We have our flagship health care conference coming up. It's actually here -- it's this weekend in San Francisco. And for the first time ever at a health conference, we actually have a semiconductor company presenting at health care and it's NVIDIA. And the head of your health care division is presenting. It's a great example of the end market verticals that the team is trying to penetrate. So first of all, Colette, help us understand how many vertical teams do you have, health care, industrial? And how big are these in terms of the overall contribution to sort of company revenues?

A - Colette M. Kress {BIO 18297352 <GO>}

Right. That's a great segue to talk about a lot of the work that we're doing in the data center, the expansion of where we are on the data center, which is really, really, industry and market specific. We chose a overall unified architecture as we take things into the overall data center. But what we know is key is a lot of the work that we are doing, whether it is accelerated computing or whether it is focused on AI, can be very, very industry specific, rather than talking about just the pure hardware. So we have continued to work on the overall software enablement with the overall right hardware underneath to address many of these markets. You've highlighted that we're coming in terms of health care. Wow, NVIDIA at health care. How can we see ourselves in there? We've been a part of health care for many, many years. For anybody going in, having any type of scan, any type of MRI, any of that, if you look with those overall machines, those have incorporated NVIDIA for many years, one for the overall speed that it can take to overall perform many of those scans but also the detail, the amount of very specific in terms of what you can see. We are bar none top of the line in any of that type of thing. But what you have found is as we see more and more use in diagnostics, in terms of there, we can lead to prevent many of the diseases that we see out there that are caught actually too late. If we could leverage our overall capability by extracting data from all of these different form factors around there to put together to say, I'm able to find something quite quickly in terms of -- in an x-ray within a scan quite quickly. We can do miles of work in terms of what it has taken in health care. So we have focused not only in terms of what the needs of them from a hardware perspective but what they need from the overall software, with a key goal in terms of speeding up the overall work and the early diagnosis. That's what you will see in terms of -- at the overall health care. They'll talk broad and wide. It's a very, very fascinating industry that has essentially been relatively untouched, even though they have a significant amount of data that they're working on. Now you've asked in terms of how many other industries are we doing this with. We choose extremely carefully in terms of how many of these different industries are we going to do. One, we look in terms of, is it a large market in front of us? Is this something that is an enormous market that can benefit from redoing the overall infrastructure of data that they have? Number two, is it a hard enough problem that we know that this is something with our work, which we have the tenacity often to sit through a very, very difficult problem to put together, we think we can do. So we have several of these continuing to be built. You saw us work on terms of that with deep learning. You see us now moving in terms of overall machine learning. You've seen us in the earliest, earliest days do high-performance computing. High-

performance computing was a 10-year project to get to where we are. And now we're probably -- the majority of everything that's in supercomputing that uses (ASIC) acceleration. So we also have a focus in terms of -- a small focus in terms of the robotics, we have the focus in terms of manufacturing, manufacturing in terms of industries. You see the on-the-edge computing, which we think is extremely important. So we're still in the early stages of that as well.

Q - Harlan Sur {BIO 6539622 <GO>}

Great. Well Colette, thank you very much for joining us this morning.

A - Colette M. Kress {BIO 18297352 <GO>}

So thank you.

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