Morgan Stanley European MedTech & Services Conference

Company Participants

- Colette Kress, Executive VP & CFO
- Joseph Moore, Executive Director

Presentation

Joseph Moore {BIO 17644779 <GO>}

Hi. Welcome back, everyone. Thanks for joining us with NVIDIA.

Before we start quickly, I have to read the safe harbor. For important disclosures, please see the Morgan Stanley research disclosure website at www.morganstanley.com/researchdisclosures. If you have any questions, please reach out to your Morgan Stanley sales representative.

So with that out of the way, I'm Joe Moore from the Morgan Stanley Semiconductor team.

I'm very happy to have with us today the CFO of NVIDIA, Colette Kress.

Welcome, Colette.

Colette Kress {BIO 18297352 <GO>}

Thanks so much for having me. Appreciate it.

Joseph Moore {BIO 17644779 <GO>}

Sure. Anytime.

Questions And Answers

A - Joseph Moore {BIO 17644779 <GO>}

So maybe you just reported very strong numbers, obviously, and you continue to be dealing with pretty significant shortages. So maybe we could start there.

You've had this tight supply situation, it keeps intensifying. Very clearly, that's because demand is really good, particularly in the gaming space.

But given the supply is the binding constraint on your revenue growth, I want to understand kind of what the issues are? And is it you need another fab cycle to catch up where it's just the business is better than you forecast? Or is there an absolute inability to get wafers or inability to get substrates or things like that, that you need?

A - Colette Kress {BIO 18297352 <GO>}

Yes. Thanks, Joe.

So Joe, I'm going to take also a little stop here to make a forward-looking statement as well. Keep in mind, throughout our discussion today, we may be discussing forward-looking statements, and this is an opportunity for folks to make sure that they read our information that we supply to the SEC through our 10-K and make sure that they understand our risks that we have identified at that time.

But let me kind of go back to your question that talks about supply.

But honestly, before we can really talk about supply, we really have to understand what we are facing, which is strong demand. We do have strong demand across our portfolio, really strong demand as it moved into the overall holiday season and with our overall launch of our Ampere architecture for Gaming. And we've been working as best as we can to continue to improve the supply.

But we do expect that supply -- or excuse me, that demand will be greater than supply for most of this year. Our channel inventory at this time is lean in our overall Gaming business. Now no one specific form of inventory or inventory component we could call out at this time because it really is tied across the board. And it takes all of those different pieces to make sure we can provide for our overall demand that is out there.

But our demand is high. We do expect to grow, and we certainly, based on what we have communicated in terms of our expectations for the First Quarter that we will certainly have the inventory for that. We've employed a dual foundry strategy. We work with both TSMC and Samsung and in really the high-end type of overall computing, which has really benefited us during this overall environment.

Our purchasing cycles are contracts that we use with our vendors, with our suppliers continues to be more and more longer-term in nature so that we can secure throughout this time and have consistency in the amount that we are pulling from our overall suppliers. So our overall operation team is executing well. We do expect supply to increase consistently as we move through this year.

A - Joseph Moore {BIO 17644779 <GO>}

That's very helpful. Maybe we could talk in this big picture. I want to get into Ampere and some of the specific success you're seeing there.

But just the general strength of gaming, how do you guys think about that? Because you've talked about everyone should be a gamer, and we're going to increase the population. And clearly, that has really accelerated with COVID. Work-from-home environment where people are limited in terms of things they can do really seems conducive to spending money on gaming.

At the same time, it does seem like there's a sustained increase in people who are experiencing gaming. And so how do you weigh those two factors? How do you think about the sustainability beyond this year when you sort of increase the population of gamers and the people buying cutting-edge hardware by such a significant amount?

A - Colette Kress {BIO 18297352 <GO>}

Yes. So I think we have to step back and really kind of assess what are we seeing in terms of Ampere? What is Ampere? Why this significant type of growth that we're seeing? We did launch our Ampere architecture with the overall high-end. We launched it for the 3090, 3080 and the 3070. It came out and was extremely well received. It has probably been our best-ever launch with our overall Ampere for overall gaming. And our volume in this segment of just the 3090, 3080 and 3070 is really showing probably more than 40% quarter-over-quarter growth, so extremely strong.

Our 3060 desktop GPUs that we've just launched, as we discussed last week in our earnings, essentially vaporized when we went to launch. So we're continuing to work to supply additional 3060s into the market. But what we're seeing is the excitement for overall gaming, gaming not only on desktops, but laptop GPUs with the 70-plus models that we also launched back at CES, is an important driver of what we're seeing in this demand.

A powerful upgrade cycle, I think, is an important thing to keep in mind. Right now, we have less than 15% of probably 200 million overall installed base that are only on RTX. So essentially, we've got 85% of our installed base that can still be able to upgrade and experience overall ray tracing. A huge incentive, therefore, to upgrade.

You have more than 2x the overall performance improvement and 2x the power efficiency from Turing. That doesn't even comment in terms of what we see in terms of the performance improvement that you have with Pascal. Pascal being two generations prior, it is an amazing performance improvement for people that want to overall upgrade. But now you have seen that ray tracing is also really an industry standard. NVIDIA was the one that put it out in terms of real ray tracing with the unique capability to also include DLSS or essentially using AI to have that unique ray tracing without a loss of performance.

So you see more than three dozen games that are out there to support overall ray tracing and some of the most important games that are out there: Fortnite, the #1 battle royale game; Cyberpunk 2077, the #1 role playing; and keep in mind, even Minecraft, the best-selling game of all-time, is out there to support it.

So what we saw in these last couple of quarters, an important quarters as it really just fueled the excitement around gaming, probably in a way pulled in terms of the excitement. And we see more and more gamers now entering the market new because it has become even a bigger and better social and entertainment sport as many of them are working from home.

So correct. We believe that all will be gamers eventually. And what they just did was start earlier, start earlier in that process. But when you start the process and you become a gamer, you're always a gamer. So I think this is something that we'll see continue moving forward, as people get excited about the ability to play with their friends in a very safe environment and a very virtual environment, whether they are at home with the desktop or with a mobile laptop as we move forward.

A - Joseph Moore {BIO 17644779 <GO>}

Yes. That is very helpful. So yes, you've started at the high end of the market with Ampere, and you've moved kind of now to 3060, as you said, as a mainstream. That seems pretty positive for the rest of the year because you really have put up these very large numbers with sort of without a full Ampere product portfolio and certainly given the older product is not on shelves anymore. So it seems like a very good backdrop. So can you talk about that a little bit?

And then you mentioned the investment in ray tracing. It's a little bit of a chicken-and-egg problem with technologies like that. And I know you saw that with programmable shaders a decade ago, too, where you introduced the hardware and then the software comes later. It seems like we now are at the sweet spot for that. But generally, it just seems like we don't -- we should have a very strong backdrop for demand certainly beyond this quarter, as you'd said.

A - Colette Kress {BIO 18297352 <GO>}

Yes. So what we had seen was strong demand for Ampere in the high level of the cards that we produced in Q4. Gamers are continuing to enter into the market and/or refresh by what we refer to as buying up the stack. And so we're getting an average overall card that continues to move up generation per generation. So our units were supply-constrained in total. But remember, more than 40% of the quarter-over-quarter improvement was really selling that overall high-end.

Now bringing the overall mainstream 3060 GPUs, we talked about this 30 overall series and that overall 60 class as an important area. It's mainstream. It is a volume overall SKU or what we refer to as a sweet spot. So our visibility that we see as we provided our overall guidance for Q1 and what we will believe will be a strong overall gaming demand as it continues throughout the year is really fueled by what we're seeing in terms of the acceptance even on day one, but also after even being in market, we have low channel inventories at this time. And we're also in the early stages of the full upgrade opportunity as we had just launched the high end of the stack and are just now moving to the overall 3060.

So we have a ways to go. But again, we do believe that visibility of excitement over gaming, excitement on our architecture is fueling what we're seeing in terms of our

visibility.

A - Joseph Moore {BIO 17644779 <GO>}

Great. And I just had a couple more gaming questions. One of the real growth drivers for you guys over really, even predating Ampere, has been mobile gaming and notebook gaming. You guys have enabled some new form factors, and it's pretty impressive gaming performance. Can you talk about that? And then you had just launched Ampere mobile products? Where are you with Ampere in the mobile space?

A - Colette Kress {BIO 18297352 <GO>}

Yes. So we've been quite excited to see both the adoption and the excitement out there for gamers regarding the laptops. We essentially created a market for high-performance laptops but also that mobility in the terms of the thin and light. We refer to that as our Max-Q. Now our Max-Q is on our third generation in terms of assisting the OEM manufacturers on how to engineer that in terms of 50% the size, 50% the weight but more than 10x the performance improvement over time.

Laptops right now, gaming laptops is probably the fastest growing gaming platform that's out there. It is up 7x in just seven years. Q4, for example, was our 12th consecutive quarter of double-digit year-over-year growth in our overall laptops. Our RTX 30 Series laptops launch was one of our largest launches ever with more than 70-plus different devices. So we're on our second generation of ray tracing, which is also extremely helpful for the gamers to know that they can also do ray tracing on our laptops and not just have to purchase it for the overall desktops.

We have a very large upgrade opportunity as well here. We've got 50 million GeForce laptop gamers at this time. 95% of that installed base is before -- is below performance of what they might see in terms of new consoles going forward. The 3060 Series laptops is 30% faster than what you can get with PS5. So important overall things that can be done.

But additionally, it also opens up a market to creatives that are out there. The creative community, the independent community that focuses on their craft, their craft that works on catalogs, photos, all of these different things, there are 45 million creatives that can benefit from the Ampere studio laptops that we are also putting out in market. So we see this as a great opportunity to improve their rendering as our Ampere laptops offer 5x improvement versus what we had seen in Pascal. So lean overall channel inventory out there, but I highly recommend those laptops as well.

A - Joseph Moore {BIO 17644779 <GO>}

Great. Yes, it's good color. I think maybe we can talk a little bit about cryptocurrency mining. And you gave some color on the call about kind $100 million to $300 million of trailing revenue. I know you guys have taken action to make sure that your gaming cards end up in the hands of gamers, to the extent that you can. But just cryptocurrency has been a little bit disruptive for you guys in the past. It seems like your gaming business is a lot bigger now. But maybe just put that into perspective

for us. And where do you see that $100 million to $300 million going over the rest of the year between specialty crypto products versus gaming?

A - Colette Kress {BIO 18297352 <GO>}

Yes. Let's step back and comment about where we were in Q4, what we saw in Q4. I just want to make sure everybody understands that our ability to see exactly how our overall cards are being used and unique ways that are being used, such as cryptocurrency mining, it's not something that we are able to see. The privacy that our overall products will continue to have in terms of how users are using it, but also the ability for them to create new uses is what we're seeing in terms of the overall GPUs.

So we had given out an estimate, an estimate that was referring to what analysts had marked in terms of what they saw in our overall Q4 results, meaning we do not have access to those models. We do not have a good understanding of how they concluded in terms of those ranges. But in fact, in our Q4 revenue and our Q1 guidance, we probably would have had the exact same numbers with or without crypto as gaming demand is well ahead of our available supply, and we needed to refill those very low levels in the terms of the channel inventories. So the inventory that became available in terms of retail really took quite a significant amount of time for those to uplift and will take time over the next couple of quarters to do so. So our revenue would have been the same with or without, if there is crypto in our overall gaming business.

We believe the situation, though, for crypto is quite different than what we had seen in the previous cycle that we had. For one, we have a very large installed base, a large installed base that can produce some of the same hash rate levels that we're seeing today. That large installed base has the potential to reactivate at this time. Additionally, we see ASICs that are in the market. ASICs that can also address mining and mining for ethereum as well. And we are at the start of a new architecture. Versus the last time in this previous cycle, we were at the tail end of an architecture and moving to transition. So therefore, at this time, our channel inventory is very low.

Our strong demand from our gamers is probably the main contributor and is driving our overall tight supply. So we created the overall CMP. Our CMP stands for our crypto mining processor, we created it for our professional miners as we will start shipping to them in the March time frame. We have put into our guidance in Q1 approximately $15 million for CMP in Q1, though it could be more. And we have indicated that at the end of the quarter, we will make sure that we articulate and provide transparency of how much we sold of the overall CMP board.

This was also an opportunity for us to look at the 3060 that we just launched and make sure that we were tailoring not just for gaming. We did that by reducing the efficiency of doing hashing for mining with the overall 3060. Essentially, that card is best engineered now for our overall gamers.

We believe these two pieces that we put in place for crypto at this time will allow us to separate the market as best as we can, separate the market for gamers and

separate the market for the overall miners.

A - Joseph Moore {BIO 17644779 <GO>}

Great. And I know gamers do appreciate you trying to get cards in their hands. So that's good to hear. So maybe shifting to HPC and cloud, a number of impressive growth drivers. Obviously, you've had a phenomenal run over the last several years. Can you just talk generally about what's the drivers of that business? And then we can go into some of the pieces from there.

A - Colette Kress {BIO 18297352 <GO>}

Yes. So what we are experiencing right now in our high-performance computing in our cloud is in -- as parts of our overall data center business is we're far outpacing the industry at this time. NVIDIA is growing at a time when many others are not. We saw the industry decline sequentially into Q4. We saw them also from an industry perspective, discussed in terms of between Q4 and Q1 that they will also be down, maybe down approximately 20%.

But what we are seeing at NVIDIA is growth, growth sequentially between Q3 and Q4, and we also anticipate growth between Q4 and Q1. This is an important time that even in the overall lockdowns that we have seen, the importance of the cloud, the importance of high-performance computing and AI solutions is so important and vital to enterprises, hyperscales and many other types of companies around there.

What we've seen in Q4 was our compute reached double digits quarter-over-quarter growth, better than our outlook that we had anticipated as well. We are seeing strong growth in terms of the vertical industries. Our vertical industries and key areas of focus have been supercomputing, financial services, higher education as well as also the consumer Internet companies that are out there. This gives them an opportunity to adopt the overall cloud usage or move to an on-premise solution as well. And therefore, from an on-premise solution, they may choose our DGXs. We had strong growth in our DGX, strength both in our CSPs or higher education in term -- as well as health care.

But what we're seeing in terms of the overall cloud presence, the cloud presence is an important area for our vertical industries to start, sometimes remain or continue to move to build it in terms of on-premise. Our hyperscales have been very excited about Ampere and have really tried to put Ampere into the cloud as fast as they can, really working on that qualification and working with NVIDIA in terms of to smooth that overall movement to the cloud of the new overall architecture. And we actually have seen that over the last couple of quarters, and we know that there is more room to grow in terms of with our hyperscale in terms of expanding the cloud.

A - Joseph Moore {BIO 17644779 <GO>}

Great. That's very helpful. I think, thinking about the compute part of this, and it's been hard to predict from quarter-to-quarter, but when I sort of look at the big wave of investment that you saw a couple of years ago around really computer vision, deep learning and supplied to vision applications.

Now you're looking at natural language and the models will have a million times the number of parameters as what we saw with vision models. I mean, there's sort of demonstrable increase in complexity, and the application set seems to increase. So it seems like there's a lot of growth potential in that business.

Where are we in the adoption of that?

It's probably a little over a year ago that Google started saying the BERT transformer is kind of the most important element of their business. Where are we in terms of deep learning as applied to natural language recommendation and things like that? It seems like we're still at a relatively early stage.

A - Colette Kress {BIO 18297352 <GO>}

Yes. We are in the early stages, definitely, in terms of the growth of AI. I comment often that I say, we'll look back. We'll look back at this time. And what we thought was we knew a lot about AI, we knew a lot about solutions, we will learn that it was truly, truly in the early days. But there's important things that have grown over the last couple of years. We refer to these models.

You refer to BERT. The understanding that you can leverage overall AI to improve that conversational AI or that natural language processing is what we talk about. That natural language processing is really fueling the use of voice, the use of voice and translation in terms of multiple language, or the use of voice to translate from speech to words and words back in terms of overall speech.

There are so many different use cases that can occur, not only what you're seeing in terms of the hyperscales focused on search, but you also know that the enterprises see this as an improvement opportunity to their call centers, their support centers that they do, if they can use AI to better serve and service their overall customers.

Those models, though, are quite, quite complex. Quite complex, we see them growing. We see them doubling every few months. Up to 30,000x in five years is what we've seen the overall model complexity do. So that is one big thing that natural language processing is added. But we're also seeing the surge of overall recommendator engines. Recommendator engines were important to overall hyperscales, but you now see consumer Internet companies also understanding the importance of drawing folks to their sites and consumers to realize their overall services that they have. So this drives not only model complexity, but it also drives overall inference.

Inference is a major driver and a fast-growing part of our cloud at this time. And so we're seeing more and more adoption of A100 and its form factor. To remind you, A100 is quite unique in terms of how we built that system for our overall hyperscales and our enterprises. It is a system that can accomplish both training of models and also be used for inferencing. It gives that overall flexibility, the universal use to support high-performance computing, to support overall AI and then support many different forms of AI, from training to overall inferencing. This has really fueled the simplistic ability to purchase, to deploy and the flexibility to change it through their

overall ownership. And that is what these big waves in the business and the improvements that we have seen from the early days of AI.

A - Joseph Moore {BIO 17644779 <GO>}

Great. So we have about five more minutes.

I'll take one question from the webcast now, which is the question probably I'm asked quite frequently. It's competition from hyperscale solutions like Google's TPU or I think Amazon's premium, does that pose a threat to NVIDIA's long-term market share?

A - Colette Kress {BIO 18297352 <GO>}

Yes. So there's always discussion about start-ups, custom ASICs, will some build their own shifts? And how does that come through? Now what we have built and what is unique about NVIDIA is we're approaching this market to support it from a full system perspective.

Not only are we focused on a high-performance chip, but as you can see, we think about the chip, we think about the system, we think about the software and the future solutions that will be supporting that. That allows us to provide the whole complete solution for whatever they may need to do today and what they need to do going forward.

Using all of that together, supporting our overall CUDA and supporting our overall development for overall developers on there is a very big thing. CUDA is already in v11, and that's an important continued growth that we're seeing. We already have 2.3 million developers on our platform, and we have more than 6 million CUDA downloads just in last year.

So the important thing is people continue to turn towards NVIDIA because it gives you that full stack in order to do that. Whether or not you are starting a brand-new application or you have continued with the work that we have provided with CUDA-X and the many overall SDKs that we have offered, you continue to have the option to jump into overall CUDA and design and write your own for how you do that.

I think our work in terms of MLPerf has really shown that our overall performance continues to be the best performance that is out there, better than 7x for any AI or 2x in terms of any traditional HPC versus a lot of the overall competition that is out there. That performance continues to bring people to us and our performance in MLPerf continues to be an important benchmark that people use to choose.

From time to time, there may be workloads that are static commodity that they may choose a custom ASIC to do. But as we've talked about, as we're in the early stages of AI that will be with us for many decades to come, really continuing to move with a platform that is evolving all the time, and the innovation is going to be very key to support a very fast-growing market.

A - Joseph Moore {BIO 17644779 <GO>}

Great. So I think I'll wrap up with one final question on your automotive business.

Maybe if you could talk about the Mercedes deal that you announced second half of last year. And both what you're doing for them? And what kind of timeframe?

Then maybe some of the economics of that deal where it seems like there's some revenue sharing that takes place above and beyond just the hardware sale.

A - Colette Kress {BIO 18297352 <GO>}

We are very excited about our deal with Mercedes, really a transformational deal, not only for us but for the industry as a whole. We do believe a lot of people are looking at our deal and how it was overall structured.

So we are providing Mercedes with our full technology stack expanding from the data center and the data center with its infrastructure and development as well as in car AI. The cars will be software-defined and upgradable over the life of the vehicle. And what we see right now is Mercedes sells probably about 2 million cars a year.

So let's take an example. If you assume that probably about $10,000 per car in software is sold for autonomous types of cars, kind of similar to what we see in the market for overall Tesla, that's an opportunity of revenue to be split between NVIDIA and Mercedes in software for us, outside of also the purchase in terms of the actual hardware that will sit inside of the Mercedes car. This is a very large multibillion-dollar opportunity for us. The deal is not exclusive and can strike similar deals with others in the industry. So we have now built a multibillion-dollar design win pipeline that will drive probably an inflection in revenue in the next couple of years.

A - Joseph Moore {BIO 17644779 <GO>}

Okay. Great. Well unfortunately, we're out of time. I didn't get to all my questions. But that was a great overview.

Thank you, so much for your time today. Good luck.

A - Colette Kress {BIO 18297352 <GO>}

Thanks Joe, for having us. Appreciate it.

A - Joseph Moore {BIO 17644779 <GO>}

Thank you.