Company Name: Applied Materials
Company Ticker: AMAT US
Date: 2019-02-14
Event Description: Q1 2019 Earnings Call

Market Cap: 38,831.50
Current PX: 40.71
YTD Change($): +7.97
YTD Change(%): +24.343

Bloomberg Estimates - EPS
Current Quarter: 0.725
Current Year: 3.296
Bloomberg Estimates - Sales
Current Quarter: 3557.059
Current Year: 15113.227

Q1 2019 Earnings Call

Company Participants

- Michael Sullivan
- Gary E. Dickerson
- Daniel J. Durn

Other Participants

- C.J. Muse
- Atif Malik
- Toshiya Hari
- John William Pitzer
- Harlan Sur
- Pierre C. Ferragu
- Steven Kinney Chin
- Timothy Arcuri
- Vivek Arya
- Joseph Moore
- Patrick J Ho
- Quinn Bolton

MANAGEMENT DISCUSSION SECTION

Michael Sullivan

GAAP and Non-GAAP Financial Measures

Today's call also includes non-GAAP financial measures

Reconciliations to GAAP measures are contained in today's earnings press release and in our reconciliation slides, which are available on the Investor Relations page of our website at appliedmaterials.com

Gary E. Dickerson

Business Highlights

Opening Remarks

- In our first fiscal quarter of 2019, Applied Materials delivered solid results in a challenging business environment
- Over the past two months, we have become increasingly cautious about near-term macroeconomic risks and have seen further pullback in customers' investments
- At the same time, we remain highly optimistic about the long term

- Powerful new growth drivers for the semiconductor and display industries are emerging, and we see tremendous opportunities for the company ahead
- While we're taking appropriate actions to navigate current market dynamics, we are not losing focus on the bigger picture
- We're making strategic investments in new technology, products and capabilities that will position Applied to play a bigger and brighter role in the future
- In today's call, I'll start by providing more details about our outlook for the year ahead, then I'll talk about the future growth drivers that are reshaping our industry, and I'll finish by describing Applied's strategy and highlight some recent accomplishments and milestones

Near-Term Environment

- Let me begin with the near-term environment and our current perspective on 2019
- In the past quarter, there's been more negative than positive news with the whole industry facing challenges, which include macro conditions in emerging markets that have weakened, smartphone demand falling short of expectations, particularly for high-end models which have more semiconductor content, and DRAM prices which have declined as inventory levels build
- On the positive side, we've also observed that NAND inventories are coming down from very high levels seen in the fall, although they remain above normal levels
- Fundamental dynamics in the memory market are healthy with very disciplined investment in new capacity and a strong commitment to advance the technology road map

Semiconductor Capital Investment

- And looking more broadly at semiconductor capital investment, it's important to note that we are in a period of market transition and diversification
- For the past several years, smartphones drove the majority of wafer fab equipment spending
- This year, more than half of customers' investments will be driven by other categories as new growth drivers, including cloud data centers, IoT devices, 5G and automotive applications gain momentum
    - When we take all these factors into account, we see the following implications for Applied's served markets

NAND and DRAM Bit Demand

- Based on recent public comments by our customers, NAND bit demand is expected to grow in the mid-30% range this year and DRAM bit demand in the mid to high-teens
- As a result, we believe that investment by memory customers will be down substantially in 2019
- However, we also expect channel inventory levels to normalize as the year progresses, creating a more favorable setup for 2020

Foundry/Logic

- In foundry/logic, we see investment being flat to slightly up year-on-year, but we expect a higher portion of the spending to be directed towards long lead time equipment specifically EUV lithography

- While this represents a market share headwind for Applied in both 2018 and 2019, it's also a positive indicator of customers' future investment in leading-edge process tools
- Overall, we believe that wafer fab equipment spending in 2019 will be down mid to high-teens on a percentage basis vs. last year

Display

- In display, weakness in emerging markets is also impacting the timing of customers' investment plans
- We see some TV factory projects pushing out of the year and into 2020

Revenue

- As a result, we now believe our display equipment revenue in 2019 will decline by about one-third from 2018s record levels
- We also expect revenue in the second fiscal quarter to be significantly lower than our average run rate for the year
- Over the longer term, we believe the display market remains attractive as the industry is going through several large technology transitions as larger substrates are introduced in TV manufacturing, rigid OLED adoption increases in smartphones and expands to other applications, and initial flexible OLED products get closer to release
    - These inflections create important growth opportunities for Applied over the next several years

Headwinds

- While we're paying close attention to current headwinds and driving efficiencies across the company, we remain focused on our long-term opportunities
- I strongly believe that in the future, technology will play a larger part in many areas of our lives
- Entire industries will be transformed by artificial intelligence, big data, and Industry 4.0 and that the foundation of those transformations are semiconductors
- We're moving beyond a world of general-purpose computing to specialize solutions that address new types of applications and workloads in the cloud and at the edge

Semiconductor Innovation

- And while the need for semiconductor innovation has never been greater, classic Moore's law scaling is challenged
- Simply shrinking transistors no longer delivers simultaneous improvements in the power, performance, and cost of chips
- As I've said before, to unlock the full potential of AI and big data, we need a new playbook for semiconductor design and manufacturing which will include new architectures, new 3D techniques, novel materials, new ways to shrink transistors, and advanced packaging techniques
    - All five of these areas require major advances in materials engineering and create tremendous opportunities for Applied Materials

Investments

- To enable this playbook and accelerate innovation for our customers, we're making investments in new capabilities, creating entirely new types of products and extending our engagements across the ecosystem
- For example, we recently announced that we're expanding our long-standing technology partnership with IBM as a member of their new AI Hardware Center

META Center

- We're also making good progress with our new Materials Engineering Technology Accelerator which is on track to open later this year
- The META Center will support deeper collaborations with system architects, chip designers and the manufacturing community
- In addition to broadening our participation in the AI-big data inflection, we are also building a more resilient company with diversified revenue streams
- The portion of our revenue generated from sources other than new 300-millimeter semiconductor equipment sales is increasing
- Combined, we expect our services, spares, upgrades, consulting, software, and Display and Flexible Technology businesses to represent about 45% of total sales this year

Applied Global Services

- In Applied Global Services, our progress is fueled by our growing installed base and new advanced service products that help customers shorten ramp times, improve device performance and yield, and optimize operating costs
- We grew AGS revenue more than 20% in FY2018, and we anticipate high single-digit growth this year even with wafer fab equipment spending expected to be down significantly
    - One reason for this is that more than half our service and spares business now comes from subscription-type revenues in the form of long-term service agreements

Summary

Before I turn the call over to Dan, I'll quickly summarize

Given the elevated macro risks and the challenging environment in both the memory and display markets, our near-term outlook is one of caution

Despite these headwinds in 2019, we remain highly optimistic about the future

While we're taking steps to ensure our spending is aligned with short-term market conditions, we're focusing our investments on long-term opportunities

We're driving innovative new product development and building new capabilities that position Applied to play a bigger and broader role in the industry over the coming years

Daniel J. Durn

Financial Highlights

Opening Remarks

- Today, I'll outline our financial strategy in the current environment, then summarize our Q1 financial results, provide our Q2 business outlook, and give you an update on our new META Center in New York
- As Gary outlined, the end markets that our customers serve weakened during the quarter
- As a result, our semi equipment customers are taking proactive steps to carefully manage capacity additions and reduce inventories
- This sets the industry up well for 2020 and beyond
- We continue to expect the recovery to be shallow and gradual
- And we're still not ready to call the bottom of the current cycle
- At the same time, it's important to put this year's spending into context
- Our WFE forecast for 2019 is still billions of dollars higher than the peaks of all the prior cycles

Backlog, FCF, Investments and Expenses

- Today, our backlog remains healthy, our profitability is solid, we're generating strong FCF, and we're returning cash to shareholders
- Most importantly, we see significant opportunities ahead
- And we have the resources to make disciplined investments to secure technology leadership and growth
- Our strategy is to navigate the current environment by carefully managing our overall expenses, fully funding our new product pipeline, and maximizing our recurring revenue

Expense Control

- Here are some specific examples
- First, expense control
- Our Q1 non-GAAP OpEx was $750mm, including savings from our holiday shutdown and only one month of our annual merit increase
- In Q2, absent these same benefits, we're guiding our overall OpEx to be approximately flat sequentially

R&D Funding

- Next, R&D funding
- Even in the current environment, we're investing more in R&D to strengthen and grow our new technology and product pipeline
- Gary described how the industry needs new architectures and materials to enable better chips for AI
- Later this year, we plan to introduce materials engineering solutions designed to accelerate the adoption of the next-generation of memory chips, which will be highly enabling to cloud computing and the Internet of Things

Recurring Revenue

- Third, recurring revenue
- Gary described how our services revenue should be higher in 2019 even as WFE declines
- We expect the transactional portion of our AGS revenue to grow more slowly this year, as our customers work down excess inventories
- But the subscription-like part of AGS should be higher y-over-y
- In fact, in 2018, we grew the number of tools under comprehensive service agreements at three times the rate of new system shipments
- So we're doing a good job of delivering ongoing value to our customers across a larger portion of our installed base, which is the largest in the industry

Q1 Results

Adoption of ASC 606

- Next, I'll summarize our quarterly results
- As a reminder, Applied adopted the ASC 606 standard for revenue recognition this quarter using the full retrospective approach
- Bear in mind, the differences between revenue recognized under ASC 606 and the old standard will fluctuate from quarter-to-quarter
  - But over time, they will offset each other and the cumulative difference will be minimal
- As we expected, the adoption of ASC 606 had a minimal cumulative impact on the company, increasing our retained earnings by about $6mm

Revenue, Gross Margin, Operating Expenses and Tax Rate

- Now to the results
- In Q1, we delivered revenue that was slightly above the midpoint of guidance
- Our non-GAAP gross margin and operating expenses were at the midpoint of guidance
- We generated non-GAAP earnings of $0.81, which was $0.02 above the midpoint including the impact of a slightly higher tax rate

Semiconductor Systems

Revenue and Operating Margin

- Turning to the segments
- Semiconductor Systems revenue was $2.27B and about 1 percentage point above the midpoint of our outlook
- SSG's non-GAAP operating margin was 28.3%

- Global Services (sic) [Applied Global Services] (14:23) revenue was $962mm and 2 points above the midpoint of our guidance
- AGS non-GAAP operating margin was 29.6%
- Display revenue was $507mm and 1 point above the midpoint of our guidance
- The group's non-GAAP operating margin was 23.3%

Balance Sheet

Turning to the balance sheet

We generated operating cash flow of $834mm or 22% of sales

We returned $942mm to shareholders including $750mm in buybacks

We ended the quarter with $5.3B in cash and investments, and $3.6B remaining in our buyback authorization

Q2 Guidance

Revenue

- Next, I'll provide our Q2 guidance
- We expect company revenue to be approximately $3.48B +/- $150mm
- Within the outlook, we expect Silicon Systems revenue to be in the range of $2.15B +/- $100mm
- Services revenue should be $970mm +/- $25mm
- Our Display revenue should be in the range of $340mm +/- $25mm

Gross Margins, OpEx and Tax Rate

- We expect non-GAAP gross margins of around 43.5% and non-GAAP OpEx of around $750mm, +/- $10mm
- Non-GAAP earnings should be in the range of $0.62 to $0.70 per share
- And our current non-GAAP tax rate expectation is approximately 14%
  - This is about 2 percentage points higher than our initial expectation for 2019
- We've raised our rate expectation primarily to reflect the potential impact of new regulations proposed by the treasury department, along with our latest forecast for geographic revenue mix

R&D Capabilities

- Now, I'll close with an update on the R&D capabilities we're creating at our META Center in Upstate New York
- Over the past quarter, we received approvals needed to begin receiving $250mm in public funding, which is being used to purchase and install Applied Materials systems and other equipment
- We've now shipped our first systems to the META Center, which will be one of the most advanced R&D centers in the world

- We're already engaged with multiple customers to accelerate breakthroughs in semiconductor technology, along with new applications of our materials engineering capabilities
- And we're on track to be running wafers in H2

QUESTION AND ANSWER SECTION

<Q - C.J. Muse>: I guess a two-part question. In terms of your overall guide by segment, it looks like you're suggesting roughly $3.55B a quarter in revenues. And I guess is that math kind of in the ballpark of what you're thinking? And then more importantly, how are you thinking about gross margin trajectory as we go through the year on the change in mix?

<A - Daniel J. Durn>: Thanks, C.J. Can I get you to repeat your first question? I didn't quite understand where you're going.

The second part of the question is, is as we look sequentially into Q2, you see the gross margin guide. Off of those levels and to the back half of our FY, we would expect to see incremental improvement into Q3 and then step up again into Q4. But I apologize, I didn't catch the first part of your question.

<Q - C.J. Muse>: It was just adding up the different segment guide. And is it fair to say that roughly $3.55B is kind of what you're seeing on average on a quarterly basis for revenues through the CY?

<A - Daniel J. Durn>: Yeah. So, I don't think on this call we'll be guiding for the full year. But what we do see into Q2 is $3.48B for the overall company revenue, +/- $150mm.

<Q - Atif Malik>: A two-part question from me as well. First, Gary, can you talk about what should we expect Display mix between LCD and OLED this year? And then, is there any change to your view on the capital intensity of OLED TVs into next year as some of the LCD makers are converting their LCD lines to quantum dot and other flavors of OLED? And then I have a follow-up for Dan.

<A - Gary E. Dickerson>: Okay. Thanks for the question. Let me give you some overall color on the Display business and hopefully I'll cover the two questions that you have. In the six years to 2018, we were able to grow the Display business at a compound annual growth rate of around 25% to $2.5B last year. In 2019, we signaled the incremental weakness on the last call and the market has continued to weaken since that call. We now believe that the market is down around one-third from 2018's record levels. With second quarter – our second quarter to be significantly lower than our projected average run rate for 2019 to 2020.

Relative to the mix on what we have is the biggest incremental change since the last call as weakness in TV, delays in TV investments, it's still compelling for customers to go to Gen 10.5 panels because you can produce eight 65-inch TVs vs. three on Gen 8.5, so it's strategically important for them to go and make that transition, but the timing of the investments are being pushed out.

And then going into 2020, we see small improvement in 2020 and we definitely like the longer-term technology trends and opportunities to grow the business. So hopefully, that gives you some indication around the mix. The biggest difference from our last call is in the TV market.

<Q - Toshiya Hari>: Gary, you talked about the EUV headwinds and the impact it's had on your market share in 2018 and your expectations for 2019. Should we be concerned that it could remain a headwind into 2020 and beyond? Or is this sort of the initial ramp of EUV that's causing some of these issues for you? Thank you.

<A - Gary E. Dickerson>: Yeah. I think if you look at overall market share, third-party data is going to come out in a little over a month. We all's see the numbers including our share. One thing that we'll see is that in the six years going into 2017, we were the only major supplier to be up or flat for six consecutive years. And certainly what we've said in 2018 is that our share will be down, demand softened. And in the back half of the year, we saw a push out to NAND, reuse in foundry.

And overall, spending mix shifted towards litho and areas we don't compete. What you will see in about a month is gains in areas like implant, epi, etch, gaining momentum in packaging. And also, in our Process Control business, I'm happy about the progress there. We had a record year, very strong growth in our e-beam technologies. We may end up being number one in e-beam for the first time ever and very well-positioned with the additional adoptions of new products in 2019.

In 2018 and 2019, logic customers are buying EUV systems and those systems have very long lead times. They're buying the EUV tools years before they go into high-volume manufacturing. We look at that as a positive indicator in the adoption of future nodes. But certainly right now, in 2018 and 2019, it's definitely a headwind. And as we go forward, as NAND spending resumes, that's more material spending vs. litho spending, that's certainly good for us. The trailing-nodes are also not litho-dependent, so that's also going to be good going forward.

And then another factor in 2019 that's more favorable setup for us, we have balanced share in foundry, logic, and memory. So, in a year where DRAM and NAND are much weaker, the relative setup for us is better in 2019. And then what we've talked about is over the longer term we see a very different picture emerging. It's clear the industry needs a new playbook that goes beyond 2D scaling and I deeply believe Applied is in the best position to enable the playbook.

I meet all the time with customers, the leaders of R&D for our top customers on a monthly basis, and this is a big focus for all of those customers. We've talked about five drivers of power, performance, area, and cost as 2D scaling slows and all of those are dependent on breakthroughs in materials engineering. So, I would say longer term, that creates a great opportunity for us. Dan talked about in his prepared remarks new memory technology for AI that's coming later this year. I've talked about 1000x improvement in leakage current that improves power efficiency. Now, those are just early examples of the new playbook, extensive playbook that we've developed.

And then we've also talked about speeding up the new playbook by opening the META Center and figuring out how to integrate all this together so customers can move it into their fabs. Now, I definitely believe the right vision for the industry is materials assistance 10 times faster driving this new playbook. There's never been a time where it's more important, so that's the playbook on how we're going to move the needle for the industry and for Applied.

<Q - John William Pitzer>: Gary, as always, appreciate all the detail you give in your prepared comments. One of the things you mention is just the expectation that memory will be down significantly this year in CY2019 which really shouldn't be a surprise to anybody. But I was wondering if you could just help us understand how your views differ between NANDs and DRAM CapEx for this year and whether or not you see either recovering in the back half of the CY. And I guess importantly, can you talk a little bit about what happens to your SEM and NAND as the industry transitions from 64 to 96 layers?

<A - Gary E. Dickerson>: So, thanks for the question. Let me take first the market opportunity for us. There's no question as customers increase the number of layers, it's all about materials intensity and so that creates a tremendous opportunity for us. We grew market share in memory, a significant amount over the last five years. A lot of the improvements around new materials, new technologies that drive that scaling are really great opportunities for Applied. We are increasing our etch share also in memory. So that's also a very good setup for us.

So, certainly, as the scaling goes forward, we expect that we're going to continue to grow our share as we've done over the last several years. And maybe, Dan, you can answer the question about DRAM vs. NAND?

<A - Daniel J. Durn>: Sure. Thanks, Gary. And John, to get to how 2019 is profiling in the memory space, let me start with what we saw in 2018 and use that as a jumping off point to make some comparative statements about how we see that market profiling in 2019. We'll probably not going to be point-specific on how 2018 ended up because Gartner is going to come out in a month or two with those estimates, but we definitely saw 2018 up over 2017, definitely has a five handle on it. And as you indicated, it was a strong memory growth year. We think as 2018 settled, 60% of the spend in the market was memory-related, 40% – about 40% was foundry/logic-related. Within memory, we saw the NAND, DRAM spend very balanced.

As we look forward into 2019 in Gary's prepared comments, he said y-over-y WFE in 2019 will be down. Memory will be down by a good amount. We expect foundry/logic to be flat to up a little bit. So as 2019 shakes out, we expect

foundry/logic to be greater than memory. Overall, the market will be down mid to high-teens. And as we look at the market between NAND and DRAM, we see it profiling very similar to 2018 and being balanced.

In terms of H2 and I come back in the market, I think we want to set expectations for a slow, gradual recovery off of these levels. While we're having conversations with customers and we see positive lead indicators, we think it's prudent in this environment to set those expectations for a slow, gradual recovery.

As we look into the back half of the year, inventory levels come down faster than we expect, utilizations come up and price stability, those would all create the environmentals for a more robust H2. And if that scenario materializes, then we would benefit significantly from that environment.

And then I wanted to come back to C.J.'s original question because now I think I understand a bit of what he was asking for. And I apologize, C.J.

Let me help shape the revenues this year to I think get at the question you were asking. Off of the levels we guided in Q2, we see our Semi Systems Group flattish on a quarterly basis into the back part of the year.

The run rate of our Display business in Q2 will be below the annual average, so we would see – expect to see that growing into the back part of the year. And then AGS will have its normal, seasonal profile and be higher into Q3 and Q4.

So hopefully, that helps, giving you a bit of the profile and color. And then the gross margin part of your question, again, we expected that to incrementally step up in Q3 and again into Q4.

<Q - Harlan Sur>: Can you just help us understand how you're thinking about the OpEx trajectory beyond Q2, if you do start to see gradual recovery as you describe it? And then on the other hand, if revenues were to take another step-down, let's say beyond Q2, how much could the team flex their OpEx?

<A - Daniel J. Durn>: So OpEx is definitely a controllable spend line. The philosophy we have at the company is, we are going to be an inflection-focused growth company. We're going to grow organically and invest in products and capabilities that will help drive that growth going forward. We do it in the context of the environment we operate in. We will be disciplined operators and instill spend discipline throughout the company.

As you take a look at the guide into Q2, what I would expect if you take a step back and think about where we were a quarter or two ago, we had said we spent about $3B on OpEx in 2018. We would expect that to grow by about $200mm into 2019.

We've adjusted those plans in light of the current environment we're in, and we'll probably bring that down by about $175mm over the course of 2019 off of the original expectations. So up 1%, maybe 1.5% off of the levels we were in 2018.

And we think this strikes the right balance, giving everything we know between near-term discipline that reflects the environment we operate in and strong pursuit of new technologies, new platforms, new winning products that will preserve shareholder value creation into the inflections that we see materializing in the years ahead.

<Q - Pierre C. Ferragu>: I just wanted to come back to the points you made, Gary, about EUV being like a share gainer against you this year but a leading indicator for you going forward.

So how much visibility do you have at this point in time on when EUV gets introduced in mass manufacturing? How's the share, I would say, of AMAT of spending their wafer yielding? So that's one question.

And then the second question is how much of the benefits you see on the back of EUV? Is just more what you do already? And how much is actually new technology that you're going to introduce as well, things like [ph] pro-volt and back-connect (33:24) and others? Thank you.

<A - Gary E. Dickerson>: Thanks for the question, Pierre. So, EUV, as I've talked about, you're seeing early adoption in 2018 and 2019. And in 2019, you're going to see the first chips being built, so you have pilot production.

And when you're adopting a new technology like this, it happens years before you go into high-volume manufacturing. So you see this initial adoption surge in advance of the high-volume manufacturing. And so, again, we do see that as a good leading indicator relative to N5, for instance, when that happens.

Now, one thing also to remember is that EUV will remove legacy etch and depth steps. I mean that's why customers are adopting EUV because it replaces a number of different etch steps, but those aren't our steps.

So at every node, the most important thing for the customers is they have to drive power, performance, area, and cost. And definitely with power and performance, 2D scaling helps. But even more important is innovation in materials.

So if you look at a node like N5 for instance, there are many materials inflections that are being adopted, as customers drive improvements in power and performance. We have a number of different new steps there advanced metal gate materials, epi steps. We have hot and cold implant going from 500 degrees C to minus 140, new surface treatments. We're increasing our share in critical etch steps and have good momentum in new process control solutions. So, that is what will come for us, but what you see right now is this early adoption of EUV as customers prepare for those higher-volume ramps.

What I would also say and I've talked about this many times is I do believe that the industry needs a new playbook. We have stronger and deeper engagements than we've ever had with customers. So that really positions us well. Relative to N5, we're well-positioned. We have deep engagements with customers to drive power and performance on N5 and also for future nodes.

And just the last thing I would add, when we talk about EUV adoption, the majority of the EUV is really in leading-edge technology and logic/foundry. You have half the market that's memory that's driven by materials. You've got about 25% of the market that's the specialty nodes, power devices, image sensors which also are great opportunities for us. So we see about 75% of the market really great opportunities. And in the leading-edge foundry and logic, it's really about power and performance in addition to 2D scaling. And we're in the best position to drive that with our customers going forward.

<Q - Steven Kinney Chin>: First one, as I put, Gary, on your Semi Systems business as it relates to China fully appreciate the ongoing U.S.-China trade tension and also given that there is the one export control on one of your DRAM customers in China, I was wondering if you have seen any spillover effects from the trade tensions and that export control to some of your other customers whether it's in terms of push out in any ramp schedules or perhaps even any increased focus or sourcing tools from local Chinese vendors by your Chinese customers as well.

<A - Gary E. Dickerson>: Yeah. Thanks for the question. So relative to China, from what we see today, it seems like mostly business as usual with our customers in the region. We're very well-positioned in China with domestic and multinational customers. We've been in China for 35 years, very deep relationships across Semi and Display. Just a little bit of color on China. We expect China wafer fab equipment investment to be down y-over-y in 2019 vs. 2018, and we see both domestic and multinational down in China.

In China domestic, we see higher spending on foundry/logic vs. memory. With foundry/logic focused on trailing-nodes for sensors, IoT, those types of devices. Within China domestic spending, we're in a great position and we expect that we're going to gain share. And then also our Display business in China will be down in line with our overall global display forecast. So overall, we have a super strong position in China, semi, service display, great teams, strong relationships and feel good about how we're positioned going forward.

<A - Michael Sullivan>: Thanks, Steve.

<Q - Steven Kinney Chin>: Great. If I could ask a quick follow-up on 200-millimeter equipment demand, I think a number of foundries globally had talked about 8-inch wafer fab initiatives focused specifically on IoT, automotive opportunities in the future. Is that something that will help demand – equipment demand later this year? And should we expect to see these benefits on the systems side or the AGS side? Thanks.

<A - Daniel J. Durn>: Thanks for the question, Steve. The trailing-node geometries in general have been profiling very strong for the last couple of years and 200-millimeter equipment demand is also the same. We continue to expect a

healthy outlook for those mature nodes going forward. And the 200-millimeter equipment demand remains strong. Like you said, IoT sensors are proliferating and driving significant demand at those mature nodes.

I'd also say that there are new AI chip architectures that are being designed at the 28-nanometer node, and they're going to deliver high performance. But to get the same transistor count out into the market as a 7-nanometer node, you need eight times the wafers at 28-nanometers. And so the fact that we're getting new designs of highly capable silicon at nodes like 28-nanometers I think bodes well for the trailing-node market. 200-millimeter is experiencing the same type of dynamic and continues to be strong.

From a financial reporting standpoint, we report our 200-millimeter equipment segment as part of our services AGS reporting segment.

<Q - Timothy Arcuri>: I had two questions. Dan, I guess, the first one is I'm looking at the gross margin guidance 43.5%, it's about the same as you were doing on like $1B lower revenue sort of in mid-2016. So my first question is, I'm just kind of wondering why gross margin gains are not really dropping through over that period. Is that because a lot of the incremental revenue is coming on the services side? And then I have a follow-up. Thanks.

<A - Daniel J. Durn>: Thanks, Tim. As you – as we talked about historically, gross margin is going to be a function of a number of factors. There's an aggregate revenue component, there's mix between our segments and then product mix within segments, as well as overall activity levels in the factory, and they will vary from quarter-to-quarter.

As we take a look at our guide into Q2 when we compare it to peak quarter about a year ago, we're profiling favorably relative to our peers in the industry. And so, the company we think is doing a good job in a difficult environment given the parameters we talked about that influence gross margin, and we're profiling I think favorably relative to peers in the industry given that peak comparison. And you had a follow-up question, Tim?

<Q - Timothy Arcuri>: I did. I did, Dan. Yeah. I'm just trying to understand the change in the model. I think you said maybe six or so months ago before WFE fell off, I think the feeling was that you would do roughly $3.25 annualized that $40B WFE. We're sort of even a little bit above that right now, we're probably at $41B or $42B. But even if you say we're at $40B, you're sort of – based on the guidance, you're roughly $2.65 a year annualized so that's roughly 20% below where you thought. So, pretty big number. I'm just wondering sort of what's changed? Thanks.

<A - Daniel J. Durn>: Sure. So, here's what I would share with you and what we see. In the November quarter, we noted that 2019 was going to shape up a lot like 2017 and that would give us an EPS a bit above $3.25. And since then, we've seen pre-announcements by end customers. One company in the smartphone space, another one in the GPU, and cryptocurrency continues to be weak. So, we've taken customer spending down in Semi and Display. And if you layer in what Gary said down mid to high-teens on a y-over-y basis, clearly, WFE spend is now below the levels we saw in 2017. So my expectation is that earnings not surprisingly will be lower than they were in 2017. But I do like the way the customers are taking proactive steps to get supply in balance with demand work down inventories in both memory and the logic/foundry space so I see the setup into 2020 as being quite good.

<Q - Vivek Arya>: A clarification and a question. On the clarification, Dan, I was hoping you could give us some more color around the subscription vs. transactional mix in AGS, so let us predict how sensitive that business is to WFE vs. your increasing base of deployed tools.

And then the question is, if I look at WFE over a longer period of time, it was in the low to mid-30s for many years and then in 2017 and 2018, it jumped well above that trend to $50 billion-plus; and now, this year, they are in the low $40B. What I'm trying to understand is, what is the right baseline level that when we have, let's say, 2020 as a "normal year", do we grow off of the low-40s that we're right now or do we grow off of the $50B? How do you conceptually think about modeling WFE growth over the next three to five years? Thank you.

<A - Gary E. Dickerson>: Thanks for the question. I'll start with a subscription question and then turn it over to Dan. So overall our service business has grown about 15% compound annual growth rate over the last four years. In 2018, we grew over 20%. What I said in the prepared remarks is we see high-single-digit growth in 2019 in a soft market. And part of what helps us is exactly what you talked about is this subscription revenue. We have a higher percentage.

Over half of our business is subscription revenue with long-term agreements. And so when you're in a soft market, those long-term agreements vs. just selling parts makes a very, very big difference. That's been a conscious strategy on our part to create value for customers, drive more of these comprehensive service agreements.

If you look at 2018, the comprehensive service agreements grew three times faster than the rate of new shipments. So we have – we really changed that strategy around five years ago relative to driving more long-term agreements subscription-type revenue. And even in 2018, it's still growing at a very high rate. It really comes back to creating value for customers, optimizing output, yield, cost. We've put a tremendous focus there. And again, we're getting a lot of traction. So it's good for us and also definitely good for our customers. And then I'll have – turn it over to Dan for the next question.

<A - Daniel J. Durn>: Yeah. And Vivek, on the second part of your question, I think there's a couple of ways to look at it. If we take a longer-term perspective around WFE and we look at it as a percentage of overall semiconductor revenue.

And you go back a couple decades to 2000, WFE as a percentage of semiconductor revenues was about 17%. This was a bit of a peak because our customers were investing in both 200- and 300-millimeter systems.

And then over the course of the next decade, as 300-millimeter cut in, all the factory automation systems and the way our customers consolidated and became more efficient in operating their footprint of capacity, you saw it come down to about 9% in 2013.

Now that all the efficiency gains from 300-millimeter have worked their way through the system, 450 millimeters is not on the road map. In the last few years, since 2013, that WFE intensity has climbed to 11%, 12%.

In an environment characterized like we're in now, where we see elevated inventory levels on both the foundry/logic side, as well as the memory side, and our customers managing in a very disciplined way supply to meet end market demand, we see those inventories come down. And so, I think it's a good setup for 2020. But I don't think what happens this year forms the baseline, because we do think what's happening this year is shipping below true end market demand as these inventories come down.

<Q - Joseph Moore>: I wanted to follow up on the comment that you made about China spending being down and being a little bit foundry-oriented. There still seems to be quite a bit of desire to build a sovereign memory business. And we've seen a number of players talk about spending large amounts of money.

What do you think it has to – it's going to take to sort of kick-start that effort? And is it a function of the technology being production-ready? Is it a function of the market environment, green room space? Just what's the gating factor behind that business starting to grow?

<A - Gary E. Dickerson>: Yeah. Thanks for the question. Memory technology, I think you can see in terms of the 3D NAND ramp is very difficult. Companies that have decades of experience, tremendous technology, deep experienced talent, I mean those customers had difficulty transitioning from 2D to 3D NAND.

And certainly DRAM scaling is extremely difficult right now. So, it just takes a lot of time to build that type of a technology base. And you also need experienced talent across many, many different types of skill sets.

So, what we've said before, in terms of China, is that China will definitely continue to incrementally spend. But it's going to be years before you see, if you look at the cost per bit, any type of competitiveness. On the leading-edge it's going to take a lot of time to develop the technology, to develop the talent.

And in the meantime, again, in the foundry/logic area, there is a tremendous growth in sensors, IoT, trailing-edge technologies. And we see rational spending there, ramping in China. And again, that's the – more of the spending in 2019.

So again, we see increases. But as we've said before, we don't see a hockey stick. It's going to take many years to build the talent and technology.

<Q - Patrick J Ho>: Gary, maybe just following up some of the commentary you've made about EUV on this conference call, particularly for the leading-edge foundry and the increasing litho intensity in the near term.

At the same time, as these leading-edge nodes shrink to 10, 7 and 5 nanometers, we're seeing new materials implementation, stuff like cobalt for interconnects and other new processes being brought on board. Can you discuss a little more specifically Applied Materials capital intensity for its process segment, that even with EUV, you'll continue to see increases for your business segments on a going-forward basis for leading-edge logic and foundry?

<A - Gary E. Dickerson>: Yeah. Thanks, Patrick. As I said earlier on N5, really for all the customers, every node, they're driving power, performance, area and cost. 2D scaling is one of the ways that they're driving those improvements and certainly shrinking is part of that.

Pattern placement, techniques to place patterns in the right location, are also part of that, where we've said before we expect our patterning revenue to grow. We've grown significantly over the last several years. We do still see, if you look across the whole industry, our patterning share to continue to grow for Applied Materials.

And then for power and performance, some of the things I talked about earlier in N5, gate materials, epi, implant, surface treatment technologies. I'll tell you, the interfaces are getting very, very difficult.

And so when you look at how you improve power and performance, you're talking about a few atoms making a very big difference. In some cases, you take wafers out of one process chamber. Immediately, in a matter of seconds or minutes, you have moisture being absorbed into the films, oxidizing. That impacts device performance.

So more of these integrated material solutions will be the path in terms of how people drive scaling going forward. The 1000x leakage, current example I've given, is I think a prime example of a huge improvement in power and performance and that requires a combination of technologies on a platform where Applied has a significant advantage. So those are the areas we're focused on. We have many deep conversations with a number of different companies I meet on a regular basis with all of the R&D leaders and really that's the focus for us and creates a big opportunity.

<Q - Quinn Bolton>: Gary, I just wanted to follow up on the market share comments. Obviously, the mix shift towards EUV hurt supply. But if you look at the segments in which you compete today, what are your expectations for share gains? Are you flat to still gaining share in those segments? And then sort of a second question is just, you talked about it in the script, you're not yet ready to call the bottom. Just curious what signs are you looking for before you're ready to call the bottom on the semiconductor side? Thank you.

<A - Daniel J. Durn>: Yeah. On the semiconductor cycle and calling the bottom, I think what we're looking to in the back part of the year, we've got conversations, deep conversations ongoing with customers. And while we like some of the positively indicators we're seeing, we still see inventory at an elevated level coming down. And if we were to see that come down faster than we're currently contemplating, utilizations rising, ASP stability, I think those will be all good lead indicators that would look into the back half of 2019 and change the trend lines that we see. And again, if that is the scenario that materializes, we will benefit greatly in that environment.

<A - Gary E. Dickerson>: Yeah. I think on the market share question, certainly, we're doing well in the areas we're competing, but we're driving to compete in more areas. There are certain areas where there are big TAM expansion opportunities, those are areas that we're very focused on. And we've talked many times about inflection-focused innovation.

There's no question the playbook is changing going forward. It's not all about 2D scaling. So whether it's in advanced logic, specialty nodes like power devices, CMOS image sensors or scaling new memory technologies, all of those areas are areas that we're very focused on. They're all dependent on materials innovation and we're driving major investments in those new products and also new structures that enable that new playbook. So, that's a big focus for us and we see it as a great opportunity.

Daniel J. Durn

Closing Remarks

Just a couple of quick thoughts

First, I want you to know that while the environment is challenging, we feel very good about the structural WFE growth that we see in the years ahead. So, today, we're going to do the right things that increase the value of the company

- We will drive spend discipline throughout the organization while we're still investing
- We're going to invest in new products and new capabilities
- This is about winning, winning in new inflections that we know are going to play out in the growth years we see coming

Second, even though we see some positive lead indicators based on conversations with our customers, we will resist the temptation to call the bottom

- What we will do though, we're going to stay close to our customers, we're going to continue to be transparent, and we're going to continue to be available to you
- On that point, we've got the Morgan Stanley Conference coming up in a little less than two weeks
- I look forward to seeing many of you there and both Gary and I at many other events throughout the rest of the year